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Basic Science Poster Session I *

Tuesday, February 25, 2020
5:20 p.m. - 7:30 p.m.

Judges: A. Lenore Ackerman, MD, PhD
Yingchun Zhang, PhD

*Not CME Accredited. Wine and Cheese will be served.

**Poster #BS1**

**THERAPEUTIC EFFECTS AND FATE OF MESENCHYMAL STEM CELLS IN STREPTOZOTOCIN-INDUCED DIABETIC DETRUSOR UNDERACTIVITY RAT MODEL**

Jung Hyun Shin, MD, PhD1, Chae-Min Ryu, PhD1, Hwan Yeul Yu, PhD1, Joon Chul Kim, MD, PhD2, Dong-Myung Shin, PhD3, Myun-Soo Choo, MD, PhD1

1Department of Urology, Asan Medical Center, University of Ulsan College of Medicine, 2Department of Urology, College of Medicine, The Catholic University of Korea, 3Department of Biomedical Sciences, Asan Medical Center, University of Ulsan College of Medicine

Presented By: Jung Hyun Shin, MD, PhD

**Poster #BS2**

**CHRONOLOGICAL STUDY OF MESENCHYMAL STEM CELLS (MSCS), AND MSC-TREATED INJURED URETHRAL TISSUE CROSS-TALK IN RAT BIRTH TRAUMA URINARY INCONTINENCE MODEL: A HIGH ALTITUDE GENE ANALYSIS**

Zhina Sadeghi1,2, Jonathan Kenyon3, Brian Richardson4, Ahmad Khalifa1,2, Michael Cartwright4, Mark Cameron4, Arnold Caplan3, Adonis Hijaz1,2

1University Hospitals Cleveland Medical Center, 2Case Western Reserve University, Urology Institute, Cleveland, OH, 3Department of Biology, Case Western Reserve University, Cleveland, OH, 4Department of Population and Quantitative Health Sciences, Case Western Reserve University, Cleveland, OH

Presented By: Zhina Sadeghi, MD

**Poster #BS3**

**SYNERGISTIC EFFECTS OF N-ACETYLCYSTEINE AND MESENCHYMAL STEM CELL IN LIPOPOLYSACCHARIDE INDUCED CYSTITIS RAT MODEL**

Jung Hyun Shin, MD, PhD1, Chae-Min Ryu, PhD1, Hwan Yeul Yu, PhD1, Joon Chul Kim, MD, PhD2, Dong-Myung Shin, PhD3, Myun-Soo Choo, MD, PhD1

1Department of Urology, Asan Medical Center, University of Ulsan College of Medicine, 2Department of Urology, College of Medicine, The Catholic University of Korea, 3Department of Biomedical Sciences, Asan Medical Center, University of Ulsan College of Medicine

Presented By: Jung Hyun Shin, MD, PhD

**Poster #BS4**

**ENGINEERED STEM CELLS IMPROVE NEUROGENIC BLADDER BY OVEREXPRESSING SDF-1 IN A PELVIC NERVE INJURY RAT MODEL**

Woong Jin Bae, Korea, Kyung Jae Hur, Korea, Ji Youl Lee, Korea, Sae Woong Kim, Korea

Seoul St. Mary's Hospital

Presented By: Woong Jin Bae

**Poster #BS5**

**INDUCED POLARIZATION OF M0 MACROPHAGES TO AN M2 PHENOTYPE UPON SEEDING ON GENIPIN CROSSLINKED COLLAGEN MESH FOR TREATMENT OF STRESS URINARY INCONTINENCE**

Ilaha Isali1, Phillip McClellan1, Eswar Shankar1, Sanjay Gupta1, Mukesh Jain3, Ozan Akkus2, Adonis Hijaz1

1Department of Urology, Case Western Reserve University, 2Department of Mechanical and Aerospace Engineering, Case Western Reserve University, 3Harrington Discovery Institute and the Harrington Heart and Vascular Institute, University Hospitals Cleveland Medical Center, and the Case Cardiovascular Research Institute, Case Western Reserve University

Presented By: Ilaha Isali, MD

**Poster #BS6**

**VERIFICATION OF MESENCHYMAL STEM CELL INJECTION THERAPY FOR INTERSTITIAL CYSTITIS IN A RAT MODEL**

Eun Sang Yoo, Urologist, Jae-Wook Chung, Urologist, Jun Nyung Lee, Urologist, Hyeong Gon Kim, Urologist

Kyungpook National University Hospital

Presented By: Eun Sang Yoo
Poster #BS7 LIQUID CRYSTAL ELASTOMERS AS DYNAMIC MATERIAL FOR THE TREATMENT OF URINARY INCONTINENCE
Seelay Tasmim¹, Cedric P. Ambulo¹, Mario I. Romero-Ortega¹, Philippe E. Zimmern², Taylor H. Ware¹
¹The University of Texas at Dallas, Dept. Bioengineering, Richardson, TX, ²The University of Texas Southwestern Medical Center, Dept. Urology, Dallas, TX
Presented By: Seelay Tasmim, BMEN PhD

Poster #BS8 WITHDRAWN

Poster #BS9 SEQUENTIAL OR SIMULTANEOUS SELECTIVE STIMULATION OF RELEVANT PELVIC FLOOR NERVES WITH NOVEL NEUROCLIP ELECTRODES CAN AFFECT THE URETHRAL CLOSING MECHANISM
Ana Hernandez-Reynoso, Graduate Student¹,², Brian Hedden, Graduate Student¹,², Farial Rahman, Graduate Student¹, Ramy Goueli, Fellow³,⁴, Margarita Martinez-Gomez, Professor³, Philippe Zimmern, Professor³,², Mario Romero-Ortega, Professor¹,²,⁵
¹Bioengineering, University of Texas at Dallas, ²Department of Surgery, University of Texas Southwestern Medical Center, ³Department of Urology, University of Texas Southwestern Medical Center, ⁴Instituto de Investigaciones Biomedicas, UNAM, ⁵Department of Health Care Sciences, University of Texas Southwestern Medical Center
Presented By: Ana Guadalupe Hernandez Reynoso, MS

Poster #BS10 SELECTIVE NEUROMODULATION OF THE BULBOSPONGIOSUS NERVE IMPROVES VOIDING EFFICIENCY IN OLD MULTIPAROUS RABBITS
Ana Hernandez-Reynoso, Graduate Student¹,², Dora Corona-Quintanilla, Research Associate³, Francisco Castelan, Research Associate³,², Philippe Zimmern, Professor³,², Margarita Martinez-Gomez, Professor³,², Mario Romero-Ortega, Professor¹,²,⁵
¹University of Texas at Dallas, Department of Bioengineering, Richardson, TX, ²University of Texas Southwestern Medical Center, Department of Surgery, Dallas, TX, ³Universidad Autonoma de Tlaxcala, Centro de Investigaciones Biomedicas, UNAM, ⁴University of Texas Southwestern Medical Center, Department of Health Care Sciences, Dallas, TX
Presented By: Ana Guadalupe Hernandez Reynoso, MS

Poster #BS11 IN VITRO BENCH TESTING OF A TElemetric DEVICE USING BLUE TOOTH TECHNOLOGY: ADVANCING THE SCIENCE OF PRECISE URETHRAL COMPRESSION
Angelo Gousse, MD¹, Christopher Gomez, MD², Chris Ross³, Peter Sayet⁴
¹Bladder Health Reconstructive Urology Institute, ²Baptist Hospital, ³Engineering Resources Group, ⁴Precision Medical Devices
Presented By: Angelo E. Gousse, MD

Poster #BS12 A STUDY OF SACRAL LEAD STABILITY USING BOTH EXPERIMENTAL AND COMPUTATIONAL MODELS
Jeff Bodner, MS, Walt Baxter, PhD, Christina Leung, BS, Phillip Falkner, DVM, Rob Sandgren, BS Medtronic
Presented By: Jeff Bodner, MSBME, MSME

Poster #BS13 IMAGING BLADDER FLUID DYNAMICS USING MRI
Kerac Falk, Fellow¹, Mustafa Usta, Post-doctoral Fellow², Polina Advolodkina, Fellow³, Cyrus Aidun, Assistant Professor², Robert Kelley, Assistant Professor¹
¹Div. Female Pelvic Medicine and Reconstructive Surgery, Emory University Schol of Medicine, Atlanta, GA, ²Dept. Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA, ³Division of Female Pelvic Medicine and Reconstructive Surgery, UT Southwestern, Dallas, TX
Presented By: Robert Kelley, DO, MBA

Poster #BS14 A NOVEL METHOD TO INCREASE BLADDER CAPACITY USING EXTERNAL COMPRESSION EXERCISES
Samuel Weprin, Zachary Cullingsworth, John Speich, Adam Klausner
Virginia Commonwealth University
Presented By: Samuel A. Weprin, MD

Poster #BS15 SEGMENTATION AND 3D ANATOMICAL RENDERINGS FROM PELVIC MRI PROVIDE A NOVEL METHOD TO QUANTIFY CLINICALLY RELEVANT FEATURES OF THE BLADDER AND PROSTATE
Lucille Anzia¹, Cody Johnson¹, Diego Hernando¹, Shane Wells¹, Wade Bushman², Alejandro Roldán-Alzate¹
¹Department of Radiology, ²Department of Urology
Presented By: Alejandro Roldan-Alzate, PhD
**ABSTRACT LISTING**

**Poster #BS16**  
**PELVIC MRI DEMONSTRATES REGIONALIZED THICKENING OF THE BLADDER IN ASSOCIATION WITH AGE-DEPENDENT INCREASE IN PROSTATE VOLUME**  
Lucille Anzia¹, Cody Johnson¹, Diego Hernando¹, Shane Wells¹, Wade Bushman², Alejandro Roldán-Alzate¹  
¹Department of Radiology, ²Department of Urology  
Presented By: Alejandro Roldan-Alzate, PhD

**Poster #BS17**  
**WHAT IS BEING REPORTED ABOUT VAGINAL "LASERS"?: AN EXAMINATION OF ADVERSE EVENTS REPORTED TO THE FDA**  
Linda Burkett, MD, Pamela Moalli, MD, PhD, Mary Ackenbom, MD, MSc  
Dept OB/GYN/REI, University of Pittsburgh Medical Center, Magee-Womens Hospital, Pittsburgh, PA  
Presented By: Linda Scheider Burkett, MD

**Poster #BS18**  
**ASSOCIATION BETWEEN GAIT AND PELVIC FLOOR SYMPTOMS: A PILOT STUDY**  
Kevin Morgan, MD¹, Erin McCallister, PT, DPT², Daniel Flowers, PT, DPT², Amanda Mahoney, PT, DPT², Travis Wilmore³, Clifton F. Frilot II, PhD⁴, Alex Gomelsky, MD  
¹LSU Health Shreveport Department of Urology, ²LSU Health Shreveport School of Allied Health Professions, ³LSU Health Shreveport School of Medicine  
Presented By: Kevin N. Morgan, MD

**Poster #BS19**  
**UTERINE BIOIMPEDANCE COMBINED WITH ARTIFICIAL INTELLIGENCE AS A MEANS OF CANCER DETECTION**  
Shabnam Gupta, MD¹, Andres Vargas, PhD², Gary Saulnier, PhD³, Jon Newell, PhD⁴, Robert Kelley, DO, MBA¹  
¹Obstetrics and Gynecology, Emory University, Atlanta, GA, ²Mathematics, Rensselaer Polytechnic Institute, Troy, NY, ³College of Engineering and Applied Sciences, University at Albany – SUNY, Albany, NY, ⁴Biomedical Engineering, Rensselaer Polytechnic Institute, Troy, NY  
Presented By: Robert Kelley, DO, MBA

**Poster #BS20**  
**DEVELOPMENT OF URINATION TIME RECOGNITION TECHNOLOGY IN MOBILE ENVIRONMENT**  
Kyung Jin Chung¹, Su Jin Kim², Young Sam Cho³, Myung-Soo Choo⁴, Khae Hawn Kim¹  
¹Gachon University Gil Medical Center, Gachon University School of Medicine, Incheon, Korea, ²Department of Urology, Yonsei University Wonju College of Medicine, Wonju, Korea, ³Department of Urology, Sungkyunkwan University School of Medicine, Seoul, Korea, ⁴Department of Urology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea  
Presented By: Kyung Jin Chung

**Poster #BS21**  
**CARRYING OUT A NOMOGRAM ALLOWING FOLLOW-UP BY FREE UROFLOWMETRY OF WOMEN AT RISK OF RETENTION AFTER MID URETHRAL SLING**  
Françoise Valentini, Pierre Nelson  
Hopital Rothschild  
Presented By: Francoise A. Valentini, MD, PhD

**Poster #BS22**  
**METAGENOMIC ANALYSIS OF THE GENITOURINARY MICROBIOME OF POSTMENOPAUSAL WOMEN AND ITS RELATIONSHIP TO RECURRENT UTI**  
Michael Neugent, MS¹, Neha Hulyalkar¹, Ashwani Kumar, BS², Amy Kuprasertkul, BS³, Chao Xing, PhD², Philippe Zimmern, MD⁴, Kelli Palmer, PhD⁵, Nicole De Nisco, PhD⁶  
¹University of Texas at Dallas, Biological Sciences, ²U.T. Southwestern Medical Center, McDermott Center Bioinformatics Lab, ³U.T. Southwestern Medical Center, Urology  
Presented By: Michael Neugent, MS, BS

**Poster #BS23**  
**EVALUATION OF THE COX-2 PATHWAY AS A THERAPEUTIC TARGET FOR RECURRENT URINARY TRACT INFECTION IN POSTMENOPAUSAL WOMEN**  
Tahmineh Ebrahimzadeh, BS¹, Amy Kuprasertkul, BS², Belle Marco, M.S.¹, Kim Orth, PhD³, Philippe Zimmern, MD⁴, Nicole De Nisco, PhD⁵  
¹University of Texas at Dallas, Biological Sciences, ²U.T. Southwestern Medical Center, Urology, ³U.T. Southwestern Medical Center, Molecular Biology, ⁴Howard Hughes Medical Institute  
Presented By: Tahmineh Ebrahimzadeh, BS

**Poster #BS24**  
**UROPATHOGENIC ESCHERICHIA COLI MOTILITY TYPES: GENETICS, CONTROL, AND ELECTRON MICROSCOPY**  
Jacob Hogins, BS¹, Sankalya Ambagaspitiye, PhD¹, Philippe E. Zimmern, MD; PI², Larry Reitzer, Phd; PI¹  
¹The University of Texas at Dallas, Department of Biological Sciences, ²U.T. Southwestern Medical Center, Urology  
Presented By: Jacob Hogins, BS
Poster #BS25  COMPARATIVE RNA SEQ ANALYSIS OF UROPATHOGENIC AND NONPATHOGENIC ESCHERICHIA COLI STRAINS SUGGEST A UPEC-SPECIFIC METABOLISM
Jacob Hogins, BS1, Philippe E. Zimmern, MD;PI2, Larry Reitzer, PhD;PI1
1The University of Texas at Dallas, Department of Biological Sciences, 2U.T. Southwestern Medical Center, Urology
Presented By: Jacob Hogins, BS

Poster #BS27  THE GENITO-URINARY MICROBIOME OF POSTMENOPAUSAL WOMEN WITH RECURRENT URINARY TRACT INFECTIONS AS COMPARED TO POSTMENOPAUSAL CONTROLS
Megan Bradley1, Amanda Artsen1, Kelvin Li2, Barbara Methe3
1Magee Womens Hospital - University of Pittsburgh Medical Center, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Urogynecology, 2Center for Medicine and the Microbiome, University of Pittsburgh, 3Division of Pulmonary, Allergy and Critical Care Medicine, Department of Medicine, University of Pittsburgh School of Medicine and University of Pittsburgh Medical Center
Presented By: Megan Sara Bradley, MD

Poster #BS28  ELUCIDATING THE FUNCTION OF THE T-CELL-MEDIATED ADAPTIVE IMMUNE RESPONSE IN HUMAN RECURRENT URINARY TRACT INFECTION
Jashkaran Gadhvi, BS1, Fatima Khan, BS1, Philippe Zimmern, MD2, Nicole De Nisco, PhD1
1University of Texas at Dallas, Biological Sciences, 2U.T. Southwestern Medical Center, Urology
Presented By: Jashkaran Gadhvi, BS

Poster #BS29  DIFFERENTIAL SENSITIVITY OF UROPATHOGENIC E. COLI STRAINS ISOLATED FROM POSTMENOPAUSAL WOMEN TO CETYLPYRIDINIUM CHLORIDE
Namrata Sawant, M.S.1, Krutika Pandit1, William Randolph Warner2, Philippe Zimmern, MD3, Nicole De Nisco, PhD1
1University of Texas at Dallas, Biological Sciences, 2US-BioPharma, 3U.T. Southwestern Medical Center, Urology
Presented By: Namrata Sawant, MS

Poster #BS30  PROPHYLACTIC ANTIBIOTICS AND THE URINARY MICROBIOME IN MENOPAUSAL WOMEN WITH RECURRENT URINARY TRACT INFECTIONS
Monique Vaughan, MD1, Li Ma, MS, PhD2, Lisa Karstens, PhD, MBI3, Cindy Amundsen, MD1, Nazema Siddiqui, MD1
1Duke University, Department of Obstetrics and Gynecology, Division of Female Pelvic Medicine and Reconstructive Surgery, Durham, NC, 2Duke University, Department of Statistical Science, Durham, NC, 3Oregon Health and Science University, Departments of Medical Informatics and Clinical Epidemiology and Obstetrics Gynecology, Portland, OR
Presented By: Monique Hiersoux Vaughan, MD

Poster #BS31  MALX AS A VIRULENCE FACTOR IN UROPATHOGENIC ESCHERICHIA COLI: CORRELATION WITH URINARY TRACT INFECTIONS AND ANALYSIS OF ITS FUNCTION
Andrew Petter, BS1, Jacob Hogins, BS1, Philippe E. Zimmern, MD;PI2, Larry Reitzer, MD;PI1
1The University of Texas at Dallas, Department of Biological Sciences, 2U.T. Southwestern Medical Center, Urology
Presented By: Andrew Petter, BS

Poster #BS32  REDUCED UROTHELIAL EXPRESSION OF UROPLAKIN-3A FOLLOWING CYSTOSCOPY WITH FULGURATION OF TRIGONITIS IN POSTMENOPAUSAL WOMEN WITH RECURRENT URINARY TRACT INFECTION
Amy Kuprasertkul, BS1, Luming Chen, BS2, Kim Orth, PhD2, Nicole De Nisco, PhD3, Philippe Zimmern, MD1
1U.T. Southwestern Medical Center, Urology, 2U.T. Southwestern Medical Center, Molecular Biology, 3University of Texas at Dallas, Biological Sciences
Presented By: Amy Kuprasertkul, BS
Top 10 Basic Science Abstract Presentations

Wednesday, February 26, 2020
11:15 a.m. - 12:20 p.m.

Moderators: Julie Christianson, PhD
Larissa V. Rodriguez, MD, FPMRS

11:15 a.m.  #1  BRAIN CIRCUITS UNDERLYING URINARY URGENCY IN OVERACTIVE BLADDER SYNDROME: A SYMPTOMS OF LOWER URINARY TRACT DYSFUNCTION RESEARCH NETWORK (LURN) NEUROIMAGING STUDY
Ishtiaq Mawla, MS1,2, Andrew Schrepf, PhD1, Eric Ichescu, BS1, H. Jason Kutch, PhD3, H. Henry Lai, MD4, Margaret E. Helmuth, MA5, Victor P. Andrevev, PhD, DSc5, Steven E. Harte, PhD1,2, Richard E. Harris, PhD1,2, Ziya Kirkali, and the LURN Group, MD6
1Chronic Pain and Fatigue Research Center, Department of Anesthesiology, University of Michigan, Ann Arbor, MI, 2Neuroscience Graduate Program, University of Michigan, Ann Arbor, MI, 3Division of Biokinesiology and Physical Therapy, University of Southern California, Los Angeles, CA, 4Division of Urologic Surgery, Departments of Surgery and Anesthesiology, Washington University in St. Louis, St. Louis, MO, 5Arbor Research Collaborative for Health, Ann Arbor, MI, 6National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD
Presented By: Ishtiaq Mawla, MS

11:21 a.m.  #2  EXERCISE MODULATES NEURONAL ACTIVATION IN THE MICTURITION CIRCUIT OF CHRONICALLY STRESSED RATS: A MAPP RESEARCH NETWORK STUDY
Larissa Rodriguez1, Zhuo Wang2, Yumei Guo2, Mellisa T. Stanford3, Jihchao Yeh4, Jackie J Mao4, Rong Zhang4, Daniel Holschneider5
1University of Southern California, Departments of Urology and Obstetrics and Gynecology, 2University of Southern California, Department of Psychiatry and the Behavioral Sciences, 3Texas Tech University Health Sciences Center, 4University of Southern California, Department of Urology, 5University of Southern California, Psychiatry and the Behavioral Sciences
Presented By: Larissa V. Rodriguez, MD, FPMRS

11:27 a.m.  #3  SUBTYPES OF SENSORY SENSITIVITY IN OVERACTIVE BLADDER SYNDROME: RESULTS OF NEUROIMAGING AND SENSORY TESTING FROM THE SYMPTOMS OF LOWER URINARY TRACT DYSFUNCTION RESEARCH NETWORK (LURN)
Ishtiaq Mawla, MS1,2, Andrew Schrepf, PhD1, Eric Ichescu, BS1, H. Jason Kutch, PhD3, H. Henry Lai, MD4, Margaret E. Helmuth, MA5, Victor P. Andrevev, PhD, DSc5, Richard E. Harris, PhD1,2, Steven E. Harte, PhD1,2, Ziya Kirkali, and the LURN Group, MD6
1Chronic Pain and Fatigue Research Center, Department of Anesthesiology, University of Michigan, Ann Arbor, MI, 2Neuroscience Graduate Program, University of Michigan, Ann Arbor, MI, 3Division of Biokinesiology and Physical Therapy, University of Southern California, Los Angeles, CA, 4Division of Urologic Surgery, Departments of Surgery and Anesthesiology, Washington University in St. Louis, St. Louis, MO, 5Arbor Research Collaborative for Health, Ann Arbor, MI, 6National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD
Presented By: Ishtiaq Mawla, MS

11:33 a.m.  #4  NEURAL CONTROL OF THE LOWER URINARY TRACT BY STAUFEN2
Valerie Schumacher1,2, Vivian Cristofaro1,3, Bryan Sack1,2,4, Claire Doyle1,2,4, Rosalyn Adam1,2, Maryrose Sullivan1,2
1Department of Urology, Boston Children’s Hospital, Boston, MA, 2Department of Surgery Harvard Medical School, Boston, MA, 3Division of Urology, VA Boston Healthcare System, West Roxbury, MA, 4Present address Department of Urology, University of Michigan, Ann Arbor, MI
Presented By: Valerie Schumacher
11:39 a.m. #5 FUNCTIONAL AND HISTOLOGICAL CHANGES IN THE DOG URINARY BLADDER AFTER DIFFERENT DECENTRALIZATION AND REINNERVATION STRATEGIES
Mary F Barbe, Professor1, Geneva E Cruz, Research Scientist1, Brian S. McIntyre, MD student2, Emily P Day, Student1, Dania Giaddui, Research Scientist1, Courtney L Testa, Research Scientist1, Alan S Braverman, Research Associate1, Ekta Tiwari, Postdoctoral Fellow1, Justin M Brown, Director, Paralysis Center3, Michael R Ruggieri, Professor1
1Temple University School of Medicine, 2Drexel University College of Medicine, 3MGH-Harvard
Presented By: Mary F. Barbe, PhD

11:45 a.m. #6 DELINIATION OF INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME PATIENT SUBGROUPS BASED ON MOLECULAR EXPRESSION PROFILE ANALYSES
Tyler Overholt, MD1, Robert Evans, MD1,2, Catherine Matthews, MD1,2, Gopal Badlani, MD1,2, Trang Simon, BS3, Olivia Cain, Stephen Walker, PhD1,2,3
1Wake Forest Baptist Health Department of Urology, 2Wake Forest Baptist Health Female Pelvic Medicine and Reconstructive Surgery, 3Wake Forest Baptist Health Institute for Regenerative Medicine
Presented By: Tyler Lynne Overholt, MD

11:51 a.m. #7 MICROBIAL COMPOSITION DEFINES PELVIC PAIN PHENOTYPES IN REPRODUCTIVE-AGE WOMEN
A. Lenore Ackerman, MD, PhD1, Muhammed Khalique, M.S.1, James Ackerman, MA1, Zhi Cheng, MD1, Karyn Eilber, MD1, Jennifer Anger, MD, MPH1, David Underhill, PhD2
1Cedars-Sinai Medical Center, Dept. of Surgery, 2Cedars-Sinai Medical Center, Immunobiological Research Institute
Presented By: A. Lenore Ackerman, MD, PhD

11:57 a.m. #8 REDUCED HIPPOCAMPAL VOLUME AND METABOLIC RESPONSE TO ADULT STRESS EXPOSURE IN A MOUSE MODEL OF UROGENITAL HYPERSENSITIVITY
Aaron Brake1, Xiaofang Yang1, Chu-Yu Lee2, Paul Keselman2, Olivia Eller-Smith1, In-Young Choi2, Janna Harris1,2, Julie Christianson1
1University of Kansas Medical Center, Department of Anatomy and Cell Biology, 2University of Kansas Medical Center, Hoglund Brain Imaging Center
Presented By: Julie Christianson, PhD

12:03 p.m. #9 EFFECT OF VITAMIN D DEFICIENCY ON THE DAY-NIGHT MICTURITION RHYTHM OF FEMALE MICE
Elishia McKay1, Marcia Urban-Maldonado2, Sylvia Suadicani2
1Department of OB/GYN, Albert Einstein College of Medicine and Montefiore Medical Center, 2Department of Urology, Albert Einstein College of Medicine and Montefiore Medical Center
Presented By: Elishia Renee McKay

12:09 p.m. #10 FUNCTIONAL MRI DETECTED CHANGES IN BRAIN ATTENTIONAL NETWORKS: ASSOCIATION WITH HYPNOTHERAPY FOR TREATMENT OF URGENCY URINARY INCONTINENCE
Loren Ketai1, Yuko Komesu1, Andrew Mayer2, Andrew Dodd2, Ron Schrader3, Robert Sapien1, Rebecca Rogers4
1University of New Mexico Health Science Center, 2Mind Research Network, 3University of New Mexico Clinical and Translational Center, 4University of Texas Dell Medical School
Presented By: Loren Ketai, MD
Basic Science Poster Session II *

Wednesday, February 26, 2020
4:45 p.m. - 6:55 p.m.

Judges: Vivian Cristofaro, PhD
       John P. Lavelle, MD, FRCSI

*Not CME Accredited

Poster #BS26 ASSOCIATIONS BETWEEN URINARY BACTERIAL LOAD AND URGENCY URINARY INCONTINENCE*
Lisa Karstens, PhD1, Eric Leung1, Fatoumata Jallow2, Matthew Schlieisman3, Manny Rodriguez4, W.Thomas Gregory, MD5, Rahel Nardos, MD, MCR6,7
1Oregon Health Science University, Division of Bioinformatics and Computational Biomedicine, Portland, Oregon, 2Portland State University, Portland, Oregon, 3Oregon Health Science University, Flow Cytometry Core, Portland, Oregon, 4Oregon Health Science University, Division of Arthritis and Rheumatic Diseases, Portland, Oregon, 5Oregon Health Science University, Division of Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, Portland, Oregon, 6Oregon Health Science University, 7Kaiser Permanente Northwest, Division of Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, Portland, Oregon
Presented By: Rahel Nardos, MD, MCR
*2015 OAB Grant Recipient

Poster #BS33 DETRUSOR UNDERACTIVITY IS ASSOCIATED WITH OXIDATIVE STRESS AND DETRUSOR FIBROSIS IN METABOLIC SYNDROME
CR Powell, MD1, Albert Kim, PhD2, Joshua Roth, MD1, James Byrd, MS1, Khalid Mohammad, MD PhD1, Mouhamad Alloosh, MD MS1, Babak Ziaie, PhD3, Ragini Vittal, PhD4, Michael Sturek, MS PhD1
1Indiana University, 2Temple University, 3Purdue University, 4University of Michigan
Presented By: C.R. Powell II, MD

Poster #BS34 COMPARISON OF THE IMPACT OF TWO SINGLE INCISION SLINGS
Katherine Shapiro, MD1, Katrina Knight, PhD2, Rui Liang, MD3, Stacy Palscey3, Gabrielle Knight3, Steven Abramowitch, PhD4, Pamela Moalli, MD, PhD4
1University of Pittsburgh Medical Center, Department of Urology, 2University of Pittsburgh, Department of Bioengineering, 3Magee-Womens Research Institute, 4Magee-Womens Research Institute, University of Pittsburgh Department of Urogynecology
Presented By: Katherine Kaiser Shapiro, MD

Poster #BS35 STAGES OF DECOMPENSATION DURING ACUTE ISCHEMIA DEMONSTRATED IN AN EX-VIVO PORCINE BLADDER MODEL
Natalie Swavely, MD1, Samuel Weprin, MD1, Zachary Cullingsworth2, Naveen Nandanan, MD1, John Speich, PhD2, Adam Klausner, MD1
1Virginia Commonwealth University School of Medicine, Department of Surgery, Division of Urology, Richmond, VA, 2Virginia Commonwealth University School of Engineering, Department of Mechanical Nuclear Engineering, Richmond, VA
Presented By: Natalie Swavely, MD

Poster #BS36 FUNCTIONAL CONSEQUENCES OF SPINAL CONTUSION INJURY IN THE LOWER URINARY TRACT IN A FEMALE MURINE MODEL
Salvador Lopez1, Cary DeWitte2, Chan-ho Lee2, Jennifer DeBerry, PhD2
1University of Alabama at Birmingham, Dept. of Psychology, Birmingham, AL, 2University of Alabama at Birmingham, Dept. of Anesthesiology Perioperative Medicine, Birmingham, AL
Presented By: Salvador Ruiz Lopez
ABSTRACT LISTING

Poster #BS37  URODYNAMIC STUDIES AND TELEMETRIC MONITORING OF BLADDER FUNCTION AFTER TRAUMATIC THORACIC SPINAL CORD INJURY IN MINIPIGS
Martin Keung, BSc1,2, Megan Webster, BSc1, Femke Streijger, PhD1, Shera Fisk, MA1, Kuan-Yin Chen, BSc1, Neda Manouchehri, BSc1, Seth Tichelaar, PhD1,2, Kitty So, BSc1, Lynn Stothers, MD1,3, Alex Kavanagh, MD3, Brian Kwon, MD, PhD1,4
1International Collaboration on Repair Discoveries, Vancouver, BC, Canada, 2University of British Columbia, Department of Neuroscience, Vancouver, BC, Canada, 3University of British Columbia, Department of Urology, Sciences, Vancouver, BC, Canada, 4University of British Columbia, Department of Orthopaedics, Vancouver, BC, Canada
Presented By: Martin Keung, BSc

Poster #BS38  OPTOGENETIC CHRONIC NEUROMODULATION OF THE DIABETIC CYSTOPATHY MOUSE MODEL - STUDY DESIGN*
Shannon Wallace, MD1, Yan Wan, MD1, Mason Briggs, BS1, Darlene Tran, BS1, Kate Montgomery, PhD2, Guobing Zhuang, MD, PhD1, Amy Dobberfuhl, MD, M.S.3, Scott Delp, PhD2, Bertha Chen, MD1
1Stanford University School of Medicine, Department of Obstetrics and Gynecology, Stanford, CA, 2Stanford University, Departments of Bioengineering and Mechanical Engineering, Stanford, CA, 3Stanford University School of Medicine, Department of Urology, Stanford, CA
Presented By: Shannon Leigh Wallace, MD
*2017 Neuromodulation Grant Recipient

Poster #BS39  BLADDER WALL MICROMOTION REGIONAL AND DIRECTIONAL VARIATION IN AN ELECTRO-STIMULATED PORCINE MODEL MEASURED BY TEXTURE CORRELATION WITH ANATOMICAL MOTION MODE (AMM) ULTRASOUND
Anna Nagle, PhD1, Zachary Cullingsworth, MS2, Andrea Balthazar, MD3, Charles Blocker, BS3, John Speich, PhD2
1Indiana Tech, 2Virginia Commonwealth University, 3Virginia Commonwealth University Health
Presented By: Anna S. Nagle, PhD

Poster #BS40  THE SEARCH FOR MOUSE MODELS OF TYPE II DIABETIC BLADDER DYSFUNCTION: VOIDING PARAMETERS IN MALES AND FEMALES OF TWO POLYGENIC STRAINS: A PROGRESS REPORT
Erica Bien, Mark Zeidel, Warren Hill
Department of Medicine, Beth Israel Deaconess Medical Center
Presented By: Warren Hill, PhD

Poster #BS41  A NOVEL MOUSE MODEL OF ACUTE URINARY RETENTION
Xiang Xie, Lanlan Zhang, Daniel Chan, Huan Chen, Warren Hill, Mark Zeidel, Weiqun Yu
Beth Israel Deaconess Medical Center
Presented By: Weiqun Yu, PhD

Poster #BS42  OPTOGENETIC CHRONIC NEUROMODULATION OF THE DIABETIC CYSTOPATHY MOUSE MODEL - FUNCTIONAL EFFECT
Shannon Wallace, MD1, Mason Briggs, BS1, Yan Wen, MD1, Darlene Tran, BS1, Kate Montgomery, PhD2, Guobing Zhuang, MD, PhD1, Amy Dobberfuhl, MD, M.S.3, Scott Delp, PhD2, Bertha Chen, MD1
1Stanford University School of Medicine, Department of Obstetrics and Gynecology, Stanford, CA, 2Stanford University, Departments of Bioengineering and Mechanical Engineering, Stanford, CA, 3Stanford University School of Medicine, Department of Urology, Stanford, CA
Presented By: Shannon Leigh Wallace, MD

Poster #BS43  OPTOGENETIC CHRONIC NEUROMODULATION OF THE DIABETIC CYSTOPATHY MOUSE MODEL - HISTOLOGY AND BLADDER TISSUE ANALYSIS
Shannon Wallace, MD1, Darlene Tran, BS1, Mason Briggs, BS1, Yan Wen, MD1, Kate Montgomery, PhD2, Guobing Zhuang, MD, PhD1, Amy Dobberfuhl, MD, M.S.3, Scott Delp, PhD2, Bertha Chen, MD1
1Stanford University School of Medicine, Department of Obstetrics and Gynecology, Stanford, CA, 2Stanford University, Departments of Bioengineering and Mechanical Engineering, Stanford, CA, 3Stanford University School of Medicine, Department of Urology, Stanford, CA
Presented By: Shannon Leigh Wallace, MD
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<th>Poster #</th>
<th>Title</th>
<th>Authors</th>
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<th>Presenting Author</th>
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<td>BS44</td>
<td><strong>BLADDER SENSATION IS REDUCED AFTER EXTENSIVE BLADDER DECENTRALIZATION IN CANINES</strong></td>
<td>Ekta Tiwari, Postdoctoral Fellow¹, Nagat A. Frara, Postdoctoral Fellow¹, Lucas Hobson, Research Scientist¹, Alan S. Braverman, Research Associate¹, Danielle S. Porreca, MD-Phd student¹, Daohi Yu, Professor², Mary F. Barbe, Professor¹, Michael R. Ruggieri Sr., Professor¹,³</td>
<td>¹Anatomy and Cell Biology Department, Lewis Katz School of Medicine, Temple University, Philadelphia, PA 19140, ²Department of Clinical Sciences, Lewis Katz School of Medicine, Temple University, Philadelphia, PA, ³The Shriners Hospital of Philadelphia, PA 19140</td>
<td>By: Ekta Tiwari, PhD</td>
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<td>BS45</td>
<td><strong>EPIDERMAL GROWTH FACTOR AND ITS ASSOCIATION WITH TISSUE CELLS IN EXPERIMENTAL INTERSTITIAL CYSTITIS/PAINFUL BLADDER SYNDROME</strong></td>
<td>Rashad Sholan, Head of Urology department, Rashad Sholan, Head of Urology department, Republican diagnostic center</td>
<td>By: Rashad Sholan</td>
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<td>BS46</td>
<td><strong>TOWARDS FUNCTIONAL MAPPING OF THE BLADDER: STUDYING THE EFFECTS OF MECHANICAL STRETCHING AND ELECTRICAL STIMULATION ON CONTRACTILE PROPERTIES OF PORCINE DETRUSOR IN-VITRO</strong></td>
<td>Bhaskar Ravishankar¹ ², Weston Upchurch³, Paul laizzo, PhD³, Tinen Iles, PhD³, Guangjian Wang, PhD², Dwight Nelson, PhD³, Gerald Timm, PhD²</td>
<td>¹University of Minnesota, Dept. of Electrical Engineering, ²University of Minnesota, Dept. of Urology, ³University of Minnesota, Visible Heart Laboratories, Neureux LLC.</td>
<td>By: Bhaskar Ravishankar, MSEE</td>
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<td>BS47</td>
<td><strong>WITHDRAWN</strong></td>
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<td>BS48</td>
<td><strong>NATURALISTIC BLADDER FILLING AS TOOL TO EXAMINE BRAIN CIRCUITS OF URINARY URGENCY IN HEALTHY INDIVIDUALS: A MAPP RESEARCH NETWORK STUDY</strong></td>
<td>Ishtiaq Mawla, MS¹ ², Andrew Schrepf, PhD¹, Eric Ichesco, BS¹, Steven Harte, PhD¹, Richard Harris, PhD¹, Jason Kutch, PhD³</td>
<td>¹Chronic Pain and Fatigue Research Center, Department of Anesthesiology, University of Michigan, Ann Arbor, MI, ²Neuroscience Graduate Program, University of Michigan, Ann Arbor, MI, ³Division of Biokinesiology and Physical Therapy, University of Southern California, Los Angeles, CA</td>
<td>By: Ishtiaq Mawla, MS</td>
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<td>BS49</td>
<td><strong>OPTICAL MONITORING OF CHANGES IN OXYGENATED HEMOGLOBIN CONCENTRATION IN THE ANTERIOR CORTEX DURING URINARY URGENCY</strong></td>
<td>Lynn Stothers, MD¹, John Speich, PhD², Adam Klausner, MD², Andrew Macnab, MD¹</td>
<td>¹UBC, ²Virginia Commonwealth University</td>
<td>By: M. Lynn Stothers, MD</td>
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<td>BS50</td>
<td><strong>A NOVEL METHOD TO EVALUATE OBJECTIVE RESPONSES TO AUDIO-VISUAL URGENCY TRIGGERS USING FUNCTIONAL NEAR-INFRARED SPECTROSCOPY OF THE BRAIN</strong></td>
<td>Rui Li, PhD¹, Priscilla Koirala, BS², Urmila Sivagnanalingam, BS², Kaitlyn Maddra, BS², Kyla Egenberger¹, Sydney Roberts¹, Zachary Cullingsworth, MS¹, Natalie Swavely, MD⁴, Samuel Weprin, MD⁵, Andrew Macnab, MD⁴, Lynn Stothers, MD⁴, Adam Klausner, MD⁴, John Speich, PhD¹</td>
<td>¹Department of Mechanical Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, ²Department of Surgery/Division of Urology, Virginia Commonwealth University, Richmond, VA, ³Department of Urologic Sciences, University of British Columbia, Vancouver, Canada</td>
<td>By: Rui Li, PhD</td>
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<td>BS51</td>
<td><strong>INTERSTIM MICRO™ SYSTEM PERFORMANCE COMPARISON IN A SHEEP MODEL</strong></td>
<td>Katie C. Bittner¹ ², Sarah J. Offutt¹ ², Tina Billstrom¹, Melissa A. Mattson³, Nathan Johnson⁴, Kellie Berg⁵, Lance Zirpel¹ ²</td>
<td>¹Research and Core Technology, Restorative Therapies Group, Medtronic, Inc., Minneapolis, MN, ²Pelvic Health Gastric Therapies, Restorative Therapies Group, Medtronic, Inc., Minneapolis, MN, ³Physiological Research Laboratories, Medtronic, Inc., Minneapolis, MN, ⁴Systems Engineering, Restorative Therapies Group, Medtronic, Inc., Minneapolis, MN, ⁵Clinical Research, Restorative Therapies Group, Medtronic, Inc., Minneapolis, MN</td>
<td>By: Katie Bittner, PhD</td>
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ABSTRACT LISTING

Poster #BS52  THE EFFECT OF BOTOX A ON ICI, BLADDER PRESSURE AND HRV PARAMETERS IN RATS SUBMITTED TO URODYNAMIC STUDY AFTER BLADDER INSTILLATION OF ACETIC ACID
israel Franco, Dept of Urology¹, Asal Hojjat, Dept of Urology¹, Jose Murillo Netto, Dept of Urology², Darryl Martin, Dept of Urology³, Adam Hittelman, Dept of Urology¹
¹Yale School of Medicine, ²Universidade Federal de Juiz de Fora (UFJF), Juiz de Fora, Brazil
Presented By: Israel Franco, MD

Poster #BS53  GENE PROFILING IN UTEROSACRAL LIGAMENTS IN PREMENOPAUSAL WOMEN WITH PROLAPSE
Kathleen Connell, MD¹, Marsha K. Guess, MD², David Orlicky, PhD³, Lauren Rascoff, MD⁴, Jaime Arruda, MD⁵, T.Rajendra Kumar, PhD⁶, Joshua Johnson, PhD⁷
¹Division of Urogynecology Reconstructive Pelvic Surgery, Department of Obstetrics and Gynecology, ²Division of Reproductive Sciences, Dept. Obstetrics Gynecology, University of Colorado School of Medicine, ³Division of Urogynecology Reconstructive Pelvic Surgery, Dept. Obstetrical Gynecology, University of Colorado School of Medicine, ⁴Department of Pathology, University of Colorado School of Medicine, ⁵Division of Gynecologic Oncology, Dept. Obstetrics Gynecology, University of Colorado School of Medicine, ⁶Division of Reproductive Sciences, Dept. Obstetrics Gynecology, University of Colorado School of Medicine
Presented By: Kathleen Connell, MD

Poster #BS54  UNDERREPRESENTATION OF FPMRS IN FEDERAL FUNDING FOR BENIGN UROLOGIC CONDITIONS
Colby Souders, MD, A. Lenore Ackerman, MD, PhD
Cedars-Sinai Medical Center, Dept. of Surgery
Presented By: Colby Perkins Souders, MD

Poster #BS55  CHRONIC MEALTIME SHIFT DISTURBS METABOLIC AND URINARY FUNCTIONS IN MICE
Young Sam Cho¹, Su Jin Kim², Kyung Jin Chung³, Myung-Soo Choo⁴, Khae Hawn Kim⁵
¹Department of Urology, Sungkyunkwan University School of Medicine, Seoul, Korea, ²Department of Urology, Yonsei University Wonju College of Medicine, Wonju, Korea, ³Department of Urology, Gachon University Gil Medical Center, Gachon University School of Medicine, Incheon, Korea, ⁴Department of Urology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea, ⁵Department of Urology, Gachon University Gil Medical Center, Gachon University of School of Medicine, Incheon, Korea
Presented By: Young Sam Cho, MD, PhD

Poster #BS56  FLEXIBLE SURGICAL TRAINING WITHIN THE ROYAL AUSTRALASIAN COLLEGE OF SURGEONS: THE NEW PARADIGM
Caroline Dowling, Head of Urology Department¹, Marnique Basto, Urology trainee¹, Christine Lai, FRACS², Carolyn Vasey, FRACS³, Debra Nestel, Professor⁴, Shomik Sengupta, Professor⁵
¹Eastern Health, Melbourne, Victoria, Australia, ²Queen Elizabeth Hospital, Adelaide, South Australia, Australia, ³Ballarat Health Services, Ballarat, Victoria, Australia, ⁴Monash University, Clayton, Victoria, Australia
Presented By: Caroline Dowling, MS

Poster #BS57  UNEXPECTED EFFECTS OF CAB, A NOVEL TRPM4 CHANNEL INHIBITOR, ON GUINEA PIG DETRUSOR SMOOTH MUSCLE EXCITATION-CONTRACTION COUPLING
John Malysz, PhD¹, Sarah E. Maxwell, BSc¹, Todor B. Gasharov, BSc², Georgi V. Petkov, PhD¹
¹College of Pharmacy, University of Tennessee Health Science Center, Memphis, TN, ²Faculty of Pharmacy, Medical University of Plovdiv, Plovdiv, Bulgaria
Presented By: John Malysz, PhD

Poster #BS58  PHENOTYPIC CHANGES OF DETRUSOR PDGFR ALPHA POSITIVE CELLS AND IMPACT ON MYOGENIC DETRUSOR OVERACTIVITY IN SPINAL CORD INJURY
Ken Lee¹, HaeYeong Lee¹, Robert Corrigan², Kenton Sanders¹, Sang Don Koh¹
¹University of Nevada Reno, ²Univewrsity of Nevada Reno
Presented By: Ken Lee

Poster #BS59  DISRUPTION OF CAV1.2-MEDIATED SIGNALING IS A MAJOR PATHWAY FOR KETAMINE INDUCED PATHOLOGY
Huan Chen, David Vandorpe, Xiang Xie, Seth Alper, Mark Zeidel, Weiqun Yu
Beth Israel Deaconess Medical Center
Presented By: Huan Chen
Poster #BS60

IN THE CANINE BLADDER, NICOTINIC RECEPTOR AGONISTS INDUCE MORE CONTRACTILE RESPONSES IN SUB-MUCOSAL THAN IN SUB-SEROSAL SMOOTH MUSCLE STRIPS
Nagat Frara, Postdoctoral Fellow, Dania Giaddui, Research Scientist, Alan S. Braverman, Research Associate, Lucas Hobson, Research Scientist, Mary F. Barbe, Professor, Michael R. Ruggieri, Professor
Department of Anatomy and Cell Biology, Lewis Katz School of Medicine at Temple University
Presented By: Michael R. Ruggieri, Sr., PhD

Poster #BS61

GLUCAGON LIKE PROTEIN 1 (GLP-1) ELICITS MORE PROFOUND CALCIUM DISCHARGE AND SARCOPLASMIC RETICULUM CALCIUM ATPASE (SERCA) RESPONSE IN OSSABAW PIG DETRUSOR SMOOTH MUSCLE THAN CAFFEINE
CR Powell, MD1, Mouhamad Alloosh, MD, MS2, Michael Sturek, PhD3
1Indiana University, 2Indiana University School of Medicine, Department of Cellular and Integrative Physiology, 3Indiana University School of Medicine Department of Cellular and Integrative Physiology
Presented By: C.R. Powell II, MD

Poster #BS62

REGULATION OF ADENOSINE LEVELS IN LAMINA PROPRIA DURING BLADDER FILLING
Violeta Mutafova-Yambolieva, MD, PhD1, Benjamin Kwok, BS2, Priya Kukadia, BS3
1Department of Physiology and Cell Biology, University of Nevada Reno School of Medicine, Reno, NV 89557, USA, 2Department of Physiology and cell Biology, University of Nevada Reno School of Medicine, Reno, NV 89557, 3Department of Physiology and Cell Biology, University of Nevada School of Medicine, Reno, NV 89557, USA
Presented By: Violeta Mutafova-Yambolieva, MD, PhD

Poster #BS63

CHARACTERIZATION OF UROTHELIAL CELLS CULTURED FROM A SINGLE BLADDER BIOPSY IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME PATIENTS
Tyler Overholt, MD1, Jeffrey Schachar, MD2, Tran Simon, BS3, Robert Evans, MD1,2, Catherine Matthews, MD1,2, Andre Plair, MD1, Whitney Smith, MD1, Gopal Badlani, MD1,2, Stephen Walker, MD1,2,3
1Wake Forest Baptist Health Department of Urology, 2Wake Forest Baptist Health Female Pelvic Medicine and Reconstructive Surgery, 3Wake Forest Institute for Regenerative Medicine
Presented By: Tyler Lynne Overholt, MD

Poster #BS64

DECREASED INFLAMMATORY RESPONSE OF UROTHELIAL AND SMOOTH MUSCLE CELLS TO LIPOPOLYSACCHARIDE BY P75NTR ANTAGONISM
Benjamin Desormeau1, Laura Yan1, Abubakr Mossa1, Philippe Cammisotto1, Lysanne Campeau2
1Lady Davis Institute, McGill University, Montreal, Quebec, Canada, 2Lady Davis Institute, McGill University Urology Department, Jewish General Hospital, Montreal, Quebec, Canada
Presented By: Benjamin Desormeau

Poster #BS65

DIVERGENT RESPONSES OF UROTHELIAL AND SMOOTH MUSCLE CELLS TRIGGERED BY NERVE GROWTH FACTOR PRECURSOR (PRONGF)
Abubakr Mossa1, Philippe Cammisotto1, Lysanne Campeau2
1Lady Davis Institute, McGill University, Montreal, Quebec, Canada, 2Lady Davis Institute, McGill University Urology Department, Jewish General Hospital, Montreal, Quebec, Canada
Presented By: Abubakr H. Mossa, MD, MSc
IC/Pelvic Pain/Geriatrics/BPH Podium Session

Thursday, February 27, 2020
1:00 p.m. - 2:20 p.m.

Moderators: Humphrey O. Atiemo, MD
Ashley Cox, MD, MSc, FRCSC

1:00 p.m.  #1 CHANGE OF NOCTURIA BEFORE AND AFTER HOLEP: A PROSPECTIVE STUDY
Hwanik Kim, MD, Young Jae Im, MD, PhD, Hyukdal Jung, MD, Jee Eun Do, Sung Yong Cho, MD, PhD, Seung-June Oh, MD, PhD
Seoul National University Hospital
Presented By: Hwanik Kim, MD

1:10 p.m.  #2 HUMAN PROSTATE COLLAGEN INCREASES WITH AGE BUT DIMINISHES WITH INFLAMMATION
Andrew Schneider, PhD, Matthew Grimes, MD, Amanda Kemper, Hassan Zagloul, BS, Wade Bushman, MD, PhD
University of Wisconsin-Madison
Presented By: Wade Bushman, MD, PhD

1:20 p.m.  #3 URINARY INCONTINENCE CARE FOR OLDER ADULTS: DIFFERENCE OR DISPARITY
Claire Burton¹, Jennifer Tran², Gabriela Gonzalez², Catherine Bresse³, Eunice Choi⁴, Victoria Scott⁵, A. Lenore Ackerman⁶, Karyn S. Elber⁶, Jennifer T. Anger⁶
¹Department of Urology, University of California Los Angeles, Los Angeles, CA, ²Central Michigan University School of Medicine, Mount Pleasant, MI, ³David Geffen School of Medicine, University of California, Los Angeles, CA, ⁴Cedars Sinai Medical Center, ⁵Department of Surgery, Division of Urology, Cedars-Sinai Medical Center, Los Angeles, CA
Presented By: Jonathan George Pavlinec, MD

1:30 p.m.  #4 FLUID HANDLING IN THE AGING URINARY TRACT
Thomas Monaghan¹, Marie-Astrid Denys², An-Sofie Goessaert², Veerle Decalf², Candy Kumps², Johan Van de Walle³, Jeffrey Weiss³, Donald Bliwise³, Matthew Epstein⁴, Jeremy Weedon⁵, Jason Lazar⁶, Karel Everaert⁷
¹Department of Urology, State University of New York Downstate Health Sciences University, Brooklyn, New York, ²Department of Urology, Ghent University Hospital, Ghent, Belgium, ³Department of Pediatric Nephrology, Ghent University Hospital, Ghent, Belgium, ⁴Department of Neurology, Emory University School of Medicine, Atlanta, Georgia, ⁵Department of Urology, Temple University Hospital, Philadelphia, Pennsylvania, ⁶Research Division, SONY Downstate Health Sciences University, Brooklyn, New York, ⁷Department of Medicine, Division of Cardiovascular Medicine, SONY Downstate Health Sciences University, Brooklyn, New York
Presented By: Thomas F. Monaghan

1:40 p.m.  #5 UROPATHOGENS FORM BIOFILMS PREDOMINANTLY ON DISTAL AND LUMINAL ASPECTS OF CATHETERS, EXHIBIT FREQUENT ANTIBIOTIC RESISTANCE, AND ARE INHIBITED BY A NOVEL CETYLPYRIDINIUM CHLORIDE BASED FORMULATION
Glenn Werneburg¹,², Nadine Henderson², Raymond Rackley¹, Anh Nguyen³, Daniel Shoskes¹, Amanda Le Sueur¹, Anthony Corcoran¹, Aaron Katz¹, Jason Kim¹, Annie Rohan³, David Thanassi³
¹Department of Urology, Glickman Urological and Kidney Institute, Cleveland Clinic Foundation, Cleveland, OH, ²Department of Microbiology and Immunology, Stony Brook University, Stony Brook, NY, ³School of Medicine, Stony Brook University, Stony Brook, NY
Presented By: Glenn T. Werneburg, MD, PhD

1:50 p.m.  #6 AGREEMENT OF TRADITIONAL URINARY CULTURE AND MULTIPLEX PCR: RESULTS FROM A PROSPECTIVE STUDY
Annah Vollstedt¹, Natalie Luke², Kirk Wonjo², Colleen Kelly², David Smith², David Baunoch², Michael Opel², Howard Korman², Patrick Keating², Frank Burks³, Mohammad Jafri³, Kevin Cline³, Laurence LaBelkoff³, Aaron Milbank¹, Neil Sherman⁶, Rashel Haverkorn⁷, Laurence Yore⁸, Neil Shore⁹, Larry Sirls¹
¹Beaumont Hospital, Royal Oak, MI, ²Pathnostics, Irvine, CA, ³Comprehensive Urology, Royal Oak, MI, ⁴Kelly Statistical Consulting, ⁵Regional Urology, Shreveport, LA, ⁶MidLantic Urology, Philadelphia, PA, ⁷Minnesota Urology, ⁸Premier Urology, NJ, ⁹Urology San Antonio, TX, ¹⁰Urology of South Florida, Delray Beach, FL, ¹¹Atlantic Urology Clinics, Myrtle Beach, SC
Presented By: Annah Vollstedt, MD
2:00 p.m.  #7  INITIAL EXPERIENCE OF HOLMIUM LASER ENUCLEATION OF THE PROSTATE FOLLOWING PREVIOUS PROSTATIC URETHRAL LIFT FOR MANAGEMENT OF BENIGN PROSTATIC HYPERPLASIA
Timothy Han, Lydia Glick, Thomas Hardacker, Tomy Perez, Patrick Shenot, Akhil Das
Department of Urology, Thomas Jefferson University, Philadelphia PA
Presented By: Timothy Moonhwan Han

2:10 p.m.  #8  BIOINFORMATIC APPROACH FOR IDENTIFYING NOVEL BIOMARKERS AND THEIR SIGNALING PATHWAYS INVOLVED IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME
Aram Kim1, Moon Ki Jo2, YongTae Kim3, Hong Yong Choi4, Hyun Woo Kim5, Myung-Soo Choo6, Hyeong Gon Kim1
1Department of Urology, Konkuk University Medical Center, Konkuk University School of medicine, Seoul, Korea, 2Department of Urology, Korea Cancer Center Hospital, Seoul, Korea, 3Department of Urology, Hanyang university Hospital, Hanyang University School of medicine Seoul, Korea, 4Department of Urology, Hanyang university Guri Hospital, Hanyang University School of medicine Seoul, Korea, 5Department of Urology, Eunpyeong St.Mary's Hospital, The Catholic University of Korea, Seoul, Korea, 6Department of Urology, Asan Medical Center, Ulsan University School of medicine, Seoul. Korea
Presented By: Aram Kim
LUTS/Voiding Dysfunction/Neurogenic Bladder Moderated Poster Session

Thursday, February 27, 2020
1:00 p.m. - 2:20 p.m.

Moderators: Ekene A. Enemchukwu, MD, MPH
David E. Rapp, MD

Poster #M1 CAN TELEMEDICINE IMPROVE FOLLOW UP ADHERENCE AND OUTCOMES IN PATIENTS WITH OVERACTIVE BLADDER?
Ricardo Palmerola¹, Christina Escobar², Rachael Sussman³, Caroline Brandon⁴, Scott Smilen⁵, Dominique Pape⁶, Nirit Rosenblum⁷, Benjamin Brucker⁸
¹Mount Sinai Medical Center Miami Beach, ²New York University, ³Georgetown University
Presented By: Ricardo I. Palmerola, MD

Poster #M2 AUDIO-VISUAL STIMULI IN AN ORAL HYDRATION STUDY: HEIGHTENED RESPONSE IN OVERACTIVE BLADDER PARTICIPANTS
Urmila Sivagnanalingam¹, Natalie Swavelly, MD², Priscilla Koirala¹, Kaitlyn Maddra¹, Rui Li, PhD³, Kyla Egenberger⁴, Sydney Roberts⁵, Samuel Weprin, MD⁶, Adam Klausner, MD⁷, John Speich, PhD⁸
¹Virginia Commonwealth University School of Medicine, ²Virginia Commonwealth University, Department of Surgery, Division of Urology, Richmond, VA, ³Virginia Commonwealth University College of Engineering, Department of Mechanical Nuclear Engineering Richmond, VA
Presented By: Natalie Swavelly, MD

Poster #M3 TREATMENT PATTERNS AND COSTS AMONG PATIENTS WITH OVERACTIVE BLADDER (OAB) RECEIVING COMBINATION ORAL THERAPY, SACRAL NERVE STIMULATION (SNS), PERCUTANEOUS TIBIAL NERVE STIMULATION (PTNS), OR ONABOTULINUMTOXINA
Stephen Kraus, MD¹, Aki Shiozawa, DrPH², Shelagh Szabo, MSc³, Christina Qian, MSc³, Basia Rogula, MSc³, John Hairston, MD²
¹University of Texas Health Sciences Center, San Antonio, ²Astellas Pharma Global Development, Inc, Northbrook, ³Broadstreet HEOR, Vancouver
Presented By: Stephen R. Kraus, MD, FACS

Poster #M4 EVALUATING THE QUALITY OF OVERACTIVE BLADDER PATIENT EDUCATION MATERIAL ON YOUTUBE USING THE PATIENT EDUCATION MATERIALS ASSESSMENT TOOL
Lunan Ji¹, Elisabeth Sebesta¹, Matthew Rutman², Doreen Chung²
¹Department of Urology, Columbia University, New York, NY, USA, ²Department of Urology, Columbia University, New York, NY, USA
Presented By: Lunan Ji, MD

Poster #M5 PRELIMINARY ANALYSIS OF BRAIN FOOTPRINTS OF MULTIPLE SCLEROSIS WOMEN WITH DETRUSOR SPHINCTER DYSSYNERGIA: A CONCURRENT URODYNAMIC AND FMRI STUDY
Khue Tran¹, Christof Karmonik, PhD², Timothy Boone, MD¹, Rose Khavari, MD¹
¹Houston Methodist Hospital, ²Houston Methodist Research Institute
Presented By: Khue Tran

Poster #M6 ALPHA-1 ADRENERGIC ANATOGNISTS FOR TREATMENT OF OBSTRUCTIVE URINARY SYMPTOMS IN PATIENTS WITH MULTIPLE SCLEROSIS
Daniel Raza, Medical Student¹, Lauren Corona², Giulia Lana², Paholo Barboglio Romo², Priyanka Gupta², Quentin Clemens², Anne Cameron², John Stoffel²
¹Tulane University School of Medicine, ²University of Michigan
Presented By: Daniel Raza

Poster #M7 SAFETY OF SUPRAPUBIC CATHETER INSERTION: A CONTEMPORARY NORTH AMERICAN SERIES
Jane T. Kurtzman, MD, Lunan Ji, MD, Shawn Mendonca, MD, Steven B. Brandes, MD, Doreen E. Chung, MD
Department of Urology, Columbia University Irving Medical Center, New York, NY
Presented By: Jane Kurtzman, MD
Poster #M8  

**EVALUATION OF INDEPENDENT PREDICTORS OF COMPLIANCE TO CONTINUED THERAPY WITH INTRADETRUSOR BOTOX INJECTION**

Ramy Goueli, MD, MHS, Dayron Rodriguez, MD, MPH, Jonathan Hong, BS, Maude Carmel, MD, Gary Lemack, MD  

Department of Urology, University of Texas Southwestern Medical Center  

Presented By: Ramy Goueli, MD, MHS
Open-Moderated Poster Session
Thursday, February 27, 2020
1:00 p.m. - 2:20 p.m.

Moderators: Elodi J. Dielubanza, MD
Jason M. Kim, MD

Poster #OM1 WITHDRAWN

Poster #OM2 CYCLOSPORINE FOR THE TREATMENT OF HUNNER’S LESION INTERSTITIAL CYSTITIS
Lauren Tennyson1, Kate Turner2, Annah Vollstedt2, Kenneth Peters1,2
1Beaumont Health, Royal Oak, 2Oakland University William Beaumont School of Medicine
Presented By: Annah Vollstedt, MD

Poster #OM3 OUTCOMES OF PROSTATIC URETHRAL LIFT IN A MEDICALLY COMPLEX US MILITARY VETERAN POPULATION
Shreeya Popat, MD, Katherine Utech, BS, Jennifer Taylor, MD, MPH, Jeffrey Jones, MD, MS
Baylor College of Medicine
Presented By: Shreeya Popat, MD

Poster #OM4 PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR GAMMA AGONIST AS A NOVEL TREATMENT FOR INTERSTITIAL CYSTITIS: A RAT MODEL
Craig Comiter, Department of Urology, Amandeep Mahal, Department of Urology, Amy Dobberfuhl, Department of Urology
Stanford University School of Medicine
Presented By: Craig Vance Comiter, MD

Poster #OM5 INTRAVESICAL BOTULINUM TOXIN INJECTIONS FOR DETRUSOR OVERACTIVITY IN PATIENTS SUFFERING FROM MULTIPLE SCLEROSIS; APPROPRIATE CLINICAL PRACTICE FOR RETAINING THIS POPULATION
Michael Goltzman1, Brendan Gontarz2, Gerard Pregenzer2
1UConn Health, Farmington, CT, 2Saint Francis Hospital and Medical Center, Hartford, CT
Presented By: Michael Emanuel Goltzman, MS, MD

Poster #OM6 POSTOPERATIVE COMPLICATIONS AND FACTORS ASSOCIATED WITH EARLY VERSUS LATE DISCHARGED MALES FOLLOWING URETHROPLASTY
Scotty McKay, MS1, Mahmoud Khalil, MD1, Naleen Raj Bhandari, PhD2, Rodney Davis, MD1, Nalin Payakachat, PhD2, Omer Raheem, MD3, Ehab Eltahawy, MD1
1Department of Urology, University of Arkansas for Medical Sciences, Little Rock, USA, 2Division of Pharmaceutical Evaluation and Policy, Department of Pharmacy, University of Arkansas for Medical Sciences, Little Rock, USA, 3Department of Urology, Tulane University, New Orleans, Louisiana
Presented By: Ehab Eltahawy, MD, MRCS

Poster #OM7 “MIXED” MOTOR SACRAL NEUROMODULATION LEAD PLACEMENT RESULTS IN HIGHER IMPLANT RATES
Kristen Gurtner, MD, Anastasia Couvaras, MD, Colin Goudelocke, MD
Ochsner Clinic Foundation
Presented By: Kristen E. Gurtner, MD

Poster #OM8 PREVALENCE OF COITAL URINARY INCONTINENCE IN NULLIPAROUS WOMEN
Siobhan Hartigan, MD1, Sophia Goodridge, MD2, Leah Chisholm1, Elizabeth Rourke, DO1, Roger Dmochowski, MD1, Melissa Kaufman, MD, PhD1, W. Stuart Reynolds, MD1
1Department of Urology, Vanderbilt University Medical Center, Nashville, TN, 2Urology, WellStar Medical Group, Roswell, GA
Presented By: Siobhan M. Hartigan, MD
Poster #OM9  MEDIUM TERM FOLLOW UP OF PATIENT REPORTED OUTCOMES FOLLOWING COMPLETE REMOVAL OF TRANSOBTURATOR MIDURETHRAL SLING
Eva Fong1, Sum Sum Lo1, Andrew Graydon2
1Urology Department, Waitemate District Health Board, Auckland, New Zealand, 2Paediatric Orthopaedic Department, Starship Children’s Hospital, Auckland, New Zealand
Presented By: Sum Sum Lo, MB ChB

Poster #OM10  CHARACTERIZATION OF URETHRAL DIVERTICULA IN FEMALES
Rohan Vaidya, Resident, Kathleen Olson, Resident, Christopher Wolter, Assistant Professor of Urology, Aqsa Khan, Assistant Professor of Urology
Mayo Clinic Arizona, Department of Urology, Phoenix, AZ
Presented By: Rohan Vaidya

Poster #OM11  THE THREE-LEVEL RECONSTRUCTION OF ADVANCED PELVIC ORGAN PROLAPSE WITH THE USE OF ULTRAMINIMESH
Dmitry Shkarupa, PhD, Nikita Kubin, PhD, Ekaterina Shapovalova, MD, Alexander Petrov, MD
Saint-Petersburg State University Clinic of advanced medical technologies n.a. Nikolay I. Pirogov, Saint-Petersburg, Russia
Presented By: Nikita Kubin, PhD

Poster #OM12  AXIS™ ALLOGRAFT DERMIS FOR FEMALE PELVIC ORGAN PROLAPSE REPAIR: A POST-MARKET STUDY
Kristene Whitmore, MD1, Neha Rana, MD2, Tess Crouss, MD2, Xibeii Jia, MD4, Peter Rosenblatt, MD5, Vincent Lucente, MD6, G. Willy Davila, MD7, Douglas Van Drie, MD8
1Drexel University, 2University of Pennsylvania, 3Cooper University Health Care, 4University of Massachusetts, 5Harvard Medical School, 6The Institute for Female Pelvic Medicine, 7Cleveland Clinic Florida Department of Gynecology, 8Female Pelvic Medicine Urogynecology Institute of Michigan
Presented By: Kristene E. Whitmore, MD

Poster #OM13  THE TIME BURDEN OF SPECIALTY CLINIC VISITS FOR PERSONS WITH NEUROLOGIC DISEASE - A CASE FOR UNIVERSAL TELEMEDICINE COVERAGE
Christopher Elliott1, Daniel Solomon2, Ben Dirlikov2, Kazuko Shem2
1Santa Clara Valley Medical Center Division of Urology, Stanford University Medical Center Department of Urology, 2Santa Clara Valley Medical Center Department of Physical Medicine and Rehabilitation
Presented By: Christopher Stephen Elliott, MD, PhD

Poster #OM14  PREOPERATIVE URODYNAMIC FINDINGS AMONG MEN UNDERGOING TRANSOBTURATOR MALE SLING
M. Francesca Monn, 1, Michael E Chua, 1, Jack M Zuckerman, 1, Jessica M DeLong, 1, Ramon Virasoro, 1, Kurt McCammon
Eastern Virginia Medical School
Presented By: Maria Francesca Monn, MD, MPH

Poster #OM15  PREDICTIVE FACTORS OF PNE SUCCESS IN A CONTEMPORARY SERIES: A SINGLE INSTITUTION EXPERIENCE
Neil Kocher, MD, Samir Derisavifard, MD, Jessica Rueb, MD, Michele Fascelli, MD, Raymond Rackley, MD, Courtenay Moore, MD, Sandip Vasavada, MD, Howard Goldman, MD
Cleveland Clinic
Presented By: Neil John Kocher, MD

Poster #OM16  USING A HUMAN FACTORS APPROACH TO DEVELOP INTERVENTIONS AIMED AT IMPROVING PATIENT EXPERIENCE WITH SACRAL NEUROMODULATION*
Tara Cohen, PhD1, Claire Burton, MD2, Kate Cohen, BA3, A. Lenore Ackerman, MD, PhD1, Karyn Eilber, MD1, Jennifer Anger, MD1
1Cedars-Sinai Medical Center, 2UCLA David Geffen School of Medicine
Presented By: Claire Burton, MD
*2017 Neuromodulation Grant Recipient
Poster #OM17

SOURCES OF CONFUSION: MEDIA COVERAGE OF THE UNITED STATES FOOD AND DRUG ADMINISTRATION BAN ON TRANSVAGINAL MESH FOR PELVIC ORGAN PROLAPSE


1Oregon Health and Science University, Portland, OR; 2Virginia Mason, Seattle, WA

Presented By: Poone Shoureshi, MD
LUTS/Voiding Dysfunction/Neurogenic Bladder Non-Moderated Poster Session
Thursday, February 27, 2020
1:00 p.m. - 2:20 p.m.

Poster #NM1

ULTRASOUND-DEFINED BLADDER SHAPE PARAMETERS FOR IMPROVED OVERACTIVE BLADDER PHENOTYPING: A REPEATABILITY STUDY USING HEALTHY VOLUNTEERS
Kaitlyn Maddra1, Natalie Swavely, MD2, Rui Li, PhD3, Anna Nagle, PhD3, Naomi Vinod1, Suzanne Prince3, Sarah Tensen1, Hameeda Naimi1, Samuel Weprin, MD2, Derek Sheen1, Hiren Kolli1, Laura Carucci, MD3, Adam Klausner, MD3, John Speich, MD*
1Virginia Commonwealth University School of Medicine, 2Virginia Commonwealth University, Department of Surgery, Division of Urology, Richmond, VA, 3Virginia Commonwealth University College of Engineering, Department of Mechanical Nuclear Engineering, Richmond, VA, 4Virginia Commonwealth University College of Engineering, Department of Biomedical Engineering, Richmond, VA, 5Virginia Commonwealth University School of Medicine, Department of Radiology, Richmond, VA
Presented By: Kaitlyn Maddra, MD

Poster #NM2

GETTING PATIENTS WITH OAB ADEQUATELY TREATED - ATTRITION RATES AND THIRD LINE THERAPIES IN A CONTEMPORARY PRACTICE
David Abramowitz1, Alexandra Rogers2, Amna Ali3, Nick Bertrand4
1University at Buffalo, 2Sansum Clinic, Santa Barbara, CA, 3Valencia Technologies Corporation
Presented By: David Abramowitz, MD

Poster #NM3

DECISION AIDS IMPROVE PATIENT-REPORTED SHARED DECISION MAKING: AN ANALYSIS OF SURGICAL CONSUMER ASSESSMENT OF HEALTHCARE PROVIDERS AND SYSTEMS (CAHPS) DATA
Giulia I. Lane, MD1, Nicholas L. Berlin, MD, MPH1, Chad Ellimoottil, MD, MS1, Sara M. Lenherr, MD, MS2, J. Quentin Clemens, MD, MSCI1
1University of Michigan, 2University of Utah
Presented By: Giulia Ippolito Lane, MD

Poster #NM4

EFFECT OF PREOPERATIVE 5ALPHA-REDUCTASSE INHIBITORS TREATMENT ON THE EFFICIENCY OF THULIUM:YAG(REVOLIX®) VAPORESECTION FOR BENIGN PROSTATIC HYPERPLASIA
Sung-Dae Kim1, Jae-Seung Chung2, Dong-Wan Sohn3
1Dept. Urology, School of Medicine, Jeju National University, Korea, 2Dept. Urology, Haeundae Paik Hospital, Inje University, Korea., 3Dept. Urology, School of Medicine, The Catholic University, Korea
Presented By: Sung Dae Kim

Poster #NM5

VALIDATION OF THE DIAGNOSTIC ACCURACY OF DIAGNOSTIC GROUPINGS OF PATIENTS WITH STORAGE LOWER URINARY TRACT SYMPTOMS GENERATED BY MACHINE LEARNING ALGORITHMS
Kai Dallas, Jennifer Anger, Ashley Caron, Karyn Ellber, A. Lenore Ackerman
Cedars-Sinai, Division of Urology, Los Angeles, CA
Presented By: Kai B. Dallas, MD

Poster #NM6

A NOCTURNAL URINE TRAJECTORY INDEX FOR NOCTURNAL POLYURIA
Thomas Monaghan1, Kyle Michelson1, Christina Agudelo1, Syed Rahman1, Connelly Miller1, Matthew Epstein2, Jason Lazar3, Donald Bliwise3, Joseph Verbalis5, Karel Everaert6, Jeffrey Weiss3
1Department of Urology, State University of New York Downstate Health Sciences University, Brooklyn, New York, 2Department of Urology, Temple University Hospital, Philadelphia, Pennsylvania, 3Department of Medicine, Division of Cardiovascular Medicine, SUNY Downstate Health Sciences University, Brooklyn, New York, 4Department of Neurology, Emory University School of Medicine, Atlanta, Georgia, 5Division of Endocrinology and Metabolism, Department of Medicine, Georgetown University Medical Center, Washington, DC, 6Department of Urology, Ghent University Hospital, Ghent, Belgium
Presented By: Thomas F. Monaghan

Poster #NM7

ARE NOCTURNAL POLYURIA AND 24-HOUR POLYURIA MUTUALLY EXCLUSIVE?
Thomas Monaghan1, Syed Rahman1, Kyle Michelson1, Connelly Miller1, Christina Agudelo1, Jason Lazar2, Donald Bliwise3, Karel Everaert6, Jeffrey Weiss3
1Department of Urology, State University of New York Downstate Health Sciences University, Brooklyn, New York, 2Department of Medicine, Division of Cardiovascular Medicine, SUNY Downstate Health Sciences University, Brooklyn, New York, 3Department of Neurology, Emory University School of Medicine, Atlanta, Georgia, 5Division of Endocrinology and Metabolism, Department of Medicine, Georgetown University Medical Center, Washington, DC, 6Department of Urology, Ghent University Hospital, Ghent, Belgium
Presented By: Thomas F. Monaghan
Poster #NM8: RATES OF TERTIARY PROCEDURES AMONG WOMEN REFERRED FOR URINARY INCONTINENCE
Claire Burton1, Gabriela Gonzalez2, Falisha Kanji3, Ashley Caron3, Catherine Bressee4, Karyn S. Eilber3, A. Lenore Ackerman3, Jennifer T. Anger3
1Department of Urology, University of California Los Angeles, Los Angeles, CA, 2David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, 3Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA, 4Department of Biostatistics and Bioinformatics, Cedars Sinai Medical Center, Los Angeles, CA
Presented By: Jonathan George Pavlinec, MD

Poster #NM9: WITHDRAWN

Poster #NM10: TRIAMCINOLONE ACETONIDE INJECTIONS FOR THE TREATMENT OF RECALCITRANT POST-RADICAL PROSTATECTOMY VESICOURETHRAL ANASTOMOTIC STENOSIS - A LARGE MODERN-DAY SERIES
Sarah Ferrara, MD, BScH, FRCSC, Humberto Vigil, MD, MSc, BSc, FRCSC, Jennifer Locke, MD, PhD, FRCSC, Sender Herschorn, MDCM, FRCSC
University of Toronto, Sunnybrook Health Sciences Centre, Dept Urology, Toronto, ON, Canada
Presented By: Sarah R. Ferrara, MD, BScH, FRCSC

Poster #NM11: NUMERACY IN FUNCTIONAL UROLOGY
Rachael Sussman, MD1, Christina Escobar, MD2, Dora Jericevic, MD2, Cheonguen Oh, PhD2, Alan Arslan, PhD2, Ricardo Palmerola, MD2, Victor Nitti, MD3, Scott Smilen, MD2, Dominique Pape, MD2, Nirit Rosenblum, MD2, Benjamin Brucker, MD2
1MedStar Georgetown University Hospital, 2New York University, 3UCLA
Presented By: Rachael Dana Sussman, MD

Poster #NM12: A SYSTEMATIC REVIEW OF THE EVIDENCE LINKING LOW BACK PAIN AND URINARY SYMPTOMS.
Blayne Welk1, Richard Baverstock2
1Western University, 2University of Calgary
Presented By: Blayne Kaili Welk, MD

Poster #NM13: CLINICAL EPIDEMIOLOGY OF BOO SUBTYPES IN MEN WITH LOWER URINARY TRACT SYMPTOMS AND NORMAL DETRUSOR CONTRACTION (CONTRACTILITY) DURING VOIDING
Peter F.W.M. Rosier, MD PhD
Department of Urology, University Medical Center Utrecht
Presented By: Peter Rosier, MD, PhD

Poster #NM14: FACTORS ASSOCIATED WITH POST-OPERATIVE URINARY RETENTION IN PATIENTS UNDERGOING IMPLANTATION OF INFLATABLE PENILE PROSTHESIS: A SINGLE CENTER EXPERIENCE
Johnathan Drevik, MD1,2, Jacob Lucas, DO1,2, Shishir Gupta, BS1, Jay Simhan, MD1,2, Joshua Cohn, MD1,2
1Department of Urology, Einstein Healthcare Network, Philadelphia, PA, 2Department of Urology, Fox Chase Cancer Center, Philadelphia, PA
Presented By: John Drevik, MD

Poster #NM15: APPLICATION OF MACHINE LEARNING ALGORITHMS TO CLASSIFY STORAGE LOWER URINARY TRACT SYMPTOMS
Kai Dallas, Ashley Caron, Jennifer Anger, Karyn Eilber, A. Lenore Ackerman
Cedars-Sinai, Division of Urology, Los Angeles, CA
Presented By: Kai B. Dallas, MD

Poster #NM16: WHY DON'T WOMEN USE THE RESTROOM? A MIXED-METHODS STUDY ON PERCEIVED LIMITATIONS TO WORK AND PUBLIC RESTROOM USE
Siobhan Hartigan, MD1, Leah Chisholm1, Casey Kowalik, MD2, Kimberlee Bonnet3, Elizabeth Rourke, DO1, Roger Dmochowski, MD1, David Schlundt, PhD1, W. Stuart Reynolds, MD1
1Department of Urology, Vanderbilt University Medical Center, Nashville, TN, 2Department of Urology, The University of Kansas Health System, Kansas City, KS, 3Department of Psychology, Vanderbilt University, Nashville, TN
Presented By: Leah Chisholm
Poster #NM17
SCREENING AND MANAGEMENT OF URINARY RETENTION IN MEDICAL AND SURGICAL PATIENTS
Kristin Chrouser, MD, MPH1,2, Ted Skolarus, MD, MPH1,3, Karen Fowler, MPH3, Jason Mann, MSA4, Steven Burstein, MD, MPH4,5, Jennifer Meddings, MD, MS3,4,6
1Department of Urology, University of Michigan, 2VA Ann Arbor Healthcare System, 3VA Center for Clinical Management Research, VA Ann Arbor Healthcare System, 4Division of General Medicine, Department of Internal Medicine, University of Michigan, 5Department of Health Management and Policy, School of Public Health, University of Michigan, 6Division of General Pediatrics, Department of Pediatrics and Communicable Diseases, University of Michigan
Presented By: Kristin Chrouser, MD, MPH

Poster #NM18
LOWER URINARY TRACT DISEASE PREVENTION STRATEGIES RECOMMENDED ON SOCIAL MEDIA PLATFORMS: MIXED CORRELATION WITH EVIDENCE
Claire Burton1, Gabriela Gonzalez2, Christopher Almario3, Corey Arnold4, Brennan M.R. Spiegel3, Jennifer T. Anger1
1Department of Urology, University of California Los Angeles, Los Angeles, CA, 2David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, 3Cedars-Sinai Center for Outcomes Research and Education (CS-CORE), Los Angeles, CA, 4Medical Imaging Informatics, Department of Radiology, UCLA, Los Angeles, CA, 5Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA
Presented By: Jonathan George Pavlinec, MD

Poster #NM19
DEVELOPMENT OF POST-OPERATIVE URINARY RETENTION AFTER MIDURETHRAL SLING PLACEMENT: CAN WE COUNSEL PATIENTS ON DURATION?
Paige Kuhlmann, MD1, John Masterson, MD1, Kai Dallas, MD1, Kyle Tsai2, Amit Reddy3, Peris Casteneda4, A. Lenore Ackerman, MD PhD1, Karyn Elber, MD1, Jennifer Anger, MD MPH1
1Cedars Sinai Medical Center, 2Northwestern University Feinberg School of Medicine, 3University of Michigan Medical School, 4University of Utah School of Medicine, 5University of Michigan Medical School
Presented By: Paige Kuhlmann, MD

Poster #NM20
FREQUENCY OF UTIs PREDICTS POOR QUALITY OF LIFE AFTER SPINAL CORD INJURY
Katherine Theisen1, Rachel Mann1, Josh Roth2, Joseph Pariser1, John Stoffel3, Sara Lenherr4, Jeremy Myers4, Blayne Welk5, Sean Elliott1
1University of Minnesota Medical Center, 2Indiana University, 3University of Michigan, 4University of Utah, 5Western University, London, Ontario, Canada
Presented By: Katherine M. Theisen, MD

Poster #NM21
THE TIME BURDEN OF BLADDER MANAGEMENT IN INDIVIDUALS WITH SPINAL CORD INJURY
Kyla Velaer, MD1, Blayne Welk, MD2, David Ginsberg, MD3, Jeremy Myers, MD4, Kazuko Shem, MD5, Christopher Elliott, MD PhD6,1
1Stanford University Medical Center, Department of Urology, 2Western University, Division of Urology, 3University of Southern California, 4University of Utah, Division of Urology, 5Santa Clara Valley Medical Center, Department of Physical Medicine and Rehabilitation, 6Santa Clara Valley Medical Center, Department of Physical Medicine and Rehabilitation
Presented By: Kyla Nichole Velaer, MD

Poster #NM22
MIRABEGRON UTILIZATION IN THE UNITED STATES - AN INCREASING TREND
Kevin Chua, MD1, Hiren V. Patel, MD1, Alexandra Tabakin, MD1, Saikrishnaraya Doppalapudi, MD1, Elias Hyams, MD2, Hari Tunuguntla, MD3
1Rutgers Robert Wood Johnson Medical School Division of Urology, 2Columbia University Medical Center Department of Urology
Presented By: Kevin Chua, MD

Poster #NM23
UTILIZATION OF THIRD LINE THERAPY IN THE UROLOGIC MANAGEMENT OF PATIENTS WITH MULTIPLE SCLEROSIS
Lee Baumgarten, MD, Vicki Irish, NP, Samantha Raffee, MD, Humphrey Atiemo, MD
Henry Ford Hospital
Presented By: Lee C. Baumgarten, MD
Poster #NM24  LOWER URINARY TRACT SYMPTOMS IN WOMEN WITH SPINAL PATHOLOGIES: A PROSPECTIVE PREVALENCE STUDY  
Samantha Raffee, MD¹, Meghan Griffin, DO², Lara Massie, MD³, Azam Basheer, MD³, Kelly Tundo, RN, BSN³, Amanda Brown, MPA³, Ellen Air, MD, PhD³, Humphrey Atiemo, MD¹  
¹Henry Ford Vattikuti Urology Institute, Detroit, MI, ²Henry Ford Department of OB/GYN, Detroit, MI, ³Henry Ford Department of Neurosurgery, Detroit, MI  
Presented By: Samantha M. Raffee, MD

Poster #NM25  PREDICTORS OF REHOSPITALIZATION IN PATIENTS WITH SPINAL CORD INJURY: USING DATA FROM MODEL SPINAL CORD INJURY SYSTEMS  
Karthik Tanneru, Fellow, Shiva Gautam, Daniel Norez, Jazayeri Seyedbehzad, Jatinder Kumar, Umar Alam, Balaji KC, Joseph Costa  
university of florida, jacksonville  
Presented By: Karthik Of Tanneru

Poster #NM26  PELVIC FLOOR SYMPTOMS IN PATIENTS WITH MULTIPLE SCLEROSIS: AN OBSERVATIONAL STUDY  
Elia Bassini¹, Mauro Zampolini², Matteo Balzarro, Dept. of Urology³, Emanuele Rubilotta, Dept. of Urology⁴, Silvano Baratta², Francesco Corea²  
¹University of Perugia, ²Foligno Hospital, ³AOU Verona, Verona Italy  
Presented By: Elia Bassini
## Male Incontinence/Urodynamics Podium Session

**Thursday, February 27, 2020**  
5:00 p.m. - 6:30 p.m.  

Moderators: Daniel S. Hoffman, MD  
Ajay K. Singla, MD

### 5:00 p.m. #9  
**ADVERSE EVENTS ASSOCIATED WITH SYNTHETIC MALE SLINGS: AN ANALYSIS OF THE FDA MAUDE DATABASE**  
Hanson Zhao, MD, Colby P. Souders, MD, Kai Dallas, MD, Paige Kuhlmann, MD, Karyn Eilber, MD, Jennifer T. Anger, MD MPH  
Cedars-Sinai Medical Center, Los Angeles, CA  
Presented By: Hanson H. Zhao, MD

### 5:10 p.m. #10  
**PREVALENCE OF COGNITIVE IMPAIRMENT AND SPHINCTER MISUSE AMONG MEN WITH ARTIFICIAL URINARY SPHINCTERS**  
Christopher Ballantyne¹, Devang Sharma¹, Sarah Krzastek¹, Kimberly Boatman², Raymond Costabile¹, David Rapp¹  
¹University of Virginia, Dept. of Urology, Charlottesville, VA, ²University of Virginia, School of Medicine, Charlottesville, VA  
Presented By: Christopher Ballantyne, MD

### 5:20 p.m. #11  
**VERY LONG TERM FOLLOW-UP IN THE MANAGEMENT OF COMPLEX BLADDER NECK CONTRACTURE AND URINARY INCONTINENCE AFTER PROSTATE CANCER TREATMENT: LESSONS LEARNED**  
Angelo Gousse, MD, Jan-Michael Pohudka  
Bladder Health Reconstructive Urology Institute  
Presented By: Angelo E. Gousse, MD

### 5:30 p.m. #12  
**A NOVEL ADJUSTABLE SLING SYSTEM FOR MALE STRESS URINARY INCONTINENCE**  
Ralf Anding, MD  
Dept. of Urology, University Hospital, Bonn, Germany  
Presented By: Ralf G. Anding, MD

### 5:40 p.m. #13  
**INTRADETRUSOR ONABOTULINUMTOXINA FOR NON-CATHETERIZING MALES WITH NEUROGENIC DETRUSOR OVERACTIVITY**  
Alexandra Berger, Valary Raup, Graeme Steele, Elodi Dielubanza  
Brigham and Women's Hospital, Boston, MA, USA  
Presented By: Alexandra Berger, MD

### 5:50 p.m. #14  
**ARE NEGATIVE URINE CULTURES NEEDED PRIOR TO URODYNAMIC STUDIES IN CHILDREN?**  
Patricia Maymi-Castrodad, Karina Escudero, Marcos Perez-Brayfield  
University of Puerto Rico Medical Campus  
Presented By: Patricia Nicole Maymi Castrodad, MD

### 6:00 p.m. #15  
**URODYNAMIC STAGEING AND GRADING OF MEN WITH SYMPTOMS OF LOWER URINARY TRACT DYSFUNCTION**  
Peter F.W.M. Rosier, MD PhD  
Department of urology, University Medical Center Utrecht  
Presented By: Peter Rosier, MD, PhD

### 6:10 p.m. #16  
**DO OVERNIGHT AMBULATORY URODYNAMICS CHANGE PATIENT MANAGEMENT AND IMPROVE SYMPTOMATIC OUTCOMES?**  
Richard Axell¹, Habiba Yasin¹, Kristina Aleksejeva¹, Eskinder Solomon², Mahreen Pakzad¹, Rizwan Hamid¹, Jeremy Ockrim¹, Tamsin Greenwell¹  
¹Female, Functional and Restorative Urology Unit, UCLH NHS Foundation Trust, UK, ²Dept of Urology, Guy's and St Thomas' NHS Foundation Trust, UK  
Presented By: Richard Axell, BEng, MSc, PhD
6:20 p.m.    #17  DOES PREOPERATIVE URODYNAMICS IMPACT ON MANAGEMENT OF WOMEN WITH DETRUSOR UNDERACTIVITY CANDIDATED TO MIDDLE URETHRAL SLING FOR STRESS URINARY INCONTINENCE?
Emanuele Rubilotta, Dept of Urology¹, Antonio D'Amico, Dept. of Urology¹, Ester Illiano, Dept. of Andrology and urogyne², Vito Mancini, Dept. of Urology renal trans³, Elisabetta Costantini, Dept. of Andrology and urogyne², Frank Van der Aa, Dept. Urology³, Alessandro Antonelli, Dept of Urology³, Matteo Balzarro, Dept. of Urology¹
¹AOUI Verona, Verona, Italy, ²S. Maria Hospital, Terni, Univ of Perugia, Italy, ³Univ. of Foggia, Foggia, Italy, ⁴UZ, Leuven, Belgium
Presented By: Matteo Balzarro, MD
Female Urology/Incontinence Moderated Poster Session
Thursday, February 27, 2020
5:00 p.m. - 6:30 p.m.
Moderators: Farzeen Firoozi, MD
Brian J. Flynn, MD

Poster #M9
UROFLOWMETRY ON POD #1 AFTER MIDURETHRAL SLING: A MEDIUM-TERM VOIDING DYSFUNCTION PREDICTOR
Fernanda Santis-Moya\textsuperscript{1,2}, Marcelo Mass-Lindenbaum\textsuperscript{3}, Javier Pizarro-Berdichevsky\textsuperscript{1,2}
\textsuperscript{1}Urogynecology Unit, Hospital Sótero del Río, Santiago, Chile, OR, \textsuperscript{2}Obstetrics and Gynecology Division, Pontificia Universidad Católica de Chile, \textsuperscript{3}Universidad de los Andes, Santiago, Chile
Presented By: Javier Pizarro-Berdichevsky, MD

Poster #M10
TELEMEDICINE OPTIMIZES EARLY POST-OPERATIVE FOLLOW UP AFTER SYNTHETIC MID-URETHRAL SLING (MUS): A RANDOMIZED, MULTI-INSTITUTIONAL CONTROL TRIAL
Samir Derisavifard\textsuperscript{1}, Jessica Rueb\textsuperscript{1}, Neil Kocher\textsuperscript{1}, Laura Giusto\textsuperscript{1}, Patricia Zahner\textsuperscript{1}, Deyi Luo\textsuperscript{2}, Elodi Dielubanza\textsuperscript{1}, Jiayi Li\textsuperscript{1}, Raphael de Jesus Moreira\textsuperscript{1,2}, Alexander Gomelsky\textsuperscript{1}, Matteo Balzarro\textsuperscript{2}, Raymond Rackley\textsuperscript{1}, Sandip Vasavada\textsuperscript{1}, Courtenay Moore\textsuperscript{1}, Howard Goldman\textsuperscript{1}
\textsuperscript{1}The Glickman Urological Kidney Institute, Cleveland Clinic, Cleveland, OH, \textsuperscript{2}West China Hospital of Sichuan University, Chengdu, China, \textsuperscript{3}Renji Hospital of Shanghai Jiao Tong University, Shanghai, China, \textsuperscript{4}Hospital Maternidade Escola Vila Nova Cachoeirinha, Sao Paulo, Brazil, \textsuperscript{5}Louisiana State University Health Shreveport, Shreveport, LA, \textsuperscript{6}University Hospital of Verona, Verona, Italy
Presented By: Samir Derisavifard, MD

Poster #M11
VIBEGRON STATISTICALLY SIGNIFICANTLY IMPROVES QUALITY-OF-LIFE MEASURES IN PATIENTS WITH OVERACTIVE BLADDER: EMPOWUR STUDY
Jeffrey Frankel, MD\textsuperscript{1}, David Staskin, MD\textsuperscript{2}, Susann Varano, MD\textsuperscript{3}, Denise Shortino, MS\textsuperscript{4}, Rachael Jankowich, RN\textsuperscript{5}, Paul N Mudd Jr, PharmD\textsuperscript{4}
\textsuperscript{1}Seattle Urology Research Center, Seattle, WA, \textsuperscript{2}Tufts University School of Medicine, Boston, MA, \textsuperscript{3}Clinical Research Consulting, Milford, CT, \textsuperscript{4}Urovant Sciences, Inc., Irvine, CA
Presented By: Jeffrey M. Frankel, MD

Poster #M12
PREDICTIVE FACTORS OF PROGRESSION TO SURGICAL TREATMENT OF STRESS URINARY INCONTINENCE AFTER DETRUSOR BOTULINUM TOXIN INJECTION VS SACRAL NEUROMODULATION IN WOMEN WITH MIXED URINARY INCONTINENCE.
Kim Thai, MD\textsuperscript{1}, Ryan Morris, MS\textsuperscript{4,5}, Rachel High, DO\textsuperscript{6}, Erin Bird, MD\textsuperscript{1}, Jill Danford, MD\textsuperscript{3}
\textsuperscript{1}Department of Urology, Baylor Scott White, Temple, TX, \textsuperscript{2}Texas AM College of Health Sciences, Bryan College Station, TX, \textsuperscript{3}Department of Obstetrics and Gynecology, Baylor Scott White, Temple, TX
Presented By: Kim H. Thai, MD

Poster #M13
IS STRESS INCONTINENCE AND PELVIC ORGAN PROLAPSE SURGERY ASSOCIATED WITH THE DEVELOPMENT OF AUTOIMMUNE RHEUMATIC DISEASE? THE RESULTS OF A POPULATION-BASED COHORT STUDY
Humberto Vigil, MSc, MD, FRCSC\textsuperscript{1}, Rano Matta, MSc, MD\textsuperscript{2}, Arielle Mendel, MSc, MD, FRCPC\textsuperscript{3}, Lesley Carr, MD, FRCSC\textsuperscript{2}, Sender Herschorn, MDCM, FRCSC\textsuperscript{2}
\textsuperscript{1}The Ottawa Hospital, Division of Urology, University of Ottawa, Ottawa, ON, \textsuperscript{2}Sunnybrook Health Sciences Centre, Division of Urology, University of Toronto, Toronto, ON, \textsuperscript{3}Mount Sinai Hospital, Division of Rheumatology, University of Toronto, Toronto, ON
Presented By: Humberto Vigil, MD, MSc

Poster #M14
LIBERATE INTERNATIONAL: EVALUATION OF THE SAFETY AND EFFICACY OF THE VIVEVE TREATMENT FOR STRESS URINARY INCONTINENCE
Blayne Welk, MD, MSc, FRCSC\textsuperscript{1}, Sean Peterson, MD, CCFP(EM), BASc\textsuperscript{2}, Sender Herschorn, BSc, MDCM, FRCSC\textsuperscript{3}
\textsuperscript{1}Western University, \textsuperscript{2}Bluewater Clinical Research Group Inc., \textsuperscript{3}University of Toronto Sunnybrook Health Sciences Centre
Presented By: Blayne Kaili Welk, MD
Poster #M15  NATIONAL PATTERNS OF FILLED PRESCRIPTIONS AND THIRD-LINE TREATMENT UTILIZATION FOR WOMEN WITH OVERACTIVE BLADDER
Nicole A Dodge¹, Elizabeth B Habermann², John B Gebhart³, Daniel S Elliott¹, Holly K Van Houten², Lindsey R Sangaralingham², Brian J Linder¹
¹Mayo Clinic Rochester Department of Urology, ²Mayo Clinic Rochester Health Services Research, ³Mayo Clinic Rochester Department of OB/GYN
Presented By: Nicole Dodge, MD

Poster #M16  DO RATES OF MACROPLASTIQUE® REINJECTION AMONG PATIENTS WITH OR WITHOUT MIDURETHRAL SLINGS DIFFER?
Jacquelyn Gonka-Griffo, University at Buffalo, Teresa L. Danforth, University at Buffalo
Department of Urology, Buffalo, NY
Presented By: Jacquelyn Gonka-Griffo, MD

Bradley Garden, Tal Cohen, Alexandra R Siegal, Michael D Gross, Steven Weissbart, Jason Kim
Stony Brook Medicine Department of Urology
Presented By: Bradley Garden, MD

Poster #M18  EXPOSURE TO FEMALE PELVIC MEDICINE AND RECONSTRUCTIVE SURGERY (FPMRS) AMONG AMERICAN UROLOGY RESIDENTS
Jacquelyn Gonka-Griffo, University at Buffalo¹, Jordan Levine, University at Buffalo², Teresa L. Danforth, University at Buffalo³
¹Dept. of Urology, Buffalo, NY, ²Jacobs School of Medicine and Biomedical Sciences, Buffalo, NY, ³Department of Urology, Buffalo, NY
Presented By: Jacquelyn Gonka-Griffo, MD
Open-Moderated Poster Session
Thursday, February 27, 2020
5:00 p.m. - 6:30 p.m.

Moderators: Ayman Mahdy, MD, PhD
Fenwa Milhouse, MD

Poster #OM18
CLINICAL SIGNIFICANCE OF 5-α REDUCTASE INHIBITOR AND ANDROGEN DEPRIVATION THERAPY IN BLADDER CANCER INCIDENCE, RECURRENCE, AND SURVIVAL: A META-ANALYSIS AND SYSTEMIC REVIEW
Aram Kim1, Moon Ki Jo2, YongTae Kim3, Hong Yong Choi4, Hyun Woo Kim5, Myung-Soo Choo6, Hyeong Gon Kim1
1Department of Urology, Konkuk University Medical Center, Konkuk University School of medicine, Seoul, Korea, 2Department of Urology, Korea Cancer Center Hospital, Seoul, Korea, 3Department of Urology, Hanyang University Hospital, Hanyang University School of medicine Seoul, Korea, 4Department of Urology, Hanyang university Guri Hospital, Hanyang University School of medicine Seoul, Korea, 5Department of Urology, Eunpyeong St.Mary's Hospital, The Catholic University of Korea, Seoul, Korea, 6Department of Urology, Asan Medical Center, Ulsan University School of medicine, Seoul. Korea
Presented By: Aram Kim

Poster #OM19
URINARY TRACT INFECTION AFTER MID-URETHRAL SLING: RATES AND RISK FACTORS
Kai Dallas1, Paige Kuhlmann1, John Masterson1, Amit Reddy2, Kyle Tsai3, Peris Casteneda4, A. Lenore Ackerman1, Karyn Eliber1, Jennifer Anger1
1Cedars-Sinai, Division of Urology, Los Angeles, CA, 2Tulane University School of Medicine, New Orleans, LA, 3Northwestern University Feinberg School of Medicine, Chicago, IL, 4University of Michigan School of Medicine, Ann Arbor, MI
Presented By: Kai B. Dallas,

Poster #OM20
SLEEP FRAGMENTATION DUE TO BENIGN PROSTATIC OBSTRUCTION RELATED NOCTURNAL FREQUENCY IS RELATED TO ERECTILE DYSFUNCTION
Dongsup Lee, Associate Professor, Dongwan Sohn, Professor, Hyun Woo Kim, MD
The Catholic University of Korea
Presented By: Dongsup Lee

Poster #OM21
‘PERSISTENCY’: A NOVEL URINARY SYMPTOM MEASURE ECOMPASSING THE MYOFASCIAL COMPONENT OF LUTS
A. Lenore Ackerman, MD PhD1, Ashley Caron, M.S.1, James Ackerman, MA1, Jennifer Anger, MD, MPH1, Karyn Eliber, MD, MD1, Melissa Kaufman, MD, PhD2
1Cedars-Sinai Medical Center, Dept. of Surgery, 2Vanderbilt University Medical Center, Dept. of Urology
Presented By: A. Lenore Ackerman, MD, PhD

Poster #OM22
PILOT PROSPECTIVE STUDY FOR THE EFFICACY OF DEEP BRAIN STIMULATION IN CONTROLLING URINARY SYMPTOMS
Sanchita Bose1, Yi-Hsien Yeh2, Brian Dalm, Department of Neurosurgery3, Rose Khavari3
1Maine Medical Partners Urology, 2Texas AM College of Medicine, 3Houston Methodist Hospital
Presented By: Sanchita Bose, MD

Poster #OM23
IS THE 50% IMPROVEMENT THRESHOLD ADEQUATE FOR PROGRESSION TO IMPLANTATION IN SACRAL NEUROMODULATION?
David Charles, MD, Ross Everett, MD, Zachary Prebay, Truman Landowski, R. Corey O’Connor, MD, Michael Guralnick, MD
Medical College of Wisconsin, Dept. of Urology
Presented By: David K. Charles, MD

Poster #OM24
CAUSES OF SACRAL NEUROMODULATOR REVISION BETWEEN SPECIALTY AND FELLOWSHIP TRAINED PROVIDERS: A 16-YEAR STATE-WIDE ANALYSIS
Michael D. Gross1, Michael Hung1, Sina Mehraban-Far1, Wai Lee2, Steven J. Weissbart1, Jason M. Kim1
1Department of Urology, Stony Brook Medicine, Stony Brook, NY, 2Urology and Renal Transplantation, Virginia Mason, Seattle, WA
Presented By: Michael Hung
Poster #OM25

POST VOID RESIDUAL VOLUME AND RATES OF CLEAN INTERMITTENT CATHETERIZATION WITH SPONTANEOUS AND NON-SPONTANEOUS VOIDING AFTER ONABOTULINUMTOXINA TREATMENT: POOLED ANALYSIS OF TWO PHASE 3 STUDIES
Michael J. Kennelly, MD, FACS, FPMRS1, Victor Nitti, MD2, Vik Khullar, MD3, Sender Herschorn, MD4, Mickey Karram, MD5, Amin Boroujerdi6, Anand Patel1
1Carolinas Rehabilitation, 2David Geffen School of Medicine at UCLA, 3St Mary’s Hospital, Imperial College London, 4University of Toronto, 5The Christ Hospital, Cincinnati, OH, 6Allergan plc, Irvine, CA, 7Allergan plc, Marlow, UK
Presented By: Michael J. Kennelly, MD

Poster #OM26

VAGINAL RETAINED FOREIGN OBJECTS: APPLYING A HUMAN FACTORS PERSPECTIVE
Colby Souders, MD, Tara Cohen, PhD, Kai Dallas, MD, Kate Cohen, Falisha Kanji, Carrie Stewart, MD, Jennifer T. Anger, MD MPH
Cedars-Sinai Medical Center
Presented By: Colby Perkins Souders, MD

Poster #OM27

SACROSPINOUS LIGAMENT FIXATION WITH OR WITHOUT APICAL TAPE FOR PELVIC ORGAN PROLAPSE. DOES IT MATTER?
Mauricio Plata, Chairman Department1,2, Jessica Santander, Research assistant3, Laura Zuluaga, Research assistant4, Julian Azuero, Urologist
1Hospital Universitario Fundación Santa Fe de Bogotá,Bogotá D.C., Colombia, 2Universidad de los Andes, Bogotá, Colombia, 3Hospital Universitario Fundación Santa Fe de Bogotá, Bogotá D.C., Colombia
Presented By: Mauricio Plata, MD, MSc, FACS

Poster #OM28

COMPLEX FEMALE PANURETHRAL STRICTURE DISEASE MANAGED WITH DORSAL AND VENTRAL DUAL BUCCAL MUCOSAL GRAFT ONLAY URETHROPLASTY
M. Francesca Monn, 1, Michael Chua, 1, Jessica DeLong, 1, Melanie Aube, 1, Ramon Virasoro, 1, Kurt McCammon
Eastern Virginia Medical School
Presented By: Maria Francesca Monn, MD, MPH

Poster #OM29

DO IMPROVEMENTS IN UPPER EXTREMITY MOTOR FUNCTION AFFECT CHANGES IN BLADDER MANAGEMENT AFTER SPINAL CORD INJURY?
Caleb Seufert1, Dimitar Zlatev1, Kazuko Shemi2, Evginy Kreydin3, Christopher Elliott4,1
1Stanford University Medical Center Department of Urology, 2Santa Clara Valley Medical Center Department of Physical Medicine and Rehabilitation, 3University of Southern California Department of Urology, 4Santa Clara Valley Medical Center Division of Urology
Presented By: Christopher Stephen Elliott, MD, PhD

Poster #OM30

SHOULD WE REMOVE THE PSEUDO-CAPSULE AT TIME OF REVISION FOR SACRAL NERVE STIMULATORS? RATE OF MICROBIAL COLONIZATION.
Yaejee Hong, MD, Ayman Mahdy, MD
University of Cincinnati
Presented By: Yaejee H. Hong, MD

Poster #OM31

EVALUATION OF A NON-IMPLANTED, TRANSVAGINAL, ELECTRICAL STIMULATION CONTINENCE DEVICE FOR OVERACTIVE BLADDER: EVANESCE-OAB.
Suzette E. Sutherland, MD, MS, FPMRS1,2, Michael J. Kennelly, MD, FPMRS3,4,5,6,7, Steven W. Siegel, MD, FPMRS8
1Director, Female Urology, UWMedicine Pelvic Health Center, 2Associate Professor, Department of Urology, University of Washington School of Medicine, Seattle, WA, 3Director, McKay Urology, 4Director, Charlotte Continence Center at Carolinas Medical Center, 5Director of Urology, Carolinas Rehabilitation Hospital, 6Co-Director, Women's Center for Pelvic Health, 7Professor, Surgery, Urology, Gynecology at Carolinas medical Center and North Carolina School of Medicine, Charlotte, NC, 8Director, Center for Female Urology and Continence Care, Minnesota Urology, St. Paul, MN
Presented By: Suzette E. Sutherland, MD, MS, FPMRS
**Poster #OM32**

**URINARY ATP ANALYSIS BEFORE AND AFTER ONABOTULINUM TOXIN A INJECTIONS FOR OVERACTIVE BLADDER TREATMENT: A POTENTIAL BIOMARKER FOR OAB AND TREATMENT EFFICACY**

S. Freeman¹, L. Tellechea², M. Laudano¹, N. Abraham¹, S. Suadicani¹  
¹Department of Urology, Albert Einstein College of Medicine and Montefiore Medical Center, Bronx, NY,  
²Department of OB/GYN, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, NY  
Presented By: Samantha Freeman

**Poster #OM33**

**PROLAPSE SURGERY IN THE ELDERLY AND FRAIL: COMPARING SAFETY OF RECONSTRUCTIVE VERSUS OBLITERATIVE SURGERY**

Graham Chapman, MD¹,²,³, Susan Wherley, MD¹,², Kasey Roberts, MD¹,²,³, Emily Slopnick, MD¹,²,³, Jeffrey Mangel, MD¹,³, Adonis Hijaz, MD¹,²  
¹Case Western Reserve University, ²University Hospitals Cleveland Medical Center, ³Metrohealth Medical Center  
Presented By: Graham Chapman, MD
Female Urology/Incontinence Non-Moderated Poster Session *

Thursday, February 27, 2020
5:00 p.m. - 6:30 p.m.

*Not CME Accredited

Poster #NM27  IMPLEMENTATION OF A PRIMARY CARE INTERVENTION TO IMPROVE CARE FOR WOMEN WITH URINARY INCONTINENCE
Claire Burton1, Eric Lo2, Falisha Kanji2, Ashley Caron1, Tara Cohen3, David Miller4, Neil Wenger5, Victoria Scott6, A. Lenore Ackerman6, Karyn S. Eilber7, Jennifer T. Anger7
1Department of Urology, University of California Los Angeles, Los Angeles, CA, 2Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA, 3Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA, 4Department of Urology, University of Michigan, Ann Arbor, MI, 5Department of Medicine, University of California Los Angeles, Los Angeles, CA
Presented By: Jonathan George Pavlinec, MD

Poster #NM28  POSITIVE ASSOCIATION BETWEEN LOWER URINARY TRACT SYMPTOMS AND COITAL URINARY INCONTINENCE IN NULLIPAROUS WOMEN
Siobhan Hartigan, MD1, Sophia Goodridge, MD2, Leah Chisholm1, Elizabeth Rourke, DO1, Melissa Kaufman, MD, PhD1, Roger Dmochowski, MD1, W. Stuart Reynolds, MD1
1Department of Urology, Vanderbilt University Medical Center, Nashville, TN, 2Urology, WellStar Medical Group, Roswell, GA
Presented By: Siobhan M. Hartigan, MD

Poster #NM29  IS DIGITAL ETHNOGRAPHY THE FOCUS GROUP OF THE FUTURE? FOCUS GROUPS VS. SOCIAL MEDIA ANALYSIS OF WOMEN'S EXPERIENCE WITH OVERACTIVE BLADDER (OAB)
Paige Kuhlmann, MD1, Gabriela Gonzalez2, Yuliya Zektser2, Corey Arnold, PhD3, Christopher Almario, MSHPM1, Brennan Spiegel, MD, MSHS1, Jennifer Anger, MD, MPH1
1Cedars Sinai Medical Center, 2David Geffen School of Medicine UCLA, 3University of California, Los Angeles
Presented By: Paige Kuhlmann, MD

Poster #NM30  TREATMENT FOR URINARY INCONTINENCE IN THE NURSES’ HEALTH STUDY
Giulia Lane, MD1, Elisabeth Erekson, MD, MPH2, Vatche Minassian, MD2, Francine Grodstein, ScD2, Julie Bynum, MD, MPH1
1University of Michigan, 2Dartmouth Geisel School of Medicine, 3Brigham and Women's Hospital, 4Brigham and Women's Hospital
Presented By: Giulia Ippolito Lane, MD

Poster #NM31  TRENDS IN FEMALE AUTHORSHIP WITHIN UROLOGIC LITERATURE: A COMPARISON OF 2012 AND 2017
Mei Tuong, MD1, Nickhil Patel1, Jay Shah2, Jacqueline Zillioux1, David Rapp1
1University of Virginia Health System, Department of Urology, 2University of Virginia School of Medicine
Presented By: Mei Nicole E Tuong, MD

Poster #NM32  COMPLICATIONS REPORTED TO THE FOOD AND DRUG ADMINISTRATION - A COMPARISON OF MIDURETHRAL SLING PRODUCTS
Amanda Artsen, MD, Jessica Sassani, MD, Pamela Moalli, MD, Megan Bradley, MD
University of Pittsburgh Medical Center
Presented By: Amanda Artsen, MD

Poster #NM33  CONCURRENT GYNECOLOGIC ONCOLOGIC SURGERY AND URETHRAL SLINGS: AN UNDERUSED MODALITY
Claire Burton1, Catherine Bresee2, Colby Souders3, Jennifer T. Anger3, Karyn S. Eilber3
1Department of Urology, University of California Los Angeles, Los Angeles, CA, 2Department of Biostatistics and Bioinformatics, Cedars Sinai Medical Center, Los Angeles, CA, 3Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA
Presented By: Jonathan George Pavlinec, MD

Poster #NM34  CRITICAL ANALYSIS OF PELVIC ORGAN PROLAPSE CONTENT ON PINTEREST
Lauren Pace, Medical Student, Amber Herbert, Medical Student, Alia Munir, Rena Malik, MD
University of Maryland, Baltimore
Presented By: Lauren Pace
**Poster #NM35**  
**PARTNERSHIPS ON MID URETHRAL SLING SURGERY COMPLICATIONS**  
Pansy Uberoi¹, Wai Lee¹, Donna Berry², Kathleen Kobashi¹, Alvaro Lucioni¹, Una Lee¹  
¹Virginia Mason, ²University of Washington  
Presented By: Pansy Uberoi, MPH

**Poster #NM36**  
**CLINICAL PHARMACIST-LED OVERACTIVE BLADDER SUPPLEMENTAL MANAGEMENT SUPPORT: PROSPECTIVE PILOT STUDY**  
Hamza Beano¹, Catherine Helms², Lydia Wang³, Michael Kennelly¹  
¹Dept of Urology, Carolinas Medical Center, ²Dept of Pharmacy, Carolinas Medical Center  
Presented By: Hamza Mustafa Beano, MD

**Poster #NM37**  
**WITHDRAWN**

**Poster #NM38**  
**PREOPERATIVE PRACTICES AMONG UROLOGY, OBSTETRICS AND GYNECOLOGY, AND PRIMARY CARE PHYSICIANS CAN IDENTIFY PRACTICE GAPS IN PROVIDING HIGH VALUE CARE**  
Shirly Solouki, MD¹, Hauchie Pang, MD², Sharon Ritkin, MD², Nitya Abraham, MD³  
¹Department of OB/GYN, Montefiore Medical Center, ²Department of Internal Medicine, Montefiore Medical Center, ³Department of Urology, Montefiore Medical Center  
Presented By: Shirly Solouki, MD

**Poster #NM39**  
**REAL WORLD OUTCOMES OF INTRAVESICAL ONABOTULINUM TOXIN A IN PATIENTS WITH SYMPTOMATIC OVERACTIVE BLADDER (OAB)**  
Gemma Scrimgeour, Kristina Aleksejeva, Richard Axell, Habiba Yasmin, Mehwash Nadeem, Stephen Unterberg, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell  
University College London Hospital  
Presented By: Gemma Scrimgeour

**Poster #NM40**  
**OVERACTIVE BLADDER FOLLOW MIDURETHRAL SLING PLACEMENT: DE NOVO OR PERSISTENT?**  
John M. Masterson, MD¹, Paige Kuhlmann, MD², Kai B. Dallas¹, Amit Reddy², Kyle Tsai³, Peris Castaneda⁴, Karyn L. Eibler, MD¹, Jennifer T. Anger, MD, MPH¹, A. Lenore Ackerman, MD, PhD¹  
¹Cedars-Sinai Medical Center, ²Tulane University School of Medicine, ³Northwestern University Feinberg School of Medicine, ⁴University of Michigan Medical School  
Presented By: John Michael Masterson, MD

**Poster #NM41**  
**RECREATIONAL PHYSICAL ACTIVITY IS ASSOCIATED WITH DECREASED URGE URINARY INCONTINENCE: RESULTS FROM THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY**  
Vishnu Ganesan, MD, Ramy Goueli, MD, Dayron Rodriguez, MD, Gary Lemack, MD  
UT Southwestern Department of Urology  
Presented By: Vishnu Ganesan, MD

**Poster #NM42**  
**TRENDS IN INNOVATION IN THE SURGICAL MANAGEMENT OF STRESS INCONTINENCE AND PELVIC ORGAN PROLAPSE: A “DEEP DIVE” INTO THE FDA 510(K) AND PREMARKET APPROVAL DATABASES**  
Cristina Fox, MD, Debra Fromer, MD  
Hackensack University Medical Center, Hackensack, NJ  
Presented By: Cristina M. Fox, MD

**Poster #NM43**  
**THE ROLE OF SUPPORT GROUPS IN THE MANAGEMENT OF URINARY INCONTINENCE IN WOMEN**  
Gina Toma, Research Cordinator¹,², Alexandra Carolan, Study Personal³, Skye Buckner-Petty, Data Analyst⁴, Christopher Wolter, Study Personal⁴, Laura Vargas, Study Personal⁴, Aqsa Khan, Principal Investigator³  
¹Mayo Clinic Arizona, ²Arizona State University, ³Mayo Clinic Arizona, Department of Urology, Phoenix, AZ, ⁴Mayo Clinic Arizona, Department of Research Administration  
Presented By: Gina Toma

**Poster #NM44**  
**INFLUENCE OF EXERCISE INTENSITY ON LUTS IN WOMEN**  
Su Jin Kim¹, Sung Tae Cho², Dong Wan Sohn³, Joon Chul Kim⁴, Hyun Woo Kim⁵, Sae Woong Kim⁶  
¹Department of Urology, Yonsei University Wonju College of Medicine, Wonju, Korea, ²Department of Urology, Hallym University Kangnam Sacred Heart Hospital, Hallym University College of Medicine, Seoul, Korea, ³Department of Urology, Yeouido St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, ⁴Department of Urology, Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Bucheon, Korea, ⁵Department of Urology, The Catholic University of Korea College of Medicine, Seoul, Korea, ⁶Department of Urology, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea  
Presented By: Su Jin Kim
Poster #NM45  URETHROVAGINAL FISTULA: CHARACTERISTICS AND OUTCOMES  
Sarah Ferrara, MD, BScH, FRCSC, Jennifer Locke, MD, PhD, FRCSC, Sender Herschorn, MDCM, FRCSC  
University of Toronto, Sunnybrook Health Sciences Centre, Dept Urology, Toronto, ON, Canada  
Presented By: Sarah R. Ferrara, MD, BScH, FRCSC

Poster #NM46  DOES THE ORIGIN OF REFERRAL TO PHYSICAL THERAPY MATTER? COMPARISON OF REFERRAL PATTERNS AND COMPLIANCE RATES ACROSS FPMRS, GYNECOLOGY, UROLOGY, AND PRIMARY CARE  
Morgan Fullerton, FPMRS, Patricia Mwesigwa, FPMRS, Tamara Grisales, FPMRS, Christopher Tarnay, FPMRS  
David Geffen School of Medicine at UCLA  
Presented By: Morgan Elizabeth Fullerton, MD

Poster #NM47  MAJOR ADVERSE CARDIOVASCULAR AND CEREBROVASCULAR EVENTS ASSOCIATED WITH FEMALE PELVIC RECONSTRUCTIVE SURGERY  
Kasey Roberts, MD1, David Sheyn, MD2, Graham Chapman, MD3, Emily Slopnick, MD3, Jeffrey Mangel, MD2  
1University Hospitals, Cleveland, OH, 2MetroHealth Hospitals, Cleveland OH, 3University Hospitals, Cleveland OH  
Presented By: Kasey Roberts, MD

Poster #NM48  LANGUAGE DIFFERENCES BASED ON APPLICANT GENDER FOR FEMALE PELVIC MEDICINE AND RECONSTRUCTIVE SURGERY FELLOWSHIP RECOMMENDATION LETTERS  
S. Freeman1, E. McKay2, A. Leegant2, N. Abraham1  
1Department of Urology, Albert Einstein College of Medicine and Montefiore Medical Center, Bronx, NY,  
2Department of OB/GYN, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, NY  
Presented By: Samantha Freeman

Poster #NM49  RATE OF DISCONTINUATION AND REASONS FOR DISCONTINUATION OF INTRAVESICAL ONABOTULINUM TOXIN A IN PATIENTS WITH SYMPTOMATIC OVERACTIVE BLADDER (OAB)  
Gemma Scrimgeour, Kristina Aleksejeva, Richard Axell, Habiba Yasmin, Mehwash Nadeem, Stephen Unterberg,  
Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell  
University College London Hospital  
Presented By: Gemma Scrimgeour

Poster #NM50  TRANSVAGINAL MESH LONG TERM FOLLOW-UP  
Alexandra Carolan, MD, Karan Arora, MD, Christopher Wolter, MD  
Mayo Clinic Arizona  
Presented By: Alexandra Maria Ciota Carolan, MD

Poster #NM51  LOWER URINARY TRACT SYMPTOMS (LUTS) REFRACTORY TO SACRAL NEUROMODULATION AFTER MID-URETHRAL SLING MAY BE HARBINGER OF UNDERLYING SLING COMPLICATION  
Ramy Goueli, MD, MHS, Deborah Hess, MD, MS, Dayron Rodriguez, MD, MPH, Gary Lemack, MD, Philippe Zimmern, MD  
Department of Urology, University of Texas Southwestern Medical Center  
Presented By: Ramy Goueli, MD, MHS

Poster #NM52  IMPACT OF THE COLPOPEXY AND URINARY REDUCTION EFFORTS (CARE) TRIAL ON PRACTICE PATTERNS IN NEW YORK STATE  
Annie Chen, Justina Tam, Alexandra Siegal, Michael Gross, Jason Kim, Steven Weissbart  
Stony Brook Hospital  
Presented By: Annie Chen, MD

Poster #NM53  THE EFFECT OF THE FDA PROLAPSE MESH BAN ON ADVERSE EVENT REPORTING FOR STRESS URINARY INCONTINENCE MESH  
Alyssa Yee, MD, Allison Polland, MD  
Maimonides Medical Center  
Presented By: Alyssa Yee, MD
Poster #NM54  RISK FACTORS FOR INTRAOPERATIVE BLADDER PERFORATION AT THE TIME OF MIDURETHRAL SLING PLACEMENT
Paige Kuhlmann, MD1, Kai Dallas, MD1, John Masterson, MD1, Devin Patel, MD1, Peris Casteneda2, Amit Reddy3, Kyle Tsai4, A. Lenore Ackerman, MD, PhD1, Jennifer Anger, MD, MPH1, Karyn Eilber, MD1
1Cedars Sinai Medical Center, 2University of Michigan Medical School, 3Tulane University School of Medicine, 4Northwestern University Feinberg School of Medicine
Presented By: Paige Kuhlmann, MD

Poster #NM55  ASSOCIATION BETWEEN STRESS URINARY INCONTINENCE AND METABOLIC SYNDROME IN WOMEN 20-59 YEARS
Stephanie Gleicher, Natasha Ginzburg
SUNY Upstate Medical University
Presented By: Stephanie Gleicher

Poster #NM56  EFFECTS OF RADICAL HYSTERECTOMY ON URODYNAMICS AND RISK FACTORS OF INTERMITTENT CATHETERIZATION
Jung Hyun Shin, MD, PhD1, Yeni Kim, MD2, Joon Chul Kim, MD, PhD3, Myung-Soo Choo, MD, PhD1
1Department of Urology, Asan Medical Center, University of Ulsan College of Medicine, 2Department of Obstetrics and Gynecology, Asan Medical Center, University of Ulsan College of Medicine, 3Department of Urology, College of Medicine, The Catholic University of Korea
Presented By: Jung Hyun Shin, MD, PhD

Poster #NM57  METABOLIC RISK FACTORS FOR UROLITHIASIS IN WOMEN WITH INCONTINENCE
Varun Talanki1, Anjali Kapur1, Samanvaya Sharma2, Varsha Talanki2, Colin Dabrowski2, Edward Forsyth1, Jason Kim1, David Schulsinger1, Steven Weissbart1
1Stony Brook Urology, 2Stony Brook University
Presented By: Varun Talanki, MD

Poster #NM58  POST-RADICAL CYSTECTOMY ENTEROCELE: A CASE SERIES AND REVIEW OF THE LITERATURE
Alan Paniagua Cruz, BS1, Raju Chelluri, MD2, Parvati Ramchandani, MD2, Thomas Guzzo, MD, MPH2, Ariana Smith, MD2
1University of Michigan, 2University of Pennsylvania
Presented By: Raju Chelluri, MD, MS

Poster #NM59  HABIT VERSUS URGENCY-DRIVEN VOIDING FREQUENCY IN REFRACTORY FEMALE OAB PATIENTS 18 MONTHS FOLLOWING SELECTIVE BLADDER DENERVATION: A CASE FOR THE NEUROGENIC ETIOLOGY OF OAB
Eric Rovner, Professor of Urology1, Eboo Versi, Clinical Associate Professor2, Le-Mai Tu, Professor of Urology3, Roger Dmochowski, Professor of Urology4, Stefan deWachter, Professor of Urology5
1Medical University of South Carolina, 2Rutgers RWJ Medical School of New Jersey, 3University of Sherbrooke Canada, 4Vanderbilt University Medical Center, 5University of Antwerp Belgium
Presented By: Eric Scott Rovner, MD

Poster #NM132  KETAMINE CYSTITIS: SURGICAL OUTCOMES OF RECONSTRUCTIVE SURGERY
Gabriel Vizgan, Muhammad Farooq, Jerry Blaivas
Presented By: Gabriel Vizgan
### Video Session I

**Friday, February 28, 2020**

**7:00 a.m. - 8:00 a.m.**

**Moderators:** Christopher S. Elliott, MD, PhD

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<td>Jerry G. Blaivas¹, Rajveer S. Purohit, Senad Kalkan², Eric W. Li³</td>
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<td>¹Icahn School of Medicine at Mount Sinai, New York, NY, ²Bezmialem Vakif University, Istanbul, Turkey, ³State University of New York Downstate College of Medicine, Brooklyn, NY</td>
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<td>Michael Avallone, Alan Quach, David Koslov, Kirk Redger, Dmitry Nikolavsky, Brian Flynn</td>
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<td>University of Colorado, School of Medicine, Department of Surgery, Division of Urology</td>
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<td>Presented By: Alan Quach</td>
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<tr>
<th>Video #4</th>
<th><strong>TRANSGENDER NEOVAGINA SACROCOLPOPEXY WITH AUTOLOGOUS FASCIA LATA</strong></th>
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<td>Christian Twiss, Fahad Chaus, Joel Funk</td>
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<td>University of Arizona College of Medicine</td>
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<td>Presented By: Christian Owen Twiss, MD</td>
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<th>Video #5</th>
<th><strong>BILATERAL URETEROVAGINAL FISTULAS AND VESICOVAGINAL FISTULA DUE TO RETAINED PESSARY</strong></th>
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<td>J Yates Congleton¹, Kimberly Boatman¹, Jacqueline Zillioux, MD², Natalie Karp, MD³, Tracey Krupski, MD², David Rapp, MD³</td>
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<td>¹University of Virginia School of Medicine, ²University of Virginia Department of Urology, ³Virginia Tech Carilion School of Medicine</td>
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<td>Presented By: Jacqueline Zillioux, MD</td>
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<th>Video #6</th>
<th><strong>OHMMETER DEMYSTIFIED: ISOLATING COMPONENT FLUID LEAK DURING AUS REVISION SURGERY</strong></th>
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<td>Richard Kershen, Tallwood Institute of Urology¹, Andrew Bachman, UConn School of Medicine²</td>
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<td>¹Tallwood Institute of Healthcare Medical Group, Hartford, CT, ²Farmington, CT</td>
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<td>Presented By: Andrew Bachman</td>
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Pelvic Organ Prolapse/Reconstruction Podium Session

Friday, February 28, 2020
8:15 a.m. - 9:45 a.m.

Moderators: Z. Chad Baxter, MD
Courtenay K. Moore, MD

8:15 a.m.  #18 SAME-DAY DISCHARGE SHOULD BE IMPLEMENTED AFTER MINIMALLY INVASIVE SACROCOLPOPEXY
Lisa Hickman¹, Cecile Ferrando¹, Howard Goldman², Katie Propst¹, Marie Fidela Paraiso¹
¹Center of Urogynecology and Pelvic Floor Disorders, Obstetrics/Gynecology and Women's Health Institute at the Cleveland Clinic, ²Glickman Urologic and Kidney Institute at the Cleveland Clinic
Presented By: Lisa C. Hickman, MD

8:25 a.m.  #19 A COST-EFFECTIVENESS ANALYSIS OF HYSTEROPEXY COMPARED TO VAGINAL HYSTERECTOMY WITH APICAL SUSPENSION FOR THE TREATMENT OF PELVIC ORGAN PROLAPSE USING A VAGINAL APPROACH
Raveen Syan¹, Shannon Wallace², Kyueun Lee³, Eric Sokol²
¹University of Miami Department of Urology, ²Stanford University Department of Urogynecology, ³Stanford University
Presented By: Shannon Leigh Wallace, MD

8:35 a.m.  #20 PERIOPERATIVE COMPLICATIONS OF SURGERY FOR PELVIC ORGAN PROLAPSE IN THE ELDERLY AND_FRAIL
Graham Chapman, MD¹,², Emily Slopnick, MD¹,², Kasey Roberts, MD¹,², Sangeeta Mahajan, MD¹,², Susan Wherley, MD¹,², Adonis Hijaz, MD,¹,²
¹Case Western Reserve University, ²University Hospitals Cleveland Medical Center
Presented By: Graham Chapman, MD

8:45 a.m.  #21 TRENDS IN MANAGEMENT OF COMBINED RECTAL AND VAGINAL PELVIC ORGAN PROLAPSE
Jacqueline Speed¹, Chiyuan Zhang¹, Brooke Gurland², Ekene Enemchukwu¹
¹Stanford University School of Medicine, Department of Urology, ²Stanford University School of Medicine, Department of Surgery
Presented By: Jacqueline M. Speed, MD

8:55 a.m.  #22 COMPARISON OF MAGNETIC RESONANCE DEFECOGRAPHY GRADING WITH POP-Q STAGING AND BADEN-WALKER GRADING IN THE EVALUATION OF FEMALE PELVIC ORGAN PROLAPSE
Grant Pollock, MD¹, Hina Anf Tiwari, MD², Stephane Chartier, BS³, Srinivasan Vedantham, PhD², Joel Funk, MD¹, Christian Twiss, MD¹
¹University of Arizona, Department of Urology, Tucson, AZ, ²University of Arizona, Department of Medical Imaging, ³Midwestern University
Presented By: Grant R. Pollock, MD

9:05 a.m.  #23 DOES PRE-OPERATIVE BLADDER COMPLIANCE IMPACT RENAL FUNCTION AFTER INCONTINENT URINARY DIVERSION FOR BENIGN INDICATIONS?
Alyssa Greiman, MD, Minsoo Choo, MD, Paholo Barbaglio Romo, MD, Bahaa S. Malaeb, MD, Anne P. Cameron, MD, J. Quentin Clemens, MD, John T. Stoffel, MD
Department of Urology, University of Michigan, Ann Arbor, MI, USA.
Presented By: Alyssa Kay Greiman, MD

9:15 a.m.  #24 PROSPECTIVE RANDOMIZED COMPARISON OF LONG-ACTING LIPOSOMAL BUPIVACAINE (EXPAREL) VERSUS STANDARD BUPIVACAINE (MARCAINE) FOR PAIN CONTROL FOLLOWING VAGINAL RECONSTRUCTIVE SURGERY
Akin S. Amasyali, Ashley Feldkamp, Jason Groegler, Phillip K. Stokes, Muhammad Alsyouf, Ruth Belay, John Maldonado, Julie W. Cheng, Hillary J. Wagner, D.Duane Baldwin, Andrea Staack
Loma Linda University, Dept. of Urology
Presented By: Akin Soner Amasyali
9:25 a.m.  #25  AUGMENT FOR WHAT? ENTEROCYSTOPLASTY IN MODERN UROLOGICAL PRACTICE AND 30-DAY OUTCOMES USING A LARGE MULTI-CENTRED DATABASE
James Ross, MD1, Humberto Vigil, MD, MSc1, Conrad Maciejewski, MD, MSc1, Blayne Welk, MD, MSc2, Ranjeeta Mallick, PhD, MSc3, Duane Hickling, MD, MSc1,3
1University of Ottawa, Ottawa, ON; 2Western University, London, ON; 3The Ottawa Hospital Research Institute
Presented By: James Ross, MD

9:35 a.m.  #26  SHOULD PROPHYLACTIC STRESS URINARY INCONTINENCE PROCEDURES BE PERFORMED DURING URETHRAL DIVERTICULUM REPAIR?
Jacqueline A. Chavez, BS1, Alana L. Christie, MS2, Feras Alhalabi, MD1, Maude E. Carmel, MD1, Gary E. Lemack, MD1, Philippe E. Zimmern, MD1
1U.T. Southwestern Medical Center, Urology; 2U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center
Presented By: Jacqueline Chavez, BS
Male Incontinence/Urodynamics/Neuromodulation Moderated Poster Session

Friday, February 28, 2020
8:15 a.m. - 9:45 a.m.

Moderators: Jaspreet S. Sandhu
Christopher F. tenggardjaja, MD

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**Poster #M19**

PROCEDURAL THERAPIES FOR THE MANAGEMENT OF BOTHERSOME LONG-TERM URINARY INCONTINENCE AFTER HOLMIUM LASER ENUCLEATION OF THE PROSTATE

Timothy Han, Lydia Glick, Thomas Hardacker, Patrick Shenot, Akhil Das
Department of Urology, Thomas Jefferson University, Philadelphia PA
Presented By: Thomas Hardacker, MD, MBA

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**Poster #M20**

PREDICTIVE VALUE OF URODYNAMICS FOR POST-OPERATIVE URINARY RETENTION AFTER ADVANCE® SLING PLACEMENT FOR POST-PROSTATECTOMY STRESS URINARY INCONTINENCE

Yu Zheng1, Goran Racz, Nicholas Major1, Jennifer Rolef, Lauren Rittenberg, Arthur Mourtzinos2, Ouida Westney3, Mike Metro4, Caitlin Lim, Lindsey Cox, Ross Rames, Eric Rovner
1Medical University of South Carolina, 2Lahey Health, 3MD Anderson, 4Temple Health
Presented By: Yu Zheng, MD

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**Poster #M21**

DETRUSOR CONTRACTILITY IN WOMEN: COMPARISON OF EVALUATION USING BLADDER CONTRACTILITY INDEX (BCI), PROJECTED ISOVOLUMETRIC PRESSURE 1 (PIP1) AND VBN CONTRACTILITY PARAMETER (k).

Françoise VALENTINI1, Brigitte MARTI1, Gilberte ROBAIN1, Philippe ZIMMERN2, Pierre NELSON3
1Hôpital Rothschild, Paris, France, 2UTSouthwestern Medical Center, Dallas, TX, 3Hôpital Rothschild, Paris, France
Presented By: Francoise A. Valentini, MD, PhD

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**Poster #M22**

IS INTERNATIONAL PROSTATE SYMPTOM SCORE PREDICTIVE OF URODYNAMICS FINDINGS IN MEN WITH MULTIPLE SCLEROSIS?

Hudson Pierce, Andrew Eidelberg, Ramy Goueli, Dominique Thomas, Bilal Chughtai
Weill Cornell Medicine-New York Presbyterian, Department of Urology, New York, NY
Presented By: Hudson Pierce

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**Poster #M23**

CAN URODYNAMIC PARAMETERS PREDICT THE NEED TO CATHETERIZE AFTER INTRAVESICAL INJECTIONS OF ONABOTULINUM TOXIN A FOR OVERACTIVE BLADDER

Kristina Aleksejeva, Gemma Scrimgeour, Richard Axell, Habiba Yasmin, Raveen Saigal, Stephen Unterberg, Mehwash Nadeem, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
FFR Urology, University College London Hospital
Presented By: Kristina Aleksejeva

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**Poster #M24**

THE ROLE OF PULSE WIDTH MANIPULATION COMPARED TO REPROGRAMMING ALONE FOR UNSATISFACTORY SACRAL NEURMODULATION THERAPY: A RETROSPECTIVE ANALYSIS

Jessica Rueb, Michele Fascelli, Samir Derisavifard, Neil Kocher, Courtenay Moore, Raymond Rackley, Goldman Howard, Gill Bradley
Cleveland Clinic
Presented By: Jessica J. Rueb, MD

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**Poster #M25**

SACRAL NEURMODULATION SENSORY RESPONSE STABILIZES EARLY AFTER IMPLANTATION

Hayden Jahn, MD, Bryan Savage, Colin Goudelocke, MD
Ochsner Medical Center
Presented By: Hayden E. Jahn, MD, BS

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**Poster #M26**

PREVALENCE OF ABNORMAL IMPEDANCE IN SACRAL NEURMODULATION DEVICES OVER TIME AND IMPLICATIONS FOR PRACTICE: A CASE-CONTROL STUDY

Michele Fascelli, Jessica Rueb, Samir Derisavifard, Neil Kocher, Courtenay Moore, Raymond Rackley, Sandip Vasavada, Howard Goldman, Bradley Gill
Glickman Urological and Kidney Institute, Cleveland Clinic, Cleveland, OH
Presented By: Michele Fascelli, MD
Poster #M27  AN OBJECTIVE METHOD TO CONFIRM NERVE RECRUITMENT THROUGHOUT ELECTRICAL STIMULATION IN SUBJECTS WITH OAB
John Barnard, MD¹, Stanley Zaslau, MD¹, Samir Arora, MD², Jessica Spear², Mingming Zhang, PhD³, Laura LeScoezec³
¹West Virginia University, ²Aventiv Research, ³Avation Medical, Inc.
Presented By: John T. Barnard II, MD

Poster #M28  INTERSTIM SACRAL NEUROMODULATION FOR INTRACTABLE URINARY VOIDING DYSFUNCTIONS (SOUNDS): RESULTS OF EFFECTIVENESS, QUALITY OF LIFE, PATIENT-REPORTED OUTCOMES AND SAFETY IN A FRENCH MULTICENTER OBSERVATIONAL STUDY
Emmanuel Chartier-Kastler¹, Alain Ruffion², Loïc Le Normand³, Jean-Nicolas Cornu⁴, Abdallah Abouihia⁵, Alice Melotti⁶, David Urs Josef Keller⁶
¹Academic Hospital Pitié-Salpêtrière Paris, Dept. of Urology, Paris, France, ²CH Lyon Sud, Dept. of Urology, Lyon, France, ³CHU de Nantes - Hôtel Dieu, Dept. of Urology, Nantes, France, ⁴CHU de Rouen – Hôpital Charles Nicolle, Dept. of Urology, Rouen, France, ⁵Medtronic Intl Sàrl, Dept. of Clinical RTG implantable therapies, Tolochenaz, Switzerland
Presented By: Emmanuel J. Chartier-Kastler, MD, PhD, FEBU
Male Incontinence/Urodynamics/Neuromodulation/Female Urology Non-Moderated Poster Session*

Friday, February 28, 2020
8:15 a.m. - 9:45 a.m.

*Not CME Accredited

Poster #NM60

LONG-TERM TRENDS OF SURGICAL MANAGEMENTS FOR MALE STRESS URINARY INCONTINENCE: ARTIFICIAL URETHRAL SPHINCTER VS MALE URETHRAL SLING - A 12 YEAR ALL-PAYER DATABASE ANALYSIS

Zhenyue Huang¹, Kelly Leong², Michael Gross², Xiaohui Liang², Steven Weissbart¹, Jason Kim¹
¹Stony Brook University Hospital, ²Stony Brook University School of Medicine
Presented By: Zhenyue Huang, MD

Poster #NM61

DOES RADIATION THERAPY IMPACT OUTCOMES ON INDIVIDUALS UNDERGOING REVISION ARTIFICIAL URINARY SPHINCTER SURGERY?

Ross Avant, Madeleine Manka, Brian Linder, Daniel Elliott
Mayo Clinic
Presented By: Ross A. Avant, MD

Poster #NM62

COMPARING PERCEPTION OF URINARY INCONTINENCE SEVERITY AND DEGREE OF BOTHER BETWEEN SPOUSES

Elizabeth N. Bearrick, MD¹, Brian J. Linder, MD¹, Laureano J. Rangel, MS, MSc², Daniel S. Elliott, MD¹
¹Department of Urology, Mayo Clinic, Rochester, MN, USA, ²Department of Health Sciences Research, Mayo Clinic, Rochester, MN, USA
Presented By: Elizabeth Bearrick, MD

Poster #NM63

REDUCED RADIATION TECHNIQUE FOR IMPLANTATION OF SACRAL NEUROMODULATION

Jason Groegler, Mohammad Hajiha, Forrest Jellison, Akin S. Amasyali, Ashley Feldkamp, Reihaneh Moghisi, Ruth Belay, Jonathan Maldonado, Mark Dickinson, Junchan Joshua Yune, D. Duane Baldwin, Andrea Staack
Loma Linda University
Presented By: Ruth Belay, MD

Poster #NM64

LONGITUDINAL ANALYSIS OF URINARY ATP LEVELS BEFORE AND AFTER WEEKLY POSTERIOR TIBIAL NERVE STIMULATION TREATMENTS FOR OVERACTIVE BLADDER

S. Freeman¹, L. Tellechea², M. Laudano³, N. Abraham³, S. Suadicani¹
¹Department of Urology, Albert Einstein College of Medicine and Montefiore Medical Center, Bronx, NY, ²Department of OB/GYN, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, NY
Presented By: Samantha Freeman

Poster #NM65

OUTCOMES IN SACRAL NEUROMODULATION OF PATIENTS WITH NON-OBSTUCTIVE URINARY RETENTION: EFFECT OF AGE AND COMORBIDITIES

Kim Thai, MD¹, Rachel High, DO², Zoe Blumenthal³, Katherine Dowd, MD¹, Erin Bird, MD¹, Jill Danford, MD²
¹Department of Urology, Baylor Scott and White Health, Temple TX, ²Department of Obstetrics and Gynecology, Baylor Scott and White Health, Temple, TX, ³Texas AM College of Health Sciences, Temple, TX
Presented By: Kim H. Thai, MD

Poster #NM66

EVALUATION OF COHORT PROGRESSING FROM FIRST TO SECOND STAGE SACRAL NEUROMODULATION AND INDICATIONS FOR UNPLANNED DEVICE REMOVAL

Ashley Feldkamp, Akin S. Amasyali, Jason Groegler, Jonathan Maldonado, Ruth Belay, Forrest Jellison, Andrea Staack
Loma Linda University
Presented By: Jonathan Maldonado, MD

Poster #NM67

THE RELATIONSHIP BETWEEN MOTOR AND SENSORY RESPONSES IN SACRAL NEUROMODULATION

Anastasia Couvaras, Kristen Gurtner, Colin Goudelocke
Presented By: Anastasia Couvaras
Poster #NM68 A PROSPECTIVE, MULTICENTER, INTERNATIONAL STUDY TO EXPLORE THE EFFECT OF THREE DIFFERENT AMPLITUDE SETTINGS IN SUBJECTS WITH URINARY URGE INCONTINENCE RECEIVING INTERSTIM THERAPY
Dean Elterman¹, Colin Goudelock², Michael Ehlen³, Dirk de Ridder⁴, Rebecca McCrery⁵, Mahreen Pakzad⁶, Melissa Kaufman⁷, Sagar Shah⁸, Eric Margolis⁹, Raviender Bukkapatnam¹⁰, Gayle Johnson¹¹, Thaddeus Brink¹¹, Mylene Champs¹¹
¹University Urology Associates, Toronto, Canada, ²Ochsner Medical Center, New Orleans, LA, USA, ³Minnesota Urology, Fridley, MN, USA, ⁴UZ Leuven, Leuven, Belgium, ⁵Adult Pediatric Urology and Urogynecology, Omaha, NE, USA, ⁶University College London, London, UK, ⁷Vanderbilt University Medical Center, Nashville, TN, USA, ⁸East Coast Institute for Research, Jackson, FL, USA, ⁹Urologic Research and Consulting LLC, Englewood, NJ, USA, ¹⁰Florida Urology Partners, Tampa, FL, USA, ¹¹Medtronic, Minneapolis, MN, USA
Presented By: Dean S. Elterman, MD, MSc, FRCSC

Poster #NM69 USE OF TRANSCUTANEOUS POSTERIOR TIBIAL NEUROSTIMULATION (T-PTNS) IN CHILEAN PATIENTS: COULD A HOME-BASED SUPERVISED TREATMENT OPTION BE MORE EFFECTIVE THAN AN OFFICE-BASED MODEL?
Marcelo Mass-Lindenbaum¹, Yael Dimonte-Bendov², Miriam Cohen-Vaizer³, María Ignacia Opitz⁴, Javier Pizarro-Berdichevsky⁵,⁶
¹Universidad de los Andes, Santiago, Chile, ²Universidad del Desarrollo, Santiago, Chile, ³Universidad de Chile, Santiago, Chile, ⁴Urogynecology Unit Sótero del Río Hospital, ⁵Urogynecology Unit Sótero del Río Hospital, Santiago, Chile, ⁶División de Obstetricia y Ginecología, Pontificia Universidad Católica de Chile
Presented By: Javier Pizarro-Berdichevsky, MD

Poster #NM70 IS THERE A LEARNING CURVE IN SACRAL NEUROMODULATION?
Hossein Saadat, MD, Mitchell Goldenberg, MBBS PhD, Valentin Shabataev, MD, Dean Elterman, MD, FRCSC
Division of Urology, University of Toronto
Presented By: Mitchell G. Goldenberg, MBBS, PhD

Poster #NM71 SACRAL NEUROMODULATION FOR NEUROGENIC LOWER URINARY TRACT SYMPTOMS IN SPINA BIFIDA AND SPINAL CORD INJURY PATIENTS
Yurong Mai, Yasmeen Jaber, Kyle Blum, Hajar Ayoub, Corresponding Author
University of Texas Houston, Department of Surgery, Urology, Houston, TX
Presented By: Yurong Mai

Poster #NM72 POST-PTNS TRENDS - WHO COMMITS? A PROSPECTIVE COHORT STUDY EVALUATING POST-PTNS TREATMENT IN OVERACTIVE BLADDER
Caroline Brandon, MD¹, Benjamin Brucker, MD¹, Scott Smilen, MD², Nirit Rosenblum, MD¹, Kimberly Ferrante, MD¹, Victor Nitti, MD³, Dominique Malacarne-Pape, MD¹
¹NYU Langone Health, ²Jersey Shore University Medical Center, ³Kaiser Permanente, ⁴University of California at Los Angeles
Presented By: Caroline Brandon, MD, MSc

Poster #NM73 PATIENT PERCEPTIONS OF TREATMENT OPTIONS FOR OVERACTIVE BLADDER AND THEIR LIKELIHOOD TO TRY A TRANSCUTANEOUS TIBIAL NERVE STIMULATION SYSTEM
Nel Gerg, MD¹, Samir Arora, MD², Jessica Spear², Mingming Zhang, PhD³, Laura LeScoezec³
¹The Pelvic Solutions Center, ²Aventiv Research, ³Avation Medical, Inc.
Presented By: Nel Elisabeth Gerg, MD

Poster #NM74 LONG TERM FOLLOW-UP OF IMPLANTED SACRAL NERVE STIMULATION DEVICES: AN INSTITUTIONAL REVIEW
Eileen Brandes, MD, E. Ann Gormley, MD
Dartmouth Hitchcock Medical Center, Lebanon, NH
Presented By: Eileen Brandes, MD

Poster #NM75 OUTCOMES OF PATIENTS WITH REFRACTORY OAB UNDERGOING PERCUTANEOUS TIBIAL NERVE STIMULATION IN REAL LIFE PRACTICE.
Wesley Smith, BS, Dayron Rodriguez, MD, MPH, Lauren Sudheimer, PA, Alana Christie, BS, MS, Maude Carmel, MD, Gary Lemack, MD, Philippe Zimmern, MD
Department of Urology, UT Southwestern Medical Center
Presented By: Wesley James Smith, BS
Poster #NM76  WHICH URODYNAMIC PARAMETERS CAN PREDICT OUTCOME OF INTRAVESICAL INJECTIONS OF ONABOTULINUM TOXIN A FOR OVERACTIVE BLADDER
Kristina Aleksejeva, Gemma Scrimgeour, Richard Axell, Habiba Yasmin, Danial Motan, Stephen Unterberg, Mehwash Nadeem, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
FFR Urology, University College London Hospital
Presented By: Kristina Aleksejeva

Poster #NM77  DOES EMOTIONAL CONDITION IMPACT ON UROFLOWMETRY?
Emanuele Rubilotta, Dept. of Urology1, Marilena Gubbiotti, Dept. of Urology2, Antonella Giannantoni, Dept. of Urology3, Alessandro Antonelli, Dept. of Urology1, Matteo Balzarro, Dept. of Urology1
1AOUI Verona, Verona, Italy, 2Univ. of Perugia, Perugia, Italy, 3Univ. of Siena, Siena, Italy
Presented By: Matteo Balzarro, MD

Poster #NM78  THE ROLE OF THE PREOPERATIVE POST VOID RESIDUAL URINE VOLUME IN MALES UNDERWENT TRANSURETHRAL RESECTION OF THE PROSTATE FOR LOWER URINARY TRACT SYMPTOMS
Emanuele Rubilotta, Dept. of Urology, Antonio Soldano, Dept. of Urology, Clara Cerrato, Dept. of Urology, Alessandro Antonelli, Dept. of Urology, Matteo Balzarro, Dept. of Urology
AOUI Verona, Verona, Italy
Presented By: Matteo Balzarro, MD

Poster #NM79  EFFECTIVENESS OF COGNITIVE DISTRACTORS IN DELAYING BLADDER FULLNESS SENSATION
Priscilla Koirala1, Natalie Swavely, MD2, Urmilia Sivagnanalingam1, Kaitlyn Maddra1, Rui Li, PhD3, Kyla Egenberger4, Sydney Roberts5, Samuel Weprin, MD6, John Speich, PhD7, Adam Klausner, MD2
1Virginia Commonwealth University School of Medicine, 2Virginia Commonwealth University, Department of Surgery, Division of Urology, Richmond, VA, 3Virginia Commonwealth University College of Engineering, Department of Mechanical Nuclear Engineering Richmond, VA
Presented By: Natalie Swavely, MD

Poster #NM80  IS THERE AN ASSOCIATION BETWEEN URODYNAMIC AND MRI FINDINGS AMONG MULTIPLE SCLEROSIS PATIENTS WITH LOWER URINARY TRACT SYMPTOMS?
Nadia Sion, Medical Student1, Yang Mao-Draayer2, Giulia Lane3, J. Quentin Clemens4, Priyanka Gupta5, Paholo Barboglio-Romo6, Brittany Kirch, Medical Student7, Anne Cameron7, John Stoffel2
1Central Michigan University, Mt Plesant MI, 2University of Michigan, Ann Arbor MI, 3University of Michigan, Ann Arbor, MI
Presented By: Nadia Sion, BS, MS

Poster #NM81  DETAILED ANALYSIS OF HEAD TO HEAD COMPARISON OF FULL URODYNAMICS WITH AIR FILLED VERSUS FLUID FILLED CATHETER SYSTEMS
Peter F.W.M. Rosier, MD PhD
Department of Urology. University Medical Center Utrecht
Presented By: Peter Rosier, MD, PhD

Poster #NM82  POST-VOID RESIDUAL URINE IN HEALTHY YOUNG VOLUNTEERS
Emanuele Rubilotta, Dept of Urology, Alessandro Antonelli, Dept of Urology, Matteo Balzarro, Dept of Urology
AOUI Verona, Verona, Italy
Presented By: Matteo Balzarro, MD

Poster #NM83  THE VALUE OF URODYNAMIC TESTING PRIOR TO SACRAL NEUROMODULATION IN PATIENTS WITH REFRACTORY OVERACTIVE BLADDER
Xibei Jia, MD1, Tess Crouss, MD2, Neha Rana, MD2, Kristene Whitmore, MD3, Babak Vakili, MD2
1UMass Memorial Medical Center, 2Cooper University Health Care, 3Hospital of the University of Pennsylvania, 4Drexel University College of Medicine, 5Christiana Care Health System
Presented By: Xibei Jia, MD

Poster #NM84  CLINICIAN FACTORS AFFECTING DOSE OF RADIATION DURING VIDEO URODYNAMICS.
Habiba Yasmin, Bogdan Toia, Richard Axell, Kristina Aleksejeva, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
Female Functional and Restorative Urology Unit, UCLH NHS Foundation Trust, UK
Presented By: Habiba Yasmin
Poster #NM85  UROLOGIC CHARACTERISTICS OF ADULT SPINA BIFIDA PATIENTS WHO DO NOT HAVE A CLINICAL INDICATION FOR URODYNAMICS
Shenelle Wilson, MD1, Betsy Hopson2, David Joseph, MD2, L. Keith Lloyd, MD1, Tracey Wilson, MD1
1University of Alabama at Birmingham, 2Children’s of Alabama
Presented By: Shenelle Wilson, BSN, MD

Poster #NM86  DO URODYNAMICS PREDICT URINARY RETENTION AFTER SLING PLACEMENT IN THE COMPLEX PATIENT: THE VALUE OF REPRODUCING SYMPTOMS ON URODYNAMICS
Nicholas Major1, Alyssa Greiman2, Yu Zheng1, Caitlin Lim1, Lauren Rittenberg3, Lindsey Cox1, Ross Rames4, Eric Rovner1
1Medical University of South Carolina, Dept. of Urology, Charleston, SC, 2University of Michigan, Dept. of Urology, Ann Arbor, MI, 3Tuscon, AZ
Presented By: Nicholas Major, MD

Poster #NM87  A NEW METHOD OF THE URODYNAMIC CATHETER INSERTION IN PATIENTS WITH DIFFICULT CATHETERIZATION
Olga Staroselceva, MD, Gleb Kovalev, MD, Nikita Kubin, PhD, Anastasya Zaytseva, MD
Saint-Petersburg State University Clinic of advanced medical technologies n.a. Nikolay I. Pirogov, Saint-Petersburg, Russia
Presented By: Olga Staroselceva, MD
Neuromodulation/OAB Podium Session

Friday, February 28, 2020
4:10 p.m. - 5:10 p.m.

Moderators: Richard Lee, MD, MBA
Anne M. Suskind, MD, MS, FACS, FPMRS

4:10 p.m.  #27 EFFECT OF PERCUTANEOUS TIBIAL NEUROMODULATION WITH THE NURO SYSTEM ON BRAIN ACTIVITY
Justina Tam¹, Kenneth Wengler², Kwan Chen³, Chencan Zhu⁴, Jie Yang⁵, Xiang He⁶, Jason Kim¹, Steven Weissbart¹
¹Stony Brook Medicine, Dept of Urology, ²Columbia University, New York State Psychiatric Institute, ³Stony Brook Medicine, Dept of Radiology, ⁴Stony Brook University, Dept of Applied Mathematics and Statistics, ⁵Stony Brook Medicine, Dept of Family, Population and Preventive Medicine
Presented By: Justina Tam, MD

4:20 p.m.  #28 INTERIM PIVOTAL STUDY EFFECTIVENESS DATA OF A COIN-SIZED TIBIAL NERVE STIMULATOR FOR URGENCY URINARY INCONTINENCE
Alexandra Rogers, MD¹, Rebecca McCrery, MD², Scott MacDiarmid, MD³, Subhro Sen, MD⁴, James Lukban, DO⁵, Bilal Kaaki, MD⁶, Andrew Shapiro, MD⁷, Thomas Giudice, MD⁸, John Nguyen, MD⁹, Joseph Gauta, MD¹⁰, Scott Serrels, MD¹¹, Chris Threatt, MD¹², Jed Kaminetsky, MD¹³, Vincent Lucente, MD¹⁴, Sonia Dutta, MD¹⁵, Peter Sand, MD¹⁶, Kimberly Ferrante, MD¹⁷
¹Sansum Clinic, ²Adult/Pediatric Urology Urogynecology, ³Alliance Urology, ⁴Stanford University Medical School, ⁵Colorado Pelvic Floor Consultants, ⁶Allen Memorial Hospital, ⁷Chesapeake Urology, ⁸South Carolina Ob/Gyn, ⁹SCPMG, ¹⁰Florida Bladder Institute, ¹¹Urology Associates of Norwalk, ¹²Sequioa Urology Center, ¹³Manhattan Medical Research, ¹⁴The Institute for Female Pelvic Medicine, ¹⁵Evanston Contiinece Center, NorthShore University HealthSystem, ¹⁶Kaiser Permanente San Diego
Presented By: Alexandra E. Rogers, MD

4:30 p.m.  #29 ONE-YEAR OUTCOMES FOR THE TREATMENT OF URINARY URGENCY INCONTINENCE WITH A MINIATURIZED, RECHARGEABLE SACRAL NEUROMODULATION SYSTEM
Kevin Benson, MD¹, Rebecca McCrery, MD², Chris Taylor, MD³, Osvaldo Padron, MD⁴, Bertil Blok, MD⁵, Stefan De Wachter, MD⁶, Andrea Pezzella, MD⁷, Howard B. Goldman, MD⁸, Felicia Lane, MD⁹
¹Sanford Hospital, Sioux Falls, South Dakota, ²Adult Pediatric Urology Urogynecology, Omaha, Nebraska, ³Taylor Surgical Arts, Harrison, Arkansas, ⁴Florida Urology Partners, Tampa, Florida, ⁵Department of Urology, Erasmus MC, Rotterdam, The Netherlands, ⁶Department of Urology, University Hospital Antwerp, Edegem, Belgium, ⁷Southern Urogynecology, West Columbia, South Carolina, ⁸Cleveland Clinic, Cleveland, Ohio, ⁹University of California, Irvine, California
Presented By: Kevin D. Benson, MD, MS

4:40 p.m.  #30 MRI CONNECTIVITY ANALYSIS PROVIDES EVIDENCE OF CNS MODE OF ACTION FOR PARASACRAL TENS- A PILOT STUDY
Jose Munillo Netto, Dept of Urology¹, Dustin Scheinost, Dept of Bioimaging and Radiol², John Onofrey, Dept of Urology², Israel Franco, Dept of Urology²
¹Universidade Federal de Juiz de Fora (UFJF), Juiz de Fora, Brazil, ²Yale School of Medicine
Presented By: Israel Franco, MD

4:50 p.m.  #31 SAFETY AND EFFECTIVENESS OF FULL BODY MRI SCANNING IN SUBJECTS USING INTERSTIM THERAPY
Kevin Benson, MD MS¹, Meredith Hayes, MD MS², Matthew Hayes, MD MS², Valerie Barres, PhD³, Erin Feltman, BS¹, Dianna Begeman¹
¹Department of Obstetrics/Gynecology Division FPMRS Sanford Health, Sioux Falls, SD, ²Department of Radiology, Sanford Health, Sioux Falls, SD, ³Department of Research, Sanford Health, Sioux Falls, SD
Presented By: Kevin D. Benson, MD, MS

5:00 p.m.  #32 PROXIMAL URETHRAL ELECTRICAL STIMULATION PROFOUNDLY IMPROVES UNDERACTIVE BLADDER FUNCTION IN RATS AFTER UNILATERAL PELVIC NERVE TRANSECTION
Bradley Potts, MD¹, Matthew Fraser, PhD¹,²
¹Duke University Medical Center, Dept. of General Surgery, Division of Urology, ²Durham VA Medical Center
Presented By: Bradley Potts, MD
IC/Pelvic Pain/Geriatrics/BPH Moderated Poster Session

Friday, February 28, 2020
4:10 p.m. - 5:10 p.m.

Moderators: Jennifer G. Rothschild, MD, MPH
Steven J. Weissbart, MD

Poster #M29
REAL WORLD RETROSPECTIVE STUDY OF THE PROSTATIC URETHRAL LIFT
Daniel Jaffee, MD\textsuperscript{1}, Gregg Eure, MD\textsuperscript{2}, Steven Gange, MD\textsuperscript{3}, Douglas Grier, MD\textsuperscript{4}
\textsuperscript{1}Affiliated Urologists, \textsuperscript{2}Urology of Virginia, \textsuperscript{3}Summit Urology Group, \textsuperscript{4}Sound Urological Associates
Presented By: Daniel C. Jaffee, MD

Poster #M30
SAFETY AND LEGAL ENVIRONMENT FOR VAGINAL LASERS: UNCOVERING THE EVIDENCE BEHIND THE FDA SAFETY COMMUNICATION
Julia Z. Guo, BA\textsuperscript{1}, Colby P. Souders, MD\textsuperscript{2}, Lynn McClelland, JD\textsuperscript{3}, Jennifer T. Anger, MD MPH\textsuperscript{3}, Karyn S. Elber, MD\textsuperscript{2}, A. Lenore Ackerman, MD PhD\textsuperscript{2}
\textsuperscript{1}David Geffen School of Medicine University of California, Los Angeles, \textsuperscript{2}Cedars-Sinai Medical Center, \textsuperscript{3}University of California Los Angeles
Presented By: Colby Perkins Souders, MD

Poster #M31
USING PAIN MECHANISM SCORES TO CHARACTERIZE PATIENTS WITH UROLOGIC CHRONIC PELVIC PAIN SYNDROME (UCPPS): NEW FINDINGS FROM THE MAPP RESEARCH NETWORK
David Williams, PhD\textsuperscript{1}, J. Richard Landis, PhD\textsuperscript{2}, Bruce D. Naliboff, PhD\textsuperscript{3}, H. Henry Lai, MD\textsuperscript{4}, J. Quentin Clemens, MD, MSC\textsuperscript{1}, Christopher Mullins, PhD\textsuperscript{5}, Andrew D. Schrepf, PhD\textsuperscript{1}, John T. Farrar, MD, PhD\textsuperscript{1}, Eric D. Strachan, PhD\textsuperscript{1}, Robert M. Moldwin, MD\textsuperscript{1}, Bayley J. Taple\textsuperscript{1}, Michel A. Pontari, MD\textsuperscript{9}
\textsuperscript{1}University of Michigan, \textsuperscript{2}Perelman School of Medicine at the University of Pennsylvania, \textsuperscript{3}University of California, Los Angeles, \textsuperscript{4}Washington University School of Medicine, \textsuperscript{5}DKUHD.NIDDK, NIH, \textsuperscript{6}University of Washington, \textsuperscript{7}Hofstra University School of Medicine, \textsuperscript{8}Northwestern University Feinberg School of Medicine, \textsuperscript{9}Lewis Katz School of Medicine at Temple University
Presented By: Michel Arthur Pontari, MD

Poster #M32
FOSFOMYCIN CAN DECREASE THE NEED FOR IV ANTIBIOTIC THERAPY IN THE ADVANCED MANAGEMENT OF MENOPAUSAL WOMEN WITH RECURRENT URINARY TRACT INFECTIONS
Timothy F. Carroll, BS\textsuperscript{1}, Alana L. Christie, MS\textsuperscript{2}, Bonnie Prokesch, MD\textsuperscript{2}, Philippe Zimmern, MD\textsuperscript{1}
\textsuperscript{1}U.T. Southwestern Medical Center, Urology, \textsuperscript{2}U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center, \textsuperscript{3}U.T. Southwestern Medical Center, Infectious Disease
Presented By: Timothy Field Carroll, BS

Poster #M33
IS UREAPLASMA TRULY A URINARY TRACT PATHOGEN?
Victoria Scott, MD, Colby Souders, MD, Muhammed Khalique, M.S., James Ackerman, MA, A. Lenore Ackerman, MD, PhD
Cedars-Sinai Medical Center, Dept. of Surgery
Presented By: Colby Perkins Souders, MD
Open-Moderated Poster Session
Friday, February 28, 2020
4:10 p.m. - 5:10 p.m.
Moderators: Elizabeth Takacs, MD
Christopher E. Wolter, MD

Poster #OM34  FRAILTY IS ASSOCIATED WITH WORSE LOWER URINARY TRACT SYMPTOMS IN A DIVERSE UROGYNECOLOGIC POPULATION
Stephanie Zuo, MD1, Jaden Kohn, MD, MPH2, Harley Roberts, MA2, Laura Tellechea, MD1, Ava Leegant, MD1, Nitya Abraham, MD3, Chi Chiung Grace Chen, MD, MHS2, Melissa Laudano, MD3
1Albert Einstein College of Medicine/Montefiore Medical Center, Department of Obstetrics and Gynecology,
2Johns Hopkins School of Medicine, Department of Gynecology and Obstetrics,
3Albert Einstein College of Medicine/Montefiore Medical Center, Department of Urology
Presented By: Stephanie Wang Zuo, MD

Poster #OM35  PSYCHOSOCIAL INTERVENTION FOR INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME (IC/BPS): PATIENT NEEDS AND AN EXAMINATION OF GENDER DIFFERENCES
Lindsey McKernan1, Sula Windgassen2, Roger Dmochowski1, Leslie Crofford1, Michael Finn1, Stuart Reynolds1
1Vanderbilt University Medical Center, 2King's College London
Presented By: Sula Windgassen

Poster #OM36  ASSOCIATION BETWEEN SOCIOECONOMIC STATUS AND OUTCOMES OF BENIGN PROSTATIC HYPERPLASIA SURGICAL INTERVENTIONS
Navin Sabharwal, BA, Daniel Shoskes, MD, Khaled Fareed, MD, James Ulchaker, MD, Bradley Gill, MD,MS
Cleveland Clinic Glickman Urological and Kidney Institute
Presented By: Navin Sabharwal, BA

Poster #OM37  ESTIMATION OF URINARY FREQUENCY: DOES QUESTION PHRASING MATTER?
Rachael Sussman, MD1, Christina Escobar, MD2, Dora Jericevic, MD2, Cheonguen Oh, PhD2, Alan Arslan, PhD2, Ricardo Palmerola, MD2, Victor Nitti, MD3, Scott Smilen, MD2, Dominique Pape, MD2, Nirit Rosenblum, MD2, Benjamin Brucker, MD2
1MedStar Georgetown University Hospital, 2New York University, 3UCLA
Presented By: Rachael Dana Sussman, MD

Poster #OM38  DEVICE SURVIVAL AND QUALITY OF LIFE OUTCOMES FOLLOWING ARTIFICIAL URINARY SPHINCTER PLACEMENT
Timothy Boswell, MD1, Nicole Dodge, MD1, Daniel Elliott, MD1, Laureano Rangel, PhD2, Brian Linder, MD1
1Department of Urology, Mayo Clinic, Rochester, MN, 2Health Sciences Research, Mayo Clinic, Rochester, MN
Presented By: Timothy C. Boswell, MD

Poster #OM39  SINGLE INSTITUTIONAL EXPERIENCE WITH SINGLE-STAGED SACRAL NEUROMODULATION: COST SAVINGS AND OUTCOMES IN A CONTEMPORARY CASE SERIES
Wai Lee1, Daniel Artenstein2, Christopher F Tenggardjaja3, Una J Lee4, Alvaro Lucioni1, Polina Reyblat2, Kathleen C Kobashi1
1Virginia Mason, Seattle, WA, 2Kaiser Permanente, Los Angeles, CA
Presented By: Wai Lee, MD

Poster #OM40  ELEVATED URINARY PRONGF TO NGF RATIO IN OVERACTIVE BLADDER SYNDROME IN AN AGING FEMALE POPULATION
Abubakr Mossa1, Samer Shamout2, Philippe Cammisotto1, Lysanne Campeau2
1Lady Davis Institute, McGill University, Montreal, Quebec, Canada, 2Lady Davis Institute, McGill University Urology Department, Jewish General Hospital, Montreal, Quebec, Canada
Presented By: Abubakr H. Mossa, MD, MSc

Poster #OM41  CONTINUING EDUCATION FOR THE UROLOGY CLINICAL STAFF: FOCUSED TRAINING FOR OUR FRONTLINE
Wai Lee, Jason Frankel, Pansy Uberoi, Neha Patel, Alvaro Lucioni, Una J Lee, Kathleen C Kobashi
Virginia Mason, Seattle, WA
Presented By: Wai Lee, MD
Poster #OM42  ARE THE OUTCOMES OF SURGICAL TREATMENT OF WOMEN WITH RECURRENT STRESS URINARY INCONTINENCE (SUI) AS GOOD AS THOSE IN WOMEN WITH PRIMARY SUI?  
Huriye Kocadag, Gemma Scrimgeour, Anu Ranasinghe, Bogdan Toia, Lisa Smyth, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell  
University College London Hospital  
Presented By: Huriye Gizem Kocadag

Poster #OM43  DO PREOPERATIVE DEMOGRAPHICS OR SYMPTOMS PREDICT RECURRENCE IN PATIENTS FOLLOWING COMBINED SURGICAL REPAIR FOR PELVIC ORGAN PROLAPSE AND RECTAL PROLAPSE?  
Raveen Syan, Shannon Wallace, Brooke Gurland, Ekene Enemchukwu  
1University of Miami, Department of Urology, 2Stanford University, Department of Urogynecology, 3Stanford University, Department of General Surgery, 4Stanford University, Department of Urology  
Presented By: Shannon Leigh Wallace, MD

Poster #OM44  A COMPARISON OF ARTIFICIAL URINARY SPHINCTER OUTCOMES AFTER PRIMARY IMPLANTATION AND FIRST REVISION SURGERY  
Kevin Hebert, Brian Linder, Griffin Morrisson, Daniel Elliott  
Mayo Clinic, Dept. Urology, Rochester, MN  
Presented By: Kevin J. Hebert, MD

Poster #OM45  GENDER IMPACT ON BLADDER-RELATED OUTCOMES AND QUALITY OF LIFE AFTER PARAPLEGIC SPINAL CORD INJURY  
Sara Lenherr, MD, MS, Jennifer S. Herrick, MS, Odinachi Moghalu, MD, Sean P Elliott, MD, MS, Angela P Presson, PhD, MS, John T Stoffel, MD, Blayne Weik, MD, MSc, Jeremy B Myers, MD  
1University of Utah, 2University of Minnesota, 3University of Michigan, 4Western University  
Presented By: Sara M. Lenherr, MD, MS, FPMRS

Poster #OM46  IMPACT OF SURGEON'S EXPERIENCE IN LONG-TERM OUTCOME OF SACRAL NEUROMODULATION  
Dean Elterman, Seyed Hossein Saadat, Valentine Shabataev  
Presented By: Dean S. Elterman, MD, MSc, FRCSC

Poster #OM47  DISCUSSING URINARY INCONTINENCE WITH PROVIDERS IN THE NURSES' HEALTH STUDIES  
Giulia Lane, Kaityin Hagan, Elisabeth Erekson, Vatche Minassian, Francine Grodstein, Julie Bynum  
1University of Michigan, Urology, 2Harvard School of Public Health, 3Dartmouth, Department of Obstetrics and Gynecology, 4Brigham and Women's Hospital, Department of Obstetrics and Gynecology, 5Harvard School of Public Health, Department of Epidemiology, 6University of Michigan, Department of Geriatric and Palliative Medicine  
Presented By: Giulia Ippolito Lane, MD

Poster #OM48  HIGH-DENSITY SURFACE ELECTROMYOGRAPHIC ASSESSMENT OF PELVIC FLOOR HYPERTONICITY IN IC/BPS PATIENTS  
Nicholas Dias, BS, Chuan Zhang, PhD, Christopher Smith, MD, H. Henry Lai, MD, Yingchun Zhang, PhD  
1University of Houston, Department of Biomedical Engineering, Houston, TX, 2Baylor College of Medicine, Department of Urology, Houston, TX, 3Washington University School of Medicine, Division of Surgery, St. Louis, MO  
Presented By: Yingchun Zhang, PhD

Poster #OM49  PATIENT SATISFACTION IMPROVED WHEN PATIENTS SEEN BY MULTIPLE PROVIDERS AT A MULTIDISCIPLINARY PELVIC HEALTH CENTER  
Jacqueline Speed, MD, Carlos Montalvo, Javier Cuevas, Brooke Gurland, MD, FACS, Ekene Enemchukwu, MD, MPH  
1Department of Urology, Stanford University School of Medicine, Stanford, CA, 2Stanford Health Care, Palo Alto, CA, 3Department of Surgery, Stanford University School of Medicine, Stanford, CA  
Presented By: Jacqueline M. Speed, MD
IC/Pelvic Pain/Geriatrics/BPH/LUTS Non-Moderated Poster Session*

Friday, February 28, 2020
4:10 p.m. - 5:10 p.m.
*Not CME Accredited

**Poster #NM88**

**IMMUNE CELL PROFILES AND CYTOKINE LEVELS WITHIN HUNNER’S LESION OF INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME PATIENTS**

Joel Stern¹, Robert Moldwin¹, Vishaan Nursey², Ed Miller³, Horacio Rilo¹, Inna Tabansky⁴

¹Zucker School of Medicine at Hofstra/Northwell, ²Feinstein Institute of Medicine, ³RDS2 Solutions, ⁴Rockefeller University

Presented By: Joel Stern, PhD

**Poster #NM89**

**UROPATHOGEN ISOLATES FROM SPORADIC URINARY TRACT INFECTIONS COMPARED TO RECURRENT INFECTION: CONSIDERATIONS FOR A UROGYNECOLOGIC POPULATION**

Megan Bradley¹, Jessica Sassani¹, Camila Cabrera¹, Kristen Venuti¹, Mary Ackenbom¹

¹Magee Womens Hospital - University of Pittsburgh Medical Center, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Urogynecology, ²Magee Womens Hospital - University of Pittsburgh Medical Center, Department of Obstetrics, Gynecology and Reproductive Sciences

Presented By: Megan Sara Bradley, MD

**Poster #NM90**

**PARALYZING PAIN: INTRADETRUSOR BOTULINUM TOXIN A INJECTION VIA FLEXIBLE CYSTOSCOPY FOR TREATMENT OF INTERSTITIAL CYSTITIS**

Lauren Gleich¹, David Sussman²

¹Rowan SOM, Stratford, NJ, ²New Jersey Urology, Voorhees, NJ

Presented By: Lauren D. Gleich, DO,BS

**Poster #NM91**

WITHDRAWN

**Poster #NM92**

**OUTCOMES OF SECONDARY ELECTROFULGURATION IN THE MANAGEMENT OF WOMEN WITH ANTIBIOTIC-REFRACTORY RECURRENT URINARY TRACT INFECTIONS**

Jacqueline A. Chavez, BS¹, Alana L. Christie, MS², Feras Alhalabi, MD¹, Philippe E. Zimmern, MD¹

¹U.T. Southwestern Medical Center, Urology, ²U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center

Presented By: Jacqueline Chavez, BS

**Poster #NM93**

**UROPATHOGENIC BACTERIA ISOLATED FROM HUMAN CATHETER BIOFILMS EXHIBIT DECREASED GROWTH IN HYPERTONIC SALINE RELATIVE TO NORMAL SALINE CONTROLS**

Glenn Werneburg¹,², Nadine Henderson¹, David Thanassi¹, Raymond Rackley¹

¹Department of Urology, Glickman Urological and Kidney Institute, Cleveland Clinic Foundation, Cleveland, OH, ²Department of Microbiology and Immunology, Stony Brook University, Stony Brook, NY

Presented By: Glenn T. Werneburg, MD, PhD

**Poster #NM94**

**HUNNER LESION PHENOTYPE IN IC/BPS (INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME): A SYSTEMATIC REVIEW AND META-ANALYSIS**

Nicholas Pickersgill, Joel Vetter, H Henry Lai

Division of Urologic Surgery, Washington University School of Medicine

Presented By: Nicholas Pickersgill
Poster #NM95
LONGITUDINAL CHANGES IN THE “PELVIC PAIN ONLY” AND “WIDESPEAD PAIN” PHENOTYPES IN THE MAPP UROLOGIC CHRONIC PELVIC PAIN SYNDOME (UCPPS) COHORT
H. Henry Lai1, Emine Bayman2, J Richard Landis3, Steve Harte4, J Quentin Clemens5, Lasrissa Rodriguez6, Siobhan Sutcliffe7, Bayley Taple8, Bruce Naliboff9
1Departments of Surgery (Urology) and Anesthesiology, Washington University School of Medicine, 2Departments of Biostatistics and Anesthesiology, University of Iowa, 3Department of Biostatistics, Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine, 4Department of Anesthesiology, University of Michigan, 5Department of Urology, University of Michigan, 6Departments of Urology, and Obstetrics and Gynecology, University of Southern California, 7Departments of Surgery (Public Health Sciences), Washington University School of Medicine, 8Department of Medical Social Sciences, Northwestern University Feinberg School of Medicine, 9Department of Medicine, David Geffen School of Medicine at UCLA
Presented By: H. Henry Lai, MD

Poster #NM96
PATIENT PERSPECTIVES ON CANNABINOIDS FOR INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME
Kate Anderson, Resident1, Danielle Jenkins, Resident2, Mary Lynch, Psychiatrist3, Ashley Cox, Urologist1
1Dept. of Urology, Dalhousie University, 2Dept. of Urology, Queen's University, 3Dept. of Anesthesia, Pain Management and Preoperative Medicine, Dalhousie University
Presented By: Kate Anderson, MD

Poster #NM97
PRELIMINARY REPORT OF A NOVEL THERAPY FOR CHRONIC PELVIC PAIN: SOLA THERAPY
Charles Butrick, cwbutrick@gmail.com, Charles Butrick, Author and presenter
The Urogynecology Center
Presented By: Charles W. Butrick, MD, FPMRS

Poster #NM98
URINARY TRACT INFECTION PRESENTATION OF ELDERLY PATIENTS AND THE DECISION TO EMPIRICALLY TREAT
Annah Vollstedt1, Natalie Luke2, Kirk Wonjo2, Colleen Kelly2, David Smith2, David Baunoch2, Michael Opel2, Howard Korman2, Patrick Keating2, Frank Burks2, Mohammad Jafri2, Kevin Cline2, Laurence LaBelkoff2, Aaron Milbank2, Neil Sherman3, Rashel Haverkorn3, Laurence Yore4, Neil Shore4, Larry Sirls1
1Beaumont Hospital, Royal Oak, MI, 2Pathnostics, Irvine, CA, 3Comprehensive Urology, Royal Oak, MI, 4Kelly Statistical Consulting, 5Regional Urology, Shreveport, LA, 6MidLantic Urology, Philadelphia, PA, 7Minnesota Urology, 8Premier Urology, NJ, 9Urology San Antonio, TX, 10Urology of South Florida, Delray Beach, FL, 11Atlantic Urology Clinics, Myrtle Beach, SC
Presented By: Annah Vollstedt, MD

Poster #NM99
THE EFFECT OF DIET ON URINARY PH FLUCTUATIONS AMONG OLDER WOMEN WITH RECURRENT URINARY TRACT INFECTIONS
Jacqueline A. Chavez, BS1, Juliann M. Chavez, PhD2, Alana L. Christie, MS3, Feras Alhalabi, MD1, Philippe E. Zimmern, MD1
1U.T. Southwestern Medical Center, Urology, 2Private Practice, 3U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center
Presented By: Jacqueline Chavez, BS

Poster #NM100
APPLYING TIME-DRIVE ACTIVITY-BASED COSTING (TDABC) TO WOMEN WHO UNDERWENT FULGURATION FOR THE MANAGEMENT OF RECURRENT URINARY TRACT INFECTIONS
Amy Kuprasertkul, BS, Shivani Gaitonde, BS, Joseph J. Crivelli, MD, Philippe Zimmern, MD
U.T. Southwestern Medical Center, Urology
Presented By: Amy Kuprasertkul, BS

Poster #NM101
CYSTOSCOPIC ANTIBIOTIC IRRIGANT TO REDUCE POSTOPERATIVE URINARY TRACT INFECTIONS AFTER PELVIC RECONSTRUCTION AND MINIMALLY INVASIVE GYNECOLOGIC SURGERY: A RANDOMIZED CONTROLLED TRIAL
Emily Slopnick, MD1,2, Graham Chapman, MD1,2, Welles Henderson, MD1,2, David Sheyn, MD1,2, Andre Petrikovets, MD1,2, Adonis Hijaz, MD2, Robert Pollard, MD1, Jeffrey Mangel, MD1
1MetroHealth Medical Center, Dept. of Obstetrics and Gynecology, Cleveland, OH, 2University Hospitals Cleveland Medical Center, Dept. of Urology, Cleveland, OH
Presented By: Emily Slopnick, MD
Poster #NM102

**PELVIC FLOOR TENDERNESS REPRODUCES PELVIC PAIN IN UROLOGIC CHRONIC PELVIC PAIN SYNDROME: FINDINGS FROM MULTIDISCIPLINARY APPROACH TO THE STUDY OF CHRONIC PELVIC PAIN (MAPP) STUDY**

Priyanka Gupta, Department of Urology1, J. Quentin Clemens, Department of Urology1, H. Henry Lai. Division of Urologic Surgery1, Jeffrey Landis, Department of Biostatistics3, Siobhan Sutcliffe, Department of Obstetrics and G2, Larissa V. Rodriguez, Department of Urology4

1University of Michigan, Ann Arbor, MI, USA, 2Washington University School of Medicine, St. Louis, MO, USA, 3Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine, Philadelphia, PA, USA, 4University of Southern California, Los Angeles, CA, USA

Presented By: Priyanka Gupta, MD

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Poster #NM103

**DISCREPANCIES IN PATIENT AND PHYSICIAN PERSPECTIVES OF QUALITY OF CARE DELIVERED TO PATIENTS WITH RECURRENT URINARY TRACT INFECTIONS**

Taylor Sadun1, Victoria Scott2, Lauren Thum3, Melissa Markowitz1, Sally Maliski1, Ja Hong Kim1, Jennifer Anger2

1Department of Urology, David Geffen School of Medicine at UCLA, Los Angeles, CA, 2Division of Urology, Cedars-Sinai Medical Center, Beverly Hills, CA, 3Urology Specialists, Sioux Falls, SD

Presented By: Taylor Sadun, MD

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Poster #NM104

**COMPARISON OF DEEP PHENOTYPING FEATURES OF UCPPS PATIENTS WITH AND WITHOUT HUNNER LESION – A MAPP RESEARCH NETWORK STUDY**

H. Henry Lai1, Craig Newcomb2, Dina Appleby2, J. Quentin Clemens3, Priyanka Gupta3, Larissa Rodriguez4, J. Richard Landis5

1Departments of Surgery (Urology) and Anesthesiology, Washington University School of Medicine, 2Department of Biostatistics, Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine, 3Department of Urology, University of Michigan, 4Departments of Urology, Obstetrics, and Gynecology, University of Southern California

Presented By: H. Henry Lai, MD

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Poster #NM105

**PREVALENCE AND CHARACTERIZATION OF DYSPAREUNIA IN A GENERAL UROLOGY CLINIC POPULATION**

Jacqueline Zillioux, MD1, Clinton Yeaman, MD1, Kimberly Boatman2, Sarah Krzastek, MD3, David Rapp, MD1

1University of Virginia, Dept. Urology, Charlottesville, VA, 2University of Virginia School of Medicine, Charlottesville, VA, 3Virginia Commonwealth University, Dept. Urology, Richmond, VA

Presented By: Jacqueline Zillioux, MD

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Poster #NM106

**INTERSTITIAL CYSTITIS EXAMINATION OF THE CENTRAL AUTONOMIC NETWORK (ICECAN): DESIGN AND METHODS**

Katherine Sheridan1, Jody Barbeau2, Camila Bomtempo, MD3, Gisela Chelimskey, MD4, Quentin Clemens, MD5, Lisa Conant, PhD5, Mingen Feng2, Adonis Hijaz, MD5, Jeffrey Janata, PhD5, Richard Jennings, PhD5, Thomas Kamarck, PhD5, Sumana Koduri, MD5, Henry Lai, MD6, J. Richard Landis, PhD7, Sangeeta Mahajan, MD8, Marcellus Merritt, PhD8, Luft Tugan Muftuler, PhD9, Crystal O’hara1, Pippa Simpson, PhD7, Julian Thayer, PhD10, Frank Tu, MD, MPH11, Candida Ustine12, Dewayne Williams, PhD13, Ke Yan, PhD14, Thomas Chelimskey, MD15

1Medical College of Wisconsin, Neurology, WI, 2Medical College of Wisconsin, Quantitative Health Sciences, WI, 3Medical College of Wisconsin, Obstetrics and Gynecology, WI, 4Medical College of Wisconsin, Gastroenterology, Pediatrics, WI, 5University of Michigan, Urology, MI, 6Medical College of Wisconsin, Neurosurgery, Neurology, WI, 7University Hospitals, Urology, OB/GYN, OH, 8University Hospitals Cleveland, Psychology, Adult Psychology, OH, 9University of Pittsburgh, Psychiatry, Psychology, PA, 10University of Pittsburgh, Psychology, PA, 11Washington University, Urology, WA, 12University of Pennsylvania, Biostatistics, PA, 13University Hospitals, Urological Institute, OB/GYN, OH, 14University of Wisconsin Milwaukee, Psychology, WI, 15Medical College of Wisconsin, Research, Neurorsurgery, WI, 16University of California, Irvine, Psychological Sciences, CA, 17NorthShore University Health System, IL, 18Medical College of WI, Neurology, WI, 19University of California, Irvine, Psychological science, CA, 20Medical College of Wisconsin, Neurology, NeuroMuscular, WI

Presented By: Katherine Sheridan
**ABSTRACT LISTING**

**Poster #NM107**

**REASONS FOR MISDIAGNOSIS OF INTERSTITIAL CYSTITIS/GLADDER PAIN SYNDROME (IC/BPS) IN A NATIONAL COHORT OF VA PATIENTS**
Kai Dallas1, Catherine Bressee2, Amanda De Hoedt3, Justin Senechal4, Kamil Barbour4, Jayoung Kim4, Stephen Freedland1, Jennifer Anger1
1Cedars-Sinai, Division of Urology, Los Angeles, CA, 2Cedars-Sinai, Department of Biostatistics and Bioinformatics Research, Los Angeles, CA, 3Veterans Affairs Medical Centers, Urology Section, Durham, NC, 4National Center for Chronic Disease Prevention and Health Promotion, CDC, Atlanta, GA
Presented By: Kai B. Dallas, MD

**Poster #NM108**

**INTERSTITIAL CYSTITIS/GLADDER PAIN SYNDROME WITH CO-OCURRING ENDOMETRIOSIS: A COMMON CLINICAL PHENOTYPE IN CHRONIC PELVIC PAIN SYNDROME**
Tyler Overholt, MD1, Robert Evans, MD1,2, Catherine Matthews, MD1,2, Gopal Badlani, MD1,2, Heather Heath, BS3, Stephen Walker, PhD1,4,5
1Wake Forest Baptist Health Department of Urology, 2Wake Forest Baptist Health Female Pelvic Medicine and Reconstructive Surgery, 3Wake Forest Institute for Regenerative Medicine
Presented By: Tyler Lynne Overholt, MD

**Poster #NM109**

**TRAUMA-INFORMED CARE PRACTICES IN THE TREATMENT OF INTERSTITIAL CYSTITIS/GLADDER PAIN SYNDROME**
Lindsey McKernan, Emily Newbury, Rochell Burton
Vanderbilt University Medical Center
Presented By: Lindsey Colman McKernan, PhD

**Poster #NM110**

**ASYMPTOMATIC BACTERIURIA IS NOT ASSOCIATED WITH FREQUENCY OF SYMPTOMATIC URINARY TRACT INFECTIONS IN PATIENTS WHO ARE CATHETER DEPENDENT**
Alyssa Greiman, MD, Giulia Lane, MD, Rachel Bergman, BS, Paholo Barbogio Romo, MD, J. Quentin Clemens, MD, Priyanka Gupta, MD, Diana O'Dell, John Stoffel, Anne P. Cameron
Department of Urology, University of Michigan, Ann Arbor, MI, USA.
Presented By: Alyssa Kay Greiman, MD

**Poster #NM111**

**FACTORS CONTRIBUTING TO THE CONVERSION OF HOLMIUM ENucleATION OF THE PROSTATE TO AN OPEN OR HYBRID PROCEDURE**
Timothy Han, Lydia Glick, Thomas Hardacker, Patrick Shenot, Akhil Das
Department of Urology, Thomas Jefferson University, Philadelphia PA
Presented By: Timothy Moonhwan Han

**Poster #NM112**

**Withdrawn**

**Poster #NM113**

**COMPARISON OF BIPOLAR PLASMA VAPORIZATION VERSUS STANDARD HOLMIUM LASER ENucleATION OF THE PROSTATE: SURGICAL PROCEDURES AND CLINICAL OUTCOMES FOR SMALL PROSTATE VOLUMES**
Kang Sup Kim1, Yong Sun Choi2
1Department of Urology, Incheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, 2The Department of Urology, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea
Presented By: Kang Sup Kim

**Poster #NM114**

**CONTINUATION OF ANTIPLATELET AND/OR ANTICOAGULATION IN PATIENTS UNDERGOING TRANSCORRECTIVE WATER VAPOR THERAPY FOR BPH**
Ajay Gopalakrishna, David Yang, Raevti Bole, Ruby Kuang, Matthew Houlihan, Masaya Jimbo, Sevann Helo, Matthew Ziegelmann, Tobias Kohler
Mayo Clinic, Department of Urology
Presented By: David Y. Yang, MD

**Poster #NM115**

**IMPACT OF BODY MASS INDEX ON OUTCOMES FOLLOWING LASER PHOTOSELECTIVE VAPORIZATION OF THE PROSTATE**
Hudson Pierce1, Rami Goueri1, Bashir Al Hussein Al Awamih1, Dominique Thomas1, Shokki Goel1, Malek Meskawi1, Kevin Zom2, Alexis Te1, Bilal Chughtai1
1Weill Cornell Medicine-New York Presbyterian, Department of Urology, New York, NY, 2University of Montreal Hospital Center, Montreal, Canada
Presented By: Hudson Pierce
Poster #NM116  PERSISTENT LOWER URINARY TRACT SYMPTOMS FOLLOWING UROLIFT: DOES REMOVAL HELP?
Samantha Nealon, MD, Sarah Azari, MS4, Ross Simon, MD, Daniel Hoffman, MD
University of South Florida
Presented By: Samantha C. Nealon, MD

Poster #NM117  FEASIBILITY AND SAFETY OF MONOPOLAR TRANSURETHRAL RESECTION OF THE PROSTATE IN THE OUTPATIENT SETTING
Marie-Pier St-Laurent, MD1, Samuel Tremblay, MD2, Geneviève Nadeau, MD MSc FRCSC3
1Division of Urology, Université Laval, Quebec City, Canada, 2Division of Urology, Université Laval, Quebec City, Canada, 3Division of Urology, Université Laval, Quebec City
Presented By: Marie-Pier St-Laurent, MD

Poster #NM118  NEGATIVE PSA VELOCITY AS A PREDICTOR OF NEGATIVE BIOPSY IN PATIENTS WITH ELEVATED PSA
Jeffrey Arace, Viktor Flores, Dennis Robins, Thomas Monaghan, Nicholas Suss, Miriam Andrusier, William Sterling, Nicholas Karanikolas, Andrew Winer, Jeffrey Weiss
State University of New York Downstate Medical Center, Brooklyn, NY and Department of Veterans Affairs, New York Harbor Healthcare System, Brooklyn, NY
Presented By: Jeffrey Arace
Video Session II

Saturday, February 29, 2020
7:00 a.m. - 8:00 a.m.

Moderators: Aqsa A. Khan, MD
Steven J. Weissbart, MD

Video #7    ROBOTIC SACROCOLPOPEXY: TIPS FOR EFFICIENCY
Siri Drangsholt\textsuperscript{1}, Daniel Lieberman\textsuperscript{2}, Patrick Culligan\textsuperscript{3}
\textsuperscript{1}Weill Cornell Medicine, Center for Female Pelvic Health, \textsuperscript{2}Saint Barnabas Medical Center
Presented By: Siri Drangsholt, MD

Video #8    BLADDER AUGMENTATION CYSTOPLASTY
Philippe E. Zimmern, MD, Dayron Rodriguez, MD
U.T. Southwestern Medical Center, Urology
Presented By: Philippe E. Zimmern, MD, FACS, FPMRS

Video #9    OPPORTUNISTIC SALPINGECTOMY
Archana Rajender, Gamal Ghoniem
University of California, Irvine
Presented By: Archana Rajender, MD

Video #10   VAGINAL FREE GRAFT DORSAL ONLAY URETHROPLASTY
Alex Borchert, Samantha Raffee, Humphrey Atiemo
Henry Ford Health System
Presented By: Alex F. Borchert, MD

Video #11   SURGICAL MANAGEMENT OF URETHRAL DIVERTICULUM
Yaejee Hong, MD, Ayman Mahdy, MD
University of Cincinnati
Presented By: Yaejee H. Hong, MD

Video #12   MANAGEMENT OF THE “DIFFICULT FOLEY”: CATHETER OVER WIRE AND SUPRAPUBIC
Alan Quach, Kirk Redger, David Koslov, Nadia Halstead, Tim Vanadurongvan, Michael Atwell, Ty Higuchi, Brian Flynn
University of Colorado, School of Medicine, Department of Surgery, Division of Urology
Presented By: Alan Quach
Female Urology/Incontinence Podium Session
Saturday, February 29, 2020
8:00 a.m. - 9:30 a.m.
Moderators: Donna Y. Deng, MD, MS
Lee A. Richter, MD

8:00 a.m.  #33  CHANGES IN THE BRAIN CONTROL OF THE OVERACTIVE BLADDER IN WOMEN AFTER ONABOTULINUMTOXINA
Becky Clarkson¹, Christopher Chermansky², Sachi Tyagi¹, Derek Griffiths¹, Neil Resnick¹
¹Division of Geriatrics at University of Pittsburgh School of Medicine, ²Department of Urology at University of Pittsburgh School of Medicine
Presented By: Christopher John Chermansky, MD

8:10 a.m.  #34  URINARY AEROCCOCUS DEFINES A SEVERE, TREATMENT-REFRACTORY PHENOTYPE OF URGENCY URINARY INCONTINENCE IN OLDER WOMEN
Paige Kuhlmann, MD¹, James Ackerman, MA¹, Muhammed Khalique, M.S.¹, Ashley Caron, M.S.¹, Falisha Kanji, BS¹, Jennifer Anger, MD, MPH¹, Karyn Elber, MD¹, David Underhill, PhD², A. Lenore Ackerman, MD, PhD²
¹Cedars-Sinai Medical Center, Dept. of Surgery, ²Cedars-Sinai Medical Center, Immunobiology Research Institute
Presented By: Paige Kuhlmann, MD

8:20 a.m.  #35  URINARY INCONTINENCE REFERRAL PATTERNS IN ACADEMIC AND COUNTY HOSPITALS: THE IMPACT OF ECONSULT
Claire Burton¹, Gabriela Gonzalez², Catherine Bressee³, Victoria Scott⁴, Karyn S. Elber⁴, A. Lenore Ackerman⁴, Cecilia Wieslander⁵, Jennifer T. Anger⁴
¹Department of Urology, University of California Los Angeles, Los Angeles, CA, ²David Geffen School of Medicine, ³Department of Biostatistics and Informatics, Cedars Sinai Medical Center, Los Angeles, CA, ⁴Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA, ⁵Department of Obstetrics and Gynecology, Olive View Medical Center, Sylmar, CA
Presented By: Jonathan George Pavlinec, MD

8:30 a.m.  #36  VIBEGRON SHOWS STATISTICALLY SIGNIFICANT IMPROVEMENT IN SECONDARY EFFICACY MEASURES IN OVERACTIVE BLADDER: EMPOWUR STUDY
David Staskin, MD¹, Jeffrey Frankel, MD², Susann Varano, MD³, Denise Shortino, MS⁴, Rachael Jankowich, RN⁴, Paul N Mudd Jr, PharmD⁴
¹Tufts University School of Medicine, Boston, MA, ²Seattle Urology Research Center, Seattle, WA, ³Clinical Research Consulting, Milford, CT, ⁴Urovant Sciences, Inc., Irvine, CA
Presented By: David R. Staskin, MD

8:40 a.m.  #37  VERY LONG TERM OUTCOMES OF AUTOLOGOUS PUBOVAGINAL FASCIA SLINGS FOR URINARY INCONTINENCE IN WOMEN
Sandy Kim, BS¹, Daniel Wong, BS², Dominic Lee, MD², Philippe E. Zimmerm, MD²
¹U.T. Southwestern Medical Center, Urology, ²St. George Hospital, Urology
Presented By: Sandy Kim, BS

8:50 a.m.  #38  URODYNAMIC CHARACTERISTICS OF FEMALE WITH OAB SYMPTOMS DIAGNOSED AS BLADDER OUTLET OBSTRUCTION
Su Jin Kim¹, Hee Jung Choo², Hana Yoon³
¹Department of Urology, Yonsei University Wonju College of Medicine, Wonju, Korea, ²Ewha Womans University Seoul Hospital, Seoul, Korea, ³Department of Urology, Ewha Womans University College of Medicine, Ewha Womans University Seoul Hospital, Seoul, Korea
Presented By: Su Jin Kim

9:00 a.m.  #39  ANALYSIS OF SURGICAL PERFORMANCE IN MID-URETHRAL SLING SURGERY: WHAT A "MESH!!"
Caitlin Lim¹, Nicholas Major¹, Andrew Margules², Yu Zheng¹, Alyssa Greiman³, Lindsey Cox¹, Ross Rames¹, Eric Rovner¹
¹Medical University of South Carolina, Dept. of Urology, Charleston, SC, ²Philadelphia, PA, ³University of Michigan, Dept. of Urology, Ann Arbor, MI
Presented By: Caitlin Lim, DO, MS
9:10 a.m.  #40   BLADDER NECK AND URETHRAL EXPOSURE AFTER MACROPLASTIQUE INJECTIONS
Dayron Rodriguez, Fellow¹, Ata Jaffer, Resident², Mustafa Hilmy, Consultant Urological Surgeon², Philippe
Zimmern, Professor of Urology¹
¹University of Texas Southwestern Medical Center, ²York Teaching Hospital, United Kingdom
Presented By: Dayron Rodriguez, MD, MPH

9:20 a.m.  #41   IS THERE A DIFFERENCE IN DEMENTIA OR DEPRESSION RISK WHEN ANTICHOLINERGICS OR BETA-3
AGONISTS ARE USED IN OVERACTIVE BLADDER PATIENTS?
Blayne Welk¹, Eric McArthur²
¹Western University, ²ICES
Presented By: Blayne Kaili Welk, MD
LUTS/Voiding Dysfunction/Neurogenic Bladder Podium Session

Saturday, February 29, 2020
8:00 a.m. - 9:30 a.m.

Moderators: Marisa Clifton, MD, FACS
Adonis K. Hijaz, MD

8:00 a.m.  #42 A COMMUNITY-BASED EDUCATION PROGRAM FOR OVERACTIVE BLADDER IN OLDER ADULTS: A PILOT STUDY
Hudson Pierce1, Tirsit Asfaw2, Andrew Abram1, Bilal Chuhtai1
1Weill Cornell Medicine-New York Presbyterian, Department of Urology, New York, NY, 2Weill Cornell Medicine-New York Presbyterian, Department of Obstetrics and Gynecology, New York, NY
Presented By: Hudson Pierce

8:10 a.m.  #43 FACTORS ASSOCIATED WITH NO-SHOW AND CANCELLATION LESS THAN 24 HOURS PRIOR TO APPOINTMENT IN A MODERATE VOLUME (N=3,428) OUTPATIENT UROLOGY PRACTICE
Amy D. Dobberfuhl, MD, MS, Christina M. Foote, RN, BSN, Norma J. Evaristo, RN, BSN, Angela M. Graf, MS, Craig V. Comiter, MD
Stanford University, Dept. of Urology
Presented By: Amy D. Dobberfuhl, MD, MS

8:20 a.m.  #44 SIGNIFICANT DIFFERENCE IN BRAIN FUNCTIONAL CONNECTIVITY OF FEMALE MULTIPLE SCLEROSIS PATIENTS WITH NEUROGENIC LOWER URINARY TRACT DYSFUNCTION AND VOIDING DYSFUNCTION QUANTIFIED BY MACHINE LEARNING
Christof Karmonik, PhD1, Khue Tran1, Timothy Boone, MD2, Rose Khavari, MD2
1Houston Methodist Research Institute, 2Houston Methodist Hospital
Presented By: Khue Tran

8:30 a.m.  #45 THE EFFECTIVENESS AND SAFETY OF BLADDER OUTLET PROCEDURES FOR STRESS URINARY INCONTINENCE IN PATIENTS WITH NEUROGENIC STRESS INCONTINENCE
Minsoo Choo1, Bahaa Malaeb2, John Park2, Paholo Barboglio-Romo2, J Quentin Clemens2, Anne Cameron2, John Stoffel2
1Hallym University Dongtan Sacred Heart Hospital, Hwaseong, Korea, 2University of Michigan
Presented By: Minsoo Choo

8:40 a.m.  #46 PREVALENCE OF FECAL INCONTINENCE: UTILIZATION OF LARGE POPULATION TOILETING BEHAVIOR SURVEY
Elizabeth Rourke1, Siobhan Hartigan1, Stuart Reynolds1, Roger Dmochowski1, Casey Kowalik2, Melissa Kaufman1
1Vanderbilt University Department of Urology, 2The University of Kansas Health System
Presented By: Elizabeth Rourke, DO MPH

8:50 a.m.  #47 CHANGES IN MICTURITION-RELATED BRAIN ACTIVITY AFTER CEREBROVASCULAR ACCIDENT
Evgeniy Kreydin1, Parag Gad2, Kay Jann2
1Institute of Urology, Keck School of Medicine, University of Southern California, Los Angeles, CA, 2Department of Integrative Physiology, UCLA, Los Angeles, CA, 3Stevens Neuroimaging and Informatics Institute, Keck School of Medicine, Los Angeles, CA
*2017 Neuromodulation Grant Recipient

9:00 a.m.  #48 CARDIOVASCULAR RISK FACTORS FOR NOCTURIA USING THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY DATA
Sung Tae Cho1, Shinje Moon1, Kwang Jin Ko1
1Department of Urology, Hallym University College of Medicine, 2Department of Internal medicine, Hallym University College of Medicine
Presented By: Sung Tae Cho, MD
9:10 a.m.  #49  HIGH RISK URODYNAMICS FEATURES AND ASSOCIATED ADVERSE UPPER TRACT FINDINGS IN PATIENTS WITH AND WITHOUT A NEUROLOGIC CONDITION
Avery Braun, DO¹, Alice Xiang, MD², Patrick Vecellio³, Joshua Cohn, MD²
¹Albert Einstein medical Center, ²Albert Einstein Medical Center, ³Beaumont School of Medicine
Presented By: Avery E. Braun, DO

9:20 a.m.  #50  BLADDER RECOVERY IN POPULATIONS WITH TRANSVERSE MYELITIS
Arthi Satyanarayan, MD, Dayron Rodriguez, MD, Niccolo M Passoni, MD, Benjamin Greenberg, MD, Craig Peters, MD, Gary Lemack, MD, Micah Jacobs, MD
University of Texas Southwestern Medical Center
Presented By: Arthi Satyanarayan, MD
Pelvic Organ Prolapse/Reconstruction Moderated Poster Session

Saturday, February 29, 2020
8:00 a.m. - 9:30 a.m.

Moderators: Jerry G. Blaivas, MD
Suzette E. Sutherland, MD, MS, FPMRS

Poster #M34
A COMPARISON OF OUTCOMES FOR PELVIC ORGAN PROLAPSE SURGERY BETWEEN NURSING HOME RESIDENTS AND COMMUNITY-DWELLING OLDER ADULTS
Anne Suskind, MD, MS, FACS, Shoujun Zhao, PhD, W. John Boscardin, PhD, Kenneth Covinsky, MD, MPH, MS, Emily Finlayson, MD, MS
UCSF
Presented By: Anne M. Suskind, MD, MS

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EARLY POSTOPERATIVE COMPLICATIONS AND FACTORS ASSOCIATED WITH EARLY VERSUS LATE DISCHARGE OF PATIENTS UNDERGOING SURGERY FOR PELVIC ORGAN PROLAPSE. A NATIONAL REPORT
Mahmoud Khalil, MD, Naleen Raj Bhandari, PhD, Nalin Payakachat, PhD, Rodney Davis, MD, Omer Raheem, MD, Ehab Eltahawy, MD
¹Department of Urology, University of Arkansas for Medical Sciences, Little Rock, USA, 2Division of Pharmaceutical Evaluation and Policy, Department of Pharmacy, University of Arkansas for Medical Sciences, Little Rock, USA, 3Department of Urology, Tulane University, New Orleans, Louisiana
Presented By: Ehab Eltahawy, MD, MRCS

Poster #M36
TOTAL HYSTEROCTOMY IS MORE COMMON THAN SUPRACERVICAL Hysterectomy AT THE TIME OF CONCURRENT SACROCOLOPEXY
Emily Slopnick, MD, Graham Chapman, MD, Sangeeta Mahajan, MD, David Sheyn, MD, Kasey Roberts, MD, Adonis Hijaz, MD
¹University Hospitals Cleveland Medical Center, Dept. of Urology, Cleveland, OH, 2MetroHealth Medical Center, Dept. of Ob/Gyn, Cleveland, OH
Presented By: Emily Slopnick, MD

Poster #M37
VENOUS THROMBOEMBOLISM PROPHYLAXIS IN VAGINAL SURGERY FOR PELVIC ORGAN PROLAPSE: PREDICTORS OF HIGH RISK IN A LOW RISK POPULATION
Christina Escobar, Alejandro Gomez-Viso, Surhbi Agrawal, Nirit Rosenblum, Benjamin Brucker, Scott Smilen, Dominique Malacarne Pape
¹New York University, Department of Obstetrics and Gynecology, New York, NY, 2New York University, Department of Urology, New York, NY
Presented By: Christina Escobar, MD

Poster #M38
SPINE STRUCTURE COMPARISON IN SUBJECTS WITH AND WITHOUT PELVIC ORGAN PROLAPSE
Alexandra Marasco, Scott Doyle, Frank Mendel, Steven Lewis, Anne Stoklosa, Victoria Goss, Katelyn Benson, Ellen Picciolo, Tova Aabloe
¹Jacobs School of Medicine and Biomedical Sciences, Buffalo, NY, 2Jacobs School of Medicine and Biomedical Sciences, Dept. of Pathology and Anatomical Sciences, Buffalo, NY, ³Jacobs School of Medicine and Biomedical Sciences, Dept. of Computational Cell Biology, Anatomy and Pathology, Buffalo, NY, ⁴Jacobs School of Medicine and Biomedical Sciences, Dept. of Obstetrics and Gynecology, Buffalo, NY
Presented By: Alexandra Marasco

Poster #M39
VALIDATION OF THE PELVIC FLOOR AWARENESS AND KNOWLEDGE SURVEY (PFAKS)
Claire Burton, Melissa Markowitz, Falisha Kanji, Carrie Stewart, Victoria Scott, Karyn S. Eilber, A. Lenore Ackerman, Jennifer T. Anger
¹Department of Urology, University of California Los Angeles, Los Angeles, CA, ²David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, ³Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA
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<td>Didi Theva, MD, Mohamed Etafy, MD, Angelo Gousse, MD</td>
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Saturday, February 29, 2020
8:00 a.m. - 9:30 a.m.

*Not CME Accredited

**Poster #NM119**

**PELVIC ORGAN PROLAPSE ON YOUTUBE: EVALUATION OF CONSUMER INFORMATION**
Amber Herbert¹, Amy Nemirovsky, MS¹, Deborah Hess, MD², Dawn Walter³, Nitya Abraham, MD⁴, Stacy Loeb, MD, MSc⁵, Rena Malik, MD¹
¹University of Maryland, Baltimore, ²Brigham and Women's Hospital, ³NYU School of Medical Center and the Manhattan Veterans Affairs, ⁴Montefiore Medical Center
Presented By: Amber Herbert

**Poster #NM120**

**THE TRANSGVINAL PELVIC ORGAN PROLAPSE MESH BAN - UNFAIRLY INCLUDING BIOLOGIC PRODUCTS?**
Christopher Elliott¹, ²Eric Sokol³, Lisa Rogo-Gupta³
¹Santa Clara Valley Medical Center Division of Urology, ²Stanford University Medical Center Department of Urology, ³Stanford University Medical Center Department of Obstetrics and Gynecology
Presented By: Christopher Stephen Elliott, MD, PhD

**Poster #NM121**

**RECURRENT OF APICAL PROLAPSE: COMPARISON BETWEEN ABSORBABLE AND NON-ABSORBABLE SUTURES**
Fabiola Schlageter¹, Marcelo Mass-Lindenbaum², Bernardita Blümel², Javier Pizarro-Berdichevsky¹
¹Urogynecology Unit Sótero del Río Hospital. División de Obstetricia y Ginecología, Pontificia Universidad Católica de Chile, ²Universidad de los Andes, Santiago, Chile, ³Urogynecology Unit Sótero del Río Hospital. Clínica Santa María
Presented By: Javier Pizarro-Berdichevsky, MD

**Poster #NM122**

**PREOPERATIVE PATIENT EDUCATION FOR PELVIC ORGAN PROLAPSE MOST OFTEN DONE BY PERSONAL INTERVIEW AND PRINT MATERIALS**
Amy Nemirovsky, MS, Rena D. Malik, MD
University of Maryland School of Medicine
Presented By: Amy Nemirovsky, MS

**Poster #NM123**

**COMPARING TRANSGVINAL MESH UTILIZATION IN UROGYNECOLOGIC SURGERIES BETWEEN ACADEMIC AND NON-ACADEMIC INSTITUTIONS IN NEW YORK STATE**
Sina Mehraban-Far, Michael Gross, Zhenyue Huang, Alexandra Siegal, Michael Hung, Anh Nguyen, Steven Weissbart, Jason Kim
Department of Urology, Stony Brook University, Stony Brook, NY
Presented By: Alexandra Siegal

**Poster #NM124**

**PREFERRED SURGICAL APPROACH FOR APICAL PELVIC ORGAN PROLAPSE RECONSTRUCTION SURGERY IN ELDERLY PATIENTS: STATE-WIDE ANALYSIS**
Sina Mehraban-Far¹, Michael Gross¹, Michael Hung¹, Alexandra Siegal¹, Wai Lee², Steven Weissbart¹, Jason Kim¹
¹Department of Urology, Stony Brook University, Stony Brook, NY, ²Urology and Renal Transplantation, Virginia Mason, Seattle, WA
Presented By: Alexandra Siegal

**Poster #NM125**

**AUTOLOGOUS FASCIA LATA GRAFTS FOR THE REPAIR OF ANTERIOR COMPARTMENT PELVIC ORGAN PROLAPSE**
Margeaux Dennis, DO, Colton Prudnick, DO, Leonard Zuckerman, MD
Sparrow Hospital, Lansing MI
Presented By: Margeaux Dennis, Do
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¹Cedars-Sinai, Division of Urology, Los Angeles, CA, ²Stanford University, Department of Obstetrics Gynecology, Stanford, CA, ³Cedars-Sinai, Department of Obstetrics Gynecology, Los Angeles, CA
Presented By: Kai B. Dallas, MD

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Gaik Ambartsoumian, MD¹, Souvik Roy, MD¹, Gaurav Khatri, MD², Philippe E. Zimmern, MD³
¹University of Texas at Arlington, ²U.T. Southwestern Medical Center, Department of Radiology, ³U.T. Southwestern Medical Center, Urology
Presented By: Gaik Ambartsoumian, PhD

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Hyeon Woo Kim, Busan, South Korea, Jeong Zoo Lee, Busan, South Korea, Dong Gil Shin, Busan, South Korea
Pusan National University Hospital
Presented By: Hyeon Woo Kim

Poster #NM129
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Ralf Anding, MD
Dept. of Urology, University Hospital, Bonn, Germany
Presented By: Ralf G. Anding, MD

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Michele Fascelli, Glenn Werneburg, Jessica Rueb, Samir Derasavifard, Neil Kocher, Howard Goldman
Glickman Urological and Kidney Institute, Cleveland Clinic, Cleveland, OH
Presented By: Michele Fascelli, MD

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CORRELATION OF PRESENTING SYMPTOMS WITH EXPLANTED SYNTHETIC MID-URETHRAL SLING PATHOLOGY FINDINGS
Rahul S. Patel, BS¹, Alana L. Christie, MS², Philippe E. Zimmern, MD³
¹U.T. Southwestern Medical Center, Geriatrics, ²U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center, ³U.T. Southwestern Medical Center, Urology
Presented By: Rahul S. Patel, BS

Poster #NM133
AUTOLOGOUS FASCIA SACROCOLPOPEXY FOR PELVIC ORGAN PROLAPSE: SAFETY AND SHORT-TERM OUTCOMES
Janine Oliver
University of Colorado School of Medicine
Presented By: Janine L. Oliver, MD

Poster #NM134
SINGLE INSTITUTE EXPERIENCE WITH FEMALE BUCCAL MUCOSA GRAFT URETHROPLASTY
David Koslov, MD, Kirk Redger, MD, Alan Quach, MS, Brian Flynn, MD
University of Colorado
Presented By: David Koslov, MD
BARRINGTONS’S REFLEXES REVISITED: PROXIMAL URETHRAL ELECTROSTIMULATION CAUSES REMARKABLE EXCITATORY BLADDER RESPONSE IN SPINAL CORD INTACT RATS
Bradley Potts, MD1, Matthew Fraser, PhD1,2
1Duke University Medical Center, Dept. of General Surgery, Division of Urology, 2Durham VA Medical Center
Presented By: Bradley Potts, MD

Introduction: Detrusor underactivity is an important contributor to voiding dysfunction with numerous neurogenic and myogenic cause; unfortunately, there are few reliable treatment options. In the early 1900’s, Barrington discovered excitatory urethra-to-bladder reflexes in cats via pudendal, hypogastric, or pelvic nerve afferents. We electrically field-stimulated nerves of the proximal urethras of spinal-intact (SI) rats before and, in some, subsequent to acute suprasacral spinal cord injury (SCI) to determine if we could elicit these reflexes in normal and acute spinal shock conditions.

Methods: Eight urethane-anesthetized female Sprague-Dawley rats (230-290g) received ureteral diversion and transvesical catheters via laparotomy. The ventral pubis was removed to expose the urethra. Five rats were prepped with posterior vertebral dissection to facilitate acute SCI. Following continuous cystometry, static bladder volumes were set below bladder capacity (BC) and proximal urethral electrical stimulation (PUES) was applied via two 50 μm stainless steel wire electrodes placed across the rostral and caudal proximal urethra and immediate surrounding tissue. PUES was applied for 30 sec (60 sec recovery) with 0.1msec pulse, 5-250Hz and 10-50V. Following SI stimulation, SCI was performed at T9-10 (n=5). The bladder was filled to pre-SCI BC and PUES was performed from 5-250Hz and 50-75V. Extracted data included presence/absence of bladder contraction and evidence of lower extremity motor activity. Data were assigned a score of 1 if there was a bladder without motor response, 0 for no response or both bladder and motor response, and -1 for only motor response. Data were analyzed graphically and frequencies with non-negative results were further analyzed with one-way ANOVA.

Results: Overall positive responses were observed in SI rats for frequencies of 20Hz and 50Hz. Only 20Hz demonstrated significant differences by intensity; 30 and 40V elicited significantly higher average scores than other voltages (P=0.0213-0.0365 for 10, 20, and 50V). While 50V always elicited both a bladder and motor response in SI, only motor responses were observed after SCI.

Conclusion: In the SI rat, PUES at 20Hz and 30-40V elicited reliable bladder contractions in the absence of observable motor responses. Failure to elicit bladder responses following SCI suggests supralumbar involvement in excitatory urethra-to-bladder reflex arcs.

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Basic Science Podium/Poster #BS1

BRAIN CIRCUITS UNDERLYING URINARY URGENCY IN OVERACTIVE BLADDER SYNDROME: A SYMPTOMS OF LOWER URINARY TRACT DYSFUNCTION RESEARCH NETWORK (LURN) NEUROIMAGING STUDY

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Presented By: Ishtiaq Mawla, MS

Introduction: Overactive Bladder Syndrome (OAB) may be caused in part by dysfunction of the central regulation of micturition, which has been traditionally studied with catheter-based urodynamic testing and non-invasive neuroimaging. However, large-scale neuroimaging of naturalistic, physiologically-relevant bladder filling is missing. In this study, resting state functional magnetic resonance imaging (rs-fMRI) was conducted during naturalistic bladder filling in participants with OAB and Healthy Controls (HC) (Lai et al. 2018).

Methods: OAB participants (N=145, female=52%, age=57.61±14.5 years) and HC (N=97, female=52%, age=52.76±15.38 years) completed two rs-fMRI scans following oral consumption of 350ml of water. Scans were conducted at bladder full and empty states, respectively, interleaved with a period of voiding through natural diuresis. Ratings of Urgency (0-10) and Pain (0-10) were collected throughout the scan. rs-fMRI data were preprocessed using fMRIPrep 1.1.8 and fractional Amplitude of Low Frequency Fluctuations (fALFF) in the slow-5 range (0.01-0.027Hz) was computed voxelwise across the brain for the bladder full and empty scans. General linear modelling of fALFF images were conducted in FSL FEAT V6.0 (Z>2.3, p<0.05, FLAME1+2).

Results: 103 OAB (71%) and 37 HC (38%) responded to bladder filling (i.e. non-zero urgency change), and presented significant group differences in urgency during full (M±SD, OAB: 3.83±2.29, HC: 1.86±1.92, p<0.001) and empty states (OAB: 0.95±1.44, HC: 0.14±0.30, p<0.001). Void volume was significantly higher (p<0.001) in HC (276.9±186.8cc) compared to OAB (149.5±124.2cc). Correlations between void volume and urgency showed amplified stimulus-response relationships in OAB (r=0.63) compared to HC (r=0.38), one-tailed p=0.04. Group differences in fALFF were observed in bilateral M1/premotor regions during full bladder, such that OAB patients showed lower slow-5 fALFF (higher neural activity) compared to HC. In addition, slow-5 fALFF was significantly lower in OAB in the dmPFC and ACC compared to HC, during the empty bladder. Whole-brain regression showed that urgency was significantly related to slow-5 fALFF in the MCC (r=-0.37), such that higher urgency elicited higher activity in the MCC. Moreover, higher void volume indicated lesser neural activity in the aINS (r=0.39) and IPL (r=0.27).

Conclusion: Our results demonstrate that naturalistic bladder filling engages known micturition circuitry, as well as salience, default, and sensorimotor networks which are related to amplified stimulus-response relationships in OAB.

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EXERCISE MODULATES NEURONAL ACTIVATION IN THE MICTURITION CIRCUIT OF CHRONICALLY STRESSED RATS: A MAPP RESEARCH NETWORK STUDY

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Presented By: Larissa V. Rodriguez, MD, FPMRS

Introduction: Rats exposed to water avoidance stress (WAS) show increased urinary frequency, increased nociceptive reflex responses, and altered brain responses to bladder distension, analogous to observations made in patients with UCPPS. We examined the effects of exercise on voiding parameters and functional brain activation during bladder distension in rats exposed to WAS.

Methods: Adult, female Wistar Kyoto rats were exposed to 10 days of WAS wererandomized to either voluntary exercise (WAS/EX) for 3 weeks or sedentary groups (WAS/no-EX). Voiding parameters were assessed at baseline, post-WAS, and weekly for 3 weeks. Cerebral blood flow (CBF) mapping was performed during isotonic bladder distension (20 cm H2O) after intravenous bolus injection of [14C]-iodoantipyrine. Regional CBF was quantified in autoradiographs of brain slices and analyzed in 3-D reconstructed brains by statistical parametric mapping. Functional connectivity was examined through interregional correlation analysis.

Results: WAS (WAS/no-EX) increased voiding frequency and decreased voiding volumes. Exercise (WAS/EX) resulted in a decline in voiding frequency back to the baseline and increased urinary volumes per void. Within the micturition circuit, WAS/EX compared to WAS/no-EX demonstrated a significantly lower rCBF response to passive bladder distension in Barrington’s nucleus, as well as in the periaqueductal gray (PAG) which modulates this reflex. Greater rCBF was noted in WAS/EX animals broadly across corticolimbic structures, including the cingulate, medial prefrontal cortex (prelimbic, infralimbic areas), insula, amygdala, and hypothalamus, which provide a ‘top-down’ decision point where micturition could be inhibited or triggered. WAS/EX showed a significantly greater positive brain functional connectivities compared to WAS/no-EX animals within regions of the extended reflex loop (PAG, Barrington’s nucleus, intermediodorsal thalamic nucleus, pons), as well as within regions of the corticolimbic decision-making loop of the micturition circuit, with a strikingly negative correlation between these pathways. Urinary frequency was positively correlated with rCBF in the pons, and negatively correlated with rCBF in the cingulate cortex.

Conclusion: Chronic exercise may decrease urinary frequency at two points in the micturition circuit. During the urine storage phase, it may diminish the influence of the reflex micturition circuit itself, and/or it may increase corticolimbic control of voiding. Exercise may be an effective adjunct therapy in patients with UCPPS.

Funding: Supported by a MAPP Research Network grant (U01 DK082370) from the National Institutes of Diabetes and Digestive and Kidney Diseases (NIDDK), National Institutes of Health (NIH), and a grant #12472328 from the Department of Defense.
Introduction: Although Overactive Bladder Syndrome (OAB) has traditionally been considered a disorder of the lower urinary tract, a subset of patients reports a global increase in sensory symptoms, suggesting central amplification of sensory perception may also be involved in this condition. In this study, OAB patients and Healthy Controls (HC) completed psychophysical auditory sensitivity testing and resting state functional magnetic resonance imaging (rs-fMRI) during naturalistic bladder filling (Lai et al. 2018).

Methods: OAB (N=145, female=52%, age=57.61±14.5 years) and HC (N=97, female=52%, age=52.76±15.38 years) participants completed rs-fMRI following ingestion of 350ml of water, at bladder full and post-void empty states, respectively. Participants also completed questionnaires on urinary, pain and mood symptoms. A Generalized Sensory Sensitivity (GSS) score was calculated as a measure of global sensory sensitivity (widespread body pain, response to lights and sounds). Auditory testing was conducted with a pure tone audiometer, where 6, 3-s tones were presented binaurally at various intensity levels (40-90dB, 2000Hz). After each tone, participants rated corresponding intensity and unpleasantness on a 0-100 scale.

Results: 50 (34%) OAB patients scored ≥3 on the GSS and were sub-grouped as high GSS (h-GSS). Relative to the low GSS (l-GSS) group (N=95) and HC (N=97), h-GSS patients reported increased pain severity and interference, anxiety, and depression, and exhibited higher scores on the Genitourinary Pain Index (GUPI) pain subscore (all ps<0.05). Interestingly, h-GSS and l-GSS groups did not differ in GUPI urinary symptoms or quality of life. Relative to l-GSS and HC groups, h-GSS patients reported increased hearing sensitivity on a hyperacusis questionnaire (p<0.05), and exhibited higher unpleasantness in response to 60 and 70 dB tones (p<0.05). Finally, h-GSS patients showed higher activity in sub-regions of the default mode network (DMN), relative to l-GSS [posterior cingulate cortex (PCC)] and HC (PCC and medial prefrontal cortex) in the post-voiding phase.

Conclusion: OAB patients self-reporting higher GSS demonstrate increased pain, mood issues, and auditory sensitivity. They also show greater DMN activity after voiding, consistent with higher DMN activity in fibromyalgia – the prototypical central sensory amplification syndrome - and chronic pain disorders in general. These data indicate differential neurobiological mechanisms may underlie the manifestation of clinical subtypes in OAB.

Funding: Provided by grants from NIH/NIDDK
Introduction: Neurologic deficits secondary to the altered neuronal plasticity observed in patients with spina bifida or spinal cord injury result in significant lower urinary tract dysfunction. Staufen2 is a double-stranded RNA binding protein that has been implicated in both dendritic RNA localization and synaptic plasticity in mammalian hippocampal neurons. However, its role in controlling bladder and outlet function is unknown. The aim of this study was to (A) identify the regions in the urinary tract where Staufen2 is expressed and (B) to determine the effect of Staufen2 deficiency on bladder function using wild type (WT) and Stau2KO mice.

Methods: Male WT and Stau2KO mice underwent cystometry under urethane anesthesia to evaluate bladder function. Contractility of bladder strips was assessed by isometric tension testing. The distribution of staufen2 in the spinal cord and lower urinary tract was determined by immunofluorescence microscopy in WT and Stau2KO mice.

Results: No gross histological changes of the lower urinary tract were found between WT and Stau2KO mice. Staufen2-labeled cells were identified in ganglia primarily in the vicinity of the bladder neck, proximal urethra and prostate regions, where it was co-expressed with the pan-neuronal marker, NeuN. Co-labeling of Staufen2 and NeuN was also detected in cell bodies localized in the sacral spinal cord and dorsal root ganglia. An abnormal cystometric phenotype of poor compliance followed by frequent urinary leakage was observed in 60% (6/10) of Stau2KO mice. The response of bladder tissue to electrical field stimulation was higher at all frequencies tested in Stau2KO mice compared to WT mice.

Conclusion: Our data suggest that Staufen2 is involved in regulating continence and micturition, possibly through facilitating RNA trafficking to synaptic sites in the lower urinary tract and modulating neurotransmitter release. Based on these findings, altered staufen2 localization and expression may lead to sensory or motor dysfunction of the bladder.

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**FUNCTIONAL AND HISTOLOGICAL CHANGES IN THE DOG URINARY BLADDER AFTER DIFFERENT DECENTRALIZATION AND REINNERRVATION STRATEGIES**

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Presented By: Mary F. Barbe, PhD

**Introduction:** Effects of spinal root decentralization and nerve transfer reinnervation approaches are compared by time after surgery, and bladder function, innervation and histology, using a canine model.  

**Methods:** Fifty-five female canines were divided into three decentralization procedures, four reinnervation strategies, or sham-operated control groups. Decentralized procedures included: 1) transection of sacral 1-3 dorsal and ventral roots, then 8 months recovery (S Dec + 8 mo; n=8); 2) S Dec, then 12 months recovery (S Dec + 12 mo; n=3); or 3) a more complete decentralization (transection of hypogastric nerves, dorsal roots of lumbar (L) 7, and S Dec, then 12 months recovery (H/L7d/S Dec + 12 mo; n=4). Twenty-six additional canines underwent decentralization and then transfer of genitofemoral, femoral or obturator nerve subportions to the pelvic nerves’s anterior vesical branch (GFNT, FNT and ObtNT, respectively) either immediately after decentralization or 12 months later. Surgical reinnervation groups included: 1) S Dec + Immediate GFNT (n=10); 2) S Dec + Immediate FNT (n=10); 3) S Dec + Immediate ObtNT (n=3); or 4) H/L7d/S Dec + 12 months recovery + ObtNT (n=3). Results were compared to 14 sham control dogs. Maximal detrusor pressure induced by electrical stimulation of T12 to S3 spinal cord segments was determined prior to euthanasia.  

**Results:** All nerve transfer strageties resulted in increased detrusor pressure during electrical stimulation of spinal segments corresponding to the transferred nerves. Restoration of detrusor pressure was greatest with ObtNT, over GFNT or FNT. Intramural ganglia and neurons per ganglia in the bladder wall were lowest after the most complete decentralization (i.e., in H/L7d/S Dec + 12 months recovery, and H/L7d/S Dec + 12 months recovery + ObtNT groups), compared to sham controls, and decreased with increased time of decentralization. However, mean widths of nerve bundles were higher in S Dec + Immediate GNT and H/L7d/S Dec + 12 months recovery + ObtNT animals, than in sham controls, and higher in each rerouted group, compared to sacral decentralized animals.  

**Conclusion:** Despite the loss of intramural ganglia and ganglionic neurons in long-term reinnervated animals, a change in innervation apparently allowed restoration of detrusor muscle function. However, earlier reinnervation time points maintained intramural ganglia integrity.  

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Deliniation of Interstitial Cystitis/Bladder Pain Syndrome Patient Subgroups Based on Molecular Expression Profile Analyses

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Presented By: Tyler Lynne Overholt, MD

Introduction: Interstitial cystitis/bladder pain syndrome (IC/BPS) is a chronic, pelvic pain condition with unclear pathophysiology. Identification of patient subgroups would be clinically useful for addressing challenges in diagnosis and management. Using anesthetic bladder capacity (BC) as a clinical delineator, we previously investigated gene expression profile differences in IC/BPS patient bladder biopsy samples and found that patients with low BC (\(\leq 400\text{cc}\)) had a significantly different expression profile than patients with non-low BC (>400cc). Herein, we extend these findings by adding microRNA analyses.

Methods: From our biorepository of 18-80 y/o IC/BPS patient samples, bladder biopsies representing three clinical subgroups were selected: \textbf{Group A}: low BC; \textbf{Group B}: low BC with Hunners lesion (HL+); and \textbf{Group C}: non-low BC. Tissues were obtained via cystoscopically-guided biopsy during hydrodistention. Total RNA (mRNA and miRNA) was isolated via standard protocols and assayed on whole genome and miRNA expression arrays. Differential expression analyses were conducted between: [1] Groups A & C (low vs non-low BC) and [2] Groups A & B (HL+ vs HL-).

Results: Comparison #1 identified 744 differentially expressed transcripts (DETs; p<0.01) and 54 differentially expressed miRNAs (p<0.05). Using Ingenuity Pathway Analysis (IPA) software, 11 miRNAs mapped to 40 genes. Hierarchical clustering of miRNA revealed two primary clusters (Figure 1A): one cluster consisted of entirely low BC patients and a second cluster consisted of 4 non-low and 1 low BC patients. Hierarchical clustering of mRNA also revealed two primary clusters (Figure 1B), illustrating a clear separation of samples based on BC. Comparison #2 identified 917 DETs (p<0.01) and 16 miRNAs (p<0.05); 4 miRNAs mapped to 13 genes. Hierarchical clustering of both miRNA and mRNA profiles revealed a clear separation of samples based on HL status.

Conclusion: In Comparison #1, upregulated genes were over-represented in cell proliferation and inflammation pathways, suggesting potential underlying biological themes for the low BC phenotype. In addition to over-representation of these same pathways in Comparison #2, upregulated genes were also over-represented in oxidation-reduction pathways, suggesting in addition to inflammation and abnormal cell proliferation, oxidative stress may underlie the HL+ phenotype. This study identified significant molecular differences in IC/BPS associated with low vs non-low BC phenotype, and additional molecular findings that further define the HL+ phenotype.
Figure 1. Hierarchical clustering of RNA expression profiles in IC/BPS patient bladder biopsy samples. A microRNA expression profiles in the low vs non-low BC sample comparison. Within the heatmap: Red = higher expression; Green = lower expression. B RNA (transcript) expression profiles in the same 8 samples. Red = higher expression; Blue = lower expression. Columns represent individual samples; rows represent individual miRNAs (Panel A) or mRNA (Panel B).

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Basic Science Podium/Poster #BS7

MICROBIAL COMPOSITION DEFINES PELVIC PAIN PHENOTYPES IN REPRODUCTIVE-AGE WOMEN

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Presented By: A. Lenore Ackerman, MD, PhD

Introduction: In reproductive-age women, there is significant symptomatic overlap between interstitial cystitis/bladder pain syndrome, chronic pelvic pain, overactive bladder syndrome (OAB), vulvodynia, and endometriosis leading to frequent misdiagnosis and delayed care. The epidemiology of pelvic pain suggests a microbial involvement in its etiology, but previous studies have failed to definitively identify specific bacteria associated with pain diagnoses. Given the substantial diagnostic confusion surrounding pelvic pain, we examined urinary bacterial associations with specific symptom clusters, not diagnoses.

Methods: Catheterized urinary samples were obtained from 78 pre-menopausal women (age 18-45) with a variety of urinary complaints, including bladder and pelvic pain. 16S next-generation sequencing (NGS) was used to characterize urinary microbial populations; validated questionnaires (female GenitoUrinary Pain Index, OAB questionnaire, O'Leary-Sant Indices) were used to quantify symptom type and severity. K means unsupervised clustering analysis of NGS data was used to assign subjects to urotypes, based on the urinary bacterial community state types. Quantitative PCR (qPCR) served to confirm the NGS results and provide objective concentrations for taxa of interest. Linear regression analysis confirmed the associations of bacterial concentrations and specific symptoms.

Results: In an exploratory population of 35 reproductive-age women with a variety of complaints, 16S NGS revealed four urotypes that strongly correlated with symptomatology. Isolated urgency incontinence was rare; the majority of subjects with symptoms complained of genitourinary pain. Bladder-specific pain (worse with filling, relieved by voiding) was strongly associated with Lactobacillus iners, a Lactobacillus spp. that does not produce lactic acid. Asymptomatic patients almost universally had a non-iners, Lactobacillus-predominant microbiota. Vaginal and urethral pain unrelated to voiding was positively correlated with increasing Enterobacteriaceae, confirmed on qPCR to be primarily Escherichia coli. Detection of these two pathobiont species by qPCR in a second validation population (n=43) was highly predictive of each phenotype (P<0.00001).

Conclusion: We describe the identification of clinically-useful bacterial biomarkers for specific pelvic and bladder pain phenotypes. Objective, rapid, and inexpensive testing to identify and classify reproductive-age women with bladder and pelvic pain would allow more accurate diagnosis and improve treatment decisions. The direct association of pathologic bacterial species concentration with severity of specific pain symptoms implicates a microbial role in the pathogenesis of genitourinary pain.
Figure. Correlation of microbial patterns with pain phenotypes in reproductive-age women. A) In an exploratory population (n=35), urinary microbial composition for each patient is shown in stacked box plots, ordered by urotype. Co-occurrence of *Lactobacillus iners* with bladder pain and *Enterobacteriaceae* with vaginal/urethral pain is seen from heat bars below the plot; increasing red indicates higher pain levels. B) Each urotype, defined by the major component, was assigned by unsupervised k means clustering of 16S NGS data, shown in a pie chart of median relative abundance: *Enterobacteriaceae* (blue), mixed (green), non-iners *Lactobacillli* (orange), and *Lactobacillus iners* (purple). The green and blue urotypes both express increasing *Enterobacteriaceae* and decreasing *Lactobacilli*, with the mixed group serving as an intermediate phenotype. C) In a second, independent population (n=43), specific bacterial associations with pain phenotypes were confirmed; linear regression analysis confirmed association of *L. iners* with bladder pain and *Enterobacteriaceae* with pain of the urethra/vagina, unrelated to voiding.

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Basic Science Podium/Poster #BS8
REDUCED HIPPOCAMPAL VOLUME AND METABOLIC RESPONSE TO ADULT STRESS EXPOSURE IN A MOUSE MODEL OF UROGENITAL HYPERSENSITIVITY
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Presented By: Julie Christianson, PhD

Introduction: In patients with Urologic Chronic Pelvic Pain Syndromes (UCPPS), early life stress (ELS) exposure has been correlated with greater widespread pain and negative mood. Neuroimaging studies in UCPPS patients have revealed significant changes in gray matter volume, neurochemical concentration, and functional connectivity that are correlated with widespreadness of pain and comorbid mood disorder. Here, we are investigating possible structural and metabolic changes in the hippocampus of our mouse model of ELS (neonatal maternal separation (NMS)), which demonstrates urogenital hypersensitivity, increased bladder output, widespread allodynia, impaired reward behaviors, and evidence of altered hippocampal regulation of the HPA axis.

Methods: Mouse pups underwent NMS for 3 hours/day from postnatal day (P) 1 to 21 and were weaned on P22. As adults, naïve (n=5) and NMS (n=9) female mice underwent magnetic resonance imaging (MRI) and spectroscopy (MRS) performed on a 9.4T MR system both prior to and 1d after a 1h exposure to water avoidance stress (WAS). T2-weighted images were acquired using a rapid acquisition with relaxation enhancement (RARE) sequence. Volumetric analysis was performed utilizing Voxel Base Morphometry methods implemented in SPM 8 and SPMMouse toolboxes within MATLAB. MRS measurements in a single voxel over the right hippocampus were acquired using a spin-echo full-intensity localized (SPECIAL) sequence. Spectroscopic analysis was performed with LCModel software.

Results: Hippocampal volume was analyzed in mice prior to WAS exposure and NMS mice had 0.038 mm3 smaller left hippocampal volume compared to naïve (p<0.005). Prior to WAS, no significant metabolite differences were detected between naïve and NMS mice. However, 1d after WAS, N-acetyl-aspartate (NAA), which is a marker of neuronal health and mitochondrial function, was significantly lower in NMS mice, compared to naïve and their baseline measurements (p<0.05). We also observed a significant decrease in pCreatine and pCholine (p<0.05), and a trend toward decreased glutathione (p=0.959), following WAS exposure, in NMS mice, compared to naïve.

Conclusion: We have previously shown evidence of decreased gene expression in the hippocampus from NMS mice that would indicate reduced limbic control over the hypothalamic-pituitary-adrenal axis. These data further suggest that NMS reduces both hippocampal gray matter volume and that the hippocampi of NMS mice are less metabolically responsive to WAS.

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**Basic Science Podium/Poster #BS9**

**EFFECT OF VITAMIN D DEFICIENCY ON THE DAY-NIGHT MICTURITION RHYTHM OF FEMALE MICE**

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Presented By: Elishia Renee McKay

**Introduction:** Vitamin D deficiency (VDD) is a widespread and preventable health issue. Studies suggest an association between lower urinary tract symptoms and VDD. However, the actual role of VDD in benign bladder conditions remains unknown. Vitamin D has been shown to synchronize expression of circadian clock genes. A functional circadian rhythm exists in bladder urothelium that coordinates connexin43 (Cx43) expression and plays a role in bladder mechanotransduction and signaling, which is key for proper micturition function. In this study we explore the effects of VDD on day-night micturition rhythm and urothelial Cx43 expression.

**Methods:** Female C57Bl/6 mice (8-week old) were divided into two groups based on dietary intake over a 16-week period: VDD (Tekklad Diet TD.89123; N=5) and Control (normal chow; N=5). Body weights were measured at baseline and week 16. Bladder function was evaluated at baseline and longitudinally on a weekly basis for 16 weeks using the Voided Stain on Paper (VSOP) method. At week 16, animals were euthanized, bladders harvested, weighed, the urothelial layer separated and Cx43 mRNA expression quantified by real-time PCR. Data is expressed as mean±SEM and statistical differences determined by Student t-test.

**Results:** Body weight of control and VDD mice increased significantly along the 16 weeks, but weight gain was not different between groups (Control: 46.6 ± 10.2% vs VDD: 57.9 ± 1.8%, p=0.30). Bladder weight at the 16-week endpoint was not different between VDD and controls (Control: 26.8 ± 1.3mg vs VDD: 35.9 ± 1.4mg, p=0.35). Longitudinal evaluation of bladder function demonstrated notable differences in day-night voiding behavior. Night-time voiding frequency of VDD mice was significantly higher than controls, starting at 1 week of dietary VD restriction (58.3 ± 0.2% higher, p=0.03) and remaining high throughout (47.2 ± 0.1% in average, weeks 1 to 16). In contrast, day-time voiding frequency was lower in VDD compared to controls, from week 1 (88.0 ± 8.0%, p=0.02) to week 16 (71.5 ± 16.5%, p=0.04). These changes in day-night voiding behavior were accompanied by Cx43 downregulation in urothelium (27.8 ± 2.9%, p<0.001).

**Conclusion:** VDD disrupts the day-night micturition rhythm. This effect is likely related to dysregulation of urothelial Cx43 expression and proper bladder mechanotransduction.

**Funding:** N/A
Basic Science Podium/Poster #BS10

FUNCTIONAL MRI DETECTED CHANGES IN BRAIN ATTENTIONAL NETWORKS: ASSOCIATION WITH HYPNOTHERAPY FOR TREATMENT OF URGENCY URINARY INCONTINENCE

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Presented By: Loren Ketai, MD

Introduction: Although our randomized control trial (RCT) recently showed similar efficacy of Hypnotherapy and medications for treatment of urgency urinary incontinence (UUI) (Komesu AJOG 2019 Aug 23), we hypothesized that Hypnotherapy and medication groups would differ in post treatment brain activation during bladder filling and in brain resting functional connectivity (FC).

Methods: A subgroup of women recruited from the RCT underwent functional MRI pre-treatment and 8 weeks after treatment began. Average activation during bladder filling task was compared using 2 × 2 (Therapy [Hypnotherapy vs. medications] × Time [Pre vs. Post]) ANOVAs in regions of interest (ROI)s, based on prior work (Ketai AJOG 2016 Oct;215(4):449) (N = 64). ROIs included the interoceptive cortex (dorsal anterior cingulate cortex, [dACC]), ventral attention (temporo-parietal junction [TPJ]) and dorsal attention networks (dorsolateral prefrontal cortex, dlPFC). ROIs also served as seed points for 2 × 2 voxel-wise analyses, performed with the bladder empty (N=60) and filled to 0.5 x strong urge to void (N=52). Significant Therapy × Time interactions in task-related activation or resting FC were further evaluated using one-way ANCOVAs of changes over time (Post-Pre) with pre-treatment activation as a covariate.

Results: Task data revealed a main effect of time for the left TPJ, activation diminishing in both groups following treatment, (p = 0.01). No Therapy × Time interaction remained significant after controlling for baseline differences Voxel-wise FC analyses with the bladder partially filled showed a Therapy × Time interaction between the dACC and the left dlPFC, connectivity increasing post-treatment in the Hyp compared to medications group. This difference remained significant after controlling for baseline connectivity (p<.001)(Figure).

Conclusion: Improvement in UUI with both Hypnotherapy and medication treatment was associated with decreased ventral “bottom up” attentional network activation. Activation decreased after Hypnotherapy in the absence of medication that could decrease bladder afferent stimuli to this network. Hypnotherapy, but not medication, was associated with increased resting FC between the interoceptive and dorsal, “top down” attentional network. The latter interacts with the ventral network in the selection of endogenous stimuli that warrant response. Findings suggest that effective treatment of UUI with Hypnotherapy, compared to medications, may alter attentional activation by affecting top down attentional control.
**Funding:** National Center for Complementary Integrative Health, National Institute of Health, Award Number R01AT007171
Poster #BS1

THERAPEUTIC EFFECTS AND FATE OF MESENCHYMAL STEM CELLS IN STREPTOZOTOCIN-INDUCED DIABETIC DETRUSOR UNDERACTIVITY RAT MODEL

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Presented By: Jung Hyun Shin, MD, PhD

Background
To investigate the fate of transplanted multipotent mesenchymal stem cells (M-MSCs; human embryonic stem cell derived), and identify the minimum therapeutic dosage of M-MSCs in streptozotocin (STZ)-induced diabetic (DM) cystopathy rat model.

Materials and methods
Eight-week-old female Sprague Dawley rats were divided into seven groups; sham (n=10), DM (n=10), DM+M-MSC 1,000K (n=10), DM+M-MSC 500K (n=9), DM+M-MSC 250K (n=9), DM+M-MSC 100K (n=10), DM+M-MSC 50K (n=10). After overnight fasting, STZ (50mg/kg) was injected intraperitoneally and rats with serum glucose ≥200mg/dL on the third day were included. Three weeks later, different dosages of GFP-tagged M-MSCs were directly injected into submucosal layer of bladder with 26 gauge needle. Changes in detrusor function and histology were evaluated one week after stem cell transplantation by awake cystometry, immunohistochemical staining and PCR. Minimum therapeutic dosage was determined based on awake cystometry. Next, the efficacy of identified minimum M-MSCs was compared with umbilical cord-derived stem cells (UC-MSC) (n=9, respectively). Long-term therapeutic effect was assessed two weeks and four weeks (n=4, respectively) after stem cell injection by awake cystometry.

Results: STZ-induced diabetic rats presented detrusor underactivity with significantly longer micturition interval, larger residual urine and bladder capacity, and decreased micturition pressure on awake cystometry than sham. The injection of M-MSCs reduced apoptosis (TUNEL) and restored muscle layer on H&E and Masson-Trichrome staining. GFP-tagged stem cells were co-stained in smooth muscle (α-SMA) and vascular pericytes (CD31). Desmin and NG2 stain (muscle specific markers) showed that transplanted MSCs were dominantly differentiated to myocytes. On PCR, rTk, rChrm2, rChrm3 rCacna1c was increased in DM groups while injection of M-MSCs decreased those receptors.

Stem cell dosage of 500K or more presented stable therapeutic effect on awake cystometry in DM models. In comparison with UC-MSCs, M-MSC transplanted group presented superior therapeutic effect with less non-voiding contraction (stable intravesical pressure) and shortened micturition interval. However, therapeutic effects of M-MSCs became insignificant on long-term (both 2 and 4 weeks) follow-up.

Conclusion: Therapeutic effects of transplanted M-MSCs were mainly based on myogenic restoration and minimum dosage of 500K was suitable for the treatment of diabetic detrusor underactivity rat model. However, the therapeutic effect was short-term, which was less than two weeks.

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Poster #BS2
CHRONOLOGICAL STUDY OF MESENCHYMAL STEM CELLS (MSCs), AND MSC-TREATED INJURED URETHRAL TISSUE CROSS-TALK IN RAT BIRTH TRAUMA URINARY INCONTINENCE MODEL: A HIGH ALTITUDE GENE ANALYSIS
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Presented By: Zhina Sadeghi, MD

Introduction: Periurethral mesenchymal stem cell (MSC) injections are associated with functional improvement in animal models of post-partum stress urinary incontinence (SUI). We quantified temporal gene expression modulation in MSCs and injured rat urethral tissue in an SUI model over 3 days post injury/local hMSC therapy by RNAseq.

Methods: We injected PKH fluorescent-labeled human MSC into the periurethral space of rats following a 4h vaginal distention (3 rats per time point). Control rats received vaginal distention injury only and were sacrificed at respective time points. Pelvic space was frozen in OTC embedding medium and subsequently sectioned at 12h, 24h, 36h, 72h post injury. Fluorescent labeled MSCs were easily distinguished from unlabeled adjacent rat urethral tissue. Total RNA was prepared from urethral tissue obtained by laser dissection of frozen tissue sections, and sequenced on an Illumina NextSeq 500. Differentially expressed genes (DEG) were determined by 2-group t-test (p<0.05) in the laser captured MSCs, and MSC-treated/non-treated injured urethral tissue over 72hs.

Results: Our transcriptional meta-analysis identified candidate genes involved in tissue injury resolution. These genes can be broadly sorted by injury and upon exposure to MSC throughout the first 72h of acute phase of injury. Genes differentially expressed in treated urethra compared with untreated urethra are associated with cytokines, wound healing, extracellular matrix stabilization and regeneration, cytokine signaling modification, cell cycle regulation, muscle differentiation and stabilization, angiogenesis, vasoprotection, neurogenesis, neuroprotection, oxidative stress suppression. (Figure)

Conclusion: This study suggests the changes in hMSCs gene expression in injured urethra environment and the changes in the injured urethral tissue gene expression upon hMSC treatment would play several functional roles in the resolution of urethral tissue injury.

Figure) Top 50 DEGs by magnitude between hMSC-treated vs. untreated injured urethral tissue with persistent gene expression signature across all four time points of the experiment (12, 24, 36, and 72 hrs post VD injury). Ranked by nominal p. value (leftmost column, all P<0.05) and FC (second column from the left). All rows are normalized (z-score) so that red coloring is upregulated versus the other group and blue is downregulated.
University Hospitals Cleveland Medical Center, Urology Institute departmental funding
Poster #BS3
SYNERGISTIC EFFECTS OF N-ACETYLCYSTEINE AND MESENCHYMAL STEM CELL IN LIPOPOLYSACCHARIDE INDUCED-CYSTITIS RAT MODEL
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Presented By: Jung Hyun Shin, MD, PhD

Introduction: To investigate the synergistic effect of mesenchymal stem cells (MSCs; human embryonic stem cell derive) and N-acetylcysteine (NAC), and seek the possibility of reducing amount of stem cell used in treating bladder dysfunction.

Methods: Eight-week-old female Sprague-Dawley rats were divided into seven groups; sham (n=10), LPS (n=10), LPS+NAC (n=10), LPS with 25K MSC (n=10), LPS with 50K MSC (n=10) LPS+25K MSC+NAC (n=10), and LPS+50K MSC+NAC (n=10). To induce LPS cystitis rat model, protamine sulfate (10mg, 45 minutes) and LPS (750ug, 30 minutes) was instilled once a week for consecutive five weeks via transurethral PE-50 catheter. Phosphate-buffered saline (PBS) was used in sham group. One week after final instillation, an indicated dose (25K or 50K) of MSCs or PBS were directly transplanted to the outer-layer of bladder. Simultaneously, 200mg/kg of NAC or PBS was intraperitoneally injected daily for 5 days. Therapeutic outcome was evaluated one week after MSC or PBS injection by awake cystometry and histological analysis.

Results: Functionally, LPS/PS insult led to irregular micturition, decreased inter-contraction intervals, and decreased micturition volume. Both monotherapy with NAC or stem cell and combination of stem cell and NAC significantly increased contraction intervals, increased urination volume and reduced residual volume, significantly improving the urination parameters compared to the LPS group. In particular, combination of NAC and stem cell significantly restored histological damage, including inflammation and apoptosis compared to monotherapy group.

Conclusion: We demonstrated that both MSCs and NAC based therapy had beneficial effect to restore voiding dysfunction, regenerate denudated urothelium and relieve tissue inflammation in the LPS-induced IC rat model. In addition, combination of MSC and NAC was superior to MSC or NAC monotherapy with therapeutic efficacy which was comparable to our previous exam with 1,000K MSCs. Combination of PVPC and NAC presented synergistic therapeutic effect and the dosage of stem cell used in LPS model was reduced to one fortieth.

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Poster #BS4
ENGINEERED STEM CELLS IMPROVE NEUROGENIC BLADDER BY OVEREXPRESSING SDF-1 IN A PELVIC NERVE INJURY RAT MODEL
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Presented By: Woong Jin Bae

Introduction: There is still a lack of sufficient research on the mechanism behind neurogenic bladder (NB) treatment. The aim of this study is to explore over-expressed stromal cell-derived factor-1 (SDF-1) secreted by engineered immortalized mesenchymal stem cells (imMSCs) on the NB and investigate the underlying mechanism.

Methods: Primary bone marrow mesenchymal stem cells (BM-MSCs) were transfected into immortalized up-regulated SDF-1-engineered BM-MSCs (imMSCs/eSDF-1⁺) or immortalized normal SDF-1-engineered BM-MSCs (imMSCs/eSDF-1⁻). NB rats induced by bilateral pelvic nerve (PN) transection were treated with imMSCs/eSDF-1⁺, imMSCs/eSDF-1⁻ or sham. After a four-week treatment, the bladder function was assessed by cystometry and voiding pattern analysis. The PN and bladder tissues were evaluated via immunostaining and western blotting analysis.

Results: We found that imMSCs/eSDF-1⁺ expressed higher levels of SDF-1 in vitro and in vivo. The treatment of imMSCs/eSDF-1⁺ improved NB and evidently stimulated the recovery of bladder wall in NB rats. The recovery of injured nerve was more effective in the NB+imMSCs/eSDF-1⁺ group than in other groups. High SDF-1 expression improved the levels of VEGF and bFGF. Apoptosis was decreased after imMSCs injection, and was detected rarely in the NB+imMSCs/eSDF-1⁺ group. Injection of imMSCs boosted the expression of nNOS, p-AKT, and p-ERK in the NB +imMSCs/eSDF-1⁺ group than in other groups.

Conclusion: Our findings demonstrated that over-expression of SDF-1 induced additional MSC homing to the injured tissue, which improved the NB by accelerating the restoration of injured nerve in a rat model.

Funding: N/A
Poster #BS5

INDUCED POLARIZATION OF M0 MACROPHAGES TO AN M2 PHENOTYPE UPON SEEDING ON GENIPIN CROSSLINKED COLLAGEN MESH FOR TREATMENT OF STRESS URINARY INCONTINENCE

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Presented By: Ilaha Isali, MD

Introduction: The immunological response of the body to implanted biomaterials play a central role in the biocompatibility of the material. Recently, we reported on the favorable biocompatibility results of genipin crosslinked woven collagen biotextile (CollaSling) as a novel sling for treatment of Stress Urinary Incontinence [1]. Favorable outcome from genipin crosslinked collagen mesh was accompanied by a significant elevation of anti-inflammatory M2-macrophages which are known to promote repair and regeneration through secretion of pro-angiogenic and pro-fibrogenesis factors. We hypothesized that the genipin cross-linking contributes to the favorable response through induction of M0 to M2 polarization of macrophages while reducing the activity of the M1 macrophages. Our aims are: 1) to demonstrate that M0 can be reliably polarized into desired macrophage type, 2) to determine whether the M2 polarization phenotype is promoted and maintained on aligned genipin crosslinked collagen scaffolds.

Methods: The macrophages were harvested from rat bone marrow and macrophage subtypes were identified by Flow Cytometry and Immunocytochemistry using antibodies against CD68, CD163, CD86, Arginase 1 and iNOS2. Electrochemically aligned collagen threads were filament wound to produce small collagen scaffolds which were then crosslinking using genipin. Following sterilization, scaffolds were seeded with macrophages and cultured for up to 3 days. Experimental groups included M0 (N=3), M1 (N=3), and M2 (N=3) macrophages. Seeded scaffolds were assessed for cell attachment, proliferation, structure, and protein expression.

Results: Macrophages from all groups exhibited over 70% cell attachment at 4 hours following seeding and cell proliferation was similar among all 3 groups. With respect to cytoskeletal structure using phalloidin staining, M0 macrophages demonstrated a significant degree of alignment on the surface of the collagen fibers while alignment of M1 and M2 cytoskeletal elements was not as readily apparent. Protein expression highlighted the presence of arginase I and absence of iNOS in M0 cells at 72 hours after seeding on genipin-crosslinked fibers (Fig.1). Additionally, a reduction in iNOS expression for seeded M1 macrophages was noted on blots compared to controls.

Conclusion: Genipin-crosslinked collagen scaffolds support sufficient macrophage attachment and survival for implantation. Protein expression results suggest genipin-crosslinked collagen scaffolds induce polarization of M0 macrophages to an M2 phenotype and inhibit M1 macrophage activity.

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Poster #BS6
VERIFICATION OF MESENCHYMAL STEM CELL INJECTION THERAPY FOR INTERSTITIAL CYSTITIS IN A RAT MODEL
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Presented By: Eun Sang Yoo

Introduction/Background Interstitial cystitis (IC) is a chronic intractable disease. Recently, the potential application of stem cell (SC) therapy was suggested for IC management. This study aimed to establish an optimal SC source and verify the efficacy and safety of SC injection therapy in an IC rat model.

Methods/Materials After IC animal model induction, urine-derived stem cells (USCs), adipose tissue-derived stem cells (ADSCs), bone marrow-derived stem cells (BMSCs) and amniotic fluid-derived stem cells (AFSCs) were injected into the bladder submucosa. The following parameters were analyzed: 1) functional improvement of the bladder via cystometry, 2) histological changes and 3) inflammatory gene expression and regenerative potential of damaged bladder tissues. Additionally, an optimal method for SC introduction in terms of effective bladder regeneration was analyzed.

Results Intercontraction interval was significantly increased and inflammatory reactions and fibrotic changes were decreased in all of the SC-injected groups than in the control group. PCR analysis revealed that inflammatory gene expression significantly decreased in the USC-treated group than in the other groups. To confirm the optimal SC injection route in the IC rat model, the group was divided according to the following criteria: 1) direction of SC injection into the bladder submucosa, 2) injection via tail vein, 3) transurethral instillation. In each analysis, the groups in which SCs were injected into the bladder submucosa showed significantly longer inter-contraction interval, better morphologic regeneration, and inhibition of bladder inflammatory reaction compared with the other groups.

Conclusion Regardless of the cell source, human tissue-derived mesenchymal SCs regenerated damaged bladder tissue, promoted functional recovery and inhibited inflammatory cell accumulation in an IC rat model; particularly, USC had the highest inhibitory effect on inflammation. Additionally, direct USC injection into the bladder submucosa was expected to have the best therapeutic effect, which will be an important factor for clinical applications in the future.

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Poster #BS7
LIQUID CRYSTAL ELASTOMERS AS DYNAMIC MATERIAL FOR THE TREATMENT OF URINARY INCONTINENCE
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Presented By: Seelay Tasmim, BMEN, PhD

BACKGROUND/Introduction: A common method for treating SUI in women is the placement of a sling (autologous or synthetic) which creates a fixed outlet support. This report focuses on design and prototyping of a dynamic sling made of a new class of novel material capable of reversible shape changes around the urethra.

METHOD/MATERIAL:
Liquid crystal elastomer (LCE) is a rubbery material that can be 3D printed into any shape that can fit around the urethra, offering access to personalized care. A unique feature of this material is the ability to undergo controlled shape change in response to local temperature changes in the range of 37 °C to 45 °C [1]. By incorporating infrared (IR)-absorbing fillers, such as PEDOT:PSS and carbon black, shape change can be triggered with IR light, where incident light selectively heats the material. We studied different temperature ranges and shapes with varied configuration and thickness to mimic real life urethral wall compression.

Results: LCE material actuates under a temperature range of 25 °C to 45 °C. This displays the feasibility of the LCE dynamic sling actuating under tolerable temperatures within the body, avoiding thermal damage to the surrounding tissue. Actuation, in response to IR-light, is observed in the LCE-PEDOT:PSS and LCE-carbon black 3D printed samples. Figure 1 shows actuation in response to IR light of a 3D-printed LCE-carbon black sling. Stresses and strains produced by the LCE dynamic sling under simulated physiological environments can exceed 200 kPa and 60%, respectively, both greater than the stress and strain outputs of human skeletal muscle. Using this capacity to perform mechanical work and the ability to control geometry with 3D printing, the force and deformation applied to the urethra are controlled. Deformation speed and internal temperature changes of the LCE is varied by altering filler content from 0.5 to 5 wt%.

Conclusion: A dynamic sling can be fabricated to fit the specific anatomy of each patient. This device is powered transcutaneously using IR light, which triggers a shape change in the sling material, resulting in a decrease in pressure around the urethra to facilitate voiding. Future work will involve testing device shapes and configurations in a multiparous rabbit model of incontinence.
Funding: This work was supported by the National Institute of Biomedical Imaging And Bioengineering of the National Institutes of Health under Award Number R21EB028547

Poster #BS8
WITHDRAWN
Poster #BS9
SEQUENTIAL OR SIMULTANEOUS SELECTIVE STIMULATION OF RELEVANT PELVIC FLOOR NERVES WITH NOVEL NEUROCLIP ELECTRODES CAN AFFECT THE URETHRAL CLOSING MECHANISM
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Presented By: Ana Guadalupe Hernandez Reynoso, MS

Introduction: Stress Urinary Incontinence (SUI) can be associated with dysfunction of the pelvic floor muscles (PFM), as the result of nerve damage during pregnancy and childbirth, which may affect the urethral support and function. We report on specific electrical stimulation of PFM motor nerves in an adult rabbit model using a novel NeuroClip electrode, to evoke and coordinate specific PFM activity for optimization of urethral closure (UP).

Methods: Following Ethics Committee approval, 10 New Zealand white female nulliparous rabbits (1-2 years old) were studied under general anesthesia. Perineal and pelvic floor contralateral nerves were surgically exposed and selectively stimulated, either sequentially or simultaneously, using a wired NeuroClip electrode at different frequencies (5, 10, 20, 40, and 60 Hz), while specific recording of compound muscle action potentials (CMAP) and UP measurements were obtained. The maximum evoked UP (MUP), area under the UP curve (AUC), and endurance were evaluated for the different evoked patterns (sequential and simultaneous).

Results: Selective simultaneous or sequential electrical stimulation delivered to the perineal nerve and pelvic floor nerve both resulted in a respective increase in the MUP of 1.2 – 4.7 cmH2O, observed for the 20, 40, and 60 Hz frequencies. However, the two higher frequencies produced a 3-fold increase when compared to 20 Hz. Stimulation at 40 Hz yielded the most sustained UP increase, as shown in Figure 1, and confirmed by the AUC. Stimulation at 60 Hz resulted in the worst endurance, with an UP fatigue rate of approximately 0.12 cmH2O per second.

Conclusion: Peripheral electrical neuromodulation directly delivered to the nerves controlling the pelvic floor muscles by mini-electrodes evoked their selective contraction. The activation of these muscles and resulting increase in UP was frequency-dependent, starting from 20 Hz. A frequency-dependent trade-off between the MUP achieved at higher frequencies and the fatigue-rate was observed. These observations might be translatable to restore continence in selected SUI patients.
A) **Stimulation**  
**Pattern: Sequential**  

\[\text{UP} \quad \text{Pves} \quad \text{ON} = 40 \text{ Hz}\]  
\[\text{Stim Target} \quad \text{OFF} \quad \text{OFF} \quad \text{ON} = 40 \text{ Hz} \quad \text{OFF}\]  
\[\text{Perineal Nerve} \quad \text{Pelvic Floor Nerve}\]

B) **Stimulation**  
**Pattern: Simultaneous**  

\[\text{UP} \quad \text{Pves} \quad \text{OFF} \quad \text{ON} = 40 \text{ Hz}\]  
\[\text{Stim Target} \quad \text{OFF} \quad \text{OFF}\]  
\[\text{Perineal Nerve + Pelvic Floor Nerve}\]

**Figure 1.** Urethral (UP) and vesical pressure (Pves) response to sequential and simultaneous stimulation of the perineal and pelvic floor contralateral nerves at 40 Hz using a current-controlled monophasic square pulse of 200 μs duration and 2 mA of amplitude.

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Poster #BS10
SELECTIVE NEUROMODULATION OF THE BULBOSPONGIOSUS NERVE IMPROVES VOIDING EFFICIENCY IN OLD MULTIPAROUS RABBITS
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Presented By: Ana Guadalupe Hernandez Reynoso, MS

Introduction: Although no animal models fully resemble the human condition, mid-age multiparous (MM) rabbits have been shown to have dysfunctional PFM myoelectric patterns suitable for the study of stress urinary incontinence. This study evaluated the use of acute neurostimulation of the Bulbospongiosus Nerve (Bsn) to increase bladder efficiency in MM rabbits using a novel wireless electroparticle-cuff electrode (1).

Methods: Following institutional animal care guidelines, 6 healthy 1-year adult chinchilla-breed young nulliparous (YN) and 4 mature (4-year old) MM female rabbits underwent urodynamic studies under anesthesia. At baseline, voiding duration, efficiency and inter-contraction interval were measured in triplicate. Next, the Bsn was isolated, implanted with a wireless device, and selectively stimulated five times during 30 seconds at 2-20 Hz, with a 10.7 MHz carrier frequency at 30-50% power for wireless activation. Cystometry was obtained in triplicate after each stimulation.

Results: In YN rabbits, acute neuromodulation of the Bsn did not significantly alter voided volume or inter-contraction intervals, but caused a moderate increase in void duration (p<0.05). In MM animals, a significant reduction in voiding efficiency was noted when compared to the YN group (p<0.001). Notably, electrical stimulation of the Bsn in the MM animals induced a 3-fold increase in voided volume (p<0.001), comparable to levels seen in the YN group. A corresponding increase in voiding efficiency (p<0.001) was also observed to reach levels characteristic of YN animals. Stimulation of this perineal nerve did not alter significantly voiding duration or inter-contraction intervals.

Conclusion: Acute neuromodulation of the Bsn was effective in mediating an increase in voiding duration in the YN animals, confirming the role of the rabbit Bs muscle during voiding. Deficits in voiding volume and voiding efficiency observed in the MM animals were in agreement with weak PFM and dysfunctional myographic activity patterns previously reported (2). Remarkably, the acute wireless electrical stimulation of the Bsn in the MM animals was able to reverse the abnormal baseline urodynamic performance, thus improving voiding efficiency. This study suggests that pelvic nerve damage due to parity and aging can result in low neuromuscular activity which can be partially overcome by direct pelvic motor nerve stimulation.

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Poster #BS11
IN VITRO BENCH TESTING OF A TELEMETRIC DEVICE USING BLUE TOOTH TECHNOLOGY: ADVANCING THE SCIENCE OF PRECISE URETHRAL COMPRESSION
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Presented By: Angelo E. Gousse, MD

Introduction: Sphincteric incompetence is a common problem in Urology. Precision Medical Devices (PMD) has developed a new telemetric compressive device. The Politano-Sayet-Sutherland Flow Control Device (PSS-FCD) has undergone 6 previous prototypes. The current working model is composed of 3 elements: 1) Control/Battery Pack (CBP) 2) Valve assembly with an Anvil/Cap piece; 3) Remote Master Control Module-blue tooth technology).

Methods: The CBP consists of electronic and drive components. A printed circuit board, stepper motor and a lithium cell array are contained in the fully, hermetically-sealed waterproof titanium casing. The valve assembly consists of a cable link, a plunger and two shell halves. The cable link connects the cuff and plunger to the CBP. The CBP opens and closes the plunger via the drive assembly and has the ability to adjust the magnitude of closure force with 10 different settings based on commands made to the CBP - Closure pressure of the FCD was determined from the device clamp force measured using a strain gauge load cell and amplifier in a bench top test stand. The typical closure pressure of a healthy human urethra ranges from 75 to 100 cm of water. and the external size is approximately 24Fr or a 8mm diameter. The PSS-FCD has a clamp pad with two flexible silicone ridges of 4mm in width resulting in a total clamping area at urethra closure of 75mm². The FCD produced an average clamp force of 3.67N resulting in a closure pressure of 0.057N/mm² or ~584 cm of water at the PSS-FCD clamp stroke setting of 08. The clamp force can be adjusted: range of 04 to 10 as required to occlude fluid flow

Results: The successful Phase I, Phase IIa and Phase IIb implants (and bench tests) have allowed the development of the newest Bluetooth telemetrically controlled AUS/valve. We have demonstrated biologic tissue compatibility without urethral trauma or erosion in all animals during survival experiments lasting more than 1 year. We demonstrated the easy feasibility of performing full FCD replacement on 4 animals without complications.

Conclusion: The development of a remotely controlled circumferential compressive device that allows for post-implant adjustable settings and remote telemonitoring is possible.

Funding: Precision Medical Devices
Poster #BS12
A STUDY OF SACRAL LEAD STABILITY USING BOTH EXPERIMENTAL AND COMPUTATIONAL MODELS
Jeff Bodner, MS, Walt Baxter, PhD, Christina Leung, BS, Phillip Falkner, DVM, Rob Sandgren, BS
Medtronic
Presented By: Jeff Bodner, MSBME, MSME

Introduction: A study was performed to understand if the redesigned InterStim™ basic evaluation lead (commonly known as the PNE lead or temporary stimulation lead) reduces lead tip movement during the therapy evaluation. The hypothesis is that lead tip movement is lower during simulated activities of daily living when using the redesigned basic evaluation lead (new; Model 306001/306006) compared to the market-released lead (control; Model 305901/305906).

Methods: A computational model of the human torso (Figure 1) utilizing the finite element method was created for simulating the kinematics of implanted basic evaluation leads during activities of daily living. The model was comprised of a representation of the bones and relevant soft tissues (skin, fat, muscle) of the pelvic region. A representation of the lead and its frictional interaction with the soft tissues was also included. Tissue properties were varied over wide ranges to account for patient-to-patient variability in a paired study comparing the new design to the control for three patient anatomies.

Measurements of lead tip movement were also made in ten cadavers using CT scans of subjects in various challenge positions. The measurements provide a means to compare the two lead designs directly, and to validate the computational model predictions.

Results: Figure 1 shows the interval for the difference in movement between the new and control leads, as predicted by the computational model when the model inputs were varied across a wide range of possible values. The interval was always positive, denoting that the new lead moved less than the control. The cadaver tests agreed with the computational model findings. Tip movement was between 2.1 and 19.5 mm (n=5 cadavers) for the control lead and 0.3 to 1.9 mm (n=10 cadavers) for the new design.

Conclusion: The computational model and experiments showed that the redesigned InterStim basic evaluation lead™ consistently demonstrated better tip stability than the control design in simulations and cadavers. The model allows for higher statistical power and the ability to explore wide ranges of system parameters. The cadaver tests provide real-world measurements in a system that is close to the clinical scenario. The combination of the two methodologies provides stronger evidence than either method alone.
**Funding:** N/A

*Figure 1.* The computational model of the human torso (left) for one of the three anatomies studied. The results of the simulations (right) for three torso anatomies. The intervals represent the difference (Control-New) in predicted distal tip movement over 300 simulations where tissue properties were varied across realistic ranges.
Poster #BS13
IMAGING BLADDER FLUID DYNAMICS USING MRI
Kerac Falk, Fellow¹, Mustafa Usta, Post-doctoral Fellow², Polina Advolodkina, Fellow³, Cyrus Aidun, Assistant Professor², Robert Kelley, Assistant Professor¹
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Presented By: Robert Kelley, DO, MBA

Introduction: This study developed a method for imaging fluid dynamics within the healthy human urinary bladder. We hypothesize an alteration in fluid flow pattern may occur in patients with bladder abnormalities including detrusor underactivity and structural defects. It has been shown in nature that flow pattern influences microbiological systems, suggesting that abnormal bladder flow patterns may influence the bladder microbiome and UTI risk. By defining flow patterns in healthy bladders, we will be able to study pattern alterations in bladders with known pathology.

Methods: This is a pilot study which included five healthy women and three healthy men without urinary symptoms. The real-time MRI was acquired in the mid-sagittal plane of the pelvis using a 3T PRISMA scanner with a balanced steady-state free procession (SSFP) sequence combined with parallel acceleration in the temporal direction (T-PAT), resulting in a temporal resolution of 100 msec. Descriptive flow analytics were performed on the resulting images.

Results: We were able to produce clear images of flow within the bladder. There was a laminar vortex that developed and stretched in the bulk fluid of a full bladder at rest. Complex vortical flow patterns were visualized at rest, during valsalva and terminal emptying, while laminar parallel flow was noted at the UVJ during early micturition. The largest recirculation pattern happened in the same direction in all subjects, from the urethrovessical junction (UVJ) toward the inner bladder. Ureteral jets were clearly visualized.

Conclusion: Bladder flow patterns can be detected with MRI. The consistent recirculation patterns suggest that the position and the orientation of the UVJ has an impact on the global flow patterns. Further data will be collected to build numerical models of physical flow phenomena to further characterize normal flow prior to studying abnormal bladders.

Funding: N/A
Poster #BS14
A NOVEL METHOD TO INCREASE BLADDER CAPACITY USING EXTERNAL COMPRESSION EXERCISES
Samuel Weprin, Zachary Cullingsworth, John Speich, Adam Klausner
Virginia Commonwealth University
Presented By: Samuel A. Weprin, MD

Introduction: Prior studies have evaluated the regulation of bladder dynamic elasticity with external compression and provide motivation for considering abdominal compression as a potential therapeutic tool to modulate symptoms of urgency. The objective of this study was to test the hypothesis that intermittent external compression during filling leads to increased bladder capacity at a given intravesical pressure in an isolated porcine bladder model.

Methods: Immediately after slaughter, pig bladders were harvested at local abattoirs. Bilateral superior vesical arteries were cannulated to perfuse the bladders with oxygenated Krebs-Henseleit buffer. The urethra was catheterized to allow infusion, voiding, and monitoring of intravesical pressure. The bladders underwent two control fills at 50ml/min to a capacity of ~300ml used to establish a reference pressures (Pref), defined as the average maximum filling pressure in these fills. Subsequent fills employed either pulsatile compression (10s compression to Pref, followed by 5s release x 4 cycles) or continuous compression (1min compression to Pref) performed at ~50% capacity. Following compression, filling continued to Pref. After each fill, bladders were voided by potassium-induced contraction, and voided volumes recorded.

Results: The protocol was performed on five pig bladders. A statistically significant increase in bladder capacity at Pref was achieved with pulsatile compression (p=0.01). Bladder capacity increased by 20% with pulsatile compression versus 10% with constant compression (p=0.03).

Conclusion: This study demonstrated that bladder capacity can be increased using a simple, one-minute compression exercise at approximately 50% capacity. The degree of volume accommodation was greater with pulsatile as compared to continuous compression. These results suggest that external bladder compressive exercises could potentially be used as a therapeutic tool to regulate dynamic elasticity and delay symptoms of urgency.

Funding: This study was supported by National Institutes of Health award R01DK101719
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Poster #BS15
SEGMENTATION AND 3D ANATOMICAL RENDERINGS FROM PELVIC MRI PROVIDE A NOVEL
METHOD TO QUANTIFY CLINICALLY RELEVANT FEATURES OF THE BLADDER AND PROSTATE
Lucille Anzia¹, Cody Johnson¹, Diego Hernando¹, Shane Wells¹, Wade Bushman², Alejandro Roldán-Alzate¹
¹Department of Radiology, ²Department of Urology
Presented By: Alejandro Roldan-Alzate, PhD

Introduction: Previous studies have used ultrasound (US) or computed tomography (CT) to assess physical
characteristics of the bladder and prostate. We present here a novel technique of generating 3D anatomical
renderings of the bladder and prostate from magnetic resonance imaging (MRI). These can be used to
measure important features of the lower urinary tract, including bladder wall volume (BWV), bladder wall
thickness (BWT) and prostate volume (PV). 3D renderings offer the unique advantage to visualize the bladder,
quantify both thickness and total volume of the bladder and to assess regional variation in BWT.

Methods: 14 male and 16 female pelvic fast-spin echo T2-weighted MRIs of subjects aged 30-39 were
retrospectively analyzed using Materialise Innovation Suite to create virtual 3D models. The software Mimics
was first used to segment the bladder and prostate from MRI scans (Figure 1a-c) and then to generate 3D
virtual models (Figure 1d). From the computational model, BWV and PV were collected. The software 3-matic
was then used to calculate mean BWT of the entire bladder. The bladder model was then split into both
anterior and posterior, and superior and inferior halves which were each analyzed for mean BWT (Figure 1e).
A Student’s t-test with p<0.05 was considered significant.

Results: Average BWV was 24.7cm³ in males and 22.8cm³ in females age 30-39 (p=0.52). Computationally
calculated mean BWT of the entire bladder wall volume was 2.46mm in males, and 2.22mm in females
(p=0.25). Regionally, the anterior, posterior, superior and inferior halves of the bladder had a mean BWT of
2.61, 2.22, 2.47 and 2.40mm in males, respectively. The anterior, posterior, superior and inferior mean BWT
were 2.44, 1.81, 2.03 and 2.12mm in females, respectively (p=0.58, 0.13, 0.14, 0.27). Mean prostate volume
for the males was 28.7cm³.

Conclusion: This novel method of generating and analyzing 3D models from MRI successfully measured
clinically relevant parameters of the lower urinary tract. The results show no significant difference in these
parameters between males and females aged 30-39. The data show differences in localized thickness
throughout the bladder.

Funding: NIH 4K12-DK100022-04
Poster #BS16
PELVIC MRI DEMONSTRATES REGIONALIZED THICKENING OF THE BLADDER IN ASSOCIATION WITH AGE-DEPENDENT INCREASE IN PROSTATE VOLUME
Lucille Anzia¹, Cody Johnson¹, Diego Hernando¹, Shane Wells¹, Wade Bushman², Alejandro Roldán-Alzate¹
¹Department of Radiology, ²Department of Urology
Presented By: Alejandro Roldan-Alzate, PhD

Introduction: Previous studies using ultrasound (US) and computed tomography (CT) have demonstrated increases bladder wall thickness (BWT) with age and with bladder outlet obstruction. We report the first use of magnetic resonance imaging (MRI) and 3-D reconstruction to quantify regional age-related changes of BWT in an unselected cohort of men ages 30-69.

Methods: With IRB approval and following a HIPAA compliant protocol, fifty-eight male pelvic MRIs from men aged 30-69 were retrospectively analyzed (n30 =14, n40 =15, n50 =15, n60 =14). The scans were performed in the UW Health system between the dates of June 1, 2017 and May 31, 2018 for indications unrelated to the genitourinary tract. The prostate and bladder were individually segmented using Mimics software (Materialise), and then converted to a 3D model from which bladder wall volume (BWV) and prostate volume (PV) were recorded. The 3D bladder rendering was then imported into 3-matic (Materialise), where a thickness gradient was applied to the entire structure as well as the anterior, posterior, superior and inferior halves. All five sections were analyzed for median BWT (Figure 1).

Results: Mean prostate volume increased 63.9% (28.7cm³ to 47.0cm³, p=0.05). BWV increased from the third to the sixth decade (p=0.01). Median BWT of the entire bladder wall increased from 2.46mm to 3.02mm but the difference was not significant (p=0.08). Computational thickness maps revealed significantly localized bladder thickening: the anterior and inferior median BWT increased from 2.6mm to 3.6mm (p=0.01) and 2.39mm to 3.37mm (p=0.01), respectively. The posterior and superior median BWT remained unchanged [2.2mm to 2.4mm, (p=0.56) and 2.47mm to 2.47mm (p=0.99), respectively].

Conclusion: This study demonstrates that MRI and 3-D reconstruction can be used to determine regionalized BWT as well as BWV and PV in male patients. Further, this study shows for the first time that age-related increases in PV are accompanied by regionalized thickening of the anterior and inferior bladder wall.

Funding: NIH 4K12-DK100022-04
Poster #BS17
WHAT IS BEING REPORTED ABOUT VAGINAL "LASERS"?: AN EXAMINATION OF ADVERSE EVENTS REPORTED TO THE FDA
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Dept OB/GYN/REI, University of Pittsburgh Medical Center, Magee-Womens Hospital, Pittsburgh, PA
Presented By: Linda Scheider Burkett, MD

Introduction: In 2018, FDA issued a warning that safety and effectiveness has not been established for vaginal “rejuvenation” devices or aesthetic genitourinary (GU) applications of this technology. We aimed to describe the reported adverse events (AEs) for energy based GU non-surgical devices (vaginal devices) in the Manufacturer and User Facility Device Experience (MAUDE) database then to compare to similar devices and other subspecialty applications.

Methods: The Reed Tech™ Navigator database was utilized to compile AEs from the MAUDE database medical device reports for all vaginal devices registered with 510k FDA clearances. Individual AEs reports associated with nonablative, ablative, fractionated lasers, radiofrequency, and hybrid laser technologies were reviewed. We compared AEs for GU applications versus other subspecialty applications with the same devices (n=64) and for the encompassing FDA product code “powered surgical instruments” (n=2064). Summary statistics were used for analysis.

Results: Twenty-three manufacturers were identified owning 64 products with GU applications. Thirty-nine GU AEs were reported and isolated to 6 manufacturers with 11 products, comprising 82% (n=32) injuries, 15% (n=6) device malfunction, and 3% (n=1) device not maintained. The primary anatomic location of injury was the vagina or vulva (67%, n=22), urethra (6%, n=2), other from misfire (9%, n=3), eye (3%, n=1), and unknown (15%, n=5). Local treatment reactions including irritative symptoms of discomfort, burning, and erythema are known risks of this technology and were the most commonly reported injury (61%, n=21), see Table 1. Most AEs were reported to document the need for additional medical treatment (41%, n=16) or device failure (33%, n=13). AEs varied by device type with CO2 lasers having higher burns and radiofrequency devices having higher rates of sensation loss. Total products with AEs for vaginal devices was similar to all powered surgical instruments including dermatologic and general surgery laser applications (30%) and significantly lower than products with fractionate output (70%, p= 0.01).

Conclusion: AEs were reported on 60% of the products currently available, and most were minor local reactions to treatment. The proportion of AEs is equal to that of other subspecialties indicating similar risk profiles. Further research and improved reporting are needed to fully evaluate the safety of individual vaginal devices and technologies.
Table 1. Descriptive comparison of Gynecologic AEs

<table>
<thead>
<tr>
<th>Gynecologic AEs</th>
<th>Frequency (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury Type (n=39)</td>
<td></td>
</tr>
<tr>
<td>Injuries</td>
<td>32 (82%)</td>
</tr>
<tr>
<td>Device Malfunction</td>
<td>6 (15%)</td>
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<tr>
<td>Device not maintained</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>Symptom (n=29)</td>
<td></td>
</tr>
<tr>
<td>Irritative</td>
<td>21 (61%)</td>
</tr>
<tr>
<td>Loss sensation</td>
<td>4 (12%)</td>
</tr>
<tr>
<td>Ocular damage</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>3 (9%)</td>
</tr>
<tr>
<td>Report Reason (n=39)</td>
<td></td>
</tr>
<tr>
<td>Medical treatment</td>
<td>16 (41%)</td>
</tr>
<tr>
<td>Device failure</td>
<td>13 (33%)</td>
</tr>
<tr>
<td>Improper technique</td>
<td>3 (8%)</td>
</tr>
<tr>
<td>Emotional stress</td>
<td>2 (5%)</td>
</tr>
<tr>
<td>Financial burden</td>
<td>2 (5%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>3 (8%)</td>
</tr>
<tr>
<td>Reporter Type (n=39)</td>
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<tr>
<td>Distributor</td>
<td>6 (15.4%)</td>
</tr>
<tr>
<td>Voluntary (patient or physician)</td>
<td>17 (43.6%)</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>16 (41%)</td>
</tr>
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</table>

**Funding:** N/A
Poster #BS18
ASSOCIATION BETWEEN GAIT AND PELVIC FLOOR SYMPTOMS: A PILOT STUDY
Kevin Morgan, MD¹, Erin McCallister, PT, DPT², Daniel Flowers, PT, DPT², Amanda Mahoney, PT, DPT², Travis Wilmore³, Clifton F. Frilot II, PhD², Alex Gomelsky, MD¹
¹LSU Health Shreveport Department of Urology, ²LSU Health Shreveport School of Allied Health Professions, ³LSU Health Shreveport School of Medicine
Presented By: Kevin N. Morgan, MD

Introduction: Women with pelvic floor disorders, such as incontinence, prolapse, and pelvic pain, often present with concomitant lower back and hip pain, suggesting a possible association with ambulation and gait disorders. We aim to determine if ambulatory gait characteristics have an association with pelvic disorders. As normative values for these variables are largely absent, this pilot study aims to establish baseline gait parameters in healthy women.

Methods: Female volunteers were recruited from the Schools of Medicine and Allied Health. Inclusion criteria were: age >18, nulliparity, and ambulation without assistive devices. Exclusion criteria were: currently pregnant, within 3 months post-partum, and any surgery within the last 6 months. Subjects completed a baseline questionnaire regarding pelvic floor and musculoskeletal symptoms. Standing leg length and anthropometric measurement of joint centers of both knees and ankles was performed. Gait testing is performed on a platform with force plates and images captured on 12-infrared cameras. Walking speed, step length, stride length, cadence, and step width were recorded.

Results: Twenty-three women (mean age, 23.5 years; mean BMI, 23.6) completed the questionnaire. Urinary urgency, urgency incontinence, and stress incontinence were reported by 17%, 9%, and 4%, respectively. None had fecal incontinence, and only 4% reported pelvic pain or pelvic surgery. Thirty-five percent reported seeing a physician for lower extremity or back problems, but only 4% underwent surgery to address said problem. Eighteen women had complete data sets for the extremity measurements and gait parameters (Table)

Conclusion: This pilot study has allowed us to establish baseline gait parameters, extremity and joint measurements in a relatively pure cohort of healthy, female volunteers. The next phase will be to recruit women with pelvic floor disorders and map out changes in gait and joint measurements. The ultimate intent is to isolate potential deficits that may be amenable to improvement with various facets of physical therapy.

<table>
<thead>
<tr>
<th></th>
<th>Mean (R)</th>
<th>SD (R)</th>
<th>Mean (L)</th>
<th>SD (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking Speed (m/s)</td>
<td>1.15</td>
<td>0.14</td>
<td>1.15</td>
<td>0.13</td>
</tr>
<tr>
<td>Step Length (m)</td>
<td>0.60</td>
<td>0.06</td>
<td>0.61</td>
<td>0.05</td>
</tr>
<tr>
<td>Stride Length (m)</td>
<td>1.21</td>
<td>0.11</td>
<td>1.22</td>
<td>0.10</td>
</tr>
<tr>
<td>Cadence (step/min)</td>
<td>114.28</td>
<td>13.13</td>
<td>113.36</td>
<td>11.96</td>
</tr>
<tr>
<td>Step Width (m)</td>
<td>0.17</td>
<td>0.04</td>
<td>0.16</td>
<td>0.03</td>
</tr>
<tr>
<td>Leg Length (m)</td>
<td>0.85</td>
<td>0.04</td>
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<td>0.04</td>
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Funding: N/A
Poster #BS19
UTERINE BIOIMPEDANCE COMBINED WITH ARTIFICIAL INTELLIGENCE AS A MEANS OF CANCER DETECTION
Shabnam Gupta, MD1, Andres Vargas, PhD2, Gary Saulnier, PhD3, Jon Newell, PhD4, Robert Kelley, DO, MBA1
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Presented By: Robert Kelley, DO, MBA

Introduction: The most common occult malignancy in gynecologic surgery is uterine cancer. Unintentional spillage of cells can occur during morcellation and subtotal hysterectomy performed during prolapse repair. While available screening for endometrial cancer may reduce the risk of occult malignancy, it is not cost effective in the asymptomatic patient. One diagnostic method that has not been explored for the uterine body, but has shown promise in cervical, breast, prostate, and skin cancer is bioimpedance analysis. Bioimpedance is a non-invasive technique that measures the pattern of current flow through biological tissue, which is determined by the architecture of its cells. An organ that harbors a malignancy will have cellular changes throughout to support the invasive tumor. We hypothesize that benign and tumor-bearing uterine tissue can be differentiated by its electrical characteristics.

Methods: We collected 20 whole ex-vivo uterine specimens at the time of hysterectomy. A two-armed probe with electrodes at the end of each arm was designed for this study. The probe measures impedance spectra over the range of 10 kHz to 1 MHz. Immediately following removal from the body, the cervix was serially dilated to allow for passage of the probe’s lower arm into the endometrial cavity. (fig 1) Representative sites over the uterine specimen were sampled. Pathology confirmed 11 benign (non tumor-bearing) and 9 malignant (tumor-bearing) uterine samples. The impedance data was then studied with multiple instance learning and principal component analysis (PCA).

Results: Impedance data plotted using PCA appears to visually separate between each diagnoses. The confusion matrix indicates the algorithm correctly predicts 78% of the malignant uteri and 82% of the benign uteri.

Conclusion: Our results show distinction between electrical impedance of tumor-bearing and non tumor-bearing uterine specimens. Analysis was performed with multiple instance learning, an artificial intelligence technique. These results are encouraging since the data indicates that the presence of tumor within any portion of the uterus influences the electrical properties of the uterus as a whole. Surgical technique differs in removing a tumor-bearing organ versus a non tumor-bearing organ. Thus, bioimpedance technology may have potential implications in risk assessment of patients and subsequently guide preoperative and intraoperative decision-making.
Figure 1
A) Two-armed probe with electrodes on end of each arm. B) Probe with ex-vivo uterine specimen. Lower arm of probe is inserted through dilated cervical canal and placed flush with endometrium, while upper arm is placed over uterine serosa. The probe measures impedance from bilateral fundal, mid, and lower uterine positions on both anterior and posterior surfaces. C) Plotting reactance versus resistance at a particular location.

Funding: NIH National Center for Advancing Translational Sciences (NCATS): Clinical and Translational Sciences Awards (CTSA). Grant Award. Grant #: UL1TR001433
Poster #BS20
DEVELOPMENT OF URINATION TIME RECOGNITION TECHNOLOGY IN MOBILE ENVIRONMENT
Kyung Jin Chung¹, Su Jin Kim², Young Sam Cho³, Myung-Soo Choo⁴, Khae Hawn Kim¹
¹Gachon University Gil Medical Center, Gachon University School of Medicine, Incheon, Korea, ²Department of Urology, Yonsei University Wonju College of Medicine, Wonju, Korea, ³Department of Urology, Sungkyunkwan University School of Medicine, Seoul, Korea, ⁴Department of Urology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea
Presented By: Kyung Jin Chung

Introduction: We invented a wearable device which can measure the voiding time and number by checking a habitual series of characteristic motion of men. This study collected and analyzed urination time data sensed through smart bands worn by patients in order to resolve the clinical issues posed by using voiding charts. By developing a smart band-based algorithm for recognizing urination time in patients, this study aimed to explore the feasibility of urination management systems.

Methods: This study aimed to develop the recognizes urination time based on a patient’s posture and changes in posture. Motion data was obtained from a smart band on the arm. An algorithm that recognizes the 3 stages of urination (forward movement, urination, backward movement) was developed based on data collected from a 3-axis accelerometer and from tilt angle data. Because the features used for analysis sequential data that has temporal characteristics. So we analyze HMM(Hidden Markov Model)-based sequential data and provide a way to recognize urination time. Real-time data were acquired from the smart band, and for data corresponding to a certain duration, the value of the signals was calculated and then compared with the set analysis model to calculate the time of urination.

Results: An experiment was carried out to assess the performance of the recognition technology proposed in this study. The final accuracy of the algorithm was calculated based on clinical guidelines for urologists. The experiment showed a high average accuracy of 92.5%, proving the robustness of the proposed algorithm.

Conclusion: The proposed urination time recognition technology draws on acceleration data and tilt angle data collected via a smart band; these data were then analyzed using a classifier after apply the HMM method.

Funding: N/A
Poster #BS21
CARRYING OUT A NOMOGRAM ALLOWING FOLLOW-UP BY FREE UROFLOWMETRY OF WOMEN AT RISK OF RETENTION AFTER MID URETHRAL SLING
Françoise Valentini, Pierre Nelson
Hopital Rothschild
Presented By: Francoise A. Valentini, MD, PhD

Introduction: Among women who undergo mid urethral sling (MUS) for cure of urinary incontinence, urethral narrowing is commonly observed. The result is a reduced effective cross-section of the urethra which induces voiding dysfunction and a chronic bladder outlet obstruction. The risk of retention due to urethral narrowing implies a follow-up which could be minimized if only needing free uroflowmetry.

Our purpose was a theoretical study allowing to propose such a method.

Methods: In the VBN micturition model [1], the detrusor contractility is characterized by the parameter k and the urethral obstruction by the parameter U. The standard model (flow-controlling zone at meatus) was modified to simulate a narrowing due to a urethral compression at 1.5 cm of the bladder neck.

Data from a free uroflow are filling volume (Vini) = voided volume plus post resisual (PVR) and maximum flow (Qmax). In absence of pressure recording, values of k and U cannot be evaluated. But one infinity of couples [k,U] would allow to restore Qmax which value is a compromise between k and U; a given Qmax needs high values of k and U or low values of the parameters. To restore PVR, introduction of a fading of detrusor excitation is needed. In previous study it has been shown that, in most of voidings, such condition occurs after the time of Qmax [2].

The value kmin of k, giving the lower possible value of U which is 0, will be the characteristic of each woman. So, an increase of her kmin would imply an increase of U therefore of sling obstruction.

Results: Direct evaluation of kmin was easy using VBN software [1] but this method was time consuming.

Tabulation of kmin for regularly spaced values of Vini and Qmax allowed to build a 3D nomogram described by simple equations solved using Excel.

Conclusion: For the first time a simple method allowing the follow-up of women who undergo mid urethral sling for cure of urinary incontinence is proposed. The characteristic parameter kmin is defined without ambiguity from an initial free uroflow. The associated software in Excel is easy to use by all practitioners.

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Funding: N/A
**Poster #BS22**  
**METAGENOMIC ANALYSIS OF THE GENITOURINARY MICROBIOME OF POSTMENOPAUSAL WOMEN AND ITS RELATIONSHIP TO RECURRENT UTI**

Michael Neugent, MS¹, Neha Hulyalkar¹, Ashwani Kumar, BS², Amy Kuprasertkul, BS³, Chao Xing, PhD², Philippe Zimmern, MD³, Kelli Palmer, PhD¹, Nicole De Nisco, PhD¹  
¹University of Texas at Dallas, Biological Sciences, ²U.T. Southwestern Medical Center, McDermott Center Bioinformatics Lab, ³U.T. Southwestern Medical Center, Urology  
Presented By: Michael Neugent, MS, BS

**Introduction:** Recurrent UTI (rUTI), defined as 3 UTIs per year, is a growing clinical concern disproportionally affecting postmenopausal (PM) women (1). Changes in the genitourinary (GU) microbiome after UTI may predispose PM women to rUTI (2). The composition and function of the GU microbiome of PM women has not been systematically analyzed. The goal of this cross-sectional study was to utilize whole-genome metagenomic sequencing (WGMS) to define and compare the GU microbiomes of three cohorts of PM women (Never UTI, Remittent rUTI, and Relapsed rUTI).

**Methods:** Following IRB approval and patient consent, WGMS was performed on clean-catch urine from PM women who passed strict inclusion criteria for uncomplicated rUTI. Women were sorted into cohorts by clinical history of rUTI. “Never UTI” (n=10): no clinical history of UTI, “Remittent rUTI” (n=15): history of rUTI, no current UTI, “Relapsed rUTI” (n=14): history of rUTI, current UTI. DNA was purified from urine and analyzed by Qubit for purity. Prepared libraries were sequenced on an Illumina NextSeq 500 generating 150 bp paired-end reads that were analyzed with custom bioinformatic pipelines for taxonomic enrichment and functional profiling of the detected metagenomes.

**Results:** Here we present the first systematic WGMS analysis of the GU microbiome in PM women. Our results indicate that the diversity of the GU microbiome is diminished in the “Relapsed rUTI” with respect to the “Never UTI” and “Remittent rUTI” cohorts. We also found a robust association between exogenous estrogen use and enrichment of the genus *Lactobacillus* in the GU microbiomes of women in “Never UTI” and “Remittent rUTI” cohorts. Women not taking exogenous estrogen consistently had low or undetectable levels of *Lactobacillus*. Our preliminary analysis also revealed differential enrichment of putatively protective and non-protective *Lactobacillus* species in “Never UTI” versus “Remittent rUTI” cohorts.

**Conclusion:** This cross-sectional study of the GU microbiome has revealed a strong association between exogenous estrogen use and enrichment of the genus *Lactobacillus*. Members of the genus *Lactobacillus* are protective within the cervicovaginal microbiome and may play a similar role in the GU microbiome (3). Continuing work will explore this association by functional analysis of cohort metagenomes and metabolomics.
**Funding:** Cecil H. and Ida Green Chair in Systems Biology, UT System Rising STARS

**REFERENCES:**

Poster #BS23
EVALUATION OF THE COX-2 PATHWAY AS A THERAPEUTIC TARGET FOR RECURRENT URINARY TRACT INFECTION IN POSTMENOPAUSAL WOMEN

Tahmineh Ebrahimzadeh, BS¹, Amy Kuprasertkul, BS², Belle Marco, M.S.¹, Kim Orth, PhD³, Philippe Zimmern, MD², Nicole De Nisco, PhD¹

¹University of Texas at Dallas, Biological Sciences, ²U.T. Southwestern Medical Center, Urology, ³U.T. Southwestern Medical Center, Molecular Biology, ⁴Howard Hughes Medical Institute

Presented By: Tahmineh Ebrahimzadeh, BS

Introduction: Postmenopausal women exhibit high incidence of recurrent urinary tract infection (rUTI), defined as 3 UTIs within a year.¹ Development of antibiotic resistance or allergy complicates treatment of rUTI. New therapies must be developed for rUTI in this at-risk and underserved patient population. Studies in mouse models suggest that the COX-2 pathway is activated during UTI and COX-2-mediated inflammation is a predisposing factor for rUTI.² The activity of COX-2 can be inhibited specifically with selective NSAIDs (e.g. Celecoxib) or non-specifically by non-selective NSAIDs (e.g. ibuprofen).³ The goal of this study was to determine if the COX-2 pathway is activated during rUTI in postmenopausal women and to evaluate the potential use of selective NSAIDs as a treatment for rUTI.

Methods: In an IRB-approved study, postmenopausal women meeting the study criteria were stratified into 3 cohorts based on their history of rUTI, UTI symptoms, and urinalysis (UA): 1. Never UTI (n=20), 2. Remittent (-UA, n=20), and 3. Relapsed (+UA, n=22). Midstream urine was collected and stored in liquid nitrogen. Urinary PGE2 levels were measured quantitatively using a competitive ELISA (Enzo). Creatinine level was measured with Creatinine Urinary Detection Kit (Thermo Fisher). PGE2 was normalized to creatinine. Correlation analysis of PGE2/Cr to the use of different groups of NSAIDs were performed. p-value calculated with Brown-Forsythe and Welch ANOVA test.

Results: Figure 1 shows the correlation analysis of PGE2/Cr vs Selective, Non-selective, and NSAID (-) along with clinically relevant data. Interestingly, there is a statistically significant increase in levels of urinary PGE2/Cr in the relapsed cohort. Also, a correlation was found between the use of COX-2 selective NSAIDs and lower level of PGE2/Cr which suggests the effectiveness of selective NSAIDs in mediating COX-2 inflammatory pathway in the bladder.

Conclusion: The product of the COX-2 pathway, PGE2, is elevated in the urine of postmenopausal women with relapsed rUTI. Analysis of patient metadata showed that use of both selective and non-selective NSAIDs was minimal in the relapsed cohort and that PGE2 levels were consistently low in women using selective NSAIDs. These results provide evidence that selective COX-2 inhibitors may have therapeutic value for rUTI in postmenopausal women.
**Funding:** UT System Rising STARS, Howard Hughes Medical Institute
Poster #BS24
UROPATHOGENIC ESCHERICHIA COLI MOTILITY TYPES: GENETICS, CONTROL, AND ELECTRON MICROSCOPY
Jacob Hogins, BS1, Sankalya Ambagaspitiye, PhD1, Philippe E. Zimmern, MD;PI2, Larry Reitzer, PhD;PI1
1The University of Texas at Dallas, Department of Biological Sciences, 2U.T. Southwestern Medical Center, Urology
Presented By: Jacob Hogins, BS

Introduction: E. coli is the most common cause of urinary tract infections (UTIs). Uropathogenic E. coli (UPEC) motility contributes to entry into the bladder and may account for differences in disease presentation: localized trigonitis or diffuse pancystitis. E. coli motility has been extensively studied in nonpathogenic laboratory strains, and such strains possess flagella-dependent motility in liquid, flagella-dependent surface motility, and pilus-dependent surface motility. To determine the range of UPEC motility types, we characterized motility in three UPEC strains.

Methods: We characterized the well-studied model UPEC strain UTI89, and two clinical isolates from women with recurrent UTIs, PNK-004 and PNK-006. Swimming motility was assessed in plates with glucose, tryptone, and 0.25% agar, while surface motility was assessed on plates with the same medium but with 0.45% agar. Mutants with deletions of specific genes were constructed using phage P1 transduction using marked genes from the Keio collection of E. coli mutants. Cells from surface motility plates were collected, fixed with glutaraldehyde, absorbed on carbon coated copper grids, stained with phosphotungstic acid, and viewed on a JEOL 1200 EX transmission electron microscope.

Results: For all strains, swimming motility required flagella, but unexpectedly glucose did not prevent swimming. Surface motility characteristics were strain dependent. For UTI89 (Fig 1A,D), loss of flagella (ΔfliC) impaired motility and the residual motility required pili (ΔfimA). Loss of adenylate cyclase (Δcya) resulted in an unusual pattern of movement, and electron microscopy indicated lack of flagella and pili which suggests an appendage-independent form of motility. For PNK-004 (fig 1B), loss of flagella modestly impaired movement, and electron microscopy showed the absence of an appendage. For PNK-006 (Fig 1C,D), loss of flagella eliminated surface motility.

Conclusion: UPEC strains have at least four forms of motility, including a novel appendage-independent form of motility. The motility types show variations between strains. The relevance of each motility type to UTIs is unknown. Glucose-insensitive flagella synthesis distinguishes UPEC from nonpathogenic strains, and because cyclic-AMP is a major regulator of metabolism, these results indicate unsuspected aspects of UPEC metabolism.
Figure 1. Surface motility in three different UPEC strains. (A) UTI89 parental and mutants with deletion of fliC (flagella), fim4 (fili), fliC fim4 double deletion mutant (lacks flagella and fili), and a cyaA mutant (lacks adenylate cyclase). (B) Surface motility of clinical isolate PNK-004 and ΔfliC mutant. (C) Surface motility of clinical isolate PNK-006 and its ΔfliC mutant. (D) TEM images of the indicated strains. The cells were taken directly from surface motility plates, fixed, and then imaged.

Funding: N/A
Poster #BS25
COMPARATIVE RNA SEQ ANALYSIS OF UROPATHOGENIC AND NONPATHOGENIC ESCHERICHIA COLEI STRAINS SUGGEST A UPEC-SPECIFIC METABOLISM
Jacob Hogins, BS¹, Philippe E. Zimmern, MD;PI², Larry Reitzer, PhD;PI¹
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Presented By: Jacob Hogins, BS

Introduction: Several virulence factors (VFs) from uropathogenic E. coli (UPEC) have been identified based on methods such as comparison of genome sequences, or transcript analysis of strains from patients with urinary tract infections. These studies have been coupled with analysis of strains lacking putative VFs in mouse models. Although some VFs have been identified, a common set of VFs does not exist (1). UPEC strains grow rapidly in urine, and growth and metabolism are considered VFs. Analysis of mutants with defects in metabolic pathways suggested amino acids, not carbohydrates, as the primary energy source. The metabolic studies have primarily used one UPEC strain, CFT073, which may not be representative of UPEC strains (2). Furthermore, results from mouse infections may not accurately depict events in humans. To identify UPEC-specific metabolic genes, we compared the transcriptomes of one nonpathogenic and four UPEC strains.

Methods: The strains evaluated were nonpathogenic W3110, the well-studied model UPEC strains CFT073 and UTI89, and two clinical isolates from women with recurrent UTIs, PNK-004, and PNK-006. Bacteria were grown in 0.5% glucose, 0.25% NaCl, and 1% tryptone, the RNA was isolated, transcribed to DNA, and sequenced.

Results: Over 1000 genes were significantly differentially expressed between each UPEC strain and commensal W3110 (Figure 1). 17 genes were upregulated 3-fold or more in all 4 UPEC strains. 6 were metabolic genes. One is a major regulator of genes of energy metabolism, and another suggested a novel and UPEC-specific glycolytic pathway. Deletion of either gene resulted in severe growth defects. These 17 genes also suggest major alterations of the outer surface and possibly a role in biofilm formation. Each strain expressed a characteristic set of genes.

Conclusion: We have identified several previously undescribed UPEC-specific metabolic genes. Although more strains must be analyzed, the results indicate that UPEC strains may have a common metabolic strategy that is fundamentally different from lab strains of E. coli, and that carbohydrates may be the primary energy source. Substantial variation exists between UPEC strains: UTI89 and CFT073 are not characteristic of other UPEC strains.

Funding: N/A
**Poster #BS26**  
**ASSOCIATIONS BETWEEN URINARY BACTERIAL LOAD AND URGENCY URINARY INCONTINENCE**  
Lisa Karstens, PhD¹, Eric Leung¹, Fatoumata Jallow², Matthew Schleisman³, Manny Rodriguez⁴, W. Thomas Gregory, MD⁵, Rahel Nardos, MD, MCR⁶,⁷  
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*2015 OAB Grant Recipient*  

**Introduction:** Women are twice as likely as men to be impacted by urgency urinary incontinence (UUI) with risk of UUI increasing with age. Nearly one-third of women may suffer from this condition in their lifetime. The etiology of UUI is complex and not well known. There is however emerging evidence that a shift in the normal urinary microbiome may play a role in UUI. This study aims to understand whether women with UUI have significantly different urinary bacterial load compared to women without UUI and whether this is correlated with severity of UUI symptoms.  

**Methods:** This is a prospective cohort study comparing urinary bacterial load in women with and without UUI. We recruited 25 women with and 36 without UUI between the ages of 45-85. UUI was defined as daily urinary leakage with urgency. Women with known neurological conditions, active urinary tract infections, recent antibiotic use and symptomatic pelvic organ prolapse were excluded. UUI severity was measured using the ICIQ-OAB urinary symptom questionnaire. Bacterial load was estimated from a random sample of 50 catheter collected urine specimens using SytoBC combined with flow cytometry.  

**Results:** There was no significant difference between cases and controls in menopausal status, sexual activity, or relevant comorbidities. Cases were slightly older (59.4 vs 53.1, p=0.05), had higher BMI (29.6 vs 24.9, p=0.003), were more likely to have had a hysterectomy (p=0.03) and use estrogen products (p=0.001). Bacterial load was more than doubled in women with UUI compared to women without UUI (average bacterial load 8,749 ± 6,883 bacteria per mL in UUI, 4,121 ± 4,993 in controls, p = 0.01). Furthermore, we identified a significant negative correlation between bacterial load and symptom severity as measured by the ICIQ (r = -0.63, p = 0.02).  

**Conclusion:** This study provides evidence that women with UUI have significantly higher bacterial load in their urine. Interestingly, the higher bacterial load was associated with less severe symptoms. It is possible that larger bacterial load in women with UUI symptoms represents a heterogeneous mix of both pathogenic and symbiotic bacteria and that symptom severity is dependent on proportion between these two types of bacteria rather than the overall abundance.  

**Funding:** Society of Urodynamics, Female Pelvic Medicine Urogenital Reconstruction
Poster #BS27
THE GENITO-URINARY MICROBIOME OF POSTMENOPAUSAL WOMEN WITH RECURRENT URINARY TRACT INFECTIONS AS COMPARED TO POSTMENOPAUSAL CONTROLS
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Presented By: Megan Sara Bradley, MD

Introduction: Little is known about how the genito-urinary microbiota may play a role in recurrent urinary tract infection (rUTI) in postmenopausal (PMP) women. Our objective was to determine the differences in relative abundance and diversity of urinary and vaginal microbiota in PMP women with and without rUTI.

Methods: We included PMP women with and without a history of rUTI (≥3 culture-proven UTIs/year or ≥ 2 in 6-months). Subjects were excluded for pessary use, UTI in the last 4 weeks, current antibiotics or UTI symptoms. A catheterized urine specimen and mid-vaginal swab were collected. 16S rRNA gene sequencing of the V4 region was processed from genomic DNA with an in-house quality control pipeline. Paired reads were aligned with Ribosomal Database Project and Operational Taxonomic Units (OTUs) were further classified using the SILVA reference database. PERMANOVA (permutational analysis of variance) coupled with multidimensional scaling (MDS) ordination plots were used to compare compositional differences with OTU-level data. Alpha (within sample) diversity was calculated with the tail statistic ("τ").

Results: In total, we had 10 PMP women (5 rUTI vs. 5 controls). Median age was 70 years (IQR 18) with median BMI 28.1 (IQR 7.8). All subjects were Caucasian, 20% had current prolapse, and 20% were using vaginal estrogen. There was no difference in median UTI Symptom Assessment Questionnaire and Urinary Distress Inventory Short Form score between groups. Due to DNA yield, 7/10 (70%) urine specimens and 9/10 (90%) vaginal swabs were able to be sequenced. MDS ordination plots are presented in Figure 1a. Vaginal and urine samples showed significant differences (p-value=0.05, R²= 0.19). Mean within sample (alpha) diversity was higher in vaginal samples of cases (τ=9.1) than controls (τ=4.2) and were more similar in urine samples (τ=8.1 case; τ=7.3 control). Figure 1b demonstrates a significant abundance of Bifidobacterium from vaginal controls (14.8% control versus <1% case, p-value <0.01).

Conclusion: Among PMP women with and without rUTI, there was higher within sample diversity in the vaginal samples from women with rUTI, and a higher proportion of Bifidobacterium in vaginal control samples. Although neither cohort had a significant presence of vaginal Lactobacillus, previous studies suggest that Bifidobacteria may perform similar beneficial functions to vaginal health.
**16S rRNA gene Sequencing Data: Postmenopausal Women with and without Recurrent Urinary Tract Infections**

**Figure 1a** – MDS ordination plot representing differences (distances) between microbiota composition of individual samples (small circles) and group centroids (larger filled circles) from vaginal swabs (HVS) and urine (UR). PERMANOVA showed significant differences (p-value=0.05, R²= 0.19) between sample types. Results are based on Manhattan distance calculated with OTU-level data. The closer the points are located to one another, the more similar the microbiome compositions of the samples.

**Figure 1b** - 16S rRNA gene-based microbiota composition from urine (right; case n=4 v. control n=3) and vaginal swabs (left; case n=5 v. control n=4). Each horizontal bar represents the abundance of one bacterial genus. Our results suggest a significant abundance of *Bifidobacterium* (left column, teal bar) from vaginal controls (14.8% control versus <1% case, p-value =0.01).

**Funding:** N/A
**Poster #BS28**

**ELUCIDATING THE FUNCTION OF THE T-CELL-MEDIATED ADAPTIVE IMMUNE RESPONSE IN HUMAN RECURRENT URINARY TRACT INFECTION**

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Presented By: Jashkaran Gadhvi, BS

**Introduction:** Recurrent urinary tract infection (rUTI) in postmenopausal women has become a challenging clinical problem with few therapeutic options. Adaptive immune response to UTI is limited in mice (1). The local bladder adaptive immune response in human rUTI is undefined. Specifically, T cells response, which plays a critical role in the development of sterilizing immunity, has not been analyzed (2). The goal of this study was to characterize the T-cell response in the bladder during human rUTI through immunofluorescence analysis of bladder biopsies.

**Methods/MATERIALS:** Following IRB approval and patient consent, cold cup biopsies were obtained from “no cystitis” and “cystitis” regions of the bladders of women with antibiotic-refractory rUTI undergoing cystoscopy with fulguration of trigonitis under anesthesia. Tissue biopsies were fixed in 4% Paraformaldehyde and paraffin embedded (3). Biopsy sections (5 micron) from 14 patients were analyzed by immunofluorescence (IF) confocal microscopy using antibodies against CD4+ Helper T-cell (Abcam ab133616, rabbit) and CD8+ Cytotoxic T-cell (Invitrogen MA45-13473, Mouse). 10 representative images of follicular and urothelial regions were obtained for each biopsy and analyzed in ImageJ.

**Results:** The ratio of CD4+/CD8+ T-cells are presented in the graph. Lymphoid aggregates were present in 13/14 patients suggesting active local adaptive immune response. Quantitatively, we found that both CD8+ and CD4+ T-cells were more abundant in the “cystitis” region as compared to the “no cystitis” region. The ratio of CD4+/CD8+ cells was observed to be higher in the “cystitis” region (I\(_1\)) as compared to the “no cystitis” region (C\(_1\)) in both the follicles and urothelium. High CD4+/CD8+ ratios in the follicle are associated with higher titers of Gram-negative bacteria, E. coli and K. pneumoniae in the urine (3).

**Conclusion:** In this study, we found that both CD4+ Helper T-cells and CD8+ Cytotoxic T-cells were abundant in bladder biopsies taken from regions of cystitis. The ratio of follicular and urothelial CD4+/CD8+ T-cells in the “cystitis” region was higher than the “no cystitis” region. These results suggest that a T-cell mediated immune response is active in postmenopausal women with rUTI but may not be sufficient to prevent recurrence. Further studies are needed to elucidate the role of the different CD4+ Helper T-cell lineages in rUTI.
Figure 1 Ratio of CD4+/CD8+ cells in Patients PNK001 through PNK014 (A) in Follicle and (B) in Urothelium. I1—Inflamed ("Cystitis") region C1—Control ("No Cystitis") region

REFERENCES
1. PLOS Pathogens, 2015; 11(7): e1005044

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Poster #BS29
DIFFERENTIAL SENSITIVITY OF UROPATHOGENIC E. COLI STRAINS ISOLATED FROM POSTMENOPAUSAL WOMEN TO CETYLPYRIDINIUM CHLORIDE
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Presented By: Namrata Sawant, MS

Introduction: Treatment of rUTI, defined as ≥ 3 episodes of uncomplicated, symptomatic UTI within 12 months or 2 episodes within 6 months, can be challenging in postmenopausal women (1). One treatment option is bladder instillation, which includes exposing the bladder to an antimicrobial solution to remove planktonic bacteria. The cationic detergent Cetylpyridinium chloride (CPC), used in oral rinses to treat gingivitis may be a promising candidate antimicrobial for use in bladder instillation (2). The goal of this study was to measure the sensitivity of diverse uropathogenic E. coli (UPEC) strains isolated from rUTI patients to CPC and determine the feasibility of sensitivity testing within the standard timeline for clinical care.

Methods/MATERIALS: A detergent sensitivity assay was performed using UPEC strains isolated from the urine of postmenopausal women with rUTI. PNK006 was isolated from a patient with a single-species infection, while the remaining strains were isolated from patients with UPEC and Enterococcus faecalis co-infections. Overnight bacterial cultures in sterile Luria Bertani (LB) broth were normalized to OD600 = 0.1 and inoculated in two sets of tubes: Treated (LB with 20% v/v CPC) and Control (LB). Both sets of tubes were incubated for 60 minutes at 37°C and sampled every 10 minutes. Samples were serially diluted and plated on LB agar plates, incubated overnight at 37°C, and colonies forming units were enumerated.

Results: 7 UPEC strains were isolated from postmenopausal women with rUTI enrolled in an IRB-approved study and tested for their sensitivity to 20% CPC. PF5 and PF19, isolated from polymicrobial infections, were sensitive to CPC similar to single-species infection isolate PNK006. However, UPEC strains PF2, PF15, and PF18, isolated from polymicrobial infections, were resistant to CPC similar to polymicrobial infection isolate PNK007. Assays were performed at least in duplicate. All strains were assayed in less than 48 hours, a suitable time interval for clinical care.

Conclusion: UPEC from polymicrobial and single-species infections showed differential sensitivities towards the cationic detergent CPC. These results indicate the need for sensitivity testing of bacterial strains isolated from patient samples prior to bladder instillation with CPC. The mechanistic basis of the resistance of UPEC strains PNK007, PF2, PF15 and PF15 to CPC is under investigation.
Funding: UT System Rising STARS
Poster #BS30
PROPHYLACTIC ANTIBIOTICS AND THE URINARY MICROBIOME IN MENOPAUSAL WOMEN WITH RECURRENT URINARY TRACT INFECTIONS
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Presented By: Monique Hiersoux Vaughan, MD

Introduction: Prophylactic antibiotics are frequently used to prevent recurrent urinary tract infections (rUTIs) but it is unclear how they affect the overall microbial composition in the bladder. We aimed to compare urinary microbes in three groups of menopausal women: 1) women with rUTIs taking antibiotic prophylaxis; 2) women with rUTIs but without antibiotics; and 3) age-matched controls. All women were using topical vaginal estrogen.

Methods: In this cross-sectional study, women >55 years of age were enrolled into the three groups above. Catheterized urine samples were collected at least 6 weeks after acute infection and after starting relevant medications such as vaginal estrogen or prophylactic antibiotics. Women taking UTI prevention supplements as well as those with asymptomatic bacteriuria were excluded. After DNA extraction, v4 regions of the 16S rRNA gene were sequenced, and analyzed for bacterial identification. Relative sequence abundances were plotted. Non-metric multidimensional scaling (NMDS) techniques such as Bray-Curtis and UniFrac were used to compare biological communities between groups. Pairwise group comparisons were also performed using Bayesian graphical compositional regression (GCR), a technique that incorporates the phylogenetic tree and can be used to identify rare clusters that differ between groups.

Results: We analyzed 65 samples as follows: rUTI on antibiotics (n=17), rUTI not using antibiotics (n=25), and controls (n=23). Lactobacillaceae were found in all study groups and were abundant in 35%, 44%, and 56% of the samples per group, respectively (Figure). NMDS techniques show that the microbial compositions of a small subset in the rUTI groups deviate away from those in the controls, though this is not statistically significant with the limited sample size. A statistical test based on the Bayesian GCR model identified a cluster of microbes belonging to the Order Clostridiales, Family_XI that was differentially abundant in women with rUTI using prophylactic antibiotics compared to others with rUTI.

Conclusion: In women using vaginal estrogen, Lactobacillaceae abundance varies slightly between women with rUTIs compared to controls. There may be additional differences in the microbial communities that we were unable to confirm due to small sample sizes. Bayesian graphical compositional regression may be a helpful tool to identify unusual microbes among heterogeneous samples.
**Funding:** R03 AG060082-01 and The Claude D. Pepper Older Americans Independence Center at Duke University
Poster #BS31
MALX AS A VIRULENCE FACTOR IN UROPATHOGENIC ESCHERICHIA COLI: CORRELATION WITH URINARY TRACT INFECTIONS AND ANALYSIS OF ITS FUNCTION
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Presented By: Andrew Petter, BS

Introduction: The malX gene was identified in uropathogenic Escherichia coli (UPEC) strain CFT073 as part of a pathogenicity-associated island about 20 years ago. Homology analysis indicated that it is a component of the phosphotransferase system (PTS) of carbohydrate transport. We compiled the evidence that correlates malX to UTIs. To determine its function, which is unknown, we constructed and characterized mutants lacking malX.

Methods: We compiled all published information about the presence of malX in UPEC strains. We constructed a mutant with a deletion of malX in the model UPEC strain UTI89 and characterized its growth and carbohydrate depletion.

Results: A PubMed search identified 8 papers that surveyed a correlation between malX and urinary tract infections. A compilation of these results showed that malX generally correlates with UTIs and phylogenetic group B2 which is the most common UPEC group. The malX gene associated with UPEC strains is only 40% identical to the previously described malX which means that the malX designation for the UPEC gene is incorrect. We provisionally designated the virulence factor gene as malX2. A malX2 mutant grew poorly in medium in which glucose, xylose, and glycerol were the sole carbon sources. The mutant depleted carbohydrates slowly.

Conclusion: The MalX2 protein appears to be the major transporter for several carbohydrates. A previous study of nonpathogenic E. coli proposed that the original MalX (not MalX2) transported carbohydrates by facilitated diffusion. If this is also true for MalX2, then such transport, which is potentially rapid, may in part account for rapid growth of UPEC strains. This novel transport system distinguishes uropathogenic from nonpathogenic E. coli.

Funding: N/A
Poster #BS32
REDUCED UROTHELIAL EXPRESSION OF UROPLAKIN-3A FOLLOWING CYSTOSCOPY WITH FULGURATION OF TRIGONITIS IN POSTMENOPAUSAL WOMEN WITH RECURRENT URINARY TRACT INFECTION
Amy Kuprasertkul, BS1, Luming Chen, BS2, Kim Orth, PhD2, Nicole De Nisco, PhD3, Philippe Zimmern, MD1
1U.T. Southwestern Medical Center, Urology, 2U.T. Southwestern Medical Center, Molecular Biology, 3University of Texas at Dallas, Biological Sciences
Presented By: Amy Kuprasertkul, BS

Introduction: Cystoscopy with fulguration of trigonitis (CFT) is a treatment option for postmenopausal women with antibiotic-recalcitrant recurrent urinary tract infections (rUTI). CFT effectively resolves trigonitis and prevents recurrent episodes in approximately 70% of cases, but the scientific basis for this is poorly understood (1). One hypothesis explaining the efficacy of this treatment is that the fulgurated areas of the bladder no longer express surface proteins, such as uroplakin-3, that pathogens use to attach to and invade the urothelium (2). The goal of this study was to evaluate the expression of uroplakin-3a along the luminal surface of umbrella cells in biopsies from naïve and previously fulgurated regions.

Methods: Following IRB approval, cold cup bladder biopsies from “no cystitis” and “cystitis” regions were obtained from women with antibiotic refractory rUTI undergoing CFT under anesthesia. In patients with a prior CFT, the “no cystitis” biopsy was taken from the previously fulgurated region. “No cystitis” and “cystitis” biopsies from 6 patients (2 prior CFT, 4 naïve) were analyzed by immunofluorescence (IF) confocal microscopy using antibodies against uroplakin-3a (Novus, rabbit). 10 representative images of the urothelium were taken and scored for each biopsy.

Results: The uroplakin-3a scoring results are presented in the table along with relevant clinical data. In healthy tissue, uroplakin-3 staining is normally observed as a contiguous line on the luminal surface of umbrella cells. Contiguous urothelial staining of uroplakin-3a was only observed in the “no cystitis” regions of patients without a prior CFT procedure (N=4). No uroplakin-3a staining was detected in the “no cystitis” region (bladder tissue that was previously fulgurated) for patients with prior CFT (N=2). The “cystitis” regions of all patients, all of which had not been previously fulgurated, showed varying degrees of uroplakin-3a staining, but always less than or equal to the matched control region.

Conclusion: In this preliminary study, no uroplakin-3a expression was observed in “no cystitis” regions of the bladder for patients with previous CFT. These results suggest that the presumptive umbrella cells of the healed urothelium post-CFT no longer express uroplakin-3a.
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#### BASIC SCIENCE ABSTRACTS

**Funding:** N/A

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( - ) No staining; (+) Spotty; (++) Greater than 50%; (+++) Uniform staining; (CEFT) Cystoscopy with electrofulguration of trigonitis

**REFERENCES**

Poster #BS33
DETRUSOR UNDERACTIVITY IS ASSOCIATED WITH OXIDATIVE STRESS AND DETRUSOR FIBROSIS IN METABOLIC SYNDROME
CR Powell, MD1, Albert Kim, PhD2, Joshua Roth, MD1, James Byrd, MS1, Khalid Mohammad, MD PhD1, Mouhamad Alloosh, MD MS1, Babak Ziaie, PhD3, Ragini Vittal, PhD4, Michael Sturek, MS PhD1
1Indiana University, 2Temple University, 3Purdue University, 4University of Michigan
Presented By: C.R. Powell II, MD

Introduction: Metabolic syndrome (MetS) is known to cause oxidative stress and has detrimental effects on the bladder, including detrusor underactivity. The progression and mechanism of disease are poorly understood. A large animal model for diabetic bladder dysfunction was developed to explore the hypothesis that detrusor underactivity (DU) is associated with oxidative stress and bladder fibrosis.

Methods: Ossabaw pigs underwent dietary modification with hypercaloric, atherogenic diet for 10 months to induce MetS and were compared to a matched group of lean pigs. Urodynamic studies were performed in both groups to confirm DU. Thiobarbituric acid reactive substances (TBARS) detected in the urine were used to measure oxidative stress activity in the urinary tract, and urinary IL-17a was used to detect pro-fibrotic activity. MetS was confirmed by assessing body weight, blood pressure, serum glucose, total cholesterol, and triglycerides.

Results: Eight Ossabaw MetS pigs demonstrated a 1.4 fold increase in the relative levels of urinary TBARS from a value of 3.9 ng/mL to 5.5 ng/mL over a 56 week observation period (p=0.04). The level of IL-17a also increased from 950 pg/mL to 2000 pg/mL (relative increase of 2.1 fold) during the study period (p=0.008). Bladder pressures at capacity were lower in the MetS group (22.3±8.5 vs. 49±11.1, p=0.015). Histologic analysis of the bladders from lean and MetS pigs revealed significantly increased collagen in the muscularis layer but not in the submucosa or mucosa layer (22.8% vs. 14.1%, p<0.01).

Conclusion: MetS induced in the Ossabaw pig is associated with DU, oxidative stress, and pro-fibrotic activity in the bladder, which is detectable in the urine and confirmed histologically. This has never been shown for MetS.

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<th>Table 1. Demographic parameters after 10 months MetS inducing diet modification.</th>
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Funding: This project was supported by a Project Development Team within the ICTSI NIH/NCRR Grant Number RR025761 (Powell, PI) and NIDDK DiaComp Pilot Feasibility project, sub-award DK076169 (Powell, PI) and NIH grant HL062552 (Sturek, PI), NIH UL1 RR025761 (Sturek, CO-I), NIH P30 DK097512 (Sturek Co-I), NIH NHLBI R01HL109288 (Vittal, PI).
Poster #BS34
COMPARISON OF THE IMPACT OF TWO SINGLE INCISION SLINGS
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Presented By: Katherine Kaiser Shapiro, MD

Introduction: Single incision slings (SIS) are minimally invasive devices designed to treat stress urinary incontinence. For prolapse repair, meshes with higher porosity and lower stiffness have been associated with improved outcomes. To determine if these parameters impact the host response to SISs, we compared the higher stiffness, lower porosity Altis SIS (Coloplast) and the lower stiffness, higher porosity Solyx SIS (Boston Scientific) in an ovine model.

Methods: 13 Solyx (structural stiffness 0.58 ± 0.15 N/mm, pore size 1182 μm) and 11 Altis (structural stiffness 1.5 ± 0.04 N/mm, pore size 374 μm) were implanted suburethrally into sheep according to manufacturer’s instructions on minimal tension (IACUC #17080088). The mesh-urethral-vaginal complex and ungrafted vagina (Sham) were harvested en bloc at 3 months. Masson’s trichrome and Picrosirius staining were performed to visualize inter-fiber distance (in vivo porosity) and tissue integration. Smooth muscle contractility to a KCl stimulus (120mmol/L) was performed to measure myofiber driven contractions. Glycosaminoglycan (GAG), total collagen and elastin content were measured. Bending stiffness mechanical testing was performed to evaluate SIS changes with different directions of applied force. Statistical analysis was performed using Mann-Whitney, Wilcoxon matched pairs, and Chi-Square tests.

Results: Altis significantly buckled forming a “C” or “S” shape in most samples (64%, N=7), while buckling following Solyx implantation occurred less often (8%, N=1, P=0.004). Interfiber distance was greater in Solyx groups (0.63 vs 0.29 mm, P=0.006) with improved tissue integration (73% vs 27%, P<0.05[PM1]). Total collagen was decreased in both groups compared to control (p<0.001) with no difference between SIS groups. Elastin and GAG content did not differ between groups or vs control. Both SIS slings had a significant decrease in myofiber-mediated contractile response (KCl) compared to ungrafted vaginal tissue (p<0.05) with no difference between groups. Consistent with the deformation observed after implantation, the bending stiffness of Altis was significantly lower than Solyx (0.0186 N/mm vs 0.0883 N/mm).

Conclusion: Altis had decreased porosity, decreased tissue integration and buckled after implantation whereas Solyx largely maintained a flat configuration. The deformation of Altis is not an intended effect likely caused by the low bending stiffness. Both slings induced a decrease in collagen content and smooth muscle contractility similar to previous findings for prolapse meshes.

Funding: Boston Scientific
Poster #BS35
STAGES OF DECOMPENSATION DURING ACUTE ISCHEMIA DEMONSTRATED IN AN EX-VIVO PORCINE BLADDER MODEL
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Presented By: Natalie Swavely, MD

Introduction: The aim of this project was to develop an ex-vivo porcine bladder model to test the effects of increasing durations of acute ischemia on detrusor function.

Methods: Porcine bladders were perfused with oxygenated Krebs solution through bilateral vesical arteries at standard physiologic flow (4ml/min). Bladders were filled to 250 mL through a urethral catheter and intravesical pressures were continuously recorded throughout the experiment. At 250 mL, contractions were induced via intravesical infusion of a KCl solution, and the bladders were emptied after peak contraction was reached. Total, passive, and active pressures were recorded for each contraction and data was normalized to the control fill. After equilibration, the following perfusion protocol was used for each fill, void cycle: control (4ml/min), partial ischemia (2ml/min), global ischemia (0ml/min) and reperfusion (4ml/min). Isovolumetric perfusion periods were held for 15 minutes or 30 minutes and results compared.

Results: Porcine bladders (N=19) including 8 in the 15-minute group and 11 in the 30-minute group were used. With 15-minutes of ischemia, passive pressure increased 39% (p=0.03) and the active pressure decreased 23% (p=0.002) during global ischemia. However, total pressure remained constant, identifying a compensated phase. Values returned to baseline with reperfusion. (Figure 1a). With 30-minutes of ischemia, passive pressure remained unchanged during global ischemia. However, there was a decrease in total pressure 34% (p<0.001) and active pressure 61% (p<0.001), with incomplete return to baseline, identifying a decompensated phase in global ischemia with incomplete recovery upon reperfusion (Figure 1b).

Conclusion: In a perfused porcine bladder model, 15 minutes of ischemia resulted in a compensated phase and 30 minutes of ischemia resulted in a decompensated phase of detrusor function. This study provides mechanistic insight into the physiologic changes of ischemia-mediated voiding dysfunction.
Figure 1. Normalized total (blue line), passive (orange line), and active (grey line) pressures during physiologic perfusion, control (1/min), partial ischemia (2/ml/min), global ischemia (0/ml/min), and reperfusion (4/ml/min). Time periods were held for 15 min (A) and 30 min (B). *p<0.05.

**Funding:** N/A
FUNCTIONAL CONSEQUENCES OF SPINAL CONTUSION INJURY IN THE LOWER URINARY TRACT IN A FEMALE MURINE MODEL
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Presented By: Salvador Ruiz Lopez

Introduction: Most individuals with spinal cord injury (SCI) live with lower urinary tract (LUT) dysfunction. Of these individuals, women are more than two-fold as likely than men to rely on an indwelling catheter for bladder management, a strategy associated with increased complications over other methods. Functional recovery of the bladder/bowel is consistently rated as a top priority by individuals living with SCI. Contusion SCI is most common in humans; however, LUT impairment in preclinical contusion models has been minimally characterized and only in rat, despite documented rat/mouse species differences in bladder and urethra coordination. Our goal was to characterize changes in mouse LUT function over time following moderate-to-severe contusion SCI to lay groundwork for future interventional studies.

Methods: Adult, female C57Bl/6J mice underwent laminectomy with (SCI) or without (sham) mid-thoracic contusion injury (75 or 100 kdyn). Bladder management consisted of manual expression 3x daily. 7 or 14 days later, filling cystometry was performed under anesthesia in conjunction with recording of external urethral sphincter electromyograph (EUS-EMG) activity. Intravesical pressure was recorded during saline infusion (20 μl/min) using an in-line, low volume pressure transducer. EMG was recorded by differential amplification. Data were digitized (Spike2, Cambridge Electrical Design) and saved to computer. Bladder and spinal cord histology and urodynamic parameters were quantified.

Results: Thoracic contusion injury produced large lesions in the dorsal spinal cord. During cystometry, voiding behavior in SCI mice was significantly altered relative to sham. Voiding contractions were reduced (75 kdyn, p=0.06) or abolished (100 kdyn, p<0.05) by SCI. Normal EUS-EMG patterns were also disrupted, such that urethral contractile activity became more sporadic and longer in duration, with shortened intervals between contractions. Bladder weight was significantly increased (p<0.01), and PGP9.5 immunostaining revealed a significant loss of bladder sensory nerve fiber profiles over time (p<0.05).

Conclusion: Contusion SCI results in altered bladder morphology and impaired LUT function. Severity of dysfunction is positively correlated with impact force and post-injury recovery time, and characterized by loss of bladder contractile activity, increased EUS contractile activity, and reduced voided volume. A gradual loss of peripheral sensory axons suggests a critical window for therapeutic interventions focused on recovery of afferent-driven micturition, a target of our ongoing studies.

Funding: NIH/NCMRR T32HD071866 (MMB) and Craig H. Neilsen Foundation SCIRTS 542907 (JJD)
Poster #BS37
URODYNAMIC STUDIES AND TELEMETRIC MONITORING OF BLADDER FUNCTION AFTER TRAUMATIC THORACIC SPINAL CORD INJURY IN MINIPIGS
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1International Collaboration on Repair Discoveries, Vancouver, BC, Canada, 2University of British Columbia, Department of Neuroscience, Vancouver, BC, Canada, 3University of British Columbia, Department of Urologic Sciences, Vancouver, BC, Canada, 4University of British Columbia, Department of Orthopaedics, Vancouver, BC, Canada
Presented By: Martin Keung, BSc

Introduction: The current gold standard for characterizing lower urinary tract dysfunction is urodynamic evaluation. However, it only captures a snapshot of bladder function under a non-physiological retrograde bladder filling. Furthermore, urodynamic evaluation in an animal model often requires a sedation protocol or accepts that animals may be agitated during the study. Both variables are major limitations especially for longitudinal studies. Alternatively, implanted radio-telemetric systems can provide measurements within an animal’s native housing with physiological bladder filling. In this study, we attempted to establish a method for using an implanted telemetry system to monitor detrusor pressure (Pdet) and external urethral sphincter (EUS) activity in our pig model of spinal cord injury (SCI). With this, we sought to (1) monitor bladder function in a physiological setting and (2) generate telemetric urodynamic reference data.

Methods: A four-channel telemetric transmitter (Stellar model PPBTA-XXL, Chesterfield, MO) was implanted into the side flank of female Yucatan minipigs. A pressure probe was inserted into the dome of the bladder to measure the intravesical pressure (Pves) and another pressure probe was inserted into the abdominal cavity to measure the intraabdominal pressure (Pabd). Pdet was calculated by subtracting Pabd from Pves. Two electromyography (EMG) leads were inserted to measure the activity of the EUS. Telemetric recordings in a physiological setting were performed weekly for 14 weeks pre-injury and 4 weeks after SCI. Recordings were also performed concurrently with urodynamics at various time points before and after SCI.

Results: Weekly recordings in uninjured pigs demonstrated visible detrusor contractions at the time of the void and consistent changes in Pdet values. Changes in EMG activity were observed at the start and at the end of the void with a visible silencing period during the void. Urodynamic evaluation with concurrent telemetric recording revealed comparable tracings between the two systems before and after SCI. In addition, neurogenic detrusor overactivity was observed in both systems after SCI during urodynamics.

Conclusion: Telemetric recording during urodynamics demonstrated similar pressure tracings in both uninjured and SCI pigs. These findings suggest that telemetric monitoring of the bladder is feasible in the minipig, and may provide an alternative or adjunct to urodynamics for characterizing bladder dysfunction after SCI.

Funding: Department of Defense
OPTOGENETIC CHRONIC NEUROMODULATION OF THE DIABETIC CYSTOPATHY MOUSE MODEL - STUDY DESIGN*

Shannon Wallace, MD¹, Yan Wan, MD¹, Mason Briggs, BS¹, Darlene Tran, BS¹, Kate Montgomery, PhD², Guobing Zhuang, MD, PhD¹, Amy Dobberfuhl, MD, M.S.³, Scott Delp, PhD², Bertha Chen, MD¹

¹Stanford University School of Medicine, Department of Obstetrics and Gynecology, Stanford, CA, ²Stanford University, Departments of Bioengineering and Mechanical Engineering, Stanford, CA, ³Stanford University School of Medicine, Department of Urology, Stanford, CA

Presented By: Shannon Leigh Wallace, MD

*2017 Neuromodulation Grant Recipient

Introduction: Sacral neuromodulation targets the sacral nerve with electrical pulses to treat both detrusor overactivity and nonobstructive urinary retention associated with early stage and late stage diabetic cystopathy. In order to better understand how neuromodulation affects the bladder, we developed a mouse model of chronic neuromodulation using the optogenetic technique. Optogenetics enables specific neurons to be activated by light through injection of target neurons with viral vectors carrying the opsin light-channel gene. Transdermal light can then stimulate targeted nerves multiple times noninvasively. In this abstract we present the study design of optogenetic chronic neuromodulation of the diabetic cystopathy mouse model.

Methods: To create our diabetic cystopathy mouse model, diabetes was induced using 150mg/kg IP streptozotocin (STZ) in female ovariectomized C57BL/6 mice. Ten diabetic mice were injected with a viral vector containing the channelrhodopsin gene (AAV6-hSyn-ChR2(H134R)-EYFP) into their left sciatic nerves. AAV6-hSyn-ChR2(H134R)-eYFP encodes an excitatory opsin, enabling light-inducible stimulation. Nine diabetic mice underwent sham surgery and were injected with saline into their left sciatic nerves. Eight diabetic mice and 6 non-diabetic control ovariectomized female mice did not have injections of the sciatic nerve. Three weeks after injection, all mice were exposed to 30 minutes of blue 475nm light (1 mW/ mm²) per day in an LED chamber for 35 days. Voiding behavior before and after viral infection was monitored by 2-hour filter paper recordings twice weekly. After 35 days of light exposure, the bladders were harvested for mRNA expression and protein analysis.

Results: All 10 mice underwent successful surgery with injection of the AAV6-hSyn-ChR2(H134R)-eYFP virus into the epineurium of the sciatic nerve. Opsin expression was confirmed by positive YFP fluorescence stain in the dorsal root ganglia of the sciatic nerve. C-fos immunohistochemistry and quantification confirmed neural activation.

Conclusion: We designed this pilot study in order to gain insight into the mechanism of sacral neuromodulation and how it alters diabetic function. Optogenetics allows specific, noninvasive, and chronic stimulation of the sciatic nerve, enabling us to understand the chronology of changes induced by neuromodulation in the diabetic bladder. Voiding data, mRNA and protein expression will help us to identify functional and histologic changes in the bladder caused by chronic neuromodulation.
Funding: 2018 SUFU Research Grant for the Study of Neuromodulation by the Allergan Foundation
Poster #BS39
BLADDER WALL MICROMOTION REGIONAL AND DIRECTIONAL VARIATION IN AN ELECTRO-STIMULATED PORCINE MODEL MEASURED BY TEXTURE CORRELATION WITH ANATOMICAL MOTION MODE (AMM) ULTRASOUND

Anna Nagle, PhD¹, Zachary Cullingsworth, MS², Andrea Balthazar, MD³, Charles Blocker, BS³, John Speich, PhD²

¹Indiana Tech, ²Virginia Commonwealth University, ³Virginia Commonwealth University Health

Presented By: Anna S. Nagle, PhD

Introduction: Individuals with overactive bladder often experience non-voiding rhythmic contractions of the bladder wall. An anesthetized pig model was developed to help analyze new non-invasive techniques to measure the micromotions of the bladder wall that cause these rhythmic contractions. This study’s goal was to determine how the region of and direction through the bladder wall in which micromotion is monitored affects measurement of micromotion using AMM ultrasound.

Methods: A female pig underwent urodynamics under isoflurane anesthesia. Filling was paused at a bladder volume of 500ml and electrotrodes on the bladder surface delivered electrostimulation of 5V square wave every 20s (3 cycles/minute) to simulate micromotion. An ultrasound transducer was positioned above the bladder to obtain AMM one-dimensional lines perpendicular to the anterior and posterior bladder wall as well as parallel along the anterior bladder wall (Fig. 1). A custom MATLAB texture-tracking program monitored bladder wall thickness over 85s AMM cine loops and used Fourier analysis to measure peak frequencies of thickness changes.

Results: Measurement of anterior bladder wall thickness changes using an AMM tracking line perpendicular to the bladder wall yielded a peak frequency of 2.9 cycles/minute with electrostimulation and no peak frequency in the range of interest (1-8 cycles/minute) without electrostimulation. Using a parallel tracking line, the peak frequency was 2.2 cycles per minute with electrostimulation and again there was no peak frequency in the range of interest without electrostimulation. In the posterior region, the peak frequency was 4.4 cycles/minute with electrostimulation and 6.14 cycles/min without electrostimulation.

Conclusion: The best results were achieved for image analysis in the anterior region of the bladder using the AMM line perpendicular to the bladder wall. This may be because other cyclic processes cause bladder wall thickness changes in the posterior region of the bladder, and because the image contrast (and therefore texture) is stronger in the perpendicular direction than in the parallel direction. Because of these findings, it is recommended that future non-invasive ultrasound-based micromotion studies concentrate on analysis of the through thickness (perpendicular) of the anterior bladder wall.

Funding: This research was funded by the SUFU-Cogentix Medical OAB grant.
Poster #BS40
THE SEARCH FOR MOUSE MODELS OF TYPE II DIABETIC BLADDER DYSFUNCTION: VOIDING PARAMETERS IN MALES AND FEMALES OF TWO POLYGENIC STRAINS: A PROGRESS REPORT
Erica Bien, Mark Zeidel, Warren Hill
Department of Medicine, Beth Israel Deaconess Medical Center
Presented By: Warren Hill, PhD

Introduction: While good mouse models exist for type 2 diabetes research, there has been little attempt to characterize the nature or the timing of LUTS in many strains. The purpose of this study was to test two strains of polygenic obese/hyperglycemic mice on high fat or regular diets, continuously for 12 months using the voiding spot assay.

Methods: To characterize the phenotypic emergence of voiding dysfunction in mouse strains prone to obesity and hyperglycemia, we performed 4 hour void spot assays on KK.Cg-AyJ (aka KK)) and TALLYHO/JngJ mice (Jackson Laboratory, ME) fed high fat (26% calories as fat) and control diets (16% of calories as fat), with monthly testing for four months. Mice began diets at 4 weeks of age. Female and male mice of each strain (6/group) were also weighed and had fasting blood glucose measured each month.

Results: At four weeks, TallyHo females and males were moderately hyperglycemic (190 and 223 mg/dL respectively compared to controls at ~150 mg/dL). By 16 weeks the males had fasting blood glucose levels >500 mg/dL on either diet, while females were unchanged. Males became polyuric with urine volumes increasing from 750 µl to 1600 µl, while the number of primary voids (>20 µl urine/spot) did not increase, but the volume/void doubled. Female voiding was essentially unchanged over 16 weeks. Diets had no significant influence except on female weights over this time. KK mice were more hyperglycemic than TallyHo at four weeks and this became more pronounced by 16 weeks with males and females on control diets reaching ~340 mg/dL, while those on high fat were significantly worse at 470-530 mg/dL. The females exhibited moderate polyuria with no increase in frequency, however the males increased their urine volume 4-fold (500 µl > 2000 µl) and had three times the frequency of voids with no increase in volume/void. Diet had no significant influence on voiding.

Conclusion: There were significant gender differences within the two strains for several parameters. At this early stage, KK male mice exhibited increases in both total volume and frequency. TallyHO males were polyuric with no evidence of increased frequency but apparently greater bladder volume accommodation, suggesting compensation.

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Poster #BS41
A NOVEL MOUSE MODEL OF ACUTE URINARY RETENTION
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Beth Israel Deaconess Medical Center
Presented By: Weiqun Yu, PhD

Introduction: Urinary retention (UR) is a common feature in LUTS, including benign prostate hyperplasia, spinal cord injury, and underactive bladder. The inability to eliminate urine may lead to permanent damage to bladder structure and function. However, we know little about whether UR contributes to the voiding dysfunction directly, and we don’t understand the pathogenesis or underlying molecular mechanisms. Existing UR models which usually involve a bolus injection of saline intravesically, are few in number and difficult to quantify. To better understand UR induced bladder pathology, we have developed a novel acute UR (AUR) mouse model which allows us to apply quantifiable and reproducible AUR induced bladder injury.

Methods: To mimic the excessive stress the bladder wall receives during UR, we applied 50 and 80 cm water pressure to the bladder lumen to simulate different severities of UR that patients could experience. In brief, we catheterized anesthetized mice via the urethra and filled the bladder by pumping (25 µl/min) saline into the bladder lumen to the designated pressure. A water column with designated height (50 or 80 cm) was then applied to maintain constant pressure in the bladder lumen for 30 minutes. This AUR insult was then phenotyped by the combination of void spot assay (VSA), cystometry (CMG), myography, and morphological approaches.

Results: Both 50 and 80 cm water pressure AUR for 30 minutes induced voiding dysfunction, with different degrees of severity. VSA indicates significantly increased voiding frequency, accompanied by decreased voided volume. CMG study indicated shortened voiding intervals, and reductions to both peak pressure and bladder compliance. Myographic study indicated that BSM strips from these mice have significantly diminished contraction force in response to EFS, carbachol, and KCl depolarization. Interestingly, bladders of AUR treated mice are significantly heavier and dilated, with abnormal and disorganized BSM bundles. Edma was obvious with increased epithelial and lamina propria thickness. These data indicate that AUR directly caused bladder damage and voiding dysfunction.

Conclusion: These data show a quantifiable and reproducible AUR mouse model. Our data also indicate that AUR is a direct factor contributing to bladder dysfunction. Further studies in this model will permit understanding of the molecular mechanisms of UR induced voiding dysfunction.

Funding: N/A
Poster #BS42
OPTOGENETIC CHRONIC NEUROMODULATION OF THE DIABETIC CYSTOPATHY MOUSE MODEL - FUNCTIONAL EFFECT
Shannon Wallace, MD¹, Mason Briggs, BS¹, Yan Wen, MD¹, Darlene Tran, BS¹, Kate Montgomery, PhD², Guobing Zhuang, MD, PhD¹, Amy Dobberfuhl, MD, M.S.³, Scott Delp, PhD², Bertha Chen, MD¹
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Presented By: Shannon Leigh Wallace, MD

Introduction: Mouse voiding patterns are used to assess lower urinary tract dysfunction and serve as a proxy to model factors that give rise to lower urinary tract symptoms in humans. The void spot assay (VSA) is performed by placing a conscious, unrestrained mouse in an enclosure lined with absorbent filter paper. Micturition events are captured and retained as void spot on paper. The VSA provides information about cumulative voiding behaviors over time and can detect a change in voiding pattern during or after an intervention. We describe the VSA results in a diabetic cystopathy mouse model during chronic optogenetic neuromodulation.

Methods: Using methodology described in the abstract “Optogenetic Chronic Neuromodulation of the Diabetic Cystopathy Mouse Model – Study Design,” we performed the VSA test over 12 weeks to analyze the micturition pattern in optogenetic diabetic mice, sham diabetic mice, diabetic mice and control non-diabetic mice. Voiding behavior before and after viral infection was monitored by 2-hour filter paper recordings twice weekly for the entire study period. Filter papers were illuminated with ultra-violet (UV) light. Voiding area and number of voids on filter paper were processed in Image J.

Results: There was no significant difference in the voided area between the four groups from baseline voiding, voiding function during the diabetic phase, and voiding function during light stimulation. While there was a decrease in voided area over time, this change was not statistically significant and was similar among all groups. The non-diabetic control mouse group had the least number of voids over time. The optogenetic diabetic mice group had a statistically significant increase in the number of voids during the period of light stimulation (p> 0.019).

Conclusion: In this pilot study, we showed that optogenetic neuromodulation of the diabetic mouse bladder with light stimulation achieves a functional effect by increasing the number of voids over time. Although we were not able to determine whether these mice were in the overactive or underactive stage of diabetic cystopathy, our initial data suggests that the intervention of optogenetic neuromodulation affects micturition pattern. Further animal studies should be performed to correlate precise bladder function of either overactive or underactive bladder with urinary voiding patterns.
**Funding:** 2018 SUFU Research Grant for the Study of Neuromodulation by the Allergan Foundation
Poster #BS43
OPTOGENETIC CHRONIC NEUROMODULATION OF THE DIABETIC CYSTOPATHY MOUSE MODEL – HISTOLOGY AND BLADDER TISSUE ANALYSIS
Shannon Wallace, MD¹, Darlene Tran, BS¹, Mason Briggs, BS¹, Yan Wen, MD¹, Kate Montgomery, PhD², Guobing Zhuang, MD, PhD¹, Amy Dibberfuhl, MD, M.S³, Scott Delp, PhD², Bertha Chen, MD¹
¹Stanford University School of Medicine, Department of Obstetrics and Gynecology, Stanford, CA, ²Stanford University, Departments of Bioengineering and Mechanical Engineering, Stanford, CA, ³Stanford University School of Medicine, Department of Urology, Stanford, CA
Presented By: Shannon Leigh Wallace, MD

Introduction: The mechanism of how neuromodulation alters mechanical properties of bladder wall tissue and affects bladder architecture is not well-understood. Neuromodulation may target bladder smooth muscle, vasculature, innervation or the extracellular matrix, but a detailed elucidation of these changes is lacking. In this study, we investigated the effects of optogenetic chronic neuromodulation on the proteins of the diabetic mouse bladder.

Methods: Using methodology described in the abstract “Optogenetic Chronic Neuromodulation of the Diabetic Cystopathy Mouse Model – Study Design,” we sacrificed all mice at week 12 in the optogenetic diabetic mice, sham diabetic mice, diabetic mice and control non-diabetic mice groups. Bladders were harvested. Half of the bladder tissue was used for PCR analysis and the other half for Western blot analysis. PCR and Western blot were performed to analyze collagen I, collagen III, elastin, smoothelin, heavy chain myosin, von Willebrand factor and PGP9.5.

Results: There were no significant differences in elastin, heavy chain myosin, smoothelin or von Willebrand factor in the analysis of bladder mRNA and protein expression. mRNA expression of Collagen I and Collagen III were significantly elevated in the optogenetic diabetic mouse group (p=0.03 and p=0.01, respectively). The levels of both Collagen I and Collagen III mRNA expression seemed to be similar to levels seen in the non-diabetic control mice group. However, there was no difference in protein expression of Collagen I or Collagen III among the four groups. Although mRNA expression of PGP9.5 was not statistically different between the four groups, PGP9.5 protein expression was significantly elevated in the optogenetic diabetic group compared to the sham diabetic group (p> 0.048).

Conclusion: In this pilot study, we showed that neuromodulation of the diabetic mouse bladder with light stimulation achieves a histologic effect by upregulating proteins of the extracellular matrix and neuronal innervation. Although protein expression of Collagen I and III was similar in all four groups, the increase in Collagen I and Collagen III mRNA suggests that increased transcription of extracellular matrix proteins may lead to increased translation over a longer time period of neuromodulation. Further robust animal studies should be performed to explore the effect of bladder neuromodulation on extracellular matrix proteins and neural density.
**Funding:** 2018 SUFU Research Grant for the Study of Neuromodulation by the Allergan Foundation
Poster #BS44
BLADDER SENSATION IS REDUCED AFTER EXTENSIVE BLADDER DECENTRALIZATION IN CANINES.
Ekta Tiwari, Postdoctoral Fellow¹, Nagat A. Frara, Postdoctoral Fellow¹, Lucas Hobson, Research Scientist¹, Alan S. Braverman, Research Associate¹, Danielle S. Porreca, MD-Phd student.¹, Daohi Yu, Professor², Mary F. Barbe, Professor¹, Michael R. Ruggieri Sr., Professor¹,³
¹Anatomy and Cell Biology Department, Lewis Katz School of Medicine, Temple University, Philadelphia, PA 19140, ²Department of Clinical Sciences, Lewis Katz School of Medicine, Temple University, Philadelphia, PA, ³The Shriners Hospital of Philadelphia, PA 19140
Presented By: Ekta Tiwari, PhD

Introduction: Our overall goal is to restore bladder and sphincter function via nerve transfer in long term decentralized (lower motoneuron lesioned) canines. Defining the best bladder decentralization method is critical to exploring bladder reinnervation. In this study we sought to determine the minimum decentralization method that reduces or preferably completely eliminates bladder fullness sensation.

Methods: Thirty-two female canines were divided into four decentralized groups: 1) transection of hypogastric (H) nerves and sacral (S) 1-3 dorsal and ventral roots (H/S Dec, n=6); 2) decentralization as in group 1 plus dorsal roots of lumbar (L)7 (H/L7d/S Dec, n=7); 3) decentralization as in group 2 plus dorsal roots of L6; (H/L6-7d/S Dec, n=8); and 4) decentralization as in group 2 plus removal of dorsal root ganglia from L7-S1 (H/L7d/S Dec/DRG L7-S3, n=11). Frequency of squat-and-void postures were reported based on pre- and monthly post-operation behavior analysis over 24 hour periods in housing cages for up to 9 months.

Results: Transection of only sacral roots failed to reduce squat-and-void postures in all 6 animals. Two of 7 H/L7d/S Dec animals showed postures at 1 month and 4 of 7 showed postures at 3, 6 and 9 months. None of H/L6-7d/S Dec animals showed postures at 1 and 3 months. Squat-and-void postures were reduced in approximately 50-75% of H/L7d/S Dec/DRG L7-S3 animals. Only 3 of 11 showed postures at 1 month and 9 months. Five of them showed postures at 3 and 6 months. In 2 of these 5, postures coincided with culture-confirmed bacteriuria at 3 and 6 months and disappeared with antimicrobial treatment.

Conclusion: The most challenging aspect of this project has not been reinnervation of the bladder, urethra and anal sphincters but establishing a reliable decentralization procedure prior to reinnervation surgery. Animals with H/L6-7d/S Dec showed the most promising results, however were euthanized earlier due to post-operative complications. An extensive decentralization that includes H/L7d/S Dec/DRG L7-S3 appeared to be necessary for reduction of bladder sensation as assessed by observation of squat-and-void postures prior to nerve transfer. Further experiments are needed to detect a clinical meaningful difference between H/L7d/S Dec and H/L7d/S Dec/DRG L7-S3 groups, if any, and reach a conclusive finding.

Funding: NIH 1R01NS070267
Poster #BS45
EPIDERMAL GROWTH FACTOR AND ITS ASSOCIATION WITH TISSUE CELLS IN EXPERIMENTAL INTERSTITIAL CYSTITIS/PAINFUL BLADDER SYNDROME
Rashad Sholan, Head of Urology department, Rashad Sholan, Head of Urology department
Republican diagnostic center
Presented By: Rashad Sholan

Introduction: The causes and mechanisms of interstitial cystitis / painful bladder syndrome (IC / PBS) remain poorly understood, the pathogenesis of the disease is still not clear and the etiology is not clearly defined. Of great interest is the role of epidermal growth factor (EGF). Determine the level of EGF and its relationship with leukocytes and mast cells of the bladder tissue in animals with modeling of IC / PBS.

Methods: IC / PBS modeling was performed on 29 individuals of New Zealand white rabbit females. The animals are divided into 3 groups: in group 1, IC / PBS was induced by intravesical instillation of protamine sulfate; in the 2nd group - the introduction of urine under the mucous membrane of the bladder; group 3 - intact rabbits. EGF was determined in blood and urine by an ELISA method. White blood cells and mast cells in tissues were determined by histological method. Statistical processing was carried out using the program “Statistica for Windows 8.0”. The correlation between the indicators was calculated by the Pearson correlation coefficient.

Results: Urinary EGF levels in groups 1 and 2 exceeded the intact group by 33.3% (p <0.05) and 34.6% (p <0.05), respectively. In group 1, after 14 days, EGF decreased in blood by 16.2%, in urine - by 35.5% (p <0.05), in group 2 - in blood (by 61.2%, p <0.01) in urine (28.7%). The greatest number of lymphocytes was detected in animals of the 2nd group (p <0.001). Mast cells were determined only in groups 1 and 2, but in group 2 their number was greater (p <0.001). EGF in the blood correlated strongly with mast cells, and EGF in the urine correlated with eosinophils in group 1.

Conclusion: A statistically significant increase in EGF in blood and urine was obtained in animals with simulated IC / PBS by introducing urine into the wall of the bladder. This modeling option contributed to the activation of mast cells of the bladder tissue. The association of EGF with mast cells in IC / PBS was revealed.

Funding: N/A
Poster #BS46
TOWARDS FUNCTIONAL MAPPING OF THE BLADDER: STUDYING THE EFFECTS OF MECHANICAL STRETCHING AND ELECTRICAL STIMULATION ON CONTRACTILE PROPERTIES OF PORCINE DETRUSOR IN-VITRO
Bhaskar Ravishankar¹,², Weston Upchurch³, Paul Iaizzo, PhD³, Tinen Iles, PhD³, Guangjian Wang, PhD², Dwight Nelson, PhD⁴, Gerald Timm, PhD¹,²
¹University of Minnesota, Dept. of Electrical Engineering, ²University of Minnesota, Dept. of Urology, ³University of Minnesota, Visible Heart Laboratories, ⁴Neureux LLC.
Presented By: Bhaskar Ravishankar, MSEE

Introduction: We are exploring potential technologies and methods to map the origin and spread of excitation of the urinary bladder detrusor under normal and pathological conditions with the long term goal of improving therapies for neurogenic bladder. As a first step, we investigated the effects of mechanical stretch and electrical field stimulation (EFS) on contractile activities of porcine bladder strips in-vitro. This model will facilitate development and testing technologies in future studies.

Methods: Porcine bladders were harvested within 1h of euthanasia. Eight strips (18x2mm) were prepared from each bladder, connected to isometric force transducers and suspended in 37°C tissue baths continuously perfused with oxygenated Krebs and allowed to rest for 2h. Strips were stretched to a baseline tension of 10g and rested for an additional 10 min. EFS was delivered by varying stimulus voltages from 2V to 20V in 2V increments and the peak induced force response at each voltage was recorded in grams. Responses were recorded at baseline tensions of 20g, 30g, 40g and 50g. Endogenous contractile cycles were also recorded during post-stimulation periods.

Results: Voltage dependence at lower baseline tensions (<30g) was more graded while higher baseline tensions (>30g) presented a more all-or-nothing relationship. The force response plateaued beyond 12V while lower voltages induced an incremental force response. Removing the mucosal layer had no obvious effect on the sensitivities to EFS or force of response. Mucosal and non-mucosal strips showed an average endogenous contractile activity of 2.53±0.45 cycles/min and 3.18±1.08 cycles/min (mean±SD) respectively across all baseline force loads.

Conclusion: The effects of mechanical stretching and electrical stimulation on bladder strip contractility were successfully investigated. EFS produced voltage-dependent contractile responses in detrusor strips. Force loads are important in determining the maximum contractions to EFS. Our next goals include testing the effects of ablative methods to confirm the validity of our functional assay. Future work will compare discrete locations in the bladder and work to detect electrical activities and motion dynamics that may accompany the contraction forces and endogenous activities observed here. This model will form an evolving framework and test bed to bring these methods to whole bladders in large animals and humans.
Funding: N/A

Poster #BS47
WITHDRAWN
**Poster #BS48**

**NATURALISTIC BLADDER FILLING AS TOOL TO EXAMINE BRAIN CIRCUITS OF URINARY URGENCY IN HEALTHY INDIVIDUALS: A MAPP RESEARCH NETWORK STUDY**

Ishtiaq Mawla, MS¹,², Andrew Schrepf, PhD¹, Eric Ichescu, BS¹, Steven Harte, PhD¹, Richard Harris, PhD¹, Jason Kutch, PhD³

¹Chronic Pain and Fatigue Research Center, Department of Anesthesiology, University of Michigan, Ann Arbor, MI, ²Neuroscience Graduate Program, University of Michigan, Ann Arbor, MI, ³Division of Biokinesiology and Physical Therapy, University of Southern California, Los Angeles, CA

Presented By: Ishtiaq Mawla, MS

**Introduction:** Urinary urgency is a sensory perception generated within brain circuits. This has been studied experimentally by catheter-based urodynamic testing coupled with noninvasive neuroimaging. However, large-scale neuroimaging of ecologically-valid bladder filling is missing. In this study, the Multidisciplinary Approach to the Study of Chronic Pelvic Pain (MAPP) Network collected resting state functional MRI (rs-fMRI) data during a naturalistic bladder filling paradigm in healthy volunteers.

**Methods:** 62 participants (M, N=29, age=43±13; F, N=33, age=40±15) ingested 12oz of water followed by a ‘bladder full’ rs-fMRI scan. A second ‘bladder empty’ rs-fMRI scan was conducted following natural urine voiding (voided volume measured). Ratings of urgency (0-10) were collected throughout both scans. This paradigm was conducted twice (baseline and 6-months). For rs-fMRI data, brain activity was described using the fractional amplitude of low-frequency fluctuations (fALFF) in the slow-5 range (0.01-0.027Hz), and was computed voxelwise across the brain for the bladder full and empty scans. General linear modelling of fALFF images were conducted in FSL-FEAT, with age and sex as covariates. Mediation analyses to explore mediators of stimulus-response relationship were conducted on MPLUS v8, and indirect effects were evaluated by constructing 95% bias-corrected bootstrapped confidence intervals using 20,000 resamples.

**Results:** There was a significant effect of volume on urgency within subjects (p<0.0001), such that urgency increases 0.57 points per 100cc. 37 participants from baseline and 34 from the 6-month follow-up were categorized as responders (having a non-zero urgency change), allowing for an effective N=71 between-subjects neuroimaging analysis. Whole-brain regression of urgency with fALFF showed significant relationship in the dorsal anterior cingulate cortex (dACC; r=-0.47), such that as urgency goes up, dACC neural activity shows a concomitant increase. In addition, whole-brain regression of void volume showed a similar relationship with the dACC (r=-0.45). In mediation analyses, volume was associated with greater urgency indirectly through decreased change in slow-5 fALFF (B=0.094; 95% CI=0.019-0.210). The direct effect of volume on urgency was also significant (B=0.539; 95% CI=0.341-0.707).

**Conclusion:** This natural bladder filling paradigm provides a stimulus (urine volume) and a response (urgency) that are significantly correlated in healthy individuals. Analyses of brain imaging data suggest the dACC partially mediates this stimulus-percept relationship.

Funding provided by grants from NIH/NIDDK
Poster #BS49
OPTICAL MONITORING OF CHANGES IN OXYGENATED HEMOGLOBIN CONCENTRATION IN THE ANTERIOR CORTEX DURING URINARY URGENCY
Lynn Stothers, MD¹, John Speich, PhD², Adam Klausner, MD², Andrew Macnab, MD¹
¹UBC, ²Virginia Commonwealth University
Presented By: M. Lynn Stothers, MD

Introduction: Exploration of abnormalities of brain function related to the pathophysiology of urinary urgency have been called for in order to augment diagnosis and improve treatment; fMRI studies have established the presence of neural networks integral to bladder sensation. Functional near infrared spectroscopy (fNIRS) allows detection of increases in oxygenated hemoglobin concentration as a measure of neural network activity. We tested the feasibility of simultaneously using fNIRS during evaluation of urinary urgency.

Methods: The brain, bladder and bladder sensation were simultaneously monitored using: (1) an fNIRS wearable Bluetooth brain 23 channel sensor array optimized for the frontal cortex was aligned to Broadman’s areas using a Pohemus 3D digitizer standardized to cranial surface landmarks (2) bladder NIRS wireless Portamon in N=5 tracings (2 symptomatic (OAB) 3 asymptomatic controls, 3 male 2 female) during spontaneous bladder filling to capacity while sensation was recorded using a validated patient-controlled sensory meter. Real time fNIRS data displayed real time 3D brain oxygenated, de-oxygenated and total hemoglobin concentration changes in the brain and bladder NIRS were recorded, and sensory events (bladder fullness/urgency to void) documented. At the point of urgency, a distractor was used to examine for changes in oxygenated hemoglobin secondary to neuroexcitation.

Results: In symptomatic subjects fNIRS-derived increased in oxygenated hemoglobin concentration were evident in the anterior cortex when the bladder filled to capacity; increasing to capacity and decision to void, become most intense during voiding, waning thereafter. In OAB during urgency increased in frontal activity showed reduction with distraction. (Fig. 1 sequential images from video empty bladder through to urgency with reduction in frontal cortical neuroexcitation with distraction, OAB subject)

Conclusion: This study indicates that the brain-bladder activity can be monitored along with bladder sensation in real time making it is feasible to use combined fNIRS systems to study anterior cortical neural networks linked to the sensation and control of voiding.

Funding: N/A
Poster #BS50

A NOVEL METHOD TO EVALUATE OBJECTIVE RESPONSES TO AUDIO-VISUAL URGENCY TRIGGERS USING FUNCTIONAL NEAR-INFRARED SPECTROSCOPY OF THE BRAIN

Rui Li, PhD¹, Priscilla Koirala, BS², Urmila Sivagnanalingam, BS², Kaitlyn Maddra, BS², Kyla Egenberger¹, Sydney Roberts¹, Zachary Cullingsworth, MS¹, Natalie Swavely, MD², Samuel Weprin, MD², Andrew Macnab, MD³, Lynn Stothers, MD³, Adam Klausner, MD², John Speich, PhD¹

¹Department of Mechanical Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, ²Department of Surgery/Division of Urology, Virginia Commonwealth University, Richmond, VA, ³Department of Urologic Sciences, University of British Columbia, Vancouver, Canada

Presented By: Rui Li, PhD

Introduction: There is increasing evidence that audio-visual triggers may play a role in overactive bladder. The purpose of this pilot investigation was to develop a novel method to evaluate objective responses to audio-visual urgency triggers using functional near-infrared spectroscopy (fNIRS) of the brain.

Methods: Healthy participants with minimal urgency and those with overactive bladder (OAB) were recruited based on ICIq-OAB survey scores (question 5a ≤ 1 or ≥ 2). Participants completed a trigger survey asking if the sound or sight of running water (0-4 scale) made them feel more likely to rush to the toilet to urinate. Brain fNIRS data was collected using an Artinis Brite24 headcap during an oral hydration study with simultaneous collection of real-time bladder sensation using a sensation meter on a 0-100% scale. At 50% sensation a 1.5 min control period was compared to a following-up 3-min period where participants were exposed to an audio-visual video containing scenes of known urgency triggers (restrooms, pouring water, fountains/rain, waterfalls and swimming). fNIRS oxygenated hemoglobin (O2Hb) data for the receiver located just above the right ear were filtered by a 0.1Hz low-pass filter to reduce the noise. These data were analysed to quantify relative changes in neuroexcitation and correlated with changes in participant-reported sensation.

Results: Clean fNIRS data with relatively flat control signals were available for three OAB and two healthy participants. Two out of three OAB and two healthy participants demonstrated an increasing trend O2Hb during the trigger video. Figure 1 presents an example for a participant with OAB with relatively flat O2Hb in the control period (Top) and an increase in O2Hb during the fountain portion of the trigger video (Bottom) that also correspond with an increase in sensation reported by the participant (Bottom, red line).

Conclusion: The results of this pilot study indicate that fNIRS may provide a feasible tool for non-invasive identification of changes in neuroexcitation due to audio-visual triggers of urinary urgency. Further study in a larger group of participants is needed to determine whether fNIRS can be used to identify a brain-associated subgroup of OAB patients.
**Funding:** This research was supported by NIH grant R01DK101719, NSF award 1852116 and the Virginia Commonwealth University School of Medicine Summer Research Fellowship Program.
Poster #BS51
INTERSTIM MICRO™ SYSTEM PERFORMANCE COMPARISON IN A SHEEP MODEL
Katie C. Bittner¹,², Sarah J. Offutt¹,², Tina Billstrom³, Melissa A. Mattson³, Nathan Johnson⁴, Kellie Berg⁵, Lance Zirpel¹,²
¹Research and Core Technology, Restorative Therapies Group, Medtronic, Inc., Minneapolis, MN, ²Pelvic Health Gastric Therapies, Restorative Therapies Group, Medtronic, Inc., Minneapolis, MN, ³Physiological Research Laboratories, Medtronic, Inc., Minneapolis, MN, ⁴Systems Engineering, Restorative Therapies Group, Medtronic, Inc., Minneapolis, MN, ⁵Clinical Research, Restorative Therapies Group, Medtronic, Inc., Minneapolis, MN
Presented By: Katie Bittner, PhD

Introduction: In 1997 Medtronic introduced the first ever sacral neuromodulation (SNM) device with a voltage control feature. In 2009 and 2017, Medtronic introduced current-controlled stimulation devices. To demonstrate that a new rechargeable, current-controlled SNM system (InterStim Micro™) can activate sacral nerves at comparable stimulation amplitudes as the marketed, voltage-controlled InterStim™ II system, this study compared amplitudes required to evoke a muscle contraction (motor threshold, MT) between the two systems. The basic function of SNM systems is to modulate nerve activity by direct electrical stimulation which causes pelvic floor muscles to contract. Visual detection of external anal sphincter (EAS) contraction and/or toe flexion is used during lead placement, with responses evoked by low amplitude stimulation (less than 2V) suggesting close proximity to the nerve.

Methods: Using Good Laboratory Practices, four female Polypay sheep were bilaterally implanted with one InterStim II SMN system (control) and one InterStim Micro system (test). The mechanisms by which muscles contract in response to nerve activation are conserved between sheep and humans. Body side and order of implants were randomized. After four weeks recovery, MT was measured using four electrode configurations in each animal at four timepoints. Rate and pulse width were held constant. Electrode impedances were measured to convert current to voltage using Ohm’s law for direct comparison of stimulation amplitudes. Statistics were performed using Minitab (State College, PA) with p<0.05 significant.

Results: The primary analysis compared MT amplitudes between the control and test systems using the electrode configuration which elicited the lowest MT at each time point. The mean lowest MT for the control and test systems were not different (Figure 1; Control: 0.8 ± 0.3 V, Test: 0.6 ± 0.2 V, n=16, p=0.105 paired t-test). Pooled data for all electrode configurations showed the mean MT for the control and test systems were also not different (Control: 1.7 ± 1.0 V, Test: 1.8 ± 1.6 V, n=64, p=0.489, paired t-test).

Conclusion: These results provide objective and quantified physiological evidence that when tested in a large animal model, the basic function of the new current-controlled InterStim Micro system is comparable to the voltage-controlled InterStim II system.
**Funding:** Medtronic
Poster #BS52
THE EFFECT OF BOTOX A ON ICI, BLADDER PRESSURE AND HRV PARAMETERS IN RATS SUBMITTED TO URODYNAMIC STUDY AFTER BLADDER INSTILLATION OF ACETIC ACID
israel Franco, Dept of Urology¹, Asal Hojjat, Dept of Urology¹, Jose Murillo Netto, Dept of Urology², Darryl Martin, Dept of Urology¹, Adam Hittelman, Dept of Urology¹
¹Yale School of Medicine, ²Universidade Federal de Juiz de Fora (UFJF), Juiz de Fora, Brazil
Presented By: Israel Franco, MD

Introduction: Patients with lower urinary tract symptoms may have alterations in autonomic balance as measured by heart rate variability (HRV). The aim of the present study was to evaluate the effect of instilled Botulinum Toxin A (BoTA) in the autonomic balance in an inflammatory bladder model in rats.

Methods: A total of 36 female Sprague-Dawley rats were included in the study. The rats were divided into 8 groups: using the following paradigm; group number/ pretreatment/ post treatment instillation: 1 Normal Saline(NS)/NS 2 BotA/NS 3 DMSO/NS 4 BotA+DMSO/NS 5 NS/Acetic Acid (AA) 6 BotA/AA7 DMSO/AA 8 BotA+DMSO/AA
On day 1, the bladders were instilled with either NS, Dimethylsulfoxide (DMSO), Botox (BoTA), or the combination of DMSO+BoTA for 2 hours. On day 7, the rats were anesthetized and the bladders were instilled with either NS solution or AA for 2 hours. On day 8, the rats were anesthetized and a Polyethylene 50 catheter was place via a cystostomy. The rats were allowed to stabilize prior to urodynamics. Data was analyzed using kruskall-Wallis analysis comparing groups.

Results: Bladder Descriptive statistics included Intercontraction interval (ICI), Mean Bladder pressure (MBP) in cm H2O. Significant findings were noted in the ICI between groups 2-7, 2-5, 7-8, 1-7 with respective p values of 0.035, 0.011, 0.023 and 0.031. MBP were also noted to be significant between 2-7 and 2-5 (p= 0.018, 0.039 respectively). No differences were seen within numbered groups or in the pretreament subgroup for the HRV data. There was a significant difference in the VLF (p=0.012), triangular index (0.037) and the HRVNNxx (0.04) between the AA and NS instillations prior to performing urodynamics.

Conclusion: The findings indicate that instilled Botox A has a protective effect against the inflammatory effects of AA by maintaining the longer ICI in the normal bladder and allowing the bladder to generate normal contractions. Our HRV data was not as robust as would be expected but of note the VLF power was elevated in animals treated with Acetic Acid.
### Table: Urodynamic descriptive statistics

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**Funding:** N/A
Poster #BS53
GENE PROFILING IN UTEROSACRAL LIGAMENTS IN PREMENOPAUSAL WOMEN WITH PROLAPSE
Kathleen Connell, MD1,2, Marsha K. Guess, MD3, David Orlicky, PhD4, Lauren Rascoff, MD3, Jaime Arruda, MD5, T.Rajendra Kumar, PhD6, Joshua Johnson, PhD6
1Division of Urogynecology Reconstructive Pelvic Surgery, Department of Obstetrics and Gynecology, 2Division of Reproductive Sciences, Dept. Obstetrics Gynecology, University of Colorado School of Medicine, 3Division of Urogynecology Reconstructive Pelvic Surgery, Dept. Obstetrics Gynecology, University of Colorado School of Medicine, 4Department of Pathology, University of Colorado School of Medicine, 5Division of Gynecologic Oncology, Dept. Obstetrics Gynecology, University of Colorado School of Medicine, 6Division of Reproductive Sciences, Dept. Obstetrics Gynecology, University of Colorado School of Medicine
Presented By: Kathleen Connell, MD

Introduction: The aim of this pilot study was to determine if potential pathways could be identified as targets involved in pelvic organ prolapse (POP) by correlating histology and transcriptome profiling in uterosacral ligaments (USL).

Methods: USL biopsies were obtained within 5mm of the cervical insertion from women undergoing hysterectomy for POP or benign indications without POP (controls). Twenty premenopausal (PM), non-diabetic, non-smoking women were matched by age, number of vaginal deliveries (VD), and BMI (n=10 in each group). RNA was extracted and purified. Libraries were constructed; Illumina sequencing was performed to a depth of ~40 million reads/sample. Paraffin-embedded tissue was sectioned to 5 mm for histological and immunohistochemical (IHC) analyses. Student’s t-test and Mann-Whitney U analyses were applied to demographic data. The CU RNA Biosciences Institute performed bioinformatic analysis of RNAseq data.

Results: There was no difference between controls vs POP regarding age (mean 41.4± 6.1 vs 43.8±7.0 years, P=0.9), VD (median 2 for both, P>0.05) and BMI (26.9± 5.3 vs 25.2± 4.5, p=0.44). Thirty-five gene expressions were significantly altered in USL of women with POP compared to controls (FDR corrected P value <0.05). They were predominantly related to inflammatory processes, and mesenchymal stem cell differentiation. IHC demonstrated smooth muscle bundles, connective tissue, vessels and nerves in all USL. Adipose cells were identified in 50% of the POP USL vs 20% in controls and did not correlate to age, VD, BMI. IHC staining for lymphoid CD45+ cells were present in all USL. CD45+ cells were present in adipose-containing connective tissue near vasculature, and were more often seen in the POP group. (Figure 1A-D) When no adipose was seen, CD45+ cells were found near vessels. CD45+ cells did not cluster near neural bundles.

Conclusion: Paracervical USL tissue in PM women with POP demonstrates an altered transcriptional profile compared to controls. This transcriptional profile is indicative of increased tissue inflammation and altered tissue composition. Adipose tissue was over-represented in USLs from POP patients, and this increased adiposity was accompanied by increased numbers of CD45+ immune cells. Damage to USL in women with POP may lead to a continued state of inflammation, leading to disrupted repair of the ligament and poorer long-term outcomes.
**Funding:** Eunice Kennedy Shriver National Institute for Child Health Human Development 5R21HD089555-02
Poster #BS54
UNDERREPRESENTATION OF FPMRS IN FEDERAL FUNDING FOR BENIGN UROLOGIC CONDITIONS
Colby Souders, MD, A. Lenore Ackerman, MD, PhD
Cedars-Sinai Medical Center, Dept. of Surgery
Presented By: Colby Perkins Souders, MD

Introduction: Benign urologic conditions (BUC), such as overactive bladder or interstitial cystitis, are symptomatically defined and frequently lack biochemical diagnostic tests or objective outcome measures. These diagnostic challenges are reflected in a lack of animal models and in vitro systems. Without model systems, advances in our understanding of these syndromes rely heavily on a clinical perspective, making the role of physicians in research critically important for study design and data interpretation. We sought to investigate the representation of urologists and BUC in NIH-funded research.

Methods: We performed a search of the National Institutes of Health RePORTer database for all active funding as of September 1, 2019. A comprehensive search of all NIH-funded grants by department (Urology and Surgery) and keyword (urology, urinary, bladder, incontinence, voiding, pelvic pain, cystitis, etc.) broadly captured all research addressing BUC.

Results: Despite a high prevalence for BUC, this search revealed poor representation of these conditions and of urologist-scientists in NIH-funded research, particularly in comparison to other benign conditions (Figure). For investigator-initiated funding, most research on BUC is in non-urology departments; only 17 R01 awards (33%) were supported in a department of urology. The 102 investigator-initiated R01 awards included only 86 unique investigators at 51 institutions. Of these, 33 were physicians, and only 11 were urologists. There was also a paucity of support for early-career investigators, with only 4 individual training awards (F series) and 21 career development awards (K series) in BUC. Twelve K recipients were clinicians; only 7 of these were clinical urologists. Including both the K and R series award recipients, only 16 institutions support individual research by a urologist. This deficiency in funding was evident across a range of subjects in FPMRS and extended to all levels of funding.

Conclusion: Without model systems and objective diagnostic or prognostic criteria, clinical perspective is critical in research seeking to understand BUC. Urology in general and benign urology in specific are severely underfunded at the federal level; few alternative funding sources for BUC study exist outside these mechanisms. New avenues to support clinician-scientist involvement in research examining BUC are critical to improving and advancing clinical care in FPMRS.

Funding: N/A
**Poster #BS55**

**CHRONIC MEALTIME SHIFT DISTURBS METABOLIC AND URINARY FUNCTIONS IN MICE**

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Presented By: Young Sam Cho, MD, PhD

**Introduction:** The circadian clock is an endogenous oscillator that harmonizes various physiological processes, including urinary function. However, the effect of chronic circadian disturbance on urinary function and the exact mechanism is not yet clear. Therefore, we investigated the effect of chronic mealtime shifts on the daily cycle patterns of food intake, water consumption, and urine excretion in young adult male mice.

**Methods:** We induced shifts in mealtime and the activity of the Per2 promotor in the ex vivo state of young adult bladder of Per2 :: Luc knock-in mice were analyzed. After administration with melatonin or C3G, reactive oxygen species (ROS) level was analyzed.

**Results:** Changes in mealtime increased the amplitude of Per2 oscillations. In addition, mealtime shifts clearly delayed the acrophore by delaying several hours. Mealtime shift-induced an imbalance between antioxidant capacity and ROS levels, resulting in increased oxidative damage during resting periods in mice. Daily supplementation of antioxidants such as melatonin or C3G in ZT23 can block insulin resistance due to chronic meal shifts. However, supplementation of antioxidants had no significant effect on the circadian pattern of water intake and urine excretion due to mealtime shifts from 4 to 6 weeks, or the pattern of Per2 oscillation in the ex vivo cultured bladder.

**Conclusion:** Our findings suggest that chronic mealtime shifts cause metabolic disorders and urinary changes through separable mechanisms.

**Funding:** N/A
Poster #BS56
FLEXIBLE SURGICAL TRAINING WITHIN THE ROYAL AUSTRALASIAN COLLEGE OF SURGEONS: THE NEW PARADIGM
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Presented By: Caroline Dowling, MS

Introduction: It is an Australian Medical Council (AMC) accreditation requirement that all nine surgical specialty training programs within the Royal Australasian College of Surgeons (RACS) offer flexible training positions. RACS has been working towards removing all barriers to flexible training. Over 30% of trainees would consider flexible positions, however less than 1% are currently in these roles. We must bridge this gap to meet the needs of our trainees or risk losing some very talented future surgeons, including a disproportionate number of women. We aim to evaluate models of past and present flexible training positions across all surgical specialties.

Methods: Past or present trainees or fellows of RACS who had undertaken flexible training were invited to complete a de-identified 50-point electronic survey. This did not include interruption from training. Participants were recruited through RACS’ ‘Fax Mentis’, social media networks and word of mouth and communication with specialty training boards. Data is reported as simple frequencies and qualitative data thematically analysed.

Results: We evaluated 17 flexible training positions across six surgical specialties including General Surgery (53%), Urology (18%), Paediatric Surgery (12%), Cardiothoracic Surgery (6%), Orthopaedic Surgery (6%) and Otolaryngology (6%). Respondents were predominantly female (94%), between 30-34 years old (65%) and of a variety of training levels. Child-rearing (38.9%) was the main reason cited for undertaking flexible training, followed by research, illness, exam study and needing a break from training.

There were 12 stand-alone part-time (0.5 – 0.8 full time equivalent FTE) and five block models of training (E.g. 6 months or 1 week on-off). Had the flexible position not been available at least 23.5% of respondents would have left surgical training. 16 of the 17 respondents agreed the position allowed them to manage other life commitments, and three quarters would recommend it to others. Fifty-six percent encountered negative perceptions. 76.5% felt satisfied with their operative progress and 87.5% with their knowledge acquisition.

Conclusion: Flexible surgical training positions have been successfully implemented in at least six surgical specialties in Australia and New Zealand and are essential to prevent trainees leaving and to improve diversity in the surgical workforce. Flexible training has allowed trainees to successfully manage important life commitments.

Funding: N/A
UNEXPECTED EFFECTS OF CAB, A NOVEL TRPM4 CHANNEL INHIBITOR, ON GUINEA PIG DETRUSOR SMOOTH MUSCLE EXCITATION-CONTRACTION COUPLING

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Presented By: John Malysz, PhD

Introduction: Non-selective cation channels in detrusor smooth muscle (DSM) cells are thought to mediate increases in cellular excitability and contractility. However, very little is known about their pharmaco-physiological properties. TRPM4 channels are expressed in DSM, and 9-phenanthrol, a commonly-used but non-selective TRPM4 channel inhibitor, effectively decreases DSM excitability and contractility. The recent discovery of 4-chloro-2-[2-(2-chloro-phenoxy)-acetylamino]-benzoic acid (CAB) provides a new tool for studying TRPM4 channels. CAB exhibits improved potency (IC-50=1.5 μM) and selectivity over 9-phenanthrol (IC-50=29 μM). Here, we examined how CAB affects DSM excitation-contraction coupling.

Methods: Freshly-isolated DSM cells were prepared by enzymatic dissociation of mucosa-free DSM from adult male guinea pigs and used in amphotericin-B perforated patch-clamp electrophysiological experiments. The effects of CAB and 9-phenanthrol on DSM contractility (mucosa-free strips) were examined using isometric tension recordings.

Results: In DSM cells, CAB (30 μM) did not affect voltage-step-induced whole-cell cation currents (n=6) nor the membrane potential (n=3). In the presence of CAB, 9-phenanthrol (100 μM) reduced the maximum current amplitude by 51±6% (n=5, P<0.05). The currents were not inhibited by flufenamic acid (100 μM, n=7), another non-selective TRPM4 channel inhibitor, or increased by BTP2 (also known as YM-58483, 10 μM, n=6), a TRPM4 channel activator. CAB, added cumulatively up to 100 μM, displayed either no or very weak effects (maximum inhibitions < 20%) on spontaneous and 20 mM KCl-induced phasic contractions, and on electrical field stimulated (EFS) contractions (n=12-15). For 300 μM CAB, reductions were higher (up to 68%) on all contraction parameters except for the lack of inhibition on the duration of KCl-induced, and on the duration and tone of EFS contractions. 9-Phenanthrol showed robust attenuations of DSM phasic contractions (IC-50: 1.1-21 μM and maximum inhibitions: 35-86%, n=12-20).

Conclusion: Unlike 9-phenanthrol, the novel TRPM4 channel inhibitor, CAB, did not inhibit voltage-step-induced cation currents, failed to cause membrane potential hyperpolarization in guinea pig DSM cells, and displayed no/weak attenuation of contractility (spontaneous phasic, 20 mM KCl-induced phasic, and EFS-induced) in DSM strips. These results suggest that TRPM4 channels, although expressed in guinea pig DSM, play an additional physiological role (e.g. cell proliferation). The effects of 9-phenanthrol on DSM excitability and contractility could be due to a TRPM4 channel-independent mechanism.

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Poster #BS58
PHENOTYPIC CHANGES OF DETRUSOR PDGFR ALPHA POSITIVE CELLS AND IMPACT ON MYOGENIC DETRUSOR OVERACTIVITY IN SPINAL CORD INJURY
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Presented By: Ken Lee

Introduction: There is an abundance of PDGFRα+ cells in detrusor muscles. This cell involves the membrane stabilization via activation of small conductance Ca²⁺-activated K⁺ (SK) channels in detrusor PDGFRα+ cells during filling. Clinical manifestations of spinal cord injury (SCI) involve combination of storage and voiding bladder problems. Although a number of studies have reported detrusor overactivity (DO) after SCI, the pathophysiological mechanisms remain unclear. In this study, functional, molecular and morphological changes of PDGFRα cells were employed to investigate the myogenic DO using SCI animal model.

Methods Male C57BL/6 and PDGFRα/eGFP mice (8-10 weeks old) were used. Sham or SCI (T12) surgery was performed to collect bladders at 1, 2, 3, 7, 14 and 30 days after either surgery. Ex vivo preparations were employed to examine the effect of SK channel blocker (apamin). Molecular expression of PDGFRα and SK3 channels were investigated by immunohistochemistry (IHC), quantitative analysis of transcripts and western blotting. Changes in apoptotic genes were also measured.

Results Sham bladders exhibited small amplitudes of transient contractions (TCs) during filling, while SCI bladders developed larger TCs with higher frequency through all tested periods after SCI. Apamin increased TCs in sham but failed to amplify TCs in SCI bladders at all tested points (1-30 days) after SCI. The transcriptional and protein expression of PDGFRα and SK3 was downregulated in SCI mice as a function of exposure time of SCI. The number of PDGFRα cells were decreased to 53% (3 days) and 35% (7 days) in IHC. Apaf1, Casp3 and Capns1 were highly expressed in detrusor PDGFRα+ cells and were also upregulated in SCI bladders.

Conclusion Reduced expression of PDGFRα and SK3 in SCI detrusor increased TCs and decreased sensitivity to apamin. Loss of PDGFRα+ cells results from apoptotic changes after SCI. Apoptosis and decreased availability of SK channels in PDGFRα+ cells might result in myogenic DO.

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Poster #BS59
DISRUPTION OF CAV1.2-MEDIATED SIGNALING IS A MAJOR PATHWAY FOR KETAMINE INDUCED PATHOLOGY
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Presented By: Huan Chen

Introduction: The general anesthetic and N-methyl-D-aspartate receptor (NMDAR) antagonist, ketamine, has been recently repurposed by physicians as an anti-depressant and by the public as a recreational drug. However, chronic use of ketamine can cause extensive pathological changes. Ketamine cystitis is one of the most common among severe ketamine-induced pathologies, affecting up to 30% of long-term users. The major manifestation of ketamine cystitis is intolerable bowel or bladder pain, accompanied variably by urinary urgency, frequency, nocturia, dysuria, and hematuria. 50% of ketamine cystitis patients have hydronephrosis with impaired kidney function. Current treatment of ketamine cystitis is limited to supportive therapies and abstinence from ketamine use, reflecting the lack of a generally accepted pathophysiologial mechanism. Mechanistic understanding of ketamine cystitis and other adverse effects of ketamine is a prerequisite for development of novel, effective therapies, and thus constitutes an urgent unmet need.

Methods: Based on the observation that ketamine can be concentrated in urine, we hypothesized that ketamine targets novel receptor(s) in bladder wall to cause voiding dysfunction. We tested our hypothesis using void spot assay (VSA), cystometry (CMG), myography, electrophysiological assay of recombinant protein function, and genetically modified animal models.

Results: Ketamine promoted NMDAR-independent voiding dysfunction by direct inhibition of calcium influx and smooth muscle contractility mediated by the L-type Ca2+ channel Cav1.2. Ketamine also prevented Cav1.2-mediated induction of immediate early genes and transcription factors. Heterozygous inactivation of Cav1.2 in smooth muscle mimicked the ketamine cystitis phenotype. Conversely, Cav1.2 agonist Bay k8644 abrogated ketamine-induced smooth muscle dysfunction both in vitro and in vivo. Indeed, Cav1.2 activation by Bay k8644 decreased voiding frequency while increasing void volume.

Conclusion: Our results demonstrate a novel Cav1.2 antagonist function of ketamine, and show that CaV1.2 signaling is a major pathway mediating ketamine cystitis. We suggest that CaV1.2 inhibition may mediate additional effects of ketamine in smooth muscle and other cell types. Further understanding of the mechanism by which CaV1.2 regulates bladder function may lead to development of safe and selective CaV1.2 agonists for treatment of bladder dysfunction.

Funding: N/A
Poster #BS60
IN THE CANINE BLADDER, NICOTINIC RECEPTOR AGONISTS INDUCE MORE CONTRACTILE RESPONSES IN SUB-MUCOSAL THAN IN SUB-SEROSAL SMOOTH MUSCLE STRIPS
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Presented By: Michael R. Ruggieri, Sr., PhD

Introduction: The role of nicotinic acetylcholine receptors in regulating bladder function of different mammalian species is still under investigation. We explored the contractile responsiveness of smooth muscle strips dissected from different areas of the normal canine bladder.

Methods: Smooth muscle strips were dissected from the dorsal and ventral aspects of the bladder neck, middle and dome. Mucosa was removed for each of the 6 areas and muscle strips were dissected from tissue adjacent to the mucosa and separate strips adjacent to the serosa. Strips were suspended in Tyrode's solution bubbled with 95% O2/5% CO2 at 37 C, stretched to 2 grams and maximal responses to electric field stimulation (EFS) and 120 mM KCl were determined. After washing and re-equilibration, the responses to 10μM of the nicotinic agonist epibatidine was determined followed by responses to EFS and 30μM of the muscarinic receptor agonist bethanechol in the continued presence of epibatidine.

Results: The percentage of strips that produced at least 0.2 grams of tension in response to 10μM epibatidine was greater for each of the regions for strips adjacent to the mucosa than those dissected immediately beneath the serosa. Strips from all regions produced robust contractions to EFS and bethanechol in the continued presence of epibatidine, including those that responded to epibatidine with less than 0.2 grams of tension.

Conclusion: Much of the previous literature on contractile responses of bladder muscle strips incorporates the implicit assumption that strips from the dorsal versus ventral aspects and across the thickness of the bladder respond similarly to pharmacological agents. This is the first finding, to our knowledge, that muscle strip taken from close to the bladder lumen show a difference in contractile response than strips taken closer to the outer surface of the bladder. Because epibatidine contractions are virtually abolished by muscarinic receptor blockade with atropine, nicotinic receptor stimulation causes contraction indirectly by inducing acetylcholine release from bladder nerve endings. Apparently, the density of these nerve endings is greater in the bladder smooth muscle that is closer to the mucosal surface. This finding may have important implications in the understanding of the physiology and biophysics of bladder emptying.

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Poster #BS61
GLUCAGON LIKE PROTEIN 1 (GLP-1) ELICITS MORE PROFOUND CALCIUM DISCHARGE AND SARCOPLASMIC RETICULUM CALCIUM ATPASE (SERCA) RESPONSE IN OSSABAW PIG DETRUSOR SMOOTH MUSCLE THAN CAFFEINE
CR Powell, MD1, Mouhamad Alloosh, MD, MS2, Michael Sturek, PhD3
1Indiana University, 2Indiana University School of Medicine, Department of Cellular and Integrative Physiology, 3Indiana University School of Medicine Department of Cellular and Integrative Physiology
Presented By: C.R. Powell II, MD

Introduction: Diabetic Bladder Dysfunction (DBD) is a significant health problem. Little is known about the mechanistic alterations in detrusor smooth muscle (DSM) that may contribute to DBD. We propose alterations in the size of Endoplasmic Reticulum (ER) Ca2+ stores and sensitivity of endothelin-1 (ET-1) and caffeine (CAF)-induced Ca2+ release from the ER as well as SERCA re-uptake in the detrusor smooth muscle (DSM) of diabetic (DM) pigs. This can be demonstrated with fura-2 Ca2+ imaging as has been done in coronary artery smooth muscle [1]. Unfortunately Caffeine as well as ET-1 do not discharge SERCA effectively making re-uptake difficult to study. We will investigate the role of GLP-1 as a more effective stimulant of Ca2+ release as well as SERCA – mediated Ca2+ re-uptake.

Methods: We applied methods described for coronary artery smooth muscle to study DSM ER Ca2+ stores [2]. Upon sacrifice DSM tissues were processed for single cell fura-2 Ca2+ digital imaging [3]. Cells are in a Ca2+-free bath buffer to eliminate the contribution of Ca2+ influx to the intracellular Ca2+ signal. Depolarization using 80 mM K+ is used to drive Ca2+ influx via voltage-gated Ca2+ channels, then stimulation with caffeine or GLP-1 will be used to elicit a Ca2+ spike proportional to the ER Ca2+ content.

Results: Eight Ossabaw Pigs demonstrated significant fasting blood glucose dysregulation (81.4 +/- 2.3 vs. 69.2 +/- 2.3 p = 0.003 mg/dL), elevated body weight (105.6 +/- 2.3 vs. 81.4 +/- 8.5 kg), systolic hypertension (163.6 +/- 6.8 vs. 124.8 +/- 4.4 mmHg) validating the Ossabaw DM model. DBD was demonstrated with detrusor underactivity (22.3 +/- 5.3 vs.45.6 +/- 6.1 cmH2O) after 10 months dietary treatment. Figure 1 shows fura-2 measures of DSM intracellular Ca2+ from the Ossabaw pig. The ER Ca2+ store release by caffeine (CAF) are shown by the peak of the Ca2+ transient and the effects of glucagon-like peptide-1 (GLP-1) stimulation of SERCA are noted by the greater undershoot of the Ca signal upon removal of caffeine from the bath. The GLP-1-induced increase in the undershoot demonstrates more profound effect on SERCA.

Conclusion: These data show feasibility of studying SERCA re-uptake using FURA-2 Ca2+ imaging with GLP-1 in addition to Caffeine.

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Figure 1. Size of ER Ca$^{2+}$ store in detrusor smooth muscle of lean, healthy Ossabaw elicited by caffeine (CAF). Enhanced SERCA activity (undershoot) elicited by GLP-1. (Powell and Sturek)
REGULATION OF ADENOSINE LEVELS IN LAMINA PROPRIA DURING BLADDER FILLING

Poster #BS62

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Presented By: Violeta Mutafova-Yambolieva, MD, PhD

Introduction: Adenosine (ADO) signaling plays important roles in the normal functions in the body. In the urinary bladder, ADO inhibits contraction of the detrusor smooth muscle, reduces release of ATP from the urothelium, and stimulates umbrella cell exocytosis. ADO is generated from AMP by ecto-5'-nucleotidase (NT5E/CD73). The primary extracellular precursors of AMP are ATP, NAD, and ADP-ribose. ADO and its precursors are present in suburothelium (SubU)/lamina propria (LP) of the murine bladder during filling. However, the mechanisms that determine the ADO levels in SubU/LP during filling are not resolved.

Methods: We used a novel ex vivo detrusor-free bladder model to obtain direct access to SubU/LP during bladder filling. The preparations were placed in 3-ml chambers containing oxygenated Krebs bicarbonate solution (KBS, pH 7.4, 37ºC) and filled with KBS at 15 μl/min until voiding pressure. We investigated the degradation of AMP to ADO by applying the highly fluorescent analog of AMP, 1,N6-etheno-AMP (εAMP, 2 μM) to the SubU/LP surface of bladders from wildtype (C57BL/6J, WT) and Nt5e-/− mice and monitoring the decrease of εAMP and the appearance of εADO by HPLC-FLD. We also investigated whether ADO can be transferred from the lumen to SubU/LP by applying εADO in the lumen and monitoring its appearance at SubU/LP during bladder filling.

Results: Approximately 40% of εAMP was degraded in SubU/LP of WT bladders. About half of this effect was eliminated in the Nt5e-/− preparations. Approximately 10% of εAMP was degraded in bath solution aliquots collected during bladder filling. Therefore, at least three enzymes mediate the conversion of AMP to ADO in the SubU/LP during bladder filling: 1) membrane-bound CD73, 2) unknown enzyme that is not associated with CD73, and 3) releasable enzyme activity possibly associated with cytosolic NT5E. Intraluminal infusion of εADO resulted in the rapid appearance of εADO in the extraluminal fluid, which was diminished by the nucleoside transport inhibitor NBTI (5 μM).

Conclusion: The availability of ADO in SubU/LP during bladder filling is mediated by multiple mechanisms that involve enzymatic degradation of AMP and transurothelial transport of ADO. Each of these mechanisms could be targets of new therapeutic approaches to improve bladder function.

Funding: NIH grant DK 41315
CHARACTERIZATION OF UROTHELIAL CELLS CULTURED FROM A SINGLE BLADDER BIOPSY IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME PATIENTS

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Presented By: Tyler Lynne Overholt, MD

Introduction: Interstitial cystitis/bladder pain syndrome (IC/BPS) is a chronic pelvic pain disorder with a heterogeneous clinical presentation and no clearly defined etiology. Among the hypotheses regarding IC/BPS pathophysiology, abnormal urothelial cell (UC) proliferation and function has been suggested. UC have historically been difficult to grow in culture and UC cultured from a single IC/BPS patient biopsy has not been reported. Herein, we describe our experience with culturing UC from a single bladder biopsy, from both IC/BPS patients and non-IC/BPS controls.

Methods: Bladder tissue was obtained from 18-80 y/o IC/BPS patients and non-IC/BPS controls via cystoscopically-guided biopsy under an IRB-approved protocol. Tissues were placed in urothelial cell media (UCM) reconstituted with growth supplements and antibiotics, incubated at 37°C, and cut using a scalpel into four 1x1 mm² pieces. Three pieces were placed in a 60 mm petri dish and subsequently covered with a glass coverslip anchored in the center with vacuum grease. The fourth piece was placed into one chamber of an 8-chamber plate and anchored in place with a sterile silver bead. Reconstituted UCM was added to sufficiently cover all tissue pieces and changed every 3-4 days.

Results: Eleven IC/BPS and three control samples were obtained for culture. IC/BPS samples (7/11; 63.6%) and control samples (3/3; 100%) grew successfully using this method. Cell growth and/or migration from the originally plated tissue pieces was present in as little as three days with increased cell numbers present over the subsequent weeks. We confirmed that the cells observed were UC via immunohistochemical (IHC) staining for pan cytokeratin [AE1/AE3]: a marker characteristic for human UC (Figure 1A). We then confirmed presence of proliferating cells in culture through IHC staining for two markers characteristic of epithelial progenitor cells: a nuclear marker, P63 and a cell surface marker, CD44 (Figure 2B-2C).

Conclusion: The evaluation of UC growth characteristics in IC/BPS is a useful tool to further define the underlying pathophysiology of the disease. While published UC culture methods typically start with a larger piece of explant tissue, the approach described here can be performed with tissue from a single cold-cup biopsy, enabling the evaluation of large numbers of individual patient samples across the broad spectrum of IC/BPS phenotypes.

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Poster #BS64
DECREASED INFLAMMATORY RESPONSE OF UROTHELIAL AND SMOOTH MUSCLE CELLS TO LIPOPOLYSACCHARIDE BY P75NTR ANTAGONISM
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Presented By: Benjamin Desormeau

Introduction: In acute bacterial cystitis, LPS was reported to increase the expression of p75NTR receptor, which signals through similar pathways to TLR-4, namely JNK, NF-kB and TNF-α. However, how these receptors overlap in their signaling has yet to be defined. In this study, we addressed the role of p75NTR in LPS induced TLR-4 activation in urothelial (UTC) and smooth muscle cells (SMC) of the bladder.

Methods: UTC and SMC from female Sprague-Dawley rats were treated with LPS (1µg/mL) mimicking cystitis conditions and the p75NTR antagonist THX-B (4µg/mL), alone or combined. TNF-α, NGF, proNGF, JNK, NF-kB and TRAF-6 levels were assessed by Western blot and ELISA. ATP, nitric oxide and caspase-3 were measured by enzymatic assays. Tight junction E-Cadherin and Occludin were analyzed by immunohistochemistry and immunoblotting.

Results: The p75NTR receptor was found highly expressed in LPS-treated SMC. Moreover, the ratio of proNGF/NGF was increased at low concentrations of LPS in UTC and SMC. Except for nitric oxide, urothelial secretion of TNF-α and ATP, a pro-inflammatory and a nociceptive mediator respectively, were markedly enhanced with LPS. Nevertheless, these releases were attenuated when antagonizing p75NTR. UTC treated with LPS had lower expression of occludin, while E-cadherin was unvaried. In addition, both UTC and SMC treated with LPS displayed enhanced translocation of NF-kB, which was prevented by THX-B. Similarly, phosphorylation of JNK in SMC was strongly sustained by LPS as compared to control cells, then inhibited with p75NTR blocking. Upstream from NF-kB and JNK, protein levels of p75NTR-bound TRAF-6, which also directly interacts with TLR-4, were unchanged between LPS and THX-B treated UTC. On the other hand, apoptotic caspase-3 activity, thought to result from either NF-kB or JNK signaling, was unpromoted by LPS in UTC and SMC.

Conclusion: Our study suggests that there is initial increase of proNGF production by UTC and SMC on the expense of NGF upon LPS exposure. ProNGF is a favourite ligand of p75NTR to induce cell apoptosis. Furthermore, activation of LPS/TLR-4 in UTC and SMC and the related downstream pathways can be attenuated by antagonizing p75NTR. Together our findings suggest that both TL4 and p75NTR receptors are cross activated in the process of inflammatory signalling associated with cystitis.

Funding: FRQS
Poster #BS65
DIVERGENT RESPONSES OF UROTHELIAL AND SMOOTH MUSCLE CELLS TRIGGERED BY NERVE GROWTH FACTOR PRECURSOR (PRONGF)
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Presented By: Abubakr H. Mossa, MD, MSc

Introduction: The nerve growth factor precursor (proNGF) activates p75NTR receptor and promotes cell death and degeneration in different tissues. Tissue levels of proNGF build up in conditions such as diabetes, inflammation and ischemia. Given that proNGF and p75NTR are expressed in different layers of the bladder, we aimed to identify the biological effect of proNGF/p75NTR activation on urothelial (UT) and smooth muscle cells (SM) of rodents’ bladder.

Methods: UT and SM cells cultured from bladder of Sprague Dawley rats (passages 2-7) were incubated with proNGF (5 or 10 nM) for different durations. Total cellular or nuclear protein extraction was performed, and the extracts were tested for TNF-α, RhoA, p-JNK and NF-B levels by western blotting. Nuclear translocation of NF-B was confirmed with immunocytofluorescence. Cell viability was assessed by MTT test.

Results: proNGF decreased the viability of UT cells when incubated at concentration of 5 and 10nM for 24 hours (Figure A), and increased the expression of the transmembrane TNF-α (Figure C-D). Short incubation of UT cells with proNGF (10nM) activated RhoA. However, NF-B in UT cells did not translocate to the nucleus with exposure to proNGF (30 minutes of 10nM). On the other hand, SM did not show a reduction in viability with MTT test after incubation with proNGF (Figure B) nor an increase in TNF-α or RhoA. Interestingly, there was a significant nuclear translocation of NF-B in the SM cells in the presence of proNGF, as shown by immunoblotting and immunocytofluorescence (Figure E).

Conclusion: The reduced viability of UT with increased expression of TNF-α and RhoA can be related to the activation of the death domain of p75NTR receptor, a member of the TNF family. However, this receptor showed opposing effects in other tissues where it can promote cell survival. This concept supports our finding on SM cells where they did not show reduced viability or activation of TNF-α or RhoA, rather translocation of NF-B to the nucleus response to proNGF exposure. These results suggest that proNGF causes degenerative changes in urothelial cells, and opposing effects on SMC to promote cell response to stress.
Funding: FRQS
2020 Clinical Science Prize Essay Award Winner

HIGH-DENSITY SURFACE ELECTROMYOGRAPHIC ASSESSMENT OF PELVIC FLOOR HYPERTONICITY IN IC/BPS PATIENTS

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Presented By: Yingchun Zhang, PhD

Introduction: Pelvic floor hypertonicity (PFH) is a debilitating symptom of interstitial cystitis/bladder pain syndrome (IC/BPS). The diagnosis and assessment of PFH are based on subjective pelvic examinations, and results between examiners may vary. Precise assessment and localization are critical to the clinical diagnosis and management of PFH. This study aims to provide innovative techniques to objectively and minimally-invasively assess neurogenic PFH in women with IC/BPS using intra-vaginal high-density surface electromyography (HD-sEMG) probe.

Methods: Seven female subjects (44±13 yr.) with a prior diagnosis of IC/BPS were recruited. A full pelvic exam was administered to identify hypertonic muscles. Intra-vaginal HD-sEMG was then acquired at rest from a novel 64-channel HD-sEMG probe, as shown in Figure 1(a). Z-scores were calculated using the subjects without hypertonicity as a reference population, as shown in Figure 1(b). Root-mean-squared (RMS) amplitude during resting state was calculated for each channel to define a hypertonicity index and hypertonic zone. Innervation zones (IZs) were identified from the bipolar mapping of decomposed signals and summarized into an IZ distribution mapping.

Results: Of the 7 subjects recruited, 5 had normal pelvic floor muscle tone and 2 exhibited hypertonicity upon muscle palpation. Women with PFH demonstrated a much higher hypertonicity index (12.6±3.5 vs. 4.5±1.2). The hypertonic zone defined by the 64-channel RMS mapping coincided with the digital hypertonic muscle assessment, as shown in Figures 1(c) and 1(d) for two subjects without hypertonicity, and Figures 1(e) and 1(f) for the two subjects with hypertonicity. On average 4±0.8 motor units were decomposed, and the corresponding IZs were localized, as shown in Figures 1(g) and (h) for two women without hypertonicity, and Figures 1(i) and (j) for the women with hypertonicity, where each red or blue represents an innervation zone near, or away from the hypertonic region, respectively.

Conclusion: This study represents the first effort to employ intra-vaginal HD-sEMG to assess PFH in women with IC/BPS. Our results demonstrate the feasibility of HD-sEMG to provide a quantitative analysis of PFH and provide precise localization of hypertonic muscles and IZs. The proposed HD-sEMG based techniques provide promising tools for clinical diagnosis and treatment of PFH, such as the personalized guidance of BoNT injections.
Podium #1

CHANGE OF NOCTURIA BEFORE AND AFTER HOLEP: A PROSPECTIVE STUDY

Hwanik Kim, MD, Young Jae Im, MD, PhD, Hyukdal Jung, MD, Jee Eun Do, Sung Yong Cho, MD, PhD, Seung-June Oh, MD, PhD

Seoul National University Hospital
Presented By: Hwanik Kim, MD

Introduction: Nocturia is one of many features of benign prostatic hyperplasia (BPH) and it is known to be one of the most resistant symptoms to improve after surgery. This study investigates changes in nocturia and its relevance to other clinical factors in patients with BPH, before & after HoLEP (i.e. Holmium laser enucleation of prostate).

Methods: 420 patients registered in the prospective BPH registry from September 2016 to November 2018 were enrolled in this study. Evaluation before treatment included pre-operative transrectal ultrasonography (TRUS) and urodynamic studies (UDS). Questionnaires, including the International Prostate Symptoms Score (IPSS), Overactive Bladder Symptom Score (OABSS), Nocturia Quality of Life (N-QOL) and Pittsburgh Sleep Quality Index in Korean (PSQI-K), Frequency volume chart (FVC), uroflowmetry and postvoid residual volume were taken pre-operatively, as well as post-operatively at 2 weeks, 3 months and 6 months. The relationship between the parameters of nocturia and pre-operative clinical parameters were examined.

Results: Post-operative Qmax and PVR of 420 patients (mean-age 68.4±7.7 years, SD) were significantly improved (p<0.001). The mean frequency of nocturnal voiding was measured pre-operatively and post-operatively at 2 weeks, 3 months and 6 months. In IPSS, these were 2.3±1.4, 2.1±1.3, 1.6±1.0 and 1.4±0.8 (p<0.001), pre-operative and 2 weeks, 3 months and 6 months post-operatively, respectively. In OABSS they were 2.0±1.1, 1.9±1.1, 1.5±0.9 and 1.3±0.8 (p<0.001), showing a similar decrease in the frequency of nocturnal voiding. With FVC, they were 1.4±0.9, 1.7±1.3, 1.2±0.9, 1.1±0.8 (p<0.001). Total volume of nocturnal urine recorded in FVC significantly decreased from 551.9±274.6 mL before surgery to 518.4±216.2 mL at the post-operative 6 months (p=0.031). The maximal voided volume also significantly increased from 356.2±175.6 mL before surgery to 390.3±128.3 mL at postoperative 6 months (p<0.001). Significant reduction in the frequency of nocturnal voiding at postoperative 6 months was observed in patients with a greater first desire to void volume measured in the pre-operative UDS, the greater maximal voided volume and less nocturia volume recorded in the pre-operative FVC (p<0.001). Decrease in frequency of nocturnal voiding was significantly associated with increase in maximal voided volume (r=-0.271, p=0.002) and decrease in the volume of nocturnal urine (r=0.462, p<0.001).

Conclusion: The frequency of nocturnal voiding after HoLEP operation was significantly lower compared to the pre-operative period. This reduction in the frequency of nocturnal voiding is thought to have significantly contributed to the increase in the maximal voided volume recorded in FVC.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline (n=420)</th>
<th>POP2W (n=402)</th>
<th>POP3M (n=357)</th>
<th>POP6M (n=311)</th>
<th>p value (POP6M-Baseline)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qmax</td>
<td>9.62±5.0</td>
<td>21.1±10.1</td>
<td>22.7±11.4</td>
<td>23.8±13.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Postvoid residual volume</td>
<td>85.8±116.0</td>
<td>28.6±41.6</td>
<td>25.5±50.5</td>
<td>18.6±32.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IPSS-total</td>
<td>18.5±8.9</td>
<td>11.1±5.3</td>
<td>7.7±5.6</td>
<td>6.7±5.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IPSS#7 (nocturia)</td>
<td>2.2±1.2</td>
<td>2.0±1.1</td>
<td>1.6±1.4</td>
<td>1.4±0.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IPSS-QoL</td>
<td>4.1±1.2</td>
<td>2.3±1.5</td>
<td>1.4±0.8</td>
<td>1.4±1.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>OABSS-total</td>
<td>10.5±5.3</td>
<td>6.5±4.8</td>
<td>2.6±0.8</td>
<td>4.7±3.2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>OABSS#2 (nocturia)</td>
<td>1.9±0.9</td>
<td>1.8±0.9</td>
<td>1.5±1.5</td>
<td>1.3±0.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Frequency-volume chart</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 hour urine volume</td>
<td>1625.3±514.2</td>
<td>1795.1±633.5</td>
<td>1635.6±535.9</td>
<td>1569.0±449.1</td>
<td>0.053</td>
</tr>
<tr>
<td>Nocturnal urine volume</td>
<td>551.9±274.6</td>
<td>613.4±288.3</td>
<td>557.6±303.5</td>
<td>518.4±216.2</td>
<td>0.031</td>
</tr>
<tr>
<td>Nocturnal polyuria index</td>
<td>34.4±16.6</td>
<td>36.3±21.8</td>
<td>36.6±36.6</td>
<td>34.3±21.5</td>
<td>0.467</td>
</tr>
<tr>
<td>Total number of voids</td>
<td>8.8±3.0</td>
<td>9.4±2.7</td>
<td>8.1±1.9</td>
<td>7.5±1.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No. of daytime voids</td>
<td>7.4±2.5</td>
<td>7.7±2.3</td>
<td>6.9±1.9</td>
<td>6.4±1.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No. of nocturia</td>
<td>1.4±1.0</td>
<td>1.7±1.1</td>
<td>1.2±1.6</td>
<td>1.1±0.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Maximal voided volume</td>
<td>356.2±175.6</td>
<td>361.6±133.7</td>
<td>380.9±126.0</td>
<td>390.3±128.3</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**Funding:** N/A
Podium #2
HUMAN PROSTATE COLLAGEN INCREASES WITH AGE BUT DIMinishes WITH INFLammATION
Andrew Schneider, PhD, Matthew Grimes, MD, Amanda Kemper, Hassan Zagloul, BS, Wade Bushman, MD, PhD
University of Wisconsin-Madison
Presented By: Wade Bushman, MD, PhD

Introduction: Recent clinical studies have implicated prostate inflammation and fibrosis in the genesis of LUTS and bladder outlet obstruction. Studies utilizing rodent models, including work in our laboratory, have shown prostate fibrosis to occur as a consequence of inflammation. However, the association of inflammation and collagen content in tissue obtained from surgical treatment of BPH/LUTS has not to our knowledge been previously examined.

Methods: Prostate tissue specimens, all cancer-free, were obtained from 53 patients (ages 47 – 88, mean 65.1) treated by open simple prostatectomy or transurethral resection of the prostate (TURP) for BPH/LUTS, and were stained to quantitatively assess prostate inflammation and collagen content. Immunostaining was performed with the pan-leukocyte marker CD45 and inflammation was scored using previously established guidelines (Nickels et al., 2001). To assess collagen content, tissue sections were stained with picrosirius red, imaged, and quantified digitally. Prostate volume was determined from pelvic CT scan obtained within two years prior to surgery using the ellipsoid volume equation.

Results: Analysis of the data revealed two novel and surprising findings: (1) Collagen content was positively correlated with age (r = 0.34, p=0.01), and (2) Collagen content was negatively correlated with total inflammation score (r = -0.28, p = 0.04). Additional observations were that prostate volume significantly correlated with age (r = 0.35, p = 0.01) but that neither age nor prostate volume correlated independently with total inflammation score. The significant inverse correlation of inflammation with collagen content revealed by quantitative analysis of the entire section was buttressed by the qualitative observation of diminished collagen staining specifically in areas of inflammation.

Conclusion: Our data suggest for the first time that aging drives prostate collagen accumulation in the transition zone of men with BPH/LUTS. It also suggests that in contrast to rodent models where prostate inflammation induces collagen accumulation, collagen content in the human prostate transition zone is negatively correlated with inflammation and that inflammation actually induces localized degradation of existing collagen. The disparate effects of inflammation may reflect the inherent difference between the relatively thin collagen stroma of the rodent prostate versus the dense collagen stroma of the human.

Funding: VA Merit Award: 1010 BX003454-01
Podium #3

URINARY INCONTINENCE CARE FOR OLDER ADULTS: DIFFERENCE OR DISPARITY
Claire Burton¹, Jennifer Tran², Gabriela Gonzalez³, Catherine Bresee⁴, Eunice Choi⁵, Victoria Scott⁵, A. Lenore Ackerman⁵, Karyn S. Eilber⁵, Jennifer T. Anger⁵
¹Department of Urology, University of California Los Angeles, Los Angeles, CA, ²Central Michigan University School of Medicine, Mount Pleasant, MI, ³David Geffen School of Medicine, University of California, Los Angeles, CA, ⁴Cedars Sinai Medical Center, ⁵Department of Surgery, Division of Urology, Cedars-Sinai Medical Center, Los Angeles, CA
Presented By: Claire Burton, MD

Introduction: Urinary incontinence (UI) has a significant burden on health care costs, particularly among the elderly. Assessing Care of Vulnerable Elders-2 (ACOVE-2) found that overall quality of care for vulnerable elders is inadequate. We sought to evaluate the care surrounding UI provided by primary care providers (PCPs) prior to referral to a specialist, and to determine whether UI is treated differently in elderly (≥75) vs younger (<75) female patients.

Methods: A sample of 247 women consecutively referred for new or worsening bothersome UI to a single-center FPMRS group practice between March 2017 and May 2018 was identified. Using a set of 12 previously developed Quality of Care Indicators (QIs), we measured the care provided by PCPs in the 12-month period prior to the first visit with an FPMRS specialist. The QIs for UI have been previously validated and include elements from the patient history, physical examination, urinalysis, recommended behavioral interventions, and pharmacologic treatment.

Results: For women ≥ 75 years of age, PCPs were less likely to take a focused history differentiating between stress and urge incontinence (55% vs 77%, p<0.05) or do a pelvic exam (26% vs 50%, p<0.01) when compared to their younger counterparts. Yet providers were more likely to take a history of prior pharmaceutical treatment (28% vs 10%, p<0.01) and obtain a urinalysis or urine culture (74% vs 57%, p<0.05) for older women. Rates of management initiation were low in both groups, with only 30% of PCPs offering behavioral management (Table).

Conclusion: We found generally low rates of QI compliance by PCPs, with older female patients receiving significantly worse care. Low rates of pelvic exams may be due to the fact that women over 75 no longer require routine pelvic exams per the USPSTF recommendations. On the other hand, urinalyses were more frequently obtained, possibly due to an increased incidence in this age group. Improvement of UI care at the primary care level for older female patients could significantly reduce healthcare costs and improve practical interventions aimed at improving care for geriatric conditions, including UI.
### Table 1. Quality of care provided by PCPs between older and younger women

<table>
<thead>
<tr>
<th>Quality Care Indicators</th>
<th>Overall n=247</th>
<th>Age &lt;75 n=205</th>
<th>Age ≥ 75 n=42</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focused History differentiating SUI vs UII symptoms</td>
<td>181 56%</td>
<td>158 77%</td>
<td>23 55%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>History of prior pharmacological treatment</td>
<td>33 13%</td>
<td>21 10%</td>
<td>12 28%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Assessment of symptom severity</td>
<td>83 34%</td>
<td>69 34%</td>
<td>14 33%</td>
<td>0.97</td>
</tr>
<tr>
<td>Pelvic exam</td>
<td>114 40%</td>
<td>103 50%</td>
<td>11 26%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Urinalysis or urine culture</td>
<td>148 62%</td>
<td>117 57%</td>
<td>31 74%</td>
<td>0.04</td>
</tr>
<tr>
<td>Pelvic floor exercises recommended</td>
<td>67 27%</td>
<td>58 28%</td>
<td>9 21%</td>
<td>0.36</td>
</tr>
<tr>
<td><strong>SUI specific</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight loss recommended</td>
<td>24/92 26%</td>
<td>23/84 27%</td>
<td>1/8 12%</td>
<td>0.45</td>
</tr>
<tr>
<td>Treatment response documented at future visit</td>
<td>80/127 63%</td>
<td>72/117 62%</td>
<td>8/10 80%</td>
<td>0.25</td>
</tr>
<tr>
<td>Anticholinergic not prescribed</td>
<td>71/74 96%</td>
<td>67/70 96%</td>
<td>4/4 100%</td>
<td>1</td>
</tr>
<tr>
<td><strong>UII specific</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluid intake documented</td>
<td>13 12%</td>
<td>12 14%</td>
<td>1 5%</td>
<td>0.30</td>
</tr>
<tr>
<td>Behavioral modification recommended</td>
<td>34 32%</td>
<td>30 35%</td>
<td>4 21%</td>
<td>0.24</td>
</tr>
<tr>
<td>Anticholinergic initiated or dose adjusted</td>
<td>11 10%</td>
<td>7 8%</td>
<td>4 21%</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**Funding:** R56DK117261 (JA)
Podium #4

FLUID HANDLING IN THE AGING URINARY TRACT

Thomas Monaghan¹, Marie-Astrid Denys², An-Sofie Goessaert², Veerle Decalf², Candy Kumps², Johan Vande Walle³, Jeffrey Weiss¹, Donald Bliwise⁴, Matthew Epstein⁵, Jeremy Weedon⁶, Jason Lazar⁷, Karel Everaert²

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Presented By: Thomas F. Monaghan

Introduction: This study aims to compare diuresis rate, sodium clearance, and free water clearance (FWC) by age and time of day (nighttime vs. daytime) in subjects with and without nocturnal polyuria (NP).

Methods: Post-hoc analysis of two prospective observational studies. Eight urine samples collected at 3-hour intervals and a single blood sample were used to calculate daytime (10a/1p/4p/7p/10p) and nighttime (1a/4/7a) diuresis rates, sodium clearance, and FWC. Three mixed linear models were constructed for diuresis rate, sodium clearance, and FWC using four predictor variables: NP status (present [nocturnal urine production >90mL/h] vs. absent [≤90 mL/h]), time of day, age, and study identification.

Results: A total of 230 subjects (45% NP) were included. Subjects with vs. without NP demonstrated higher daytime diuresis rates (1.44 vs. 1.06 mL/min, p<0.001), nighttime diuresis rates (1.89 vs. 0.94 mL/min, p<0.001), daytime sodium clearance (0.74 vs. 0.64 mL/min, p=0.026), nighttime sodium clearance (0.91 vs. 0.59 mL/min, p<0.001), and nighttime FWC (less negative) (-0.38 vs. -0.80 mL/min, p<0.001); no difference was observed in daytime FWC (-0.71 vs. -0.86 mL/min, p=0.097). Subjects with NP experienced higher nighttime vs. daytime diuresis rates (p<0.001), sodium clearance (p<0.001), and FWC (p<0.001), whereas those without NP experienced significantly lower nighttime diuresis rates (p<0.001), and no difference in nighttime vs. daytime sodium clearance (p=0.120) or FWC (p=0.268).

Simple effects analysis revealed a significant age by NP status effect for diuresis rate (p=0.019) (Table 1a), but not for sodium clearance (p=0.248) or FWC (p=0.279). Simple effects analysis also revealed a significant age by time of day effect, whereby increased age was accompanied by an increase in the ratio of nighttime/daytime diuresis rate and nighttime/daytime sodium clearance (Table 1b&c). There was no significant age by time of day interaction for FWC (p=0.574). However, FWC exhibited a significant quadratic main quadratic age effect: Independent of differences in time of day or NP status, FWC increased monotonically with age (p=0.039).

Conclusion: The age-related shift toward greater nocturnal sodium clearance and higher 24-hour FWC is not specific to older individuals with NP. This surge in either nocturnal sodium diuresis or nocturnal free water diuresis may represent the relevant substrate for behavioral or pharmacologic interventions targeting nocturnal urine production.
### Table 1: Significant interactions in diuresis rate and sodium clearance by age

<table>
<thead>
<tr>
<th>NP Status</th>
<th>Age</th>
<th>Adjusted Mean Diuresis Rate (mL/min)</th>
<th>Adjusted Mean Sodium Clearance Rate (mL/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No NP</td>
<td>50</td>
<td>0.98 (0.92-1.04)</td>
<td></td>
</tr>
<tr>
<td>NP</td>
<td>50</td>
<td>1.73 (1.60-1.86)</td>
<td></td>
</tr>
<tr>
<td>No NP</td>
<td>60</td>
<td>0.99 (0.94-1.05)</td>
<td></td>
</tr>
<tr>
<td>NP</td>
<td>60</td>
<td>1.67 (1.58-1.76)</td>
<td></td>
</tr>
<tr>
<td>No NP</td>
<td>70</td>
<td>1.01 (0.96-1.07)</td>
<td></td>
</tr>
<tr>
<td>NP</td>
<td>70</td>
<td>1.62 (1.53-1.71)</td>
<td></td>
</tr>
<tr>
<td>No NP</td>
<td>80</td>
<td>1.03 (0.95-1.11)</td>
<td></td>
</tr>
<tr>
<td>NP</td>
<td>80</td>
<td>1.56 (1.46-1.67)</td>
<td></td>
</tr>
</tbody>
</table>

**Time of Day (nighttime vs. daytime) by age for diuresis rate (mL/min)**

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Age</th>
<th>Adjusted Mean Diuresis Rate (mL/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime</td>
<td>60</td>
<td>1.35 (1.26-1.45)</td>
</tr>
<tr>
<td>Nighttime</td>
<td>50</td>
<td>1.28 (1.21-1.34)</td>
</tr>
<tr>
<td>Daytime</td>
<td>60</td>
<td>1.26 (1.20-1.34)</td>
</tr>
<tr>
<td>Nighttime</td>
<td>60</td>
<td>1.34 (1.29-1.39)</td>
</tr>
<tr>
<td>Daytime</td>
<td>70</td>
<td>1.19 (1.12-1.26)</td>
</tr>
<tr>
<td>Nighttime</td>
<td>70</td>
<td>1.40 (1.34-1.45)</td>
</tr>
<tr>
<td>Daytime</td>
<td>80</td>
<td>1.11 (1.02-1.20)</td>
</tr>
<tr>
<td>Nighttime</td>
<td>80</td>
<td>1.46 (1.38-1.53)</td>
</tr>
</tbody>
</table>

**Time of day (nighttime vs. daytime) by age for sodium clearance (mL/min)**

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Age</th>
<th>Adjusted Mean Sodium Clearance Rate (mL/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime</td>
<td>50</td>
<td>0.67 (0.55-0.80)</td>
</tr>
<tr>
<td>Nighttime</td>
<td>50</td>
<td>0.63 (0.51-0.75)</td>
</tr>
<tr>
<td>Daytime</td>
<td>60</td>
<td>0.68 (0.60-0.77)</td>
</tr>
<tr>
<td>Nighttime</td>
<td>60</td>
<td>0.72 (0.63-0.80)</td>
</tr>
<tr>
<td>Daytime</td>
<td>70</td>
<td>0.49 (0.40-0.75)</td>
</tr>
<tr>
<td>Nighttime</td>
<td>70</td>
<td>0.81 (0.76-0.87)</td>
</tr>
<tr>
<td>Daytime</td>
<td>80</td>
<td>0.71 (0.64-0.78)</td>
</tr>
<tr>
<td>Nighttime</td>
<td>80</td>
<td>0.92 (0.85-0.99)</td>
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</tbody>
</table>

Note: Model-generated adjusted means are reported along with 95% confidence intervals (CIs).

1a: Nocturnal polyuria status (present vs. absent) by age for diuresis rate (mL/min)

1b: Time of day (nighttime vs. daytime) by age for diuresis rate (mL/min)

1c: Time of day (nighttime vs. daytime) by age for sodium clearance (mL/min)

Funding: N/A
Podium #5
UROPATHOGENS FORM BIOFILMS PREDOMINANTLY ON DISTAL AND LUMINAL ASPECTS OF CATHETERS, EXHIBIT FREQUENT ANTIBIOTIC RESISTANCE, AND ARE INHIBITED BY A NOVEL CETYLpyridinium CHLORIDE BASED FORMULATION
Glenn Werneburg1,2, Nadine Henderson2, Raymond Rackley1, Anh Nguyen3, Daniel Shoskes1, Amanda Le Sueur4, Anthony Corcoran4, Aaron Katz4, Jason Kim5, Annie Rohan6, David Thanassi2
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Presented By: Glenn T. Werneburg, MD, PhD

Introduction: Biofilms on urinary catheters allow bacteria to resist antibiotics and host cell defenses. Biofilm formation is a critical step in the pathogenesis of catheter-associated UTI. We sought to investigate the bacterial composition and antibiotic resistance patterns of biofilms on catheters, as well as their locations of initiation and progression over indwelling time. Further, we aimed to test a novel antiseptic formulation using cetylpyridinium chloride (CPC) as the active product ingredient combined with pro-adherence factors for its capacity to inhibit growth of the biofilm bacterial isolates in liquid medium.

Methods: Urinary catheters were collected following removal from patients and documented indwelling time and gender were noted. Catheters were sectioned and stained with crystal violet, and excess dye was rinsed. Adherent dye, which represented adherent biofilm, was dissolved in acetic acid, and biofilm concentration was quantitated relative to controls using spectrophotometry. Viability was confirmed in liquid culture, and next generation sequencing via the MicroGenDX platform was employed. Five isolates were cultured, normalized, and subcultured in the presence of the 1:10 or 1:100 antiseptic formulation, or a normal saline control.

Results: Thirty-three urinary catheters were collected. Biofilm formation was detected as early as several hours indwelling time and increased as a function of time up to 5 weeks. Male and female biofilm growth trends did not differ overall. The luminal and balloon portions of the urinary catheters exhibited predominant biofilm formation. The distal end of the catheter exhibited higher biofilm formation relative to the proximal end (p=0.034). Next-generation sequencing detected uropathogenic bacteria in 10 of 10 samples analyzed (Table 1). Bacterial genes conferring resistance to multiple antibiotics were detected. Bacterial isolates consistently exhibited growth inhibition in a dose-response manner by the CPC formulation relative to the normal saline control.

Conclusion: Biofilms were composed of uropathogenic bacteria, which were frequently resistant to commonly-used antibiotics. The balloon, luminal, and distal portions of catheters exhibited biofilm predominance. Growth of biofilm isolates was inhibited by a novel antiseptic formulation in a dose-response manner. Biofilm reduction techniques such as routine irrigation with antiseptics warrant further investigation, and are well-positioned to target the luminal-predominant biofilms identified in our study and thus may potentially reduce the risk of CAUTI.
**Funding:** NIH T32GM008444 and F30AI112252 (GTW), R01GM062987 (DGT), AACN-Sigma Theta Tau Critical Care Award (AJR)
Podium #6
AGREEMENT OF TRADITIONAL URINARY CULTURE AND MULTIPLEX PCR: RESULTS FROM A PROSPECTIVE STUDY

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Presented By: Annah Vollstedt, MD

Introduction: Traditional urine culture (UC) is the gold standard for diagnosis of a urinary tract infection (UTI). Importantly, our prior study has shown non-inferiority of multiplex PCR in the detection and identification of bacteria compared to UC. We sought to describe the agreement of UC and PCR results among elderly patients presenting with UTI symptoms to a multi-provider urology practice.

Methods: A prospective trial (IRB approved) of patients > 60 years, presenting to a large urology practice from July 2018 to February 2019. All patients were symptomatic of UTI. Urine samples were sent for both traditional urine culture and multiplex PCR. Patient characteristics, presenting symptoms and urinalysis results were recorded.

Results: A total of 2,511 patients, median age 73 years, 54% female, were included. PCR detected pathogens in 1575/2511 (63%), while urine culture detected pathogens in 1098/2511 (44%). PCR and UC agreed 75% of the time (1874/2511). Both were positive in 40% (1018/2511) and negative in 34% (856/2511). PCR and UC disagreed in 25% (637/2511): PCR positive and UC negative in 22% (557/2511) and UC positive and PCR negative in 3% (80/2511). Polymicrobial infections were identified in 34% (861/2511), with PCR reporting 834 (33%) and UC reporting 144 (6%). Further, polymicrobial infections were identified in 20% patients in which UC was negative. There was no difference in symptoms between the PCR positive/culture negative patients and the culture positive/PCR negative patients.

Conclusion: In this large, prospective study on symptomatic patients, multiplex PCR was able to detect pathogens in about one-fourth of symptomatic patients who had a negative UC. PCR identified significantly more polymicrobial infections than UC. PCR provides more data than UC, which may help guide directed antibiotic treatment and improve clinical outcomes.

Funding: Pathnostics
Podium #7
INITIAL EXPERIENCE OF HOLMIUM LASER ENUCLEATION OF THE PROSTATE FOLLOWING PREVIOUS PROSTATIC URETHRAL LIFT FOR MANAGEMENT OF BENIGN PROSTATIC HYPERPLASIA
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Presented By: Timothy Moonhwan Han

Introduction: Prostatic urethral lift (PUL) has become a commonly performed procedure for symptomatic benign prostatic hyperplasia (BPH). The current recommendation for PUL is for a patient with a prostate size <80 grams. Additionally, despite more recent updates in guidelines, patients with enlarged median lobes have not always achieved desirable outcomes with PUL. In patients who fail PUL, Holmium laser enucleation of the prostate (HoLEP) is a viable and effective option, but presents its own unique challenges. We sought to determine the incidence of patients who receive HoLEP following previous PUL and to assess the benefits and pitfalls of HoLEP in these patients at our institution.

Methods: A retrospective review, from an IRB approved database, of all patients that underwent HoLEP at our institution between January 2013 and September 2019 was performed. 685 consecutive HoLEP cases in 670 patients were identified, with all cases performed by one surgeon (AD). Data collected included demographics, prostate size on pre-operative assessment, time elapsed since previous PUL procedure, and complications.

Results: Of the 685 total HoLEP cases, 11 patients (1.6%) had previous PUL procedures. Time between HoLEP and previous PUL ranged from 2.9-48.7 months (mean=17.7 months, median=12.6 months). Pre-operative prostate size ranged from 80-180 grams (mean=116.1 g, median=107.0 g). In 1 of these cases, the PUL implant prevented effective prostate adenoma morcellation, requiring the patient to return 7 days later to complete the case and recover the remaining chip fragment. No complications occurred intra-operatively in the other 10 patients with previous PUL. All patients experienced improvement in symptoms following HoLEP.

Conclusion: While HoLEP can be performed safely and effectively in the PUL failure population, unique challenges arise. Defining the true sulcus of the prostate lobes may be lost after PUL, making enucleation more challenging as the anatomy is distorted. Additionally, jamming of morcellator blades from the remaining implants may occur. Considering these challenges coupled with current guidelines suggesting laser enucleation as the endoscopic procedure of choice in patients with prostate sizes >80 grams, thorough discussion with patients considering PUL regarding interventional alternatives should be encouraged, especially in patients with larger prostate sizes (>80 grams) on pre-operative assessment.

Funding: N/A
Podium #8
BIOINFORMATIC APPROACH FOR IDENTIFYING NOVEL BIOMARKERS AND THEIR SIGNALING PATHWAYS INVOLVED IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME
Aram Kim¹, Moon Ki Jo², YongTae Kim³, Hong Yong Choi⁴, Hyun Woo Kim⁵, Myung-Soo Choo⁶, Hyeong Gon Kim¹
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Presented By: Aram Kim

Introduction: The complexity of Interstitial Cystitis/bladder Pain Syndrome (IC/BPS) has led to a great deal of uncertainty in terms of diagnosis and prevalence of the condition. Under these situations the chronic inflammation has reported to be arise after surgery in IC/BPS patients which is frequently misdiagnosed. Here, we have identified the possible candidate genes through integrated analysis of Gene Expression Omnibus (GEO) datasets and confirmed experimentally in order to predict the correct pathologic diagnosis for IC/BPS.

Methods: Bioinformatic analyses were conducted using two GEO datasets (GSE11783 and GSE57560) to determine whether individual biomarkers associated with diagnosis of IC/BPS and to predict the possible signaling pathway. Based on the results, we assayed hub genes expression of tissue samples from IC/BPS patients using RT-PCR and immunohistochemistry analysis. We prospectively enrolled IC/BPS patients, on the basis of cystoscopic findings, as having Hunner lesions. Specimens obtained from the posterior wall in Hunner-type IC cases during transurethral resection were evaluated. Radical cystectomy specimen without malignancy was selected as controls.

Results: Our Data mining analysis of GEO datasets revealed a total of 39 (25 upregulated and 14 downregulated) common differentially expressed genes (DEGs) in IC/BPS. A PPI network was then constructed with those 39 common DEGs using cytoscape v7.1 and subsequently, six hub genes (AQP9, S100A8, FPR1, CSF3R, S100A12, and NCF2, respectively) were identified using cytoscape through cytoHubba v0.1 tool. Moreover, enrichment analysis of common DEGs was revealed that cell cycle and TP53 signaling pathway were prominently involved with common 25 upregulated DEGs whereas common 14 downregulated DEGs might regulate G alpha (z) and Transmembrane transport of small molecules signaling pathway in IC/BPS. Among the all six hub genes, AQP9 and NCF2 expression were significantly augmented in our IC/BPS patient’s sample compared to their normal counterparts.

Conclusion: In this study, we have systematically predicted the significant biomarkers and possible signaling pathway involved in IC/BPS disease. We have also confirmed the differential expression level of the hubgenes in the tissue samples from patient with IC/BPS; and, AQP9 and NCF2 might be used as the potential pathological biomarker of IC/BPS diagnosis.

Figure 1. The Analysis of Significant Genes in Interstitial Cystitis / Bladder Pain Syndrome
**Funding:** N/A
Podium #9
ADVERSE EVENTS ASSOCIATED WITH SYNTHETIC MALE SLINGS: AN ANALYSIS OF THE FDA MAUDE DATABASE
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Presented By: Hanson H. Zhao, MD

Introduction: The controversy and scrutiny towards polypropylene transvaginal mesh for pelvic organ prolapse has had significant repercussions towards the usage and perception of mid-urethral slings for stress urinary incontinence in women. We aim to explore whether there has been a similar effect for synthetic polypropylene male slings by describing and analyzing the adverse events associated with male slings reported to the FDA Manufacturer and User Facility Device Experience (MAUDE) database.

Methods: We queried the MAUDE database for all entries with the brand name “Male Sling,” “Invance,” “Virtue,” or “Advance” from January 1st, 2009 to December 31st, 2018. We collected and analyzed information about the event type, date received, report source, source type, manufacturer, and event description text. Duplicate entries were removed.

Results: A total of 497 adverse events related to the male sling were identified. The adverse events were classified on the MAUDE database as injury (95.4%), malfunction (4.2%), and other (0.4%). There were no deaths reported. The slings involved were the Advance or Advance XP (69.8%), Invance (15.5%), Virtue Quadratic (12.3%), or unknown (2.4%). There was no increase in medical device reports (MDRs) from 2011 and 2012 after the FDA safety communication. On review of the event description texts, a total of 232 (47%) events were related to urinary incontinence after sling placement. Other events included sling erosion (9%), mechanical malfunction (8%), pain or numbness (8%), infection (7%), urinary retention (5%), bladder or urethral injury (3%), or were unknown (13%).
The report source was from a manufacturer for 490 (98.6%) reports. The rest were from a user facility (n=4) or voluntary (n=3). The source type was reported to be from a health care professional for 428 (86%) reports, consumer for 33 (7%) reports, or other for 36 (7%) reports. There were no reports generated by attorneys.

Conclusion: There are a modest number of MDRs related to male slings and almost half of them describe persistent urinary incontinence. The reporting of adverse events for male slings does not seem to be affected by the controversy toward transvaginal mesh and mid-urethral slings. Further work needs to investigate the safety of polypropylene slings for urinary incontinence.
Funding: N/A
Podium #10
PREVALENCE OF COGNITIVE IMPAIRMENT AND SPHINCTER MISUSE AMONG MEN WITH ARTIFICIAL URINARY SPHINCTERS
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¹University of Virginia, Dept. of Urology, Charlottesville, VA, ²University of Virginia, School of Medicine, Charlottesville, VA
Presented By: Christopher Ballantyne, MD

Introduction: As the population ages, a growing number of patients will suffer progressive cognitive decline, both normal and pathological. The association between cognitive impairment and loss of independence in activities of daily living is well documented and relates to both memory loss and functional decline in abilities like manual dexterity. These deficits can be particularly problematic for patients with artificial urinary sphincters (AUS). We aimed to define the prevalence of cognitive impairment and sphincter misuse among our institutional cohort of AUS patients.

Methods: Men who had undergone primary AUS placement or revision surgery at our institution from 2004-2019 were invited to participate in telephone surveys. Patients answered questions regarding current urinary symptoms, quality of life, medical history, AUS use, and urologic follow-up. Validated telephone mini-mental status exams (T-MMSE) were completed to assess cognitive function. Patients were categorized by degree of cognitive impairment and analyzed using appropriate statistical comparison tests.

Results: A total of 142 unique patients were identified; 74 participated in the study (61% response rate, excluding 20 deceased patients). Median age and follow-up since AUS implantation were 76 [69, 81] and 7 [4, 11] years, respectively. Some degree of cognitive impairment was seen in 18 (24%) patients: 13 (18%) mild, 2 (3%) moderate, and 3 (4%) severe. Table 1 compares patient characteristics, revision and continence rates, and sphincter usage patterns in those with normal versus impaired cognition. Twenty-three (31%) patients reported they did not cycle their device with every void, and 11 (15%) reported they were no longer using their AUS. Notably, 50% of patients with impaired cognition were not cycling their device with every void compared to 25% among those with normal cognition. Over half of all patients with impaired cognition had not seen a urologist in the last year.

Conclusion: Our study revealed significant rates of cognitive impairment and sphincter misuse among men with artificial urinary sphincters. These data suggest there may be a role for monitoring cognitive function and long-term follow-up in these patients. Further prospective study of cognitive decline and related outcomes in AUS patients is warranted.
**Funding:** N/A

<table>
<thead>
<tr>
<th>Table 1. Analysis by Cognitive Group</th>
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<td>Overall</td>
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<td>Participants</td>
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</table>

**Patient characteristics**

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<th>Overall</th>
<th>Normal cognition</th>
<th>Impaired cognition</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age [IQR], years</td>
<td>76 [69, 81]</td>
<td>75 [68, 80]</td>
<td>79 [73, 87]</td>
<td>0.02</td>
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<tr>
<td>Median FU [IQR], years</td>
<td>7 [6, 11]</td>
<td>8 [6, 10]</td>
<td>7 [6, 12]</td>
<td>0.64</td>
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<tr>
<td>Post-prostatectomy</td>
<td>64 (86%)</td>
<td>42 (60%)</td>
<td>22 (30%)</td>
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</tr>
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<td>History of radiation</td>
<td>17 (23%)</td>
<td>14 (20%)</td>
<td>3 (4%)</td>
<td>0.54</td>
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</table>

**Surgical revision rates**

<table>
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<th>Impaired cognition</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any etiology</td>
<td>76 (101%)</td>
<td>62 (86%)</td>
<td>14 (20%)</td>
<td>0.58</td>
</tr>
<tr>
<td>Erosions/infections</td>
<td>4 (7%)</td>
<td>3 (7%)</td>
<td>1 (2%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Mechanical failures</td>
<td>11 (16%)</td>
<td>10 (14%)</td>
<td>1 (2%)</td>
<td>0.28</td>
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<tr>
<td>Atrophy/recurrence</td>
<td>9 (13%)</td>
<td>4 (6%)</td>
<td>5 (7%)</td>
<td>0.68</td>
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**Continence and QoL**

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<th>Overall</th>
<th>Normal cognition</th>
<th>Impaired cognition</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry/no leakage</td>
<td>10 (14%)</td>
<td>9 (13%)</td>
<td>1 (2%)</td>
<td>0.43</td>
</tr>
<tr>
<td>Median urinary bother [IQR] / 10</td>
<td>3 (1, 6)</td>
<td>3 (1, 6)</td>
<td>2 (0, 5)</td>
<td>0.63</td>
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<tr>
<td>Median satisfaction with AUS [IQR] / 10</td>
<td>8.5 (6, 10)</td>
<td>9 (7, 10)</td>
<td>6 (5, 9)</td>
<td>0.42</td>
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**Sphincter usage and FU**

<table>
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<th>Normal cognition</th>
<th>Impaired cognition</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not cycle every void</td>
<td>29 (41%)</td>
<td>14 (25%)</td>
<td>15 (25%)</td>
<td>0.08</td>
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<tr>
<td>No longer use AUS</td>
<td>11 (15%)</td>
<td>8 (14%)</td>
<td>3 (4%)</td>
<td>1.00</td>
</tr>
<tr>
<td>No FU in past year</td>
<td>27 (36%)</td>
<td>17 (25%)</td>
<td>10 (14%)</td>
<td>0.09</td>
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</tbody>
</table>

Legend: IQR = interquartile range; FU = follow-up; QoL = quality of life; AUS = artificial urinary sphincter
Podium #11
VERY LONG TERM FOLLOW-UP IN THE MANAGEMENT OF COMPLEX BLADDER NECK CONTRACTURE AND URINARY INCONTINENCE AFTER PROSTATE CANCER TREATMENT: LESSONS LEARNED
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Bladder Health Reconstructive Urology Institute
Presented By: Angelo E. Gousse, MD

Introduction: To present our experience with 2-stage management for complex refractory bladder neck contracture (BNC) after prostate cancer treatment (PPCaT) associated with urinary incontinence.

Methods: A 12-year retrospective electronic medical record review was performed in patients with stress urinary incontinence (SUI) associated with complex BNC after PPCaT. Treatment consisted of deep hot-knife Bladder Neck Incision (BNI) or resection (TURBNC), followed by cystoscopy at 2 months. If stable, healed, and patent, an artificial urinary sphincter (AUS - AMS 800) was placed. Recurrent BNC at 2 months was treated with a second BNI or a 3rd BNI until patency was achieved.

Results: 88 Patients with BNC and urinary incontinence (UI) were identified with median age of 75 (58 - 93) years, body mass index 31.1 (21.8-66.8) kg/m2, and median follow-up of 66 (6-118) months. 60/88 (68.1%) underwent Radical Prostatectomy (RRP) and radiation treatment and 28 /88 (31.8%) RRP alone. Of the 88 patients who had successful management of the BNC, 63/88 (71.6%) underwent AUS-AMS 800 by a single surgeon (AEG). The remaining declined or were unable to proceed for various health reasons. 44/63 who underwent AUS (69.8%) had a history of radiation resulting in 8/63 poor outcomes leading to AUS removal: 6 Erosions, 1 persisting severe incontinence, 1 device scrotal infection. Of the 19/63 (30.2%) non-radiated patients who underwent AUS there were 5 poor outcomes: 4 erosions related to transurethral manipulations by non-urology providers, 1 Fistula. Symptomatic recurrent BNC after AUS implantation was noted in 15/88 (17%) patients: 10 in radiated patients and 5 in non-radiated patients. Recurrent BNC post AUS were successfully treated using a 12Fr resectoscope/hot knife in all cases. No erosion resulted from post-AUS transurethral BNI. Only 3 patients required more than 2 BNC post AUS. An AUS was never removed to manage BNC. No patient required urinary diversion. The overall long-term success rate was 84. 5% (continent defined less than 2 pads per day) and patent bladder neck.

Conclusion: This represents the largest series reported with the longest follow-up for management of complex BNC and SUI after PPcaT. Patients can be safely managed with hot-knife incision, followed by AUS, with majority of cases achieving continence and outlet patency.

Funding: N/A
Podium #12

A NOVEL ADJUSTABLE SLING SYSTEM FOR MALE STRESS URINARY INCONTINENCE

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Presented By: Ralf G. Anding, MD

Introduction: In surgical therapy of male stress urinary incontinence a distinction is drawn between fixed and adjustable slings. An example of a fixed sling is the AdVance™ sling. In contrast adjustable slings work by increasing urethral closure pressure (UCP) that can be adjusted to patients’ individual postoperative conditions. The proposed target pressures after male sling implantation in the literature range between 30 and 60 cmH2O. We introduce a novel anchored male continence system with bilateral anchor fixation in the obturator membrane and a central active element that can be filled with water via a connected port. Therefore the insertion process is vitally facilitated by avoiding large trocars.

Methods: As part of the developing process the obturator region was extensively studied and measured in male cadavers to determine the optimal area for anchor insertion. For this also a new inserter was developed. Pressure adaptation on the bulbar urethra is achieved with a water filled cushion that is integrated in the central part of the sling. The filling process is conducted via a subcutaneous port. Effectivity of the novel adjustable sling system was measured in simulated operations in fresh male cadavers as retrograde leak point pressure (RLPP). Four series of measurement were conducted after sling insertion, sling tensioning, final sling fixation, and wound closure, respectively. The active element was filled in steps of 1 ml to a maximum of 20 ml and the RLPP measured in cmH2O.

Results: The implantation process of the novel sling system was easy, quick, safe, and well reproducible in all cases. After technical refinements of the active element an ideal pressure transmission on the bulbar urethra was achieved with homogeneous pressure slopes. The closure pressures exceeded 30 cmH2O at filling volumes below 10 ml. In some series the pressure ultimately reached 100 cmH2O as an indicator of the stability and effectiveness of the sling system.

Conclusion: With the novel adjustable male sling system the urethral closure pressure can be effectively regulated as a function of the filling volume of an active element. The relationship of urethral closure pressure and continence status has to be further investigated in clinical studies after device approval.

Funding: N/A
Podium #13
INTRADETRUSOR ONABOTULINUMTOXINA FOR NON-CATHETERIZING MALES WITH NEUROGENIC DETRUSOR OVERACTIVITY
Alexandra Berger, Valary Raup, Graeme Steele, Elodi Dielubanza
Brigham and Women's Hospital, Boston, MA, USA
Presented By: Alexandra Berger, MD

Introduction: Intradetrusor OnabotulinumtoxinA (BTX-A) is an effective therapy for neurogenic detrusor overactivity (NDO). However, it may be underutilized in non-catheterizing male patients with NDO due to concern for urinary retention, as published rates of retention vary widely and have been established using cohorts which are majority female. We sought to describe the use and outcomes of BTX-A injections in real world cohort of non-catheterizing men with NDO.

Methods: We utilized the Research Patient Data Registry to identify male patients with NDO who underwent BTX-A injections at our institution between 2006-2018. Demographic and clinical data were recorded. Descriptive statistics, chi squared, and Wilcoxon rank sum tests were used for analysis.

Results: We identified 71 non-catheterizing men with NDO who underwent BTX-A, 38 (53.5%) with MS, 28 (39.4%) with PD, and 5 (7.0%) with another neurologic condition. Baseline AUA symptom scores were similar across groups. MS patients were significantly younger than all others. Pre-operative post-void residual urine volume (PVR) was available 63 patients (88.7%) with a median of 55mL (0-406). Patients with MS had higher baseline PVR than those with PD or other neurologic diagnosis (144.5 vs. 37 vs. 0, p=0.0018). The 100 unit dose was utilized in 52% and 200 unit dose in 42%, with no difference in dose distribution across groups. After BTX-A, the median PVR[BAJ1] was significantly higher 200mL[BAJ2] (p=0.0052[BAJ3] ). Urinary retention requiring catheterization occurred in 20 (28.2%), with 11 (15.5%) patients requiring long-term catheterization. Repeat BTX-A was performed in 29 patients (40.8%) at a median of 366 (range 70-2785) days[BAJ4] after initial treatment. The mean number of BTX-A treatments was 1.99 (1-10). Patients who required catheterization after BTX-A were less likely to have repeat injections (50.0% vs 20.0%, p=0.019). Neither dose nor disease type impacted urinary retention or repeat treatment.

Conclusion: In our series, intradetrusor BTX-A in non-catheterizing men with neurogenic detrusor activity was associated with at least transient urinary retention in <1/3rd of patients. Urinary retention was a predictor of treatment discontinuation. This therapy deserves further study in male populations.
**Table 1. Baseline and post-BTX-A characteristics.**

<table>
<thead>
<tr>
<th>Baseline characteristics.</th>
<th>Multiple Sclerosis (n=38)</th>
<th>Parkinson's Disease (n=28)</th>
<th>Other Neurologic Disease (n=5)</th>
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<tr>
<td>Age at first BTX-A</td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.0005</td>
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<tr>
<td>Mean (SE)</td>
<td>49.9 (1.9)</td>
<td>72.9 (1.8)</td>
<td>68.8 (3.6)</td>
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<td>PVR</td>
<td></td>
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<td>Median (range)</td>
<td>144.5 (0-406)</td>
<td>37 (0-268)</td>
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<tr>
<td>AUA symptom score</td>
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<tr>
<td>Score</td>
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<td>21.8 (1.7)</td>
<td>22 (1.0)</td>
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<td>Mean (SE)</td>
<td>22.1 (1.3)</td>
<td>21.8 (1.7)</td>
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<tr>
<td>Bother</td>
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<tr>
<td>Mean (SE)</td>
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<td>4.7 (0.38)</td>
<td>4.0 (0)</td>
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</table>

**BTX-A characteristics and results post-BTX-A.**

<table>
<thead>
<tr>
<th>Botox dosage</th>
<th>Multiple Sclerosis (n=38)</th>
<th>Parkinson's Disease (n=28)</th>
<th>Other Neurologic Disease (n=5)</th>
<th>p-value</th>
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<tbody>
<tr>
<td>100 units</td>
<td>15 (40.5%)</td>
<td>18 (64.3%)</td>
<td>5 (100%)</td>
<td>0.06</td>
</tr>
<tr>
<td>150 units</td>
<td>2 (5.4%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>200 units</td>
<td>20 (54.1%)</td>
<td>10 (35.7%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>PVR after BTX-A</td>
<td></td>
<td></td>
<td></td>
<td>0.11</td>
</tr>
<tr>
<td>Median (range)</td>
<td>200 (0-900)</td>
<td>87 (0-900)</td>
<td>135.5 (19-252)</td>
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</tr>
<tr>
<td>Number receiving repeat</td>
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<td></td>
<td>0.46</td>
</tr>
<tr>
<td>BTX-A</td>
<td>18 (47.4%)</td>
<td>9 (32.1%)</td>
<td>2 (40%)</td>
<td></td>
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<tr>
<td>Number of BTX-A treatments</td>
<td></td>
<td></td>
<td></td>
<td>0.12</td>
</tr>
<tr>
<td>Mean (SE)</td>
<td>2.3 (0.35)</td>
<td>1.5 (0.17)</td>
<td>1.8 (0.58)</td>
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**Funding:** N/A
Podium #14
ARE NEGATIVE URINE CULTURES NEEDED PRIOR TO URODYNAMIC STUDIES IN CHILDREN?
Patricia Maymi-Castrodad, Karina Escudero, Marcos Perez-Brayfield
University of Puerto Rico Medical Campus
Presented By: Patricia Nicole Maymi Castrodad, MD

Introduction: Traditionally, negative urine culture are required prior to urodynamic studies (UDS) to prevent urinary tract infections. Treatment of asymptomatic positive cultures can delay UDS. The 2019 AUA urologic procedure and antimicrobial prophylaxis guidelines state that UDS does not require pre urodynamics negative urine cultures in healthy adults in the absence of infectious signs and symptoms. We present our experience performing UDS regardless of the preprocedural urine cultures on our pediatric population.

Methods: We conducted a retrospective cohort study using our clinic's database on patients who underwent Video Urodynamic Studies (UDS) for 1 year from 2018 to 2019. A total of 43 patients underwent UDS. Information included age, sex, diagnosis, renal bladder sonogram, video-UDS impression, hydronephrosis, vesicoureteral reflux (VUR), urine culture, urinalysis, and voiding pattern. Positive urine cultures were defined as >100,000 colonies forming units/ml.

Results: We identified 43 patients who underwent UDS due to Myelomeningocele (55 %), Tethered cord (9%), Posterior urethral valves (7%), and other diagnosis (23%). Mean age was 6 years (1 month to 29 years old). Twenty of the patients performed clean intermittent catheterization (47%) and remaining voided spontaneously (53%). Renal sonograms showed hydronephrosis in 7 patients (16.2%). Twenty-two patients were male (51%) and twenty-one patients were female (49%).Fluoroscopy showed smooth bladder wall, no VUR and open bladder neck in 9.3%, and closed bladder neck in 32.5%, trabeculated bladder wall, no VUR and open bladder neck in 39.5%, closed bladder neck in 9.3%. VUR identified in 1 patient (2.3 %). On urinalysis, five patients had positive nitrates (12%) and six patients had positive leukocytes (14%). Of the 43 patients, 6 patients (14%) had positive urine cultures. All patients with positive urine cultures were on clean intermittent catheterization. All patients received post-procedure oral antibiotics. No significant post-procedure complications reported. No episodes of febrile UTI identified.

Conclusion: The risk of symptomatic UTI is minimal after urodynamic studies regardless of urine culture status. Our study included high-risk patient population and no patient developed post UDS complications with a preprocedural positive urine cultures. UDS should be considered a low-risk procedure for UTI, making it feasible to be performed without requiring negative urine cultures.

Funding: N/A
Podium #15
URODYNAMIC STAGEING AND GRADING OF MEN WITH SYMPTOMS OF LOWER URINARY TRACT DYSFUNCTION
Peter F.W.M. Rosier, MD PhD
Department of urology. University Medical Center Utrecht
Presented By: Peter Rosier, MD, PhD

Introduction: Urodynamic grading of bladder outflow obstruction (BOO) for elderly male with prostate enlargement is (ICS) standardized since 1997. Both flowrate (including PVR) and prostate size have an intermediate sensitivity and specificity with regard to the gold standard diagnosis. Symptoms have little discriminating potential.

Methods: We analysed 2459 men >45 year with bothersome LUTS. Urodynamic pressure flow test was done after ICS standard cystometry. Pressure flow result is shown per linearized passive urethral resistance class (LinPUR). Free flow study was performed in all patients just before the cystometry

Results: The graphs show (upper left) that for the total group of patients absence of BOO (combining OBS grade 0 1 and 2, vertical) with reduced contractility (combining very weak and weak contraction classes) was present in 37.7% of patients, in 34% of all patients contraction was normal or strong, and there was no BOO (< OBS 3). BOO was confirmed in 28.7% of all these men combined with weak contractility in 4.7%. BOO was severe (grade could OBS 5 or 6) in 3.3% of the patients.

If flowrate was <10mL/s (in 457 men), again, 38.7% of men had no BOO and weak contraction, and 22% of these men had no BOO and normal contraction. 39.2% of these men had BOO; 5.8% in combination with weak contraction and for 6.8% the BOO was graded severe. In the group with flowrate >14mL/s (338 men) only 3 had severe grade of BOO (1%) and 85.6% of these men had no BOO and 56.2% had normal contractility.

Conclusion: Patients with flowrate above 14mL/s rarely (14.4%) have BOO, seldom high graded (1%). If flowrate is <14mL/s ≈35% of the patients has BOO and DU. 71% of all patients would profit from conservative measures and expectative measures because no BOO is responsible for their symptoms, however >50% of these men without BOO has DU, for whom no specific treatment is available. 25.5% of all men could safely continue, or start with medical treatment based on a moderate grade of BOO.

Conclusion: Urodynamic stratification is helpful and would largely reduce unnecessary surgery in elderly men with lower urinary tract symptoms.

Funding: N/A
Podium #16
DO OVERNIGHT AMBULATORY URODYNAMICS CHANGE PATIENT MANAGEMENT AND IMPROVE SYMPTOMATIC OUTCOMES?
Richard Axell¹, Habiba Yasmin¹, Kristina Aleksejeva¹, Eskinder Solomon², Mahreen Pakzad¹, Rizwan Hamid¹, Jeremy Ockrim¹, Tamsin Greenwell¹
¹Female, Functional and Restorative Urology Unit, UCLH NHS Foundation Trust, UK, ²Dept of Urology, Guy’s and St Thomas' NHS Foundation Trust, UK
Presented By: Richard Axell, BEng, MSc, PhD

Introduction: Overnight ambulatory urodynamics (aUDS) is performed in patients with isolated nocturnal symptoms in whom simple or video urodynamics have been non-diagnostic. We aimed to determine if a urodynamic diagnosis of detrusor overactivity (DO) or urge urinary incontinence (UUI) on overnight ambulatory urodynamics resulted in a change in patient management and in urinary symptoms.

Methods: We reviewed the overnight ambulatory studies of 25 patients of median age 38 years (28% Male) whose most bothersome urinary symptoms were nocturia and/or nocturnal enuresis following non-diagnostic conventional urodynamics between November 1998 and August 2018. We determined if DO and UUI were demonstrated and assessed their urinary symptoms before ambulatory urodynamics and again after urological treatment following any changes in urodynamics diagnosis and subsequent treatment. A further 5 patients were excluded because follow-up data was not available. Statistical analysis was performed using a Fisher Exact test for non-parametric data.

Results: Twenty-four (96%) patients presented with nocturia and 20 (80%) also presented with nocturnal enuresis. DO was demonstrated in 19 (76%) patients (mean pressure 69.1 ± 53.3 cmH2O). UUI was demonstrated in 16 (80%) out of the 20 patients who also complained of nocturnal enuresis. Following overnight ambulatory urodynamics, a change in urodynamic diagnosis was made in 15 (79%) patients. 16 (84%) patients also had their clinical diagnosis and subsequent management changed. 15 (79%) patients reported an improvement in their urinary symptoms following these changes in diagnosis and treatment (Table 1).

Conclusion: Overnight ambulatory studies demonstrated DO in 76% of patients presenting with nocturia and UUI in 80% of patients presenting with nocturnal enuresis. Subsequent changes in clinical diagnosis and treatment pathway led to significant long-term symptomatic improvement in 79% of patients; 11/18 (61%) had a resolution of their nocturia and 11/15 (73%) had a resolution of their nocturnal enuresis.

Funding: N/A
Podium #17
DOES PREOPERATIVE URODYNAMICS IMPACT ON MANAGEMENT OF WOMEN WITH DETRUSOR UNDERACTIVITY CANDIDATED TO MIDDLE URETHRAL SLING FOR STRESS URINARY INCONTINENCE?
Emanuele Rubilotta, Dept of Urology1, Antonio D'Amico, Dept. of Urology1, Ester Illiano, Dept. of Andrology and urogyne2, Vito Mancini, Dept. of Urology renal trans3, Elisabetta Costantini, Dept. of Andrology and urogyne2, Frank Van der Aa, Dept. Urology4, Alessandro Antonelli, Dept of Urology1, Matteo Balzarro, Dept. of Urology1
1AOUI Verona, Verona, Italy, 2S. Maria Hospital, Terni, Univ of Perugia, Italy, 3Univ. of Foggia, Foggia, Italy, 4UZ, Leuven, Belgium
Presented By: Matteo Balzarro, MD

Introduction: To evaluate the impact of detrusor underactivity (DU) in a female population with stress urinary incontinence (SUI) candidate to middle urethral sling (MUS).
Methods: This was a multicenter prospective study started in October 2015 and still ongoing. Women with SUI, naïve for SUI surgery, candidate to MUS were evaluated. Exclusion criteria were: previous SUI surgery, associated pelvic organ prolapse, predominant urge urinary incontinence, previous pelvic surgery and/or radiotherapy, neurologic diseases. Population was divided in pts with DU (Group A) and women without DU as control group (Group B). All patients underwent pre-operative urodynamics (UDS). DU was defined by the stricter criteria reported in literature: Pdet/Qmax < 10 cmH2O and Qmax < 12 ml/sec (Gotoh M et al., Int J Urol 2006). Preoperative and 1-year follow-up evaluation included: free uroflowmetry (UFM), post void residual urine (PVR), PVR-ratio (PVR-R: ratio between bladder volume and PVR), the International Continence Index Questionnaire Urinary Female LUTS (ICIQ-FLUTS). Post-operative urinary retention (POUR) was defined as: PVR ≥200 ml in > 2 evaluations. Statistical tests used were: T student and Mann Whitney.
Results: Both the Groups had 34 patients, with similar demographic characteristics. POUR was detected in 35.3% (12/34) in Group A vs 8.8% (3/34) in Group B, and resolved in 3-30 days and in 7-20 days respectively. In both groups 5.9% (2/34) had a tape incision within one month of the first surgery. At 1 year f-up SUI recurrence and de-novo urgency were 5.9% and 11.8% in both groups respectively. Table 1 shows outcomes at 1 year f-up.
Conclusion: DU did not affect cure rate in women treated with MUS for SUI. Women with DU had four times higher early transient POUR with the same rate of resolution of the no-DU group. DU did not affect the re-operation rate for POUR. Preoperative urodynamics is useful to select patients with DU who are at higher risk of transient POUR and may need a tailored counseling and a preoperative teaching with intermittent catheterization. Thus, preoperative urodynamics diagnosis of DU may impact on pre and postoperative management.

Table 1. Outcomes at 1-year f-up.

<table>
<thead>
<tr>
<th>GROUP A</th>
<th></th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Qmax (ml/s)</td>
<td>Pre-op</td>
<td>Post-op</td>
</tr>
<tr>
<td>Mean</td>
<td>10.8</td>
<td>12.1</td>
</tr>
<tr>
<td>Mean PVR (ml)</td>
<td>21.7</td>
<td>53.2</td>
</tr>
<tr>
<td>Mean PVR-R (%)</td>
<td>19.8</td>
<td>17.2</td>
</tr>
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<td>Mean ICIQ-FLUTS</td>
<td>79.2</td>
<td>30.7</td>
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</table>

Funding: N/A
Podium #18  
SAME-DAY DISCHARGE SHOULD BE IMPLEMENTED AFTER MINIMALLY INVASIVE SACROCOLPOPEXY
Lisa Hickman¹, Cecile Ferrando¹, Howard Goldman², Katie Propst¹, Marie Fidela Paraiso⁴  
¹Center of Urogynecology and Pelvic Floor Disorders, Obstetrics/Gynecology and Women’s Health Institute at the Cleveland Clinic, ²Glickman Urologic and Kidney Institute at the Cleveland Clinic
Presented By: Lisa C. Hickman, MD

Introduction: Little research exists to support same-day discharge (SDD) after minimally-invasive sacrocolpopexy. The objectives of this study were to compare the incidence of adverse events and post-operative healthcare resource utilization, as well as to determine satisfaction in patients following a SDD protocol as compared to those discharged on post-operative day 1 (routine care).

Methods: This is a prospective cohort study of SDD after minimally-invasive sacrocolpopexy. Eligibility criteria included age <80 years, ASA grade I or II, caretaker present for at least 24 hours post-operatively, and surgical start before 1PM. All patients needed to meet routine post-operative milestones before SDD. Perioperative data (phone calls, unscheduled office visits, emergency department visits, hospital readmission and adverse events <=6 weeks) was obtained through the EMR and direct patient inquiry. A satisfaction survey was administered at the post-operative visit. A historical control group, who underwent sacrocolpopexy as part of a randomized trial, was utilized to compare outcomes.

Results: 47 women met eligibility criteria. Mean age was 62 (+/-9 years). The majority were Caucasian (95.7%), overweight (BMI 27.7+/-.5m/kg²), and had stage 3 prolapse (63.8%). SDD was achieved for 37 patients (78.7%). Indications for overnight observation included not meeting post-operative milestones (n=5), conversion to an open procedure (n=2), intraoperative bladder injury (n=2), and late case completion time (n=1). Patient characteristics of the SDD cohort were similar to the routine care cohort, with the exception of previous hysterectomy (57.5% vs 85.3%, p=0.001) and ASA score (2 [1-2] vs 2 [1-3], p=0.002). There were no significant differences in the number of post-operative phone calls, unscheduled office visits, emergency department visits, and hospital readmissions. Adverse events did not differ between the groups. The SDD cohort reported high satisfaction with their overall surgical experience. The majority of patients would recommend SDD to family/friends, independent of whether or not SDD was achieved (91.9% vs 80.0%, p=0.29)

Conclusion: Nearly 80% of women undergoing minimally-invasive sacrocolpopexy on a SDD protocol went home as planned. Compared to routine care, there was no increase in adverse events or post-operative healthcare resource utilization. Patient satisfaction in the SDD cohort was high regardless of whether or not SDD was achieved.

Funding: N/A
Podium #19
**A COST-EFFECTIVENESS ANALYSIS OF HYSTEROPEXY COMPARED TO VAGINAL HYSSTERECTOMY WITH APICAL SUSPENSION FOR THE TREATMENT OF PELVIC ORGAN PROLAPSE USING A VAGINAL APPROACH**

Raveen Syan¹, Shannon Wallace², Kyueun Lee³, Eric Sokol²
¹University of Miami Department of Urology, ²Stanford University Department of Urogynecology, ³Stanford University

Presented By: Shannon Leigh Wallace, MD

**Introduction:** Hysteropexy (HP) for treatment of uterine/apical prolapse via a vaginal approach has recently been shown to have equivalent medium-term efficacy compared to traditional vaginal hysterectomy (VH) with apical suspension (sacrospinous ligament or uterosacral ligament suspension), though each confers different risks and costs. Costs between uterine-sparing and traditional prolapse repair have not been compared. Our objective was to perform a cost-effectiveness analysis of HP compared to VH with vaginal suspension for treatment of uterine prolapse.

**Methods:** Utilizing TreeAge® software, we created a decision model tree comparing the cost-effectiveness of four surgical options: HP with sacrospinous ligament fixation (HP-SS), HP with uterosacral ligament suspension (HP-US), VH with sacrospinous ligament suspension (VH-SS), and VH with uterosacral ligament suspension (VH-US). Recurrence rates, repeat surgery for surgical failures and complication rates associated with each surgery were modeled. Parameter values were modeled using published Health Utility Indices, including baseline uterine prolapse (0.83), repeat surgery for recurrent prolapse (0.75), GU injury (0.75), dyspareunia (0.90), neuropathy (0.66), and transfusion (0.76). Cost data was derived from Stanford Hospital costs billed to insurance providers, including HP-SS $41,637.33, HP-US $41,466.00, VH-SS $50,258.00, and VH-US $50,258.00. Cost-effectiveness was defined as an incremental cost-effectiveness ratio (ICER) of < $50,000 per quality-adjusted life year (QALY). Base-case, threshold and 2-way sensitivity analyses were performed.

**Results:** HP-SS was the most cost-effective strategy, where incremental cost of HP-US was $1,096.21, VH-SS was $7,681.34 and VH-US was $8,775.98. With QALY measures similar between surgical options, the VH-SS and VH-US were dominated strategies (Figure 1A). VH strategies become cost-effective when cost of HP-SS exceeds $52,500 and HP-US exceeds $49,500. VH strategies also become cost-effective when recurrence rates of hysteropexy exceed 30% with a repeat surgery rate >60%, or with recurrence >40% and repeat surgery rate >40% (Figure 1B).

**Conclusion:** The most cost-effective surgical strategy for management of uterine prolapse via a vaginal approach is SS-HP. Sacrospinous strategies are favored over uterosacral strategies due to the high costs associated with GU injury, despite low occurrence rates. Though long-term results following hysteropexy are needed to confirm recurrence rates and efficacy, our study suggests that even at high rates of recurrence, hysteropexy is the most cost-effective surgical approach.
**Figure 1:** a) ICER table for four surgical options (HP-SS, HP-US, VH-SS, VH-US); b) 1-Way Sensitivity Analysis Varying Recurrent Vaginal Prolapse After Hysterectomy and Repair Surgery Following Hysterectomy Failure

<table>
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<th>Strategy</th>
<th>Cost</th>
<th>Incremental Cost</th>
<th>Effectiveness (QALY)</th>
<th>Incremental Effectiveness (QALY)</th>
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<td>$8,775.98</td>
<td>0.83</td>
<td>-0.00</td>
<td>$1,962,608.51</td>
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**Funding:** N/A
Podium #20
PERIOPERATIVE COMPLICATIONS OF SURGERY FOR PELVIC ORGAN PROLAPSE IN THE ELDERLY AND FRAIL
Graham Chapman, MD\textsuperscript{1,2}, Emily Slopnick, MD\textsuperscript{1,2}, Kasey Roberts, MD\textsuperscript{1,2}, Sangeeta Mahajan, MD\textsuperscript{1,2}, Susan Wherley, MD\textsuperscript{1,2}, Adonis Hijaz, MD\textsuperscript{1,2}
\textsuperscript{1}Case Western Reserve University, \textsuperscript{2}University Hospitals Cleveland Medical Center
Presented By: Graham Chapman, MD

Introduction: The elderly are one of the fastest growing populations worldwide, and the number of older patients seeking surgical care for pelvic organ prolapse continues to increase. We sought to evaluate the impact of old age and frailty on 30-day complication rates following surgery for prolapse.

Methods: The American College of Surgeons' National Surgical Quality Improvement Program (NSQIP) database was used to identify patients who underwent surgery for prolapse from 2010 to 2017. Patients were stratified by age. We compared our control group (45-64 years, index population) to those aged 65-79 (elderly) and $\geq$80 (very elderly). Frailty was assessed using the NSQIP modified frailty index-5. The primary outcome was the composite rate of serious complications and mortality.

Results: Of all included patients, 27,403 were in the index population, 20,567 were elderly, and 3,088 were very elderly. Patients in the elderly and very elderly groups had lower BMI, were less likely to smoke, less likely to be independent, had more medical comorbidities, and underwent less invasive surgery (all p<0.001). The frailty rate was 7.2% in the index population, compared to 14.5% in the elderly and 16.8% in the very elderly (both p<0.001). The composite rate of serious complications in the index population was 4.5%, compared to 4.7% in the elderly (p=0.4), and 9.0% in the very elderly (OR 2.1, 1.8-2.4, p<0.001). Compared to the index group, the very elderly had notably elevated risks of cardiac complications (OR 11.9, 6.2-23.0), stroke (OR 26.6, 5.4-131.8), and mortality (OR 39.9, 8.6-184.7) (all p<0.001). On multivariate logistic regression, the only age group independently associated with serious complications was the very elderly (OR 2.02, 1.5-2.7, p<0.001). Frailty was also predictive of complications (aOR 1.4, 1.02-1.9, p=0.04). When analyzing frail-patients only, the composite complication rate was 5.1% in the index population, compared to 6.7% in the elderly (p=0.09), and 11.2% in the very elderly (OR 2.3, 1.7-3.3, p<0.001).

Conclusion: Complication rates surrounding surgery for pelvic organ prolapse increase substantially in the cohort of patients over the age of 80, independent of medical or surgical risk factors. While frailty is associated with complications, very old age appears to be a stronger predictor in this population.

Figure 1. Composite complication rate by age

Funding: N/A
Podium #21
TRENDS IN MANAGEMENT OF COMBINED RECTAL AND VAGINAL PELVIC ORGAN PROLAPSE
Jacqueline Speed¹, Chiyuan Zhang¹, Brooke Gurland², Ekene Enemchukwu¹
¹Stanford University School of Medicine, Department of Urology, ²Stanford University School of Medicine, Department of Surgery
Presented By: Jacqueline M. Speed, MD

Introduction: The prevalence of concomitant rectal prolapse (RP) and pelvic organ prolapse (POP) is not well described in the literature. Studies suggest that a multidisciplinary approach to management is superior to uncoordinated care. However, the rate of concurrent repair is unknown. Our aim was to estimate the prevalence of comorbid RP and POP and evaluate the rates of concomitant surgical repair.

Methods: We queried Optum®, a national administrative claims database, between 2003-2017. We evaluated female patients over age 18 with a diagnosis of vaginal and/or rectal prolapse. Sociodemographic characteristics, comorbidities, and rates of concomitant repair were collected and analyzed.

Results: We identified 481,051 women with rectal and/or vaginal prolapse. The mean age was 61.3±15 years old. Overall, only 2% (n=9528) of women with any prolapse diagnosis had dual prolapse. While 30% of women with RP had dual prolapse, only 2% of women with POP had both diagnoses. Women with dual prolapse were more likely to be White, older (66.2 ±14.8), and smokers, but less likely to be obese. Women with RP alone and comorbid RP + POP had higher rates of constipation (20%) and COPD (10-12%) as compared to women with POP alone (7.3% and 6.8%, respectively; p<0.01).
Overall, 124,246 (25.8%) women had one or more surgical repairs. While 26% of women with VP and 19% of women with RP underwent surgical repair, only 10% of women with a VP + POP diagnosis had a surgical repair. Interestingly, 60.5% of these dual prolapse repairs were performed concomitantly. Over time, the rate of concomitant surgical repairs has increased significantly (p<0.05). In 2017, 71% of operations for dual prolapse were performed concomitantly, while only 48% were performed concurrently in 2007.

Conclusion: The prevalence of comorbid rectal and vaginal prolapse among women in our cohort is low (2%). 30% of women with RP had a dual prolapse diagnosis. Rates of multidisciplinary surgical management have increased significantly over the past decade. However, women with dual prolapse appear to undergo surgical repair at lower rates than women with RP or POP alone. The cause is unknown but may reflect differences in comorbidities or poor screening and coordination of care. Further studies are needed.
Figure 1. Rates of Prolapse repair over time

Funding: N/A
Podium #22
COMPARISON OF MAGNETIC RESONANCE DEFECOGRAPHY GRADING WITH POP-Q STAGING AND BADEN-WALKER GRADING IN THE EVALUATION OF FEMALE PELVIC ORGAN PROLAPSE
Grant Pollock, MD1, Hina Arif Tiwari, MD2, Stephane Chartier, BS3, Srinivasan Vedantham, PhD2, Joel Funk, MD1, Christian Twiss, MD1
1University of Arizona, Department of Urology, Tucson, AZ, 2University of Arizona, Department of Medical Imaging, 3Midwestern University
Presented By: Grant R. Pollock, MD

Introduction: The objective of this study was to compare grading of prolapse on defecography phase of dynamic magnetic resonance imaging (dMRI) with physical examination (PE) using both the Pelvic Organ Prolapse Quantification (POP-Q) staging and Baden-Walker (BW) grading systems in the evaluation of pelvic organ prolapse (POP).

Methods: We retrospectively reviewed the charts of 170 patients who underwent dMRI at our institution. BW grading and POP-Q staging metrics were collected for anterior, apical, and posterior compartments, along with absolute dMRI values and overall dMRI grade. Patients with incomplete data were excluded. For the overall grading/staging from dMRI, BW, and POP-Q, Spearman rho (ρ) was used to assess the correlation. The correlations between dMRI grading and POP-Q staging were compared to the correlations between dMRI grading and BW grading using Fisher’s Z transformation.

Results: A total of 54 patients had all required data. The overall BW grade and the overall POP-Q stage showed a significant (p=0.004) and positive correlation (ρ= 0.386) with one another. However, dMRI grading was not significantly correlated with BW grading for anterior, apical, and posterior compartment prolapse (p>0.15). Additionally, overall dMRI grading demonstrated a significant (p=0.025) and positive correlation (ρ=0.305) with the POP-Q staging system. dMRI grading for anterior compartment prolapse also demonstrated a positive correlation (p=0.001, ρ= 0.436) with the POP-Q staging derived from measurement locations Aa and Ba. Finally, the overall dMRI grade is better correlated with POP-Q stage than with BW grade (p=0.024).

Conclusion: Overall and anterior compartment dMRI grade demonstrated a significant and positive correlation with overall POP-Q stage and anterior compartment POP-Q stage, respectively. The overall dMRI grade is better correlated with the POP-Q stage than with the BW grade. These results provide objective evidence that the POP-Q staging system is a more accurate and less subjective physical exam system than the BW grading system.

Funding: N/A
Podium #23

DOES PRE-OPERATIVE BLADDER COMPLIANCE IMPACT RENAL FUNCTION AFTER INCONTINENT URINARY DIVERSION FOR BENIGN INDICATIONS?

Alyssa Greiman, MD, Minsoo Choo, MD, Paholo Barboglio Romo, MD, Bahaa S. Malaeb, MD, Anne P. Cameron, MD, J. Quentin Clemens, MD, John T. Stoffel, MD

Department of Urology, University of Michigan, Ann Arbor, MI, USA.

Presented By: Alyssa Kay Greiman, MD

Introduction: We investigated whether low bladder compliance prior to urinary diversion for benign indications would impact renal function over time compared to patients with normal compliance.

Methods: We retrospectively reviewed 235 consecutive urinary diversion surgeries from 2007 to 2018. Inclusion criteria were pre-operative urodynamics and greater than 1 year of follow-up including assessment of renal function with serum creatinine. Low bladder compliance was defined as less than or equal to 12 ml/cm H2O on urodynamics. Patients were considered to have a decline in renal function if they had a serum creatinine rise of 25% or more during follow up.

Results: Of the 49 patients who met our inclusion criteria, the most common diagnoses were: radiation cystitis (22.4%), iatrogenic injury (18.4%), spinal cord injury (16.3%), multiple sclerosis (10.2%), and interstitial cystitis (8.2%). 55.1% of patients had abnormal bladder compliance. Those who had abnormal compliance were more likely to have a diagnosis of neurogenic bladder (p = 0.002) and vesicoureteral reflux (p =0.02). There was no other difference in baseline demographics based on compliance including: age, gender, BMI, smoking status, diabetes, pre-operative radiation, or pre-operative serum creatinine. The average follow-up was four years (range 1-11 years). Mean serum creatinine before surgery was 0.84 (0.3-1.49). Mean serum creatinine at year 1 was 0.85, year 2 was 0.92, year 3 was 0.99, year 4 was 0.89, and year 5 was 0.67 (p >0.24). Seven patients (14.3%) had a 25% or greater decline in renal function during follow up. There was a trend towards patients with abnormal compliance having a higher risk of decline in renal function compared to normal compliance (22.2% versus 4.5%, p = 0.07). Additionally, patients with post-operative hydronephrosis were more likely to have a decline in renal function (85.7% versus 31%, p = 0.006). There were no other predictors of >25% change renal function including: age, gender, smoking status, diabetes, pre-operative radiation, history of vesicoureteral reflux, or post-operative reoperations.

Conclusion: Renal function is generally stable after urinary diversion for benign indications, however patients with poor bladder compliance pre-operatively and hydronephrosis on post-operative imaging are at increased risk of declining renal function over time. We recommend close follow-up in these patients.

Funding: NA
Podium #24
PROSPECTIVE RANDOMIZED COMPARISON OF LONG-ACTING LIPOSOMAL BUPIVACAINE (EXPAREL) VERSUS STANDARD BUPIVACAINE (MARCANE) FOR PAIN CONTROL FOLLOWING VAGINAL RECONSTRUCTIVE SURGERY
Akin S. Amasyali, Ashley Feldkamp, Jason Groegler, Phillip K. Stokes, Muhannad Alsyouf, Ruth Belay, John Maldonado, Julie W. Cheng, Hillary J. Wagner, D.Duane Baldwin, Andrea Staack
Loma Linda University, Dept. of Urology
Presented By: Akin Soner Amasyali

Introduction: Perioperative pain and the narcotics traditionally used to treat this pain, may increase patient morbidity, prolong hospital stays and increase health care costs. Liposomal bupivacaine (Exparel) is a depo formulation of bupivacaine which releases the drug over 72 hours to prolong local pain control. The purpose of this study was to compare the effect of using Exparel compared with standard bupivacaine (Marcaine) on both objective and subjective measures of postoperative pain control among patients undergoing vaginal reconstructive surgery.

Methods: In this prospective, randomized study, the primary outcomes included postoperative narcotic use and subjective pain score. The secondary outcome was the ability of patients to go home the day of surgery. Patients undergoing harvest and placement of rectus fascia sling (RFS) or levator plasty (LP) were randomized to receive injection of 20 cc of either Marcaine or Exparel into the fascia (RFS) or as a pudendal nerve block (LP). Postoperative narcotic use was quantified using morphine equivalent dose (MED) and pain was measured using the Brief Pain Inventory on postoperative days one and two. Comparisons between groups were performed using the Mann Whitney U and Chi-square tests with p<0.05 considered significant.

Results: Between January 2016 and September 2019, 45 patients were enrolled; 24 in the Marcaine group and 21 in the Exparel group. Within the cohort, 55.6% underwent LP, 42.2% underwent RFS, and 2.2% had both operations concurrently. Demographics between groups were similar except that the Marcaine group were significantly older (67.5±11.1 vs. 58.4±12.1 years, p=0.015) (Table 1). Mean operation time (2.3±0.8 vs. 2.3±0.7 hours, p=0.873) and estimated blood loss (89.1±46.5 vs 89.7±64.2 ml, p=0.438) were comparable between groups. No complications were recorded in all surgeries. There was no difference between postoperative MED (7.2±5.4 vs. 9.7±7.4 MED; p=0.309) in the recovery room. Length of hospital stay was similar between groups (20.0±13.0 hours in the Marcaine group, and 17.6±18.9 hours in the Exparel group; p=0.159). Furthermore, subjective pain was also similar between groups (6.3±2.5 vs. 7.3±2.1 p=0.284).

Conclusion: Exparel is not superior to Marcaine for controlling pain following vaginal reconstructive surgery. Further prospective investigations with larger sample size are needed to determine the optimal pain management for vaginal reconstructive surgery.
Funding: N/A
Podium #25
AUGMENT FOR WHAT? ENTEROCYSTOPLASTY IN MODERN UROLOGICAL PRACTICE AND 30-DAY OUTCOMES USING A LARGE MULTI-CENTRED DATABASE
James Ross, MD1, Humberto Vigil, MD, MSc1, Conrad Maciejewski, MD, MSc1, Blayne Welk, MD, MSc2, Ranjeeta Mallick, PhD, MSc3, Duane Hickling, MD, MSc1,3
1University of Ottawa, Ottawa, ON, 2Western University, London, ON, 3The Ottawa Hospital Research Institute
Presented By: James Ross, MD

Introduction: Enterocystoplasty (ECP) is a surgical procedure that can improve bladder capacity and compliance. Rates of ECP in developed countries have decreased significantly secondary to the uptake of less invasive management options such as bladder chemodenervation. Nevertheless, ECP remains a viable surgical option that, in certain patients, is paramount. This objective of this study is to provide an overview of ECP in modern urological practice as well as to analyse short-term post-operative outcomes using a large multi-centred database.

Methods: The American College of Surgeons National Surgical Quality Improvement Program database (ACS-NSQIP) was used to examine all patients who underwent ECP with or without appendicovesicostomy between January 2006 and December 2017. Basic demographic and pre-operative variables were collected. Operative variables, including number of additional surgical procedures performed at time of ECP were also collected. Post-operative outcomes within 30-days were analyzed. A composite outcome of any 30-day complication was used as the primary outcome for a univariable and multivariable regression model.

Results: One-hundred and seventy-two patients underwent ECP during the study period. Of these, 19 patients (11%) also underwent appendicovesicostomy. Mean age was 54 years and 98 (57%) were male. The most common pre-operative diagnosis was neurogenic bladder in 54%. Mean operating time was 380 minutes and mean length of stay in hospital was 8.7 days. Forty nine percent underwent at least one additional procedure at the time of ECP. Overall complication rate was 40.7%. The most common complications were bleeding requiring transfusion (14.5%), wound infection (13.9%), and urinary tract infection (8.7%). Age > 60 years, BMI > 35kg/m2, diabetes, and >/= 4 additional surgical procedures at time of ECP were associated with increased risk of complication (p < 0.05). Appendicovesicostomy at time of ECP was not associated with increase complications. There were no deaths recorded.

Conclusion: Enterocystoplasty is associated with a high rate of post-operative complication. Specific patient factors including age, BMI, and diabetes are associated with increased post-operative morbidity. Enterocystoplasty remains part of the urologic surgical armamentarium. Patients must be well selected and appropriately counselled regarding the high morbidity associated with this operation.

Funding: N/A
Podium #26
SHOULD PROPHYLACTIC STRESS URINARY INCONTINENCE PROCEDURES BE PERFORMED DURING URETHRAL DIVERTICULUM REPAIR?
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¹U.T. Southwestern Medical Center, Urology, ²U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center
Presented By: Jacqueline Chavez, BS

Introduction: To review the rates of de novo SUI following urethral diverticulum (UD) repairs performed without concomitant SUI procedures.

Methods: Following IRB approval, charts of women who underwent UD excision by three FPMRS surgeons at one tertiary care center were reviewed. Excluded were women who lacked detailed preoperative, surgical, or follow-up information. Data collected from the electronic medical record included demographic information, preoperative data including symptom presentation and evaluation (urodynamics, imaging), operative details, post-operative symptoms, and subsequent surgical interventions. UD diagnosis was confirmed by pre-operative MRI. Success was defined as complete resolution of UD on post-operative MRI. The rates of secondary SUI requiring later surgical repair were analyzed among those that did not undergo a concomitant SUI procedure.

Results: From 1998-2018, 87 women with a median age 52 (IQR 44-66) years underwent UD excision. Excluded were 25 due to incomplete or missing chart and/or follow-up information. UD configuration was unilateral (35), horseshoe (22), or circumferential (5). Pre-operative urodynamic study was obtained in 6 patients in diagnostic workup for urinary incontinence prior to the UD detection. During surgical repair, 2 patients (UDs located circumferentially and on the right-side) required an additional autologous fascial sling and 2 a Martius flap interposition (UDs located on the right side in both). Those with prior UD repair were more likely to have previously undergone mid-urethral sling placement or removal (P < 0.05), but there were no significant differences between prior UD repair and other previous procedures or surgical characteristics (Table 1). Of 38 followed beyond 3 months with a median follow-up of 12 months, secondary SUI occurred in 3 (8%), with only 1 patient requiring autologous fascial sling placement for SUI. Urinary tract infections and dyspareunia when present pre-operatively resolved in 77% and 93%, respectively.

Conclusion: This contemporary series indicates a limited role for pre-operative urodynamic testing even in women with complaints of pseudo-incontinence at baseline and infrequent indications for concomitant SUI repair at time of UD excision.
# Table 1. Surgical characteristics by prior UD

<table>
<thead>
<tr>
<th></th>
<th>No prior UD repair</th>
<th>Prior UD Repair</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 52)</td>
<td>(n = 10)</td>
<td></td>
</tr>
<tr>
<td>Median age, years (IQR)</td>
<td>51.5 (44, 62.5)</td>
<td>57.5 (36, 64)</td>
<td>0.92</td>
</tr>
<tr>
<td>Prior SUI</td>
<td>20 (42%)</td>
<td>6 (60%)</td>
<td>0.32</td>
</tr>
<tr>
<td>Prior dilation</td>
<td>4 (8%)</td>
<td>1 (10%)</td>
<td>1</td>
</tr>
<tr>
<td>Prior sling removal</td>
<td>0 (0%)</td>
<td>2 (20%)</td>
<td>0.027</td>
</tr>
<tr>
<td>Prior sling placement</td>
<td>4 (8%)</td>
<td>4 (40%)</td>
<td>0.024</td>
</tr>
<tr>
<td>Prior bulking agent</td>
<td>2 (4%)</td>
<td>1 (10%)</td>
<td>0.44</td>
</tr>
<tr>
<td>Prior bladder neck suspension</td>
<td>2 (4%)</td>
<td>2 (20%)</td>
<td>0.13</td>
</tr>
<tr>
<td>Prior prolapse repair</td>
<td>2 (4%)</td>
<td>2 (20%)</td>
<td>0.13</td>
</tr>
<tr>
<td>Median UD size, cm$^3$ (IQR)</td>
<td>4.5 (1.5, 10.6)</td>
<td>3.4 (1.3, 7.2)</td>
<td>0.73</td>
</tr>
<tr>
<td>Urethral reconstruction</td>
<td>21 (45%)</td>
<td>3 (33%)</td>
<td>0.72</td>
</tr>
<tr>
<td>Tissue interposition</td>
<td>2 (5%)</td>
<td>0 (0%)</td>
<td>1</td>
</tr>
<tr>
<td>Sling placed</td>
<td>1 (2%)</td>
<td>1 (11%)</td>
<td>0.31</td>
</tr>
<tr>
<td>Sling removed</td>
<td>4 (9%)</td>
<td>2 (22%)</td>
<td>0.27</td>
</tr>
<tr>
<td>Median surgery time, hours (IQR)</td>
<td>3.8 (3, 4)</td>
<td>4 (3, 4)</td>
<td>0.80</td>
</tr>
<tr>
<td>Median EBL (IQR)</td>
<td>50 (50, 100)</td>
<td>100 (50, 100)</td>
<td>0.71</td>
</tr>
<tr>
<td>Outcome</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure</td>
<td>5 (12%)</td>
<td>1 (13%)</td>
<td>1</td>
</tr>
<tr>
<td>Success</td>
<td>36 (88%)</td>
<td>7 (88%)</td>
<td></td>
</tr>
</tbody>
</table>

**Funding:** N/A
Podium #27

EFFECT OF PERCUTANEOUS TIBIAL NEUROMODULATION WITH THE NURO SYSTEM ON BRAIN ACTIVITY

Justina Tam1, Kenneth Wengler2, Kwan Chen3, Chencan Zhu4, Jie Yang5, Xiang He3, Jason Kim1, Steven Weissbart1

1Stony Brook Medicine, Dept of Urology, 2Columbia University, New York State Psychiatric Institute, 3Stony Brook Medicine, Dept of Radiology, 4Stony Brook University, Dept of Applied Mathematics and Statistics, 5Stony Brook Medicine, Dept of Family, Population and Preventive Medicine

Presented By: Justina Tam, MD

Introduction: Overactive bladder (OAB) affects 15% of women, and is associated with dramatic impairment to quality of life. Many fail first line oral medical therapy and do not have success when a different oral therapy is tried. Therefore, third line therapies, such as neuromodulation, play a crucial role in the care pathway of women with OAB. Percutaneous tibial neuromodulation (PTNM) is a third line therapy with proven efficacy. However, its mechanism of action is poorly understood. In this study, we use functional neuroimaging to investigate and quantify brain activity changes that may result from PTNM treatment.

Methods: We performed a prospective case-control study of 13 women without bladder pathology and 12 women with refractory OAB. All participants received an fMRI exam while their bladders were filled via a catheter at a rate of 50ml/minute. Images were obtained at pre-determined bladder volumes. Subjects were instructed to indicate when they experienced the first sensation of bladder filling, first desire to void, and strong desire to void. Patients with OAB then received a PTNM treatment using the NURO™ system and a repeat fMRI series with bladder filling. For imaging, we used arterial spin labeling fMRI, which quantifies cerebral blood flow (CBF) and serves as a proxy for brain activity. Linear mixed models for repeated measurements were used to examine the differences in brain activity in pre-specified brain regions at specific levels of bladder sensation between healthy controls and patients with OAB.

Results: Patients in the OAB group were older (51 vs 24 years, p=0.007) and had higher BMI (30.3vs 24.9, p=0.0414). They reported worse voiding symptoms based on validated questionnaires including OABq, ICIQ-FLUTS, CRAD8, and UDI6 (all p<0.015). Compared to healthy controls, patients with OAB demonstrated significant differences in cerebral perfusion during bladder filling in the insula, supplemental motor cortex, anterior cingulate cortex, middle cingulate cortex, and the dorsolateral pre-frontal cortex. After treatment with PTNS there was a significant reversal in these differences seen in the anterior cingulate cortex, insula, and supplemental motor area.

Conclusion: Our study identified brain regions where activity changes after a single PTNM treatment. Future research is needed to assess how brain activity changes with longer term PTNM therapy.
Funding: SUFU Neuromodulation Grant 2016
Podium #28
INTERIM PIVOTAL STUDY EFFECTIVENESS DATA OF A COIN-SIZED TIBIAL NERVE STIMULATOR FOR URGENCY URINARY INCONTINENCE
Alexandra Rogers, MD1, Rebecca McCrery, MD2, Scott MacDiarmid, MD3, Subhro Sen, MD4, James Lukban, DO5, Bilal Kaaki, MD6, Andrew Shapiro, MD7, Thomas Giudice, MD8, John Nguyen, MD9, Joseph Gauta, MD10, Scott Serels, MD11, Chris Threatt, MD12, Jed Kaminetsky, MD13, Vincent Lucente, MD14, Sonia Dutta, MD15, Peter Sand, MD15, Kimberly Ferrante, MD16
1Sansum Clinic, 2Adult/Pediatric Urology Urogynecology, 3Alliance Urology, 4Stanford University Medical School, 5Colorado Pelvic Floor Consultants, 6Allen Memorial Hospital, 7Chesapeake Urology, 8South Carolina Ob/Gyn, 9CPMG, 10Florida Bladder Institute, 11Urology Associates of Norwalk, 12Sequoia Urology Center, 13Manhattan Medical Research, 14The Institute for Female Pelvic Medicine, 15Evanston Continence Center, NorthShore University HealthSystem, 16Kaiser Permanente San Diego
Presented By: Alexandra E. Rogers, MD

Introduction: Percutaneous tibial nerve stimulation is approved to treat overactive bladder syndrome. Therapy drawbacks include high burden to both patient and provider due to frequent office visits which limit long-term maintenance. This study evaluated a subcutaneously implanted coin-sized tibial nerve stimulator (eCoin) for the treatment of urgency urinary incontinence (UUI). We aim to report on safety and efficacy after 12 weeks.

Methods: The eCoin-2 trial is a pivotal prospective, single-arm study evaluating the safety and efficacy of the study device for treating UUI. The primary efficacy variable is the proportion of subjects achieving >50% improvement in UUI episodes on a 3-day voiding diary. Secondary outcomes include 3-day voiding diary data. We included men and women ages 18-80 having at least one daily UUI episode on a 3-day voiding diary with intolerance or inadequate response to second or third-line therapy. Subjects previously treated with sacral nerve stimulation were ineligible. Transcutaneous nerve stimulation (TENS) was performed daily for 1 week prior to implantation.

The leadless, primary battery-powered eCoin device is slightly larger than a United States nickel and is implanted subcutaneously in the medial lower leg during an office procedure under local anesthesia. The eCoin delivers automated therapy every 3-4 days.

Paired t-tests were used to compare continuous variables between baseline and 12 weeks with differences reported with 95% confidence intervals.

Results: Of 117 subjects, 116 are female with a mean age of 64.1(+10.7). At 12 weeks post-activation, 84 subjects (72%) achieved at least 50% reduction in UUI episodes. At baseline, subjects had a mean of 13.1 (+9.4) UUI leaks and 31.2 (+9.7) voids on a 3-day voiding diary. At 12 weeks post activation, subjects improved significantly on all measures: UUI leaks were reduced by 8.5 (+8.5) (p<0.001, 95%CI (6.9,10.0)) and voids/day reduced by 3.6 (+7.0) (p<0.001, 95%CI (2.3,4.9)). In the full cohort and TENS responder cohort (n=73), 29% and 40% were dry respectively. There was one related serious adverse event, an infection resolved by device explant.

Conclusion: The interim data show eCoin was safe and effective in treating UUI. We anticipate reporting on medium-term outcomes as the study progresses, shedding further light on the promise of tibial nerve stimulation.

Funding: Valencia Technologies
Podium #29
ONE-YEAR OUTCOMES FOR THE TREATMENT OF URINARY URGENCY INCONTINENCE WITH A MINIATURIZED, RECHARGEABLE SACRAL NEUROMODULATION SYSTEM
Kevin Benson, MD1, Rebecca McCrery, MD2, Chris Taylor, MD3, Osvaldo Padron, MD4, Bertil Blok, MD5, Stefan De Wachter, MD6, Andrea Pezzella, MD7, Howard B. Goldman, MD8, Felicia Lane, MD9
1 Sanford Hospital, Sioux Falls, South Dakota, 2 Adult Pediatric Urology Urogynecology, Omaha, Nebraska, 3 Taylor Surgical Arts, Harrison, Arkansas, 4 Florida Urology Partners, Tampa, Florida, 5 Department of Urology, Erasmus MC, Rotterdam, The Netherlands, 6 Department of Urology, University Hospital Antwerpen, Edegem, Belgium, 7 Southern Urogynecology, West Columbia, South Carolina, 8 Cleveland Clinic, Cleveland, Ohio, 9 University of California, Irvine, California
Presented By: Kevin D. Benson, MD, MS

Introduction: The Axonics® System is a miniaturized sacral neuromodulation (SNM) System qualified to function for at least 15 years in the body and approval for patients to undergo conditional full-body MRI scans. The Axonics System is expected to reduce or eliminate the patient risks and costs which result from the frequent replacement surgeries associated with a non-rechargeable SNM system. The ARTISAN-SNM study is a pivotal study, designed to evaluate the safety and effectiveness of the Axonics System for treatment of urinary urgency incontinence. Clinical outcomes at 1 year are presented.

Methods: 129 participants with urinary urgency incontinence (UUI) across 19 centers in the US and Europe were implanted with the Axonics System in a single, non-staged procedure. Efficacy data was collected using a 3-day bladder diary, a validated quality of life questionnaire (ICIQ-OABqol), and a participant satisfaction questionnaire. Therapy responders were identified as participants with ≥50% reduction in urgency leaks compared to baseline. An as-treated analysis was performed in all implanted participants.

Results: At 1 year, 89% of all implanted participants were therapy responders (p<0.0001, Fig 1A). UUI episodes per day reduced from 5.6 ± 0.3 (average ± standard error) at baseline to 1.4 ± 0.2 (p<0.0001; Fig 1B). Of the responders, 77% had ≥75% reduction in UUI episodes and 29% were dry. As compared to baseline, ICIQ-OABqol scores improved by 34 points, which is clinically and statistically significant (p<0.0001). Ninety six percent (96%) of participants responded that the recharging duration and frequency was acceptable, and 93% were satisfied with their SNM therapy. No serious device-related adverse events have been reported. Revisions and device-related explants occurred in approximately 3% patients.

Conclusion: The Axonics System showed sustained safety and efficacy at 1 year for treatment of UUI. Patients reported that recharging frequency and duration of their SNM system was acceptable.

Funding: Axonics Modulation Technologies
Podium #30
MRI CONNECTIVITY ANALYSIS PROVIDES EVIDENCE OF CNS MODE OF ACTION FOR PARASACRAL TENS- A PILOT STUDY
Jose Murillo Netto, Dept of Urology¹, Dustin Scheinost, Dept of Bioimaging and Radiol², John Onofrey, Dept of Urology², Israel Franco, Dept of Urology²
¹Universidade Federal de Juiz de Fora (UFJF), Juiz de Fora, Brazil, ²Yale School of Medicine
Presented By: Israel Franco, MD

Introduction: Parasacral transcutaneous electrical nerve stimulation (pTENS) is a common treatment modality for patients with overactive bladder (OAB). Its mechanism of effectiveness has yet to be fully elucidated. Recent work with fMRI in adults with implanted sacral nerve stimulators imputes its effectiveness on changes in the brain involving the frontal areas. No prior studies have utilized sham stimulation to verify that the location of electrical stimulation is specific to the Frontal lobes.

Aim: Our aim was to evaluate MRI functional connectivity analysis to define where in the brain pTENS produces its effects utilizing a sham control stimulation.

Methods: 10 adult volunteers without urinary tract symptoms as assessed by OABSS questionnaire underwent fMRI. Electrodes were placed on skin at sacral level (S2) (pTENS) and on the right scapular region (Sham Stimulation - sTENS). Stimulation was done in each site for 6 minutes at a frequency of 10 Hz and pulse width of 200 μs and intensity determined by the motor threshold. A 6 minutes resting state fMRI was also done as control. Functional connectivity data was acquired during each state (resting, pTENS and sTENS). Standard functional connectivity preprocessing was performed. Seed connectivity was examined to investigate changes in ACC functional connectivity between the stimulations and resting-state conditions. Significance was assessed at p<0.05 corrected for multiple comparisons.

Results: For all conditions (pTENS, sTENS, and rest), standard patterns of ACC connectivity were detectable with strong connectivity between the ACC and subcortical regions and between the ACC and the frontal lobe. Functional connectivity between ACC seed and the dorsal lateral prefrontal cortex (DLPFC) was significantly increased during pTENS compared to rest. sTENS did not increase connectivity between the ACC seed and DLPFC when compared to rest.

Conclusion: Results indicate that ACC is a major site of activation during pTENS. Increased connectivity between ACC and DLPFC may be a possible mechanism of pTENS effectiveness allowing for proper balancing of sympathetic and parasympathetic activity to the bladder. These connectivity findings appear to be specific to pTENS compared to sTENS. We plan further expansion of this group to identify additional sites of interest.

Funding: N/A
Podium #31
SAFETY AND EFFECTIVENESS OF FULL BODY MRI SCANNING IN SUBJECTS USING INTERSTIM THERAPY
Kevin Benson, MD MS1, Meredith Hayes, MD MS2, Matthew Hayes, MD MS2, Valerie Bares, PhD3, Erin Feltman, BS3, Dianna Begeman3
1Department of Obstetrics/Gynecology Division FPMRS Sanford Health, Sioux Falls, SD, 2Department of Radiology, Sanford Health, Sioux Falls, SD, 3Department of Research, Sanford Health, Sioux Falls, SD
Presented By: Kevin D. Benson, MD, MS

Introduction: Sacral Neuromodulation (SNM) has become standard care for many urologic conditions. One limitation of SNM therapy is Magnetic Resonance Scanning (MRI). MRI scanning is only approved for limited head scanning. Many patients with implanted InterStim devices require MRI. It has been postulated MRI scanning may be safe based on lab simulation models and one limited clinical study. Our study confirms MRI safety and adds robustly to MRI safety data and InterStim therapy.

Methods: IRB approved prospective cohort trial was performed over 18 months. 64 subjects participated. Subjects were enrolled based on clinically indicated MRI. All scanning indications were accepted. Device function, efficacy, and quality of life variables were measured. Subjects were administered PROMIS Global Health, BRFSS Emotional Support and Life Satisfaction questionnaires before and after the scan and 1 year. Subjects underwent pre-procedural device interrogatories and plain film evaluation (rule out disconnected/partial lead fragments). Subjects then went onto indicated MRI scanning without restriction.

Results: 64 subjects were screened. Fifty-two subjects completed pre- and post- procedural questionnaires. A one-sided paired Sign Test revealed quality of life was not negatively impacted by MRI(p<0.001), 79% of patients indicated stable or improved quality of life, 2 subjects screen failed due to non-intact InterStim systems noted on x-ray. 62 subjects completed scanning. One of 64 subjects complained of an uncomfortable subjective sensation in the low back while in the scanner and the study was stopped immediately. The sensation immediately abated and no other sequalae were noted. No other device complications were observed. No objective changes in impedance or sensation of stimulation were observed. Image quality was acceptable for all subjects scanned (Figure 1). No images were uninterpretable, this was true of all body regions scanned including pelvis. Fifty-two subjects completed pre- and post- procedural questionnaires. A one-sided paired Sign Test revealed quality of life was not negatively impacted by MRI(p<0.001), 79% of patients indicated stable or improved quality of life.

Conclusion: MRI imaging of all body parts is safe, well tolerated and does not lead to efficacy or device complications in subjects utilizing InterStim therapy undergoing MRI imaging.

Funding: NA
Podium #32
PROXIMAL URETHRAL ELECTRICAL STIMULATION PROFONDLY IMPROVES UNDERACTIVE BLADDER FUNCTION IN RATS AFTER UNILATERAL PELVIC NERVE TRANSECTION
Bradley Potts, MD¹, Matthew Fraser, PhD¹,²
¹Duke University Medical Center, Dept. of General Surgery, Division of Urology, ²Durham VA Medical Center
Presented By: Bradley Potts, MD

Introduction: We previously demonstrated reliable bladder contractions in neurologically-intact rats in response to proximal urethral stimulation (PUES). We sought to investigate whether a novel stimulating mesh, placed in an anatomic position similar to that of a urethral sling, could improve bladder function in the setting of underactive bladder (UAB) caused by unilateral pelvic nerve transection (PNx).

Methods: Twenty-five urethane-anesthetized female Sprague-Dawley rats received cystometry preparation and ventral dissection to expose the proximal urethra. A 3mm mesh with integrated bipolar electrodes was placed between the urethra and vagina. Following 3hrs of continuous cystometry, 3 single-fill cystometerograms were performed prior to right PNx (8/25 rats served as sham PNx controls). After 1hr of continuous cystometry, 3 single-fill cystometerograms were performed again. In PNx rats, the bladder was filled to the largest pre-PNx total bladder capacity (TBC) or 75% of the lowest post-PNx TBC (lower of two volumes was tested first) and PUES was performed at 20, 30, 40, and 50Hz (varied randomly) at 50V for 60sec stimulation/120sec recovery periods. PUES was then repeated at the higher of the two test volumes. When voiding occurred, the bladders were emptied to calculate voiding efficiency (VE) and refilled to the test volumes. Measurements included TBC and VE before/after PNx, and the presence/absence of bladder contraction or voiding during PUES. Data were analyzed using non-parametric repeated measures 2-Way ANOVA for sham PNx vs PNx comparisons, and contingency analysis (CA) for comparisons of test fill volumes, and sequence/frequency of PUES.

Results: After unilateral PNx, mean TBC increased by 80% and mean VE decreased by 71% (P<0.0001 for both); no changes were observed in sham PNx rats. PUES elicited voids (in absence of somatomotor response) at both test volumes; CA revealed significant stimulus frequency effect (P=0.0009) with lower frequencies more effectively evoking voiding contractions (percentage voiding 52, 23, 10, 10% at 20, 30, 40, 50Hz, respectively, P=0.0013). Mean VE of voiding contractions was 115% of pre-PNx.

Conclusion: Our validated unilateral PNx model induces conditions of dramatically increased TBC and decreased VE which effectively proxy for UAB. Following PNx, PUES with stimulating mesh at 20-30Hz elicited voiding contractions at decreased fill volumes with a reversal of VE changes, thereby normalizing functional voiding in this UAB model.

Funding: Discretionary research funds
Podium #33
CHANGES IN THE BRAIN CONTROL OF THE OVERACTIVE BLADDER IN WOMEN AFTER ONABOTULINUMTOXINA
Becky Clarkson1, Christopher Chermansky2, Sachi Tyagi1, Derek Griffiths1, Neil Resnick1
1Division of Geriatrics at University of Pittsburgh School of Medicine, 2Department of Urology at University of Pittsburgh School of Medicine
Presented By: Christopher John Chermansky, MD

Introduction: The complex mechanism of brain control of the bladder is not yet well understood. Our aim was to use a therapeutic probe to investigate brain changes associated with improvement in women with overactive bladder (OAB) and urgency urinary incontinence (UUI). We assessed active brain areas on functional magnetic resonance imaging (fMRI) using an urgency simulation task in women with OAB refractory to oral medications both before and after de novo onabotulinumtoxinA treatment.

Methods: 20 women over 65 years of age with OAB and UUI underwent fMRI with an urgency-simulating ‘infusion-withdrawal’ protocol, both before and 6-8 weeks after onabotulinumtoxinA therapy. Once the subject signaled a strong urge to void, 20 ml of sterile water was delivered through an 8Fr transurethral catheter over 12 seconds and then the fluid was withdrawn 10 seconds later over 10 seconds. This was repeated 4 times. ‘Activity’ was defined as a bold signal during the fluid withdrawal phases subtracted from that during the fluid infusion phases.

Results: 13 clusters within the cingulate gyrus, posterior cingulate, superior parietal lobule, inferior frontal gyrus, precentral gyrus, anterior cingulate, caudate, and middle frontal gyrus showed significantly less activity after onabotulinumtoxinA therapy, p<0.05 (Figure – top 3 images). 9 clusters within the inferior parietal lobule, insula, and superior temporal gyrus showed significantly more activity after onabotulinumtoxinA therapy, p<0.05 (Figure – bottom 3 images).

Conclusion: This preliminary analysis demonstrated changes within the brain in response to urgency simulation after onabotulinumtoxinA therapy. Many of these areas are known to be involved in the working model of continence control, such as the anterior cingulate and insula. While some of the regions that changed in response to therapy were expected, an increase in activity in some areas was unexpected. Further subanalysis using therapeutic response and connectivity analysis will allow us to better understand the brain changes we saw in women with refractory OAB after onabotulinumtoxinA therapy.

Figure: fMRI after onabotulinumtoxin A. The top 3 images show brain clusters with less activity after onabotulinumtoxinA and the bottom 3 images shows clusters with more activity after onabotulinumtoxinA.
Funding: National Institute on Aging
Podium #34

**URINARY AEROCCOCUS DEFINES A SEVERE, TREATMENT-REFRACTORY PHENOTYPE OF URGENCY URINARY INCONTINENCE IN OLDER WOMEN**

Paige Kuhlmann, MD¹, James Ackerman, MA¹, Muhammed Khalique, M.S.¹, Ashley Caron, M.S.¹, Falisha Kanji, BS¹, Jennifer Anger, MD, MPH¹, Karyn Eilber, MD¹, David Underhill, PhD², A. Lenore Ackerman, MD, PhD¹

¹Cedars-Sinai Medical Center, Dept. of Surgery, ²Cedars-Sinai Medical Center, Immunobiology Research Institute

Presented By: Paige Kuhlmann, MD

**Introduction:** Multiple studies link the urinary microbiome to urgency urinary incontinence (UUI). Prior microbial analyses have correlated urinary bacteria with UUI severity, relating several bacterial taxa, such as Aerococcus, an emerging uropathogen, with UUI. We sought to characterize the urinary microbiome of patients with OAB to identify distinct microbial profiles with potential clinical prognostic relevance.

**Methods:** Catheterized urine samples obtained from 74 post-menopausal women (ages 58-92) who presented to our FPMRS clinic were evaluated by 16S next-generation sequencing (NGS) for bacterial community profiling. Unsupervised k means clustering analysis of NGS data was used to identify population subsets with unique microbial profiles. Quantitative PCR specifically detecting Aerococcus spp. was used to validate NGS results and create a diagnostic threshold for inclusion in the Aerococcus-positive subtype. Retrospective chart review collected data on type and severity of subjects’ symptoms and responses to therapies.

**Results:** 16S NGS profiling of urine from 45 UUI and 29 control women revealed distinct community patterns in urinary microbiota, known as urotypes, that segregated with the presence and severity of UUI. Severe UUI (UICI score >4) was seen in three urotypes, two of which were diverse, ‘Mixed’ communities dominated by Corynebacterium or Prevotella (Mixed), while a third exhibited a homogeneous microbiota dominated by Aerococcus. The patient phenotypes of Mixed UUI subjects did not differ in symptom severity from the Aerococcus group, although the latter trended towards more bladder-specific pain. Mixed UUI subjects exhibited at least partial responses to OAB medications, with good responses to intradetrusor botox or bladder instillations, and rarely required other therapies. In contrast, the Aerococcus urotype exhibited poor responses to most therapies, including vaginal estrogen, anticholinergics, botox, bladder instillations, posterior tibial nerve stimulation, or sacral neuromodulation.

**Conclusion:** UUI patients have unique urinary microbial profiles, distinct from asymptomatic controls. Severe UUI patients with abundant Aerococcus are clinically indistinguishable from the Mixed group, but have a very different prognosis with existing treatment modalities. No current OAB therapies are highly effective for this subset, but they have particularly poor response to first-line therapies, and may benefit from earlier consideration of more aggressive management. Use of our quantitative PCR threshold testing may be helpful for prognostic classification of UUI patients.
**Funding:** N/A
Podium #35
URINARY INCONTINENCE REFERRAL PATTERNS IN ACADEMIC AND COUNTY HOSPITALS: THE IMPACT OF ECONSULT
Claire Burton¹, Gabriela Gonzalez², Catherine Bresee³, Victoria Scott⁴, Karyn S. Eilber⁴, A. Lenore Ackerman⁴, Cecilia Wieslander⁵, Jennifer T. Anger⁴
¹Department of Urology, University of California Los Angeles, Los Angeles, CA, ²David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, ³Department of Biostatistics and Informatics, Cedars Sinai Medical Center, Los Angeles, CA, ⁴Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA, ⁵Department of Obstetrics and Gynecology, Olive View Medical Center, Sylmar, CA
Presented By: Claire Burton, MD

Introduction: Access to specialty care is a significant problem among disadvantaged populations, but in Los Angeles County the eConsult system, in place since 2012, has been shown to reduce wait times and decrease unnecessary referrals (Barnett, 2017). We examined referral patterns at two different institutions with distinct payer mixes to identify initial evaluation and conservative management practice patterns before Female Pelvic Medicine and Reconstructive Surgery (FPMRS) consultation.

Methods: A retrospective chart review of 200 women from two academic institutions and 63 women from a public safety-net institution consecutively referred for new or worsening bothersome urinary incontinence (UI) to an FPMRS specialist between March 2017 and September 2019 was conducted. Chart review abstraction end points were identified using a set of 12 quality-of-care indicators (QIs) to measure the quality of care provided by referring providers (PCPs) in the 12-month period prior to referral. QIs were divided into General, Stress (SUI), and urge (UUI) specific categories. Additionally, we sought to compare referral patterns between two different health systems.

Results: Patients in the county hospital were all Medicaid or self-pay while all academic center patients were Medicare, PPO, or HMO. County patients were more likely to be Hispanic (71.4% vs 15.5%, P<0.01) and to have been referred by a nurse practitioner (25.4% vs 5%, p<0.01) or a family medicine PCP (47% vs 13%, p<0.01). 60% of the referrals were generated by eConsult and the remaining 40% by direct booking through the gynecology clinic. Women seen in the county system were more likely to have received recommendations regarding pelvic floor exercises prior to referral (37% vs 22%, p=0.03). County PCPs were more likely to adhere to General UI QIs than the academic center physicians (Table 1).

Conclusion: PCPs with referral oversight in the county health system were more likely to provide the appropriate care to women with UI prior to their referral to a specialist. There was no difference in the percent of women with SUI seeing a provider within three months, suggesting no excessive wait times. The eConsult system may explain the improved adherence to QIs as PCPs can be guided in how to conservatively manage many women prior to referral.
Table: Comparison of QI adherence by hospital type

<table>
<thead>
<tr>
<th></th>
<th>Academic N=200</th>
<th>County N=63</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General UI QIs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focused History</td>
<td>13/6/200  68%</td>
<td>54/63  86%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>History of prior pharmacologic therapy</td>
<td>65/200  33%</td>
<td>23/63  37%</td>
<td>0.55</td>
</tr>
<tr>
<td>Severity Assessment</td>
<td>66/200  33%</td>
<td>32/63  51%</td>
<td>0.01</td>
</tr>
<tr>
<td>Pelvic Exam</td>
<td>98/200  49%</td>
<td>40/63  64%</td>
<td>0.05</td>
</tr>
<tr>
<td>Urinalysis</td>
<td>101/200  51%</td>
<td>42/63  67%</td>
<td>0.03</td>
</tr>
<tr>
<td>Pelvic Floor Muscle Exercises</td>
<td>44/200  22%</td>
<td>23/63  37%</td>
<td>0.03</td>
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<tr>
<td><strong>Stress UI QIs</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Weight Loss recommended (BMI &gt;25)</td>
<td>11/69  16%</td>
<td>13/29  45%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Anticholinergics Not prescribed</td>
<td>61/63  97%</td>
<td>24/25  96%</td>
<td>0.65</td>
</tr>
<tr>
<td>Follow-up within 3 months</td>
<td>74/97  76%</td>
<td>36/40  90%</td>
<td>0.07</td>
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<tr>
<td><strong>Urge UI QIs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluid Intake History</td>
<td>6/73  8%</td>
<td>5/28  18%</td>
<td>0.16</td>
</tr>
<tr>
<td>Behavioral Therapy Recommended</td>
<td>10/73  14%</td>
<td>8/28  29%</td>
<td>0.08</td>
</tr>
<tr>
<td>Behavioral therapy recommended in combination with anticholinergics</td>
<td>1/5  20%</td>
<td>2/3  67%</td>
<td>0.19</td>
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<tr>
<td>Anticholinergics prescribed</td>
<td>6/72  8%</td>
<td>4/28  14%</td>
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**Funding:** R56DK117261 (JA)
Podium #36

VIBEGRON SHOWS STATISTICALLY SIGNIFICANT IMPROVEMENT IN SECONDARY EFFICACY MEASURES IN OVERACTIVE BLADDER: EMPOWUR STUDY

David Staskin, MD1, Jeffrey Frankel, MD2, Susann Varano, MD3, Denise Shortino, MS4, Rachael Jankowich, RN4, Paul N Mudd Jr, PharmD4

1Tufts University School of Medicine, Boston, MA, 2Seattle Urology Research Center, Seattle, WA, 3Clinical Research Consulting, Milford, CT, 4Urovant Sciences, Inc., Irvine, CA

Presented By: David R. Staskin, MD

Introduction: EMPOWUR evaluated efficacy and safety of vibegron, a new β3-agonist, vs placebo with tolerodine as an active control for overactive bladder (OAB) symptoms. Vibegron demonstrated highly statistically significant reductions (P<0.001) vs placebo for the co-primary endpoints of change from baseline in daily micturition frequency and number of urge urinary incontinence (UUI) episodes. Key secondary efficacy endpoints of UUI response, volume voided, and incontinence are presented.

Methods: Patients were aged ≥18 years with OAB for ≥3 months (average ≥8 micturitions/day), and either OAB wet (average ≥1 UUI episodes/day) or OAB dry (average ≥3 urgency and <1 UUI episode/day). Patients were randomized 5:5:4 to vibegron 75 mg, placebo, or tolerodine extended-release 4 mg for 12 weeks. The difference in proportion and P-value were calculated using the Cochran-Mantel-Haenszel risk difference estimate stratified by sex (female vs male), with weights proposed by Greenland and Robins.

Results: In total, 1518 patients were randomized (vibegron, 547; placebo, 540; tolerodine, 431). Groups were well-balanced: mean age was ~60 years, with ~85% women/15% men in each group. The adjusted proportion of patients achieving ≥75% reduction in daily UUI episodes was highest for vibegron (49.3%) vs placebo (32.8%; P<0.0001) and tolerodine (42.2%) (Figure 1). Vibegron demonstrated statistically significant improvements in least squares mean change in volume voided (21.2 mL, P<0.0001) and number of daily total incontinence episodes vs placebo (-0.7, P<0.0001), and showed numerical improvement versus tolerodine. Treatment-emergent adverse events (>placebo and >2%) were headache (vibegron, placebo, tolerodine; 4.0%, 2.4%, 2.6%; respectively), nasopharyngitis (2.8%, 1.7%, 2.6%), diarrhea (2.2%, 1.1%, 2.1%), and nausea (2.2%, 1.1%, 1.2%). Notably, hypertension was 1.7% for vibegron and placebo, and 2.6% for tolerodine.

Conclusion: Once-daily vibegron 75 mg demonstrated statistically significant benefits on key efficacy endpoints in OAB patients vs placebo. Vibegron may represent an important new therapy to address a large unmet need for patients with OAB.

Figure 1. Vibegron Demonstrated a Significantly Higher Proportion of ≥75% UUI Responders at Week 12
Funding: Urovant Sciences
Podium #37

**VERY LONG TERM OUTCOMES OF AUTOLOGOUS PUBOVAGINAL FASCIA SLINGS FOR URINARY INCONTINENCE IN WOMEN**

Sandy Kim, BS¹, Daniel Wong, BS¹, Dominic Lee, MD², Philippe E. Zimmern, MD¹

¹U.T. Southwestern Medical Center, Urology, ²St. George Hospital, Urology

Presented By: Sandy Kim, BS

**Introduction:** Because very long term outcomes of autologous pubovaginal slings (PVS) are lacking in contemporary literature, we report on a prior series of primary (PVS1) and secondary (PVS2) slings, which had intermediate 5-10 year follow-up (1), to now over >10 year follow-up.

**Methods:** Following IRB approval, a retrospective cohort study of well-characterized, non-neurogenic, women who underwent an autologous PVS for stress urinary incontinence (SUI) from intrinsic sphincter deficiency (ISD) was re-evaluated for their very long-term status. Data collected from EMR included demographics and validated questionnaires (UDI-6, IIQ-7) which were compared to similar pre-operative and intermediate follow-up findings. The primary outcome was success defined as UDI-6 Question 3 (SUI) ≤ 1 and no SUI retreatment/operation. Secondary outcomes included total IIQ-7 and quality of life (QoL) scores. Patients not seen in clinics for at least 2 years were contacted via a standardized phone interview by an investigator not involved in the original care of these patients.

**Results:** From the original 110 patients (1996-2011), were interviewed at baseline, 83 patients had intermediate follow up. Of those, 5 were deceased and 34 patients provided very long term follow up based on clinic visit (7) or phone interviews (28). Those lost to follow-up (43) did not differ in demographics and intermediate outcomes from the remaining women in our study but on average lived further away (>75 miles). Mean age was 74 years old, median follow-up was 14 years (4-17), and 69% met our success criteria. Only one woman required a secondary bulking agent following procedure. Mean postoperative questionnaire scores did not differ significantly between intermediate and very long term follow-ups, and long term outcomes between PVS1 and PVS2 remained similar (See Table).

**Conclusion:** A majority of women with long term follow up after PVS for primary or secondary SUI secondary to ISD remained satisfied with their continence status. Both groups, PVS1 and PVS2, fared equally well, confirming the durable nature of PVS as a treatment alternative for SUI.

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### Table I. Long-Term Post-Operative Outcomes for Pubovaginal Slings (PVS)

<table>
<thead>
<tr>
<th></th>
<th>Baseline (n=3)</th>
<th>Post-PVS Intermediate (n=34)</th>
<th>Post-PVS Long (n=34)</th>
<th>PVS1 (n=18)</th>
<th>PVS2 (n=16)</th>
<th>P</th>
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<tbody>
<tr>
<td><strong>Follow-up (years)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Median (range)</td>
<td>8.3 (0.5-12.5)</td>
<td>14.4 (8.6-19.1)</td>
<td>14.2 (9.0-16.2)</td>
<td>14.7 (8.6-19.1)</td>
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<tr>
<td><strong>Definition of success</strong></td>
<td>Yes</td>
<td>26</td>
<td>24</td>
<td>0.59</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>8</td>
<td>10</td>
<td></td>
<td>5</td>
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<tr>
<td><strong>Questionnaires</strong></td>
<td></td>
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<tr>
<td>UDI-6 Total (0-18)</td>
<td>10.2</td>
<td>4.4</td>
<td>5.6</td>
<td>0.28</td>
<td>5.3</td>
<td>5.9</td>
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<tr>
<td>Q2 - SUI (0-3)</td>
<td>1.9</td>
<td>1.0</td>
<td>1.3</td>
<td>0.24</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Q3 - SUI (0-3)</td>
<td>2.8</td>
<td>0.7</td>
<td>1.0</td>
<td>0.32</td>
<td>0.9</td>
<td>1.1</td>
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<tr>
<td>Q5 - SUI (0-3)</td>
<td>0.9</td>
<td>0.4</td>
<td>0.7</td>
<td>0.17</td>
<td>0.8</td>
<td>0.6</td>
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<tr>
<td>IQQ-7 Total (0-21)</td>
<td>12.1</td>
<td>3.6</td>
<td>2.8</td>
<td>0.58</td>
<td>2.9</td>
<td>2.8</td>
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<tr>
<td>Qol. (0-10)</td>
<td>7.8</td>
<td>2.9</td>
<td>2.6</td>
<td>0.72</td>
<td>2.1</td>
<td>3.1</td>
</tr>
</tbody>
</table>

*Definition of success: UDI-3≤1 and no reoperation, baseline vs. intermediate and long had p-values <0.5 in primary and secondary outcomes

### References

1. Lee D, Murray S, Bacsu CD, Zimmern PE. Long-term outcomes of autologous pubovaginal fascia slings: is there a difference between primary and secondary slings?

_Neurourology Urolgy. 2015;34(1):18-23._

**Funding:** N/A
Podium #38
URODYNAMIC CHARACTERISTICS OF FEMALE WITH OAB SYMPTOMS DIAGNOSED AS BLADDER OUTLET OBSTRUCTION
Su Jin Kim¹, Hee Jung Choo², Hana Yoon³
¹Department of Urology, Yonsei University Wonju College of Medicine, Wonju, Korea, ²Ewha Womans University Seoul Hospital, Seoul, Korea, ³Department of Urology, Ewha Womans University College of Medicine, Ewha Womans University Seoul Hospital, Seoul, Korea
Presented By: Su Jin Kim

Introduction: Overactive bladder (OAB) symptoms is common lower urinary tract symptoms (LUTS) in women. However, all women complaining storage symptoms are not OAB and some of them showed bladder outlet obstruction (BOO) by urodynamic study (UDS). Therefore, we evaluated urodynamic characteristics of women whose predominant LUTS was OAB symptoms and diagnosed as female BOO by UDS.

Methods: One hundred eight women whose dominant LUTS was storage symptoms and diagnosed with a female BOO by UDS were included in this retrospective study. We compared urodynamic findings of women with BOO and women with OAB and stress urinary incontinence (SUI) to identify characteristics of BOO in women. Women with SUI included in this study were diagnosed by clinical history, physical examination, and urodynamic study. Thirty-four women with OAB and received UDS were included. The diagnostic criteria of female BOO were as follows: maximum flow rate (Qmax) < 15 ml/s, combined with detrusor pressure at maximum flow rate (PdetQmax) > 20 cmH2O in pressure-flow study.

Results: Qmax and postvoid residual volume (PVR) were significantly different in women with OAB, BOO, and SUI. Maximum cystometric capacity (MCC), PdetQmax, maximum urethral closing pressure (MUCP) were significantly different among 3 groups. In particular, MUCP of women with OAB, BOO, and SUI was significantly different. Significantly lower Qmax and increased postvoid residual volume of uroflowmetry were observed in women with BOO compared with women with OAB. MCC of women with BOO was significantly lower. Moreover, significantly lower Qmax was noted in women with BOO. PdetQmax, and MUCP were significantly higher in women with BOO. MCC of women with BOO was significantly lower. Moreover, significantly lower Qmax was noted in women with BOO. PdetQmax, and MUCP were significantly higher in women with BOO.

Conclusion: Higher MUCP was a characteristic finding in women presenting OAB symptoms and BOO. Moreover, decreased MCC due to BOO might cause OAB symptoms such as frequency and urgency. Therefore, UDS is highly recommended to identify the causes of LUTS in women who failed OAB treatment.

Funding: N/A
Podium #39

ANALYSIS OF SURGICAL PERFORMANCE IN MID-URETHRAL SLING SURGERY: WHAT A "MESH!"
Caitlin Lim¹, Nicholas Major¹, Andrew Margules², Yu Zheng¹, Alyssa Greiman³, Lindsey Cox¹, Ross Rames¹, Eric Rovner¹
¹Medical University of South Carolina, Dept. of Urology, Charleston, SC, ²Philadelphia, PA, ³University of Michigan, Dept. of Urology, Ann Arbor, MI
Presented By: Caitlin Lim, DO, MS

Introduction: Removal or revision of mid-urethral slings (MUS) may be necessary in the setting of complications such as obstruction, pain, or mesh erosion/exposure. Historically, such problems have largely been attributed to factors including patient selection and intrinsic properties of the mesh material, while little attention has been considered regarding other technical factors. We reviewed our experience with MUS revision procedures in order to evaluate initial surgical technique as a contributing factor in the need for revision surgery.

Methods: Following IRB approval, a retrospective review was performed of all women who underwent revision or removal of a synthetic (mesh) MUS at our institution between October 2012 and September 2019. Operative reports at re-exploration were reviewed. Additionally, a critical review of the original implanting surgeon’s operative and perioperative documentation (when available) was performed.

Results: 208 consecutive women underwent incision or removal of a synthetic MUS. Prior operative reports were available for 187 women. The most common indications for revision were obstruction (64.2%), erosion (11.2%), extrusion (CL1) (17.6%), UTI (13.4%), and pain (28.3%). In 126/187 women (67.4%) there was either an intraoperative finding during the revision surgery to which the complication could be attributed, or there was documentation suggestive of a contributing technical factor during the initial sling placement procedure. Among these 126 women, 83 (65.9%) were noted to have their sling either too proximal or distal to the mid urethra. 54 slings (42.9%) were over-suspended and 38 women (30.2%) had slings placed too deep into the periurethral fascia. It was noted that among the 18 women noted to have obstruction or erosion, we noted either unambiguous descriptions of over-tensioning during the initial MUS placement, or identified urinary tract injury at the level of the bladder neck or urethra per the operative note.

Conclusion: MUS re-exploration cases often reveal evidence that the initial operative technique contributed to the subsequent need for revision. Such findings suggest that surgical technique is an important and overlooked factor contributing to many postoperative complications in MUS surgery. This underscores the importance of adherence to established surgical principles and meticulous surgical technique during placement of a sling.

Funding: N/A
Podium #40
BLADDER NECK AND URETHRAL EXPOSURE AFTER MACROPLASTIQUE INJECTIONS
Dayron Rodriguez, Fellow1, Ata Jaffer, Resident2, Mustafa Hilmy, Consultant Urological Surgeon2, Philippe Zimmern, Professor of Urology1
1University of Texas Southwestern Medical Center, 2York Teaching Hospital, United Kingdom
Presented By: Dayron Rodriguez, MD, MPH

Introduction: Macroplastique® (polydimethylsiloxane injection, MPQ) is a minimally invasive urethral bulking agent and with over 20 years of data, deemed to be effective, durable, and a safe treatment option in a recent meta-analysis1. Reports of complications from MPQ use are uncommon, however, in recent years we have encountered a number of erosions associated with its use and have collated these in this two center case series.

Methods: Following IRB approval, we performed a retrospective chart review of women experiencing MPQ exposure from a prospectively maintained database at two tertiary care centers. Data collected included age, symptoms at presentation, parity, hysterectomy, comorbidities, immunocompromised, hormone replacement therapy, and smoking status. Sexual activity, pad usage, time from MPQ injection, urine culture results, as well as cystoscopic and imaging findings were also reviewed. Development of stress urinary incontinence (SUI) after MPQ removal and subsequent SUI treatments were recorded.

Results: From 2012-2018, 18 patients were identified with a median follow-up time of 24 months (IQR 8-33). All patients presented with recurrent urinary tract infections (UTI) and had cystoscopic evidence of MPQ exposure, including 6 at the bladder neck. Median time to presentation since MPQ injection was 14 months (IQR 11-35). Three patients with small exposure in the urethra were managed conservatively. Fifteen underwent transurethral resection, 4 required a repeat resection, and 12 of 15 who had a resection had complete resolution of their recurrent UTI’s. Twelve of the 15 resected patients had recurrent SUI with 4 requiring a subsequent autologous fascial sling placement with complete resolution of SUI symptoms.

Conclusion: MPQ exposure present predominantly with UTIs, sometimes years after the original injection and may necessitate endoscopic management with satisfactory results in most patients. Following excision of MPQ, the patients are highly likely to have SUI recurrence and need to be appropriately counselled. Some may require additional subsequent autologous fascial sling placement for treatment of their SUI symptoms.

Funding: N/A
Podium #41
IS THERE A DIFFERENCE IN DEMENTIA OR DEPRESSION RISK WHEN ANTICHOLINERGICS OR BETA-3 AGONISTS ARE USED IN OVERACTIVE BLADDER PATIENTS?

Blayne Welk¹, Eric McArthur²
¹Western University, ²ICES

Presented By: Blayne Kaili Welk, MD

Introduction: Concerns exist that anticholinergic use is associated with an increased risk of cognitive side effects. However there has been limited investigation specifically involving the anticholinergics commonly used to treat overactive bladder. The recent addition of a new class of beta-3 agonists which are also indicated for overactive bladder provides a unique opportunity to test the association of anticholinergics with two potential conditions: dementia and depression.

Methods: Population—based, retrospective, matched cohort study using linked administrative data from Ontario, Canada (2010-2018). New users of beta-3 agonists during the study period were matched on age, sex, antidepressant use, and propensity scores using a 1:2 ratio to new users of anticholinergic medication indicated for overactive bladder. People with existing depression or dementia were excluded. Using a propensity score, the two groups were similar across 76 covariates representing demographics, medical comorbidities, medication usage, and healthcare system utilization. The primary outcomes were dementia and depression, which were determined using validated algorithms (positive predictive value 92% and 80% respectively). Patients were considered at risk for the outcomes between the start of the medication and 3 months after discontinuing the continuous use of the medication class; they were censored when they switched medication class, died, or at March 2019. Cox proportional hazards models were used to estimate hazard ratios.

Results: We matched 23,662 beta-3 agonist users to 47,324 anticholinergic users. The median age of our cohort was 73 (68-80) years, and 56% were female. There were no significant differences among our 76 measured covariates. The rate of new onset dementia was 41 per 1000 person-years in anticholinergic users, compared to 34 per 100 person-years in beta-3 agonist users. There was a significantly increased risk of new onset dementia among anticholinergic users compared to beta-3 agonist users (HR 1.23, 95% CI 1.12-1.35, p<0.01). There was no significant difference in the rate of new onset depression between people who used anticholinergics versus beta-3 agonists (HR 1.08, 95% CI 0.92-1.28, p=0.35).

Conclusion: In a large cohort of people with similar characteristics who initiated medical therapy for overactive bladder with either an anticholinergic or a beta-3 agonist, there was a significantly increased risk of new onset dementia among the anticholinergic users.

Funding: N/A
Podium #42
A COMMUNITY-BASED EDUCATION PROGRAM FOR OVERACTIVE BLADDER IN OLDER ADULTS: A PILOT STUDY

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Presented By: Hudson Pierce

Introduction: Overactive bladder (OAB) is a highly prevalent disease in older people with significant impact on quality of life and physical functioning. Knowledge gaps regarding available treatment and social stigmatization of incontinence are barriers to care in this population. This pilot study assessed the feasibility of an incontinence education program targeting older community-dwelling individuals.

Methods: Men and women over age 60 were recruited from community centers. Individuals with previous diagnosis of OAB were excluded. Eligible participants underwent an education program covering standardized continence-promotion strategies. Primary outcome was change in OAB-q SF symptom score. Secondary outcomes were change in general and condition-specific quality of life scores as measured by the SF-12 and OAB-q SF HRQL, respectively. Measurements were taken at baseline and 1 week, 3 months, and 6 months post-intervention. Data was analyzed using a linear mixed-effects model for repeated measures.

Results: Fifty-one individuals participated in this study. Significant improvements in symptom bother (-3.3, p = 0.037) and total HRQL (+3.0, p = 0.031) were observed post-intervention for the overall cohort. Mean HRQL subscale scores all improved significantly. The majority of significant effects were observed at 3 months post-intervention. General quality of life measures did not change significantly.

Conclusion: Statistically significant improvements in symptom bother and bladder-specific quality of life measures were observed following an OAB education program in community-dwelling older adults. The program was low-cost and simple to implement. Further studies are needed to provide evidence of efficacy and optimize program design.

Funding: Weill Cornell Clinical and Translational Science Center grant support (CTSC GRANT UL1 TR000457)
Podium #43

FACTORS ASSOCIATED WITH NO-SHOW AND CANCELLATION LESS THAN 24 HOURS PRIOR TO APPOINTMENT IN A MODERATE VOLUME (N=3,428) OUTPATIENT UROLOGY PRACTICE

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Presented By: Amy D. Dobberfuhl, MD, MS

Introduction: Patient satisfaction in an outpatient urology practice (general, andrology, female, neurourolgy, voiding dysfunction) is dependent on efficient clinical work flow to allow patients to be seen in a timely manner. Patients who do not show up to their appointment, cancel with less than 24 hour notice, or arrive late result in interference scheduling other patients, loss of physician productivity, and are a source of patient-physician dissatisfaction. Prior research has been in primary care, with a paucity of publications in urology. Some studies have found benefit of reminders and confirmations, and others no difference. Our aim was to identify factors associated with no-show and cancellation <24 hours (NCL) in our outpatient urology practice.

Methods: IRB approval was obtained for a retrospective analysis of all patient encounters in our outpatient urology clinic from May to December 2018. An encounter dataset was generated by exporting variables directly from the electronic medical record. Using multivariable logistic regression, we identified patient factors associated with NCL versus completed visits. Adjustment was performed for referring service, appointment confirmation method, age, gender, and insurance. Data are presented as odds ratio (OR) with 95% confidence limits (Figure 1).

Results: There were 3,428 patients (71.1% male, 28.9% female) with a mean age of 56 years (SD=18.2, IQR 40-70) scheduled for 5,431 encounters [1,119 (20.6%) cancellations >24 hours prior to appointment; 427 (7.9%) cancellations <24 hours prior to appointment; 3,655 (67.3%) completed visits; and 230 (4.2%) no-show]. Among NCL (n=657) versus completed (n=3,655) encounters, appointments were confirmed via: online patient portal (0.5% versus 1.0%); office staff (0.2% versus 0.6%); automated telephone reminder (18% versus 39%); and no confirmation (81.4% versus 59.4%). On multivariable regression, referring service and insurance type were not significantly associated with the outcome NCL versus completed visit. In our final logistic regression model (Figure 1); automated telephone reminder (OR 2.919; 95%CI 2.363-3.605), youngest age strata (18-29 years of age OR 2.156; 95%CI 1.514-3.070) and female gender (OR 1.298; 95%CI 1.080-1.560) were significantly associated with a greater odds of NCL.

Conclusion: Future research should be directed at identifying reasons for NCL among women and younger patients, and creating interventions which improve successful utilization of automated reminders.
Funding: Stanford Clinical Effectiveness Leadership Training Program
Podium #44
SIGNIFICANT DIFFERENCE IN BRAIN FUNCTIONAL CONNECTIVITY OF FEMALE MULTIPLE SCLEROSIS PATIENTS WITH NEUROGENIC LOWER URINARY TRACT DYSFUNCTION AND VOIDING DYSFUNCTION QUANTIFIED BY MACHINE LEARNING
Christof Karmonik, PhD¹, Khue Tran², Timothy Boone, MD², Rose Khavari, MD²
¹Houston Methodist Research Institute, ²Houston Methodist Hospital
Presented By: Khue Tran

Introduction: Female multiple sclerosis (MS) patients with neurogenic lower urinary tract dysfunction (NLUTD) and voiding dysfunction (VD) show different functional connectivity (FC) of relevant brain regions during voiding initiation than those who void spontaneously. Machine learning (ML) is a suitable approach for quantifying these differences in this Voiding Initiation Network (VIN).

Methods: Twenty-seven MS women with NLUTD (divided into voiders (n=15) and VD (n=12, post-void residual ≥40% maximum cystometric capacity) underwent concurrent fMRI/urodynamic testing with a task of bladder filling and emptying repeated four times. Significantly activated brain regions (p<0.05) at voiding initiation were found for each subject and each group using generalized linear model (GLM). BOLD activation map averaged over all subjects was created. VIN in MS was defined by including only the highest activated brain regions from BOLD activation map. FC of these brain regions was quantified for each subject. Four ML algorithms (random forests, neural networks, GLM, partial least squares) were used with the individual FC as predictor variables to classify a subject as either voider or VD. The entire dataset was split into a training set (50%) and a test set (50%). Ten-fold repeated cross validation with five repeats was used to train the algorithms. Area under the curve (AUC) of the receiver-operating characteristic curve was used to determine the best-performing algorithm.

Results: The two best-performing ML algorithms (AUC=0.89, partial least squares; AUC=0.86, random forests) showed voiders had higher polarization of connectivity than VD. Worst performance of the GLM (AUC=0.71) indicates the complexity of the data and the need for non-linear algorithms. To quantify the different FC patterns between voiders and VD in MS, ML algorithms are of advantage as they allow access to the complex non-linearity of individual brain region FC for classification. Interruption of white matter integrity in female MS with VD inhibits formation of FC pattern observed in MS patients who void spontaneously. The 10 most important brain regions used in the classification were located in the left frontal brain (middle, medial, inferior frontal gyrus) and left cingulate, indicating inhibition is most pronounced in these regions.

Conclusion: FC in combination with ML analysis may become a surrogate imaging marker for VD in MS.
**Funding:** Dr. Khavari reports that she is partially supported by K23DK118209, by National Institute of Health, NIDDK (RK). Also supported by Houston Methodist Clinician Scientist Award (RK).
Podium #45
THE EFFECTIVENESS AND SAFETY OF BLADDER OUTLET PROCEDURES FOR STRESS URINARY INCONTINENCE IN PATIENTS WITH NEUROGENIC STRESS INCONTINENCE
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Presented By: Minsoo Choo

Introduction: We evaluated the effectiveness and safety of bladder outlet procedures for treating stress urinary incontinence in patients with neurogenic lower urinary tract dysfunction.

Methods: We used CPT and ICD-9 codes between 2012 – 2019 to identify patients with neurogenic bladder dysfunction who underwent urethral bulking injection (UBI), sling, or artificial urethral sphincter (AUS) for treatment of stress urinary incontinence (SUI). Failure of procedure was defined as documented bothersome stress incontinence symptoms (pad number, patient review of symptoms) at a follow up visit and/or needing additional surgical intervention for SUI. Time to failure was compared between procedure types and risk factors for failure assessed. Complications were graded on the Clavien-Dindo (CD) classification and compared for between procedure types after surgery.

Results: Of the consecutive 1138 patients reviewed, 68 procedures in 51 patients (37 male, 14 female) with neurogenic SUI were included. There were 39, 15, and 14 cases of UBI, sling, and AUS, respectively. The median age was 37 years (IQ: 15-56). Spinal cord injury and congenital spinal cord abnormality were the most common diagnoses (33 patients). The median follow-up was 256 days (IQ: 108-717). AUS procedures had the longest failure free interval, followed by sling, and UBI. AUS had 46% failure rate at 2700 days post implantation and sling and UBI had 50% failure rates at 760 and 369 days, respectively (log-rank, p = 0.037). Age< 19 years was a significant factor for failure/revision of surgery for neurogenic incontinence patients in multivariable analysis (OR 0.088, p=0.020). Failure was particularly prevalent in patients < age 19 treated with UBI (90% failure). Sex and cause of neurogenic bladder were not associated with failure. No CD IV-V complications were noted in any procedure and there were no differences in complication rates.

Conclusion: Neurogenic stress incontinence can be safely treated with artificial urinary sphincter, sling or bulking agent. However, artificial sphincter had the longest failure free interval over time. Urethral bulking agents demonstrated the most rapid time to failure particularly in patients <19 years. Since the durability is different between each procedure, shared decision making between patient and physician is necessary to match expectations and outcomes.
Funding: N/A
Podium #46
PREVALENCE OF FECAL INCONTINENCE: UTILIZATION OF LARGE POPULATION TOILETING BEHAVIOR SURVEY
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¹Vanderbilt University Department of Urology, ²The University of Kansas Health System
Presented By: Elizabeth Rourke, DO, MPH

Introduction: Fecal incontinence (FI) and symptoms associated with FI can have a profound impact on quality of life. Prevalence amongst women is often underreported as specific screening for FI is not routinely performed by providers and patients may feel uncomfortable volunteering details/symptoms of FI. In addition, studies have demonstrated prevalence of urinary incontinence (stress and urge) in conjunction with FI. Our objective was to determine overall prevalence of FI amongst women who completed a toileting behavior survey.

Methods: We performed a cross-sectional, survey-based study investigating the association between lower urinary tract symptoms, toileting behaviors and access to public and work restrooms. Within this survey, participants were asked to respond to questions about FI. FI was defined by the ICIQ Bowel questionnaire with the following parameters: ability to control leakage of mucus, liquid or formed stool some of the time, rarely or never.

Results: The survey was completed by 7,892 participants from a total of 106,000 potential subjects (7.4% response rate). 6,858 responses were received for the questions pertaining to FI with a prevalence of FI as defined above of 12% (n=834).

Conclusion: Large population-based studies can be dynamic resources for improved understanding of the prevalence of FI and have established ranges of 7-15%. Our toileting behavior survey revealed a prevalence of FI of 12% which is consistent with previous studies and therefore, the survey can be used for further evaluation of factors associated with FI including urinary incontinence, overall bother and quality of life.

Funding: N/A
Podium #47

CHANGES IN MICTURITION-RELATED BRAIN ACTIVITY AFTER CEREBROVASCULAR ACCIDENT*
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Presented By: Evgeniy I. Kreydin, MD
*2017 Neuromodulation Grant Recipient

Introduction: Functional MRI (fMRI) has revolutionized our understanding of cerebral control associated with urinary storage and emptying. Distinct patterns of brain activity have been identified in patients with overactive bladder and multiple other lower urinary tract pathologies. Stroke presents a unique opportunity to study how a single lesion impacts micturition-related brain activity, which, in turn, determines LUT function. Our objective was to define changes in brain activity that occur after a stroke.

Methods: Ten healthy (5 males, 5 females; mean age 32.5 years) and eight subjects with stroke (6 males, 2 females; mean age 54 years) were recruited. Strokes were localized to the basal ganglia (n=5), pons (n=2), and middle cerebral artery distribution (n=1). All stroke subjects complained of urgency and urge incontinence. Data were acquired on a 3T MR scanner using BOLD contrast with whole brain coverage. Urodynamic traces were recorded concurrently. A block design was utilized, with each block corresponding to a phase of the micturition cycle (rest, fill, hold, void). The experiment was repeated 4 times with different durations of the filling block. Following MRI preprocessing, statistical analysis on subject level was performed using a General Linear Model and followed by post-hoc t-tests.

Results: To confirm the validity of our approach, we compared BOLD signal between the holding and rest phases across all subjects, finding increased activity in the anterior cingulate gyrus, the caudate nucleus and the precentral motor cortex during the holding phase, in line with findings from other groups. Comparison between control and stroke subjects revealed significantly (t=3.60, p<0.001) decreased brain activity among stroke subjects during voiding vs. holding in several brain areas thought to be associated with micturition control (Figure 1).

Conclusion: We demonstrate that the urinary tract symptoms that arise after stroke may be related to alterations in micturition-related brain activity. The basal ganglia and the pons serve as gateways for communication between the lower urinary tract and higher cortical centers and loss of that communication may explain the decrease in brain activity we observed during voiding in stroke subjects. Future efforts will focus on identifying differences among other phases of the micturition cycle in stroke and healthy subjects.
Figure 1: Two-Sample T-test Controls vs. Stroke Subjects during Voiding (‘hold’ as baseline)

Funding: SUFU
Podium #48
CARDIOVASCULAR RISK FACTORS FOR NOCTURIA USING THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY DATA
Sung Tae Cho¹, Shinje Moon², Kwang Jin Ko¹
¹Department of Urology, Hallym University College of Medicine, ²Department of Internal medicine, Hallym University College of Medicine
Presented By: Sung Tae Cho, MD

Introduction: Nocturia is highly prevalent and one of the most distressing lower urinary tract symptoms among older adults. In addition, nocturia has a strongly negative impact on quality of life. However, the pathophysiology of nocturia is variable and difficult to confirm. The risk factors such as hypertension, cardiovascular disease (CVD), diabetes, cerebrovascular disease, and depression have been associated with nocturia. However, to our knowledge, there is little literature to date that has analyzed their association using a nationally representative population-based database such as the National Health and Nutrition Examination Survey (NHANES) studies of the United States. The objective of this study was to investigate the association of CVD with nocturia using NHANES data in the recent 8-year period.

Methods: Among the 40,790 individuals who participated in NHANES from 2005 to 2012, only 14,365 adults were analyzed in this study. A multivariate logistic regression analysis with adjustment for confounding variables, including age, sex, race, body mass index, smoking status, dyslipidemia, hypertension, and diabetes mellitus was performed with 1:1 propensity score matching for the confounding variables, taking into consideration heterogeneity of demographic characteristics according to CVD.

Results: The prevalence of CVD was significantly higher in men, elderly individuals, those with higher body mass index, smokers, and those with diabetes, hypertension, and hyperlipidemia. There was also a significantly higher prevalence of nocturia in the CVD group. Multivariate analysis showed that the odds ratio (OR) of mild nocturia for CVD was 1.259 (95% confidence interval (CI), 1.12-1.417, p <0.001) and that of severe nocturia was 1.996 (95% CI, 1.627-2.449, p <0.001). Although there was little heterogeneity of other confounding variables due to CVD, the ORs of mild and severe nocturia were 1.221 (95% CI, 1.064-1.401, p=0.004) and 1.833 (95% CI, 1.431-2.347, p <0.001), respectively, showing statistical significance.

Conclusion: CVD was significantly associated with the prevalence of mild-to-severe nocturia in men and women after taking major confounding factors into account. These findings indicate that nocturia may predict CVD as the number of nocturia increases.

Funding: N/A
HIGH RISK URODYNAMICS FEATURES AND ASSOCIATED ADVERSE UPPER TRACT FINDINGS IN PATIENTS WITH AND WITHOUT A NEUROLOGIC CONDITION

Avery Braun, DO¹, Alice Xiang, MD², Patrick Vecellio³, Joshua Cohn, MD²
¹Albert Einstein medical Center, ²Albert Einstein Medical Center, ³Beaumont School of Medicine

Presented By: Avery E. Braun, DO

Introduction: Urodynamics (UDS) testing guides therapeutic decisions related to management of lower urinary tract symptoms (LUTS) and urinary tract infections and helps to assess upper tract risk. Despite its utility, judicious use of invasive testing is warranted, as UDS is not without risk or discomfort. We therefore sought to evaluate the frequency of high risk UDS features and upper tract abnormalities in patients with bothersome LUTS by neurologic condition.

Methods: Adult patients undergoing UDS with or without fluoroscopy between September 2018 and September 2019 were included in the analysis. Demographic, clinical, urodynamic, and imaging data were collected and categorized according to neurologic condition. High risk urodynamic features were defined by the presence of one or more of the following: poor compliance (<30cc/cm H2O), maximal detrusor pressure during filling >40cm H2O, vesicoureteral reflux (VUR), and detrusor sphincter dyssynergia (DSD). Clinical signs of upper tract deterioration were defined by the presence of renal scarring, hydronephrosis, or history of febrile UTI. Proportions were compared across groups via Fisher's exact test and means by Student's t-test with statistical significance considered for two-sided p-values<0.05.

Results: The study population was comprised of 191 patients (117 male, 74 female), including 38 (20%) with spinal cord injury (SCI), 13 (7%) with cerebrovascular accident (CVA), 6 (3%) with traumatic brain injury/anoxic brain injury (TBI/ABI), 31 (16%) with degenerative disc disease (DDD), 7 (4%) with a demyelinating condition, 13 with other neurologic conditions (e.g. Parkinson's, ONC) (7%), and 83 (43%) without an identifiable neurologic condition (N-NGB). Chronic kidney disease differed significantly by condition, highest in those with N-NGB (34%), CVA (31%), and DDD (39%) and lowest in SCI (8%) (p=0.048). Urodynamic findings are presented in Table. High risk features were prevalent (46%-100%) as were clinical signs of upper tract deterioration (40-100%).

Conclusion: In patients with clinical indications for UDS, high-risk UDS features are frequently present, regardless of presence or absence of neurologic condition. Possibly as a result, upper tract sequelae are prevalent as well (in nearly half or more of all patients), although those with N-NGB and conditions such as Parkinson’s may be less likely to suffer from upper tract sequelae than those with SCI or CVA.

Table: Urodynamic findings

<table>
<thead>
<tr>
<th>Condition</th>
<th>N-NGB</th>
<th>SCI</th>
<th>CVA</th>
<th>TBI/ABI</th>
<th>DDD</th>
<th>Demyelinating disorder</th>
<th>Other condition</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Compliance (&lt;30 cc/cm H2O, %)</td>
<td>54%</td>
<td>67%</td>
<td>40%</td>
<td>0%</td>
<td>22%</td>
<td>100%</td>
<td>60%</td>
<td>0.182</td>
</tr>
<tr>
<td>Maximum Pdetrusor during filling (mean, cmH2O)</td>
<td>48</td>
<td>61</td>
<td>58</td>
<td>87</td>
<td>46</td>
<td>56</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Pdet Max &gt;40 cm H2O during filling (%)</td>
<td>49%</td>
<td>61%</td>
<td>33%</td>
<td>67%</td>
<td>53%</td>
<td>71%</td>
<td>55%</td>
<td>0.555</td>
</tr>
<tr>
<td>Maximum Capacity (mean, ml)</td>
<td>461</td>
<td>388</td>
<td>332</td>
<td>280</td>
<td>434</td>
<td>368</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Presence of Detrusor Overactivity (%)</td>
<td>62%</td>
<td>89%</td>
<td>69%</td>
<td>83%</td>
<td>60%</td>
<td>71%</td>
<td>69%</td>
<td>0.066</td>
</tr>
<tr>
<td>Maximum Amplitude DO (mean, cmH2O)</td>
<td>60</td>
<td>57</td>
<td>69</td>
<td>98.4</td>
<td>52.25</td>
<td>57.2</td>
<td>48.22</td>
<td></td>
</tr>
<tr>
<td>DSD (%)</td>
<td>73%</td>
<td>81%</td>
<td>100%</td>
<td>75%</td>
<td>56%</td>
<td>75%</td>
<td>67%</td>
<td>0.663</td>
</tr>
<tr>
<td>Vesicoureteral reflux (%)</td>
<td>19%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>12%</td>
<td>25%</td>
<td>11%</td>
<td>0.162</td>
</tr>
<tr>
<td>Hydro (%)</td>
<td>14%</td>
<td>29%</td>
<td>15%</td>
<td>33%</td>
<td>22%</td>
<td>17%</td>
<td>25%</td>
<td>0.71</td>
</tr>
<tr>
<td>Any high risk feature* (%)</td>
<td>72%</td>
<td>79%</td>
<td>46%</td>
<td>83%</td>
<td>71%</td>
<td>100%</td>
<td>77%</td>
<td>0.24</td>
</tr>
<tr>
<td>Scarring Hydronephrosis, or Febrile UTI (%)</td>
<td>42%</td>
<td>72%</td>
<td>78%</td>
<td>100%</td>
<td>50%</td>
<td>50%</td>
<td>40%</td>
<td>0.021</td>
</tr>
</tbody>
</table>

*Defined as: compliance <30 cc/cmH2O, Maxfilling
Pdet >40 cmH2O, VUR, DSD

Funding: N/A
Podium #50
BLADDER RECOVERY IN POPULATIONS WITH TRANSVERSE MYELITIS
Arthi Satyanarayan, MD, Dayron Rodriguez, MD, Niccolo M Passoni, MD, Benjamin Greenberg, MD, Craig Peters, MD, Gary Lemack, MD, Micah Jacobs, MD
University of Texas Southwestern Medical Center
Presented By: Arthi Satyanarayan, MD

Introduction: Patients with transverse myelitis (TM) can develop voiding dysfunction. Factors associated with bladder recovery following the diagnosis of TM are not well established. We sought to determine trends associated with spontaneous voiding in children and adults who initially required catheterization upon diagnosis of TM. We hypothesized that initial neurologic findings at the time of diagnosis might predict bladder outcomes in TM patients.

Methods: We reviewed children and adults evaluated at our institution for TM from 1998 to 2019. Patients were included if they were diagnosed with TM with urinary retention initially requiring catheterization, and had initial and follow up voiding, motor, and sensory exams documented by a neurologist or urologist. We reviewed demographics, initial, and follow-up neurologic exams to assess for an association with volitional voiding following a period of catheterization.

Results: In total, 100 patients (78 pediatric and 22 adults) were included, of whom 61 (43 pediatric and 18 adults) required catheterization after diagnosis. The pediatric cohort was followed for a median of 2.7 years, and the adult cohort 1.4 years. Among those who initially required catheterization, 62% (27/43) of children compared to 33% (6/18) adults were voiding spontaneously (no catheterization) at most recent follow up. When evaluating for features associated with resolution of spontaneous voiding among both populations, preserved reflexes was the only significant factor (p<0.05). In adults, determination of complete neurologic recovery was strongly associated with bladder recovery (p<0.05)(Table 1). On multivariable analysis, preserved reflexes remained a significant predictor in children (p<0.001), but not in adults (p=0.11). Complete neurological recovery remained significant in multivariable analysis in adults (p<0.001).

Conclusion: In pediatric patients with TM, having preserved lower extremity reflexes at presentation was a strong predictor of resumption of spontaneous voiding. Determination of complete neurologic recovery was associated with bladder recovery in adults. This finding was not reflected in children, likely due to the complexity with performing sensorimotor exam relative to age and ability to communicate. A significant percentage of patients with TM who experience voiding dysfunction initially may resume normal voiding over time, though ongoing urological surveillance is recommended in this complex group.
Table 1: Comparison of age and exam findings on bladder recovery in children and adults with transverse myelitis.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Children with Bladder Recovery</th>
<th>Adults with Bladder Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes n = 27</td>
<td>No n = 16</td>
</tr>
<tr>
<td>Age at diagnosis, years</td>
<td>11 (3.7-14)</td>
<td>9.9 (2.2-13)</td>
</tr>
<tr>
<td>Gender, no (%)</td>
<td>13 (48%)</td>
<td>10 (63%)</td>
</tr>
<tr>
<td>Female</td>
<td>14 (51%)</td>
<td>6 (38%)</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflexes preserved at presentation, no. (%)</td>
<td>8 (30%)</td>
<td>0</td>
</tr>
<tr>
<td>Urinary retention at presentation, no. (%)</td>
<td>21 (78%)</td>
<td>15 (94%)</td>
</tr>
<tr>
<td>Neurologic recovery at most recent follow-up, no. (%)</td>
<td>7 (28%)</td>
<td>2 (13%)</td>
</tr>
</tbody>
</table>

Continuous variables compared with the Mann-Whitney U test. Categorical variables compared with Fisher's exact test.

Funding: N/A
Poster #M1
CAN TELEMEDICINE IMPROVE FOLLOW UP ADHERENCE AND OUTCOMES IN PATIENTS WITH OVERACTIVE BLADDER?

Ricardo Palmerola¹, Christina Escobar², Rachael Sussman³, Caroline Brandon², Scott Smilen², Dominique Pape², Nirit Rosenblum², Benjamin Brucker²

¹Mount Sinai Medical Center Miami Beach, ²New York University, ³Georgetown University

Presented By: Ricardo I. Palmerola, MD

Introduction: Telemedicine is utilized across numerous medical specialties across the United States to improve health care accessibility and provide convenient follow up. The Society of Urodynamics Female Pelvic Medicine & Urogenital Reconstruction Overactive Bladder Clinical Care Pathway (SUFU OAB CCP) provides a well-defined treatment plan for patients and providers. The aim of the study was to assess whether the introduction of telemedicine into the SUFU OAB CCP improved patient reported outcomes.

Methods: This was a single center, randomized prospective cohort study performed between 11/12/18-5/31/19. New patients were included if they were felt by the clinician to have OAB. Patients were excluded if they clinically were suspected to have bladder outlet obstruction, greater than stage 1 pelvic organ prolapse, or were incapable of operating one form of telecommunication. Patients were also excluded if they had been previously treated with >1 medication for OAB or had been treated with third line therapies. Patients were randomized 1:1 to a telemedicine group who received a phone call follow up between office visits or to standard follow up. Both groups were followed for a minimum of 12 weeks utilizing a follow up protocol consistent with the SUFU OAB CCP. Patient reported outcomes were measured with validated questionnaires (OABq-SF).

Results: 36 patients were randomized (19, telemedicine; 17 standard follow up) of which 23 completed the study (13, telemedicine; 10 standard). Four patients in the telemedicine group, and 1 patient in the standard group progressed to third line therapies. More patients in the telemedicine group were receiving treatment at the end of the study compared to the standard follow up group (12 v. 6). Both groups demonstrated reduction in symptom bother (-29 v. -26 points, p=0.73) and improvement in health-related quality of life (+22 v. +19, p=0.75) domains of OABq-SF, with no significant difference. Non-protocol communication was assessed and significantly lower in the telemedicine group (figure 1).

Conclusion: Implementation of telemedicine phone follow ups alongside the SUFU OAB CCP further improved medication compliance and progression to third line therapies. Given the efficacy of the telemedicine follow up future studies designed at assessing the safety and efficacy of telemedicine in lieu of routine OAB follow up visits could be considered.
Phone Calls - Non Protocol

<table>
<thead>
<tr>
<th></th>
<th>Telemedicine</th>
<th>Standard</th>
<th>P value (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone Calls (mean)</td>
<td>0.15</td>
<td>0.9</td>
<td>P=0.0041 (-1.2-0.2)</td>
</tr>
<tr>
<td>Email (mean)</td>
<td>0.84</td>
<td>0.7</td>
<td>P= 0.7 (-0.61-0.89)</td>
</tr>
<tr>
<td>Phone + Email (mean, median, range)</td>
<td>Mean: 1 Median: 1 Range: 0-3</td>
<td>Mean: 1.6 Median: 2 Range: 0-3</td>
<td>P=0.14 (-1.4-0.2)</td>
</tr>
</tbody>
</table>

Funding: N/A
Poster #M2

AUDIO-VISUAL STIMULI IN AN ORAL HYDRATION STUDY: HEIGHTENED RESPONSE IN OVERACTIVE BLADDER PARTICIPANTS

Urmila Sivagnanalingam1, Natalie Swavely, MD2, Priscilla Koirala1, Kaitlyn Maddra1, Rui Li, PhD3, Kyla Egenberger3, Sydney Roberts3, Samuel Weprin, MD2, Adam Klausner, MD2, John Speich, PhD3

1Virginia Commonwealth University School of Medicine, 2Virginia Commonwealth University, Department of Surgery, Division of Urology, Richmond, VA, 3Virginia Commonwealth University College of Engineering, Department of Mechanical Nuclear Engineering Richmond, VA

Presented By: Natalie Swavely, MD

Introduction: Current urodynamic tests involve invasive methods to evaluate bladder function and identify overactive bladder (OAB). There are limited studies investigating non-invasive methods to assess the effect of environmental stimuli on sensation changes in urinary urgency. The purpose of this study was to quantify percent-sensation change due to an audio-visual intervention in individuals with normal and overactive bladders during a non-invasive oral hydration study.

Methods: Healthy and OAB participants were recruited into the study and divided into groups with no urgency or high urgency based on ICIq-OAB surveys (question 5a ≤1 or ≥2). Participants completed a survey asking if 1) the sound/sight of running water, 2) being stressed/anxious and 3) cold weather made them feel more likely to rush to the toilet to urinate. Participants then drank 2L GatoradeG2® during fill 1 and water during fills 2 and 3 and utilized a tablet-based sensation meter to record real-time bladder sensation on a 0%-100% scale. At 50% sensation during fill 3, participants waited 90-seconds and then watched a 3-minute video showing scenes of running water, flushing toilets, waterfalls, etc. The change in %sensation from the beginning to the end of the video was calculated for each group. Firth logistic regression analysis was performed to assess statistical difference and odds ratio between the groups.

Results: Data from 30 participants (19 healthy, 11 OAB) were analyzed. Percent sensation during the audio-visual intervention increased by ≥30% in 4/11 OAB and 0/19 in healthy participants. A ≥30% increase in sensation was significantly associated with OAB participants (p<0.01, odds ratio=7.183). Survey responses were categorized as low (0-1) or high (2-4), and the odds ratio for OAB participants exhibiting high responses were significant (p<0.02) for the water (8.4), stress (21.3) and cold (9.3) triggers.

Conclusion: These results suggest that OAB participants may have a more heightened sensation to urinate with audio-visual stimuli than healthy subjects. The survey further validates that water, cold or stress increases urinary urgency in OAB compared to healthy participants. This information may be used to help identify a behavioral-based OAB phenotype using a non-invasive approach. Further research is needed to understand the effect of environmental triggers on bladder sensation in OAB.

Funding: NIH grant R01DK101719 and the Virginia Commonwealth University School of Medicine Summer Research Fellowship Program
Poster #M3
TREATMENT PATTERNS AND COSTS AMONG PATIENTS WITH OVERACTIVE BLADDER (OAB) RECEIVING COMBINATION ORAL THERAPY, SACRAL NERVE STIMULATION (SNS), PERCUTANEOUS TIBIAL NERVE STIMULATION (PTNS), OR ONABOTULINUMTOXINA
Stephen Kraus, MD1, Aki Shiozawa, DrPH2, Shelagh Szabo, MSc3, Christina Qian, MSc3, Basia Rogula, MSc3, John Hairston, MD2
1University of Texas Health Sciences Center, San Antonio, 2Astellas Pharma Global Development, Inc, Northbrook, 3Broadstreet HEOR, Vancouver
Presented By: Stephen R. Kraus, MD, FACS
Introduction: Patients whose OAB symptoms are inadequately addressed with monotherapy may seek alternative treatments including SNS, PTNS, or onabotulinumtoxinA injection. As these options are relatively invasive, combination mirabegroN/Antimuscarinic oral therapy has been investigated in trials with favorable results. As real-world data are lacking, this study characterizes treatment patterns and costs among patients with OAB on target therapies (combination mirabegroN/Antimuscarinic, SNS, PTNS or onabotulinumtoxinA) in the United States.
Methods: A retrospective cohort study was performed using the 2013-2017 MarketScan databases. Two cohorts of adult patients with OAB were identified; a first cohort with incident use of pharmacotherapy and a second cohort with incident use of a target therapy (with no target therapy 12-months prior). Date of first use was defined as the index date. Both cohorts were limited to those with 12 months of pre-index and 24 months of post-index continuous enrolment. Demographic characteristics and treatment patterns over the 24-month follow-up period were summarized. Crude mean (standard deviation [SD]) all-cause (all inpatient, outpatient and pharmaceutical records) and OAB-specific (inpatient or outpatient records with an OAB diagnostic code attached or pharmaceutical records for OAB-specific dispensations) costs were estimated according to target therapy from treatment initiation until end of follow-up.
Results: Over a one-year period, 54,066 patients had incident pharmacotherapy for OAB (mean [SD] age 58.5 [15.0] years; 76% female), and 1,662 patients had incident target therapy for OAB (mean [SD] age 62.8 [14.9] years; 83% female). Over 24 months, 1.4% of the incident pharmacotherapy cohort were treated with a target therapy. Seventeen percent were treated with at least one subsequent line of therapy; switching between antimuscarinics was common (73% had antimuscarinics as second-line). Among the incident target therapy cohort, 32% were initially treated with SNS, 27% with onabotulinumtoxinA, 26% with combination mirabegroN/Antimuscarinic therapy and 15% with PTNS; approximately one-third of these patients received additional lines of therapy (Table 1). Crude mean all-cause and OAB-specific costs are presented in Table 1.
Conclusion: Efficacious treatments are needed for patients whose OAB symptoms are not responding to monotherapy. Observed treatment patterns show substantial turnover in therapy after initial pharmacotherapy. As procedural therapies are invasive and can be costly, combination mirabegroN/Antimuscarinic therapy may offer an alternative.
### Table 1: Distribution of target therapies at index, and subsequent therapies received and two-year costs from index

<table>
<thead>
<tr>
<th>Incident target therapy cohort</th>
<th>Treatment patterns</th>
<th>Two-year costs from index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incident therapy</td>
<td>First subsequent therapy</td>
</tr>
<tr>
<td></td>
<td>cohort (100% of cohort)</td>
<td>(32% of cohort)</td>
</tr>
<tr>
<td></td>
<td>Crude-all-cause, mean (SD)</td>
<td>Crude-all-cause, mean (SD)</td>
</tr>
<tr>
<td></td>
<td>N = 1,662*</td>
<td>N = 534</td>
</tr>
<tr>
<td>SNS</td>
<td>535 (32%)</td>
<td>8 (1%)</td>
</tr>
<tr>
<td>OnabotulinumtoxinA</td>
<td>456 (27%)</td>
<td>31 (6%)</td>
</tr>
<tr>
<td>Combination antimuscarinic/mirabegron</td>
<td>427 (26%)</td>
<td>8 (1%)</td>
</tr>
<tr>
<td>Botox</td>
<td>245 (15%)</td>
<td>5 (1%)</td>
</tr>
<tr>
<td>Antimuscarinic</td>
<td>352 (22%)</td>
<td>81 (13%)</td>
</tr>
<tr>
<td>Mirabegron</td>
<td>150 (9%)</td>
<td>35 (22%)</td>
</tr>
</tbody>
</table>

| Incident pharmacotherapy cohort | Index pharmacotherapy (100% of cohort) | First subsequent therapy (17% of cohort) | Second subsequent therapy (3% of cohort) | Crude-all-cause, mean (SD) | Crude-all-cause, mean (SD)  |
|------------------------------| N = 56,506 | N = 9,300 | N = 1,571 |
| SNS | 119 (1%) | 45 (3%) | $80.87$ (54.69) | $39.95$ (28.11) |
| OnabotulinumtoxinA | 132 (1%) | 82 (5%) | $59.75$ (116.99) | $10.18$ (13.72) |
| Combination antimuscarinic/mirabegron | 105 (1%) | 65 (4%) | 14 (1%) | $42.33$ (54.73) | $7.03$ (6.85) |
| Botox | 62 (1%) | 27 (2%) | $48.27$ (57.68) | $8.60$ (5.17) |
| Antimuscarinic | 48,550 (90%) | 9,005 (7.2%) | 960 (0.3%) | $39.95$ (28.11) | $10.18$ (13.72) |
| Mirabegron | 5,251 (10%) | 2,142 (22%) | 413 (26%) | $80.87$ (54.69) | $39.95$ (28.11) |

*One patient received both PTNS and onabotulinumtoxinA at index.*
*By therapy at index.*
*Estimated among those with target therapy use (i.e., combination mirabegron/antimuscarinic, SNS, PTNS, or onabotulinumtoxinA) over the two years from index.*

**Funding:** Astellas Pharma Global Development, Inc
Poster #M4
EVALUATING THE QUALITY OF OVERACTIVE BLADDER PATIENT EDUCATION MATERIAL ON YOUTUBE USING THE PATIENT EDUCATION MATERIALS ASSESSMENT TOOL
Lunan Ji1, Elisabeth Sebesta1, Matthew Rutman2, Doreen Chung2
1Department of Urology, Columbia University, New York, NY, USA, 2Department of Urology, Columbia University, New York, NY, USA
Presented By: Lunan Ji, MD

Introduction: Overactive bladder (OAB) and its treatment options can often be confusing for patients. Increasingly patients with OAB turn to the internet for education material. With around 29 billion visits per month YouTube is the most popular online video streaming platform, and the second most visited website on the internet. We sought to evaluate the characteristics and quality of available patient education content for OAB on YouTube.

Methods: We searched YouTube on September 10th 2019 and selected the top 20 search results for “overactive bladder” for review. We also reviewed 3 Urology Care Foundation (UCF) OAB education videos available on YouTube for comparison. All videos were reviewed and scored using the Agency for Healthcare Research and Quality’s (AHRQ) Patient Education Materials Assessment Tool (PEMAT) for Audiovisual (AV) materials. The PEMAT score is subdivided into understandability and actionability domains with a maximum score of 100% for each domain.

Results: The mean age of the reviewed videos was 64 (range 5-112) months, the mean length was 10.8 (0.9-34) minutes, and the mean number of views was 187,629 (350 – 2,032,441). Of the top 20 search results, the mean PEMAT understandability score was 74% ±16% (range 41%- 100%). The mean PEMAT actionability score of reviewed videos was 53% ±38% (range 0%-100%). 70% of the reviewed videos featured a physician (not necessarily urologists), 10% a physical therapist, 20% other. For example, the most viewed video featured a cardiothoracic surgeon, Dr. Oz. In comparison, the 3 UCF videos had an average of 5,840 views, 3 minutes length, and higher PEMAT understandability and actionability scores of 93% and 100%. 100% of the UCF OAB videos featured an urologist.

Conclusion: As anticipated, the quality of patient education material for OAB on YouTube varies significantly in both understandability and actionability. Many of the reviewed videos had poor actionability scores on PEMAT. Although the Urology Care Foundation videos scored much higher in the PEMAT than our reviewed videos, they did not appear within the top 20 search results for OAB. We believe there is great opportunity for the AUA/UCF and SUFU to increase its outreach to patients on platforms like YouTube.

Funding: NA
Preliminary Analysis of Brain Footprints of Multiple Sclerosis Women with Detrusor Sphincter Dyssynergia: A Concurrent Urodynamic and fMRI Study
Khue Tran1, Christof Karmonik, PhD2, Timothy Boone, MD1, Rose Khavari, MD1
1Houston Methodist Hospital, 2Houston Methodist Research Institute
Presented By: Khue Tran

Introduction: In this study, grey and white brain matter characteristics of Multiple Sclerosis (MS) women with Detrusor Sphincter Dyssynergia (DSD) and Neurogenic Lower Urinary Tract Dysfunction (NLUTD) are evaluated. Grey matter is assessed via the functional connectivity (FC) of brain regions activated during voiding. White matter evaluation focuses on the integrity of two white matter tracts (WMT) involved in proper bladder function (Anterior thalamic radiation (ATR) and Superior longitudinal fasciculus (SLF)), which are assessed via their Fractional Anisotropy (FA) and Mean Diffusivity (MD) values. We hypothesize that MS women with DSD have FC patterns that are distinct during the voiding phase, and lower FA and higher MD values in the two preselected WMTs.

Methods: Twenty-seven MS women with NLUTD (divided into two groups: Group 1; patients without DSD (n=23) and Group 2; patients with DSD (n=4)) and eight healthy control (HC) women underwent concurrent urodynamic testing and fMRI evaluation with a task of bladder filling and emptying repeated four times. A parameter called FC_sim was generated for each subject to express the similarity of individual FC pattern between regions that are activated at initiation of voiding, relative to FC patterns of all subject. ATR and SLF tracts were identified and their FA and MD values were recorded for each subject. One-way ANOVA (α=0.05) and unpaired t-tests (α=0.05) were used to compare values between groups.

Results: Mean FC_sim values of HCs was the lowest, followed by Group 2 and Group 1 (p=0.007), indicating distinct FC patterns among groups. Group 2 showed trend of lower FA (loss of coherence) and higher MD (increased free diffusion) in all WMTs compared to HCs, and in the left and right ATR compared to MS women without DSD nor voiding dysfunction (VD), suggesting more damage in these tracts for MS women with DSD.

Conclusion: MS women with DSD show significantly distinct FC patterns compared to MS women without DSD and HCs. Within MS women, there is a trend of more damage in the ATR tracts in patients with DSD compared to patients with neither DSD nor VD. Lack of statistically significant difference suggests assessing these WMTs is not a good indicator of DSD in MS women.

Funding: Dr. Khavari reports that she is partially supported by K23DK118209, by National Institute of Heath, NIDDK (RK). Also supported by Houston Methodist Clinician Scientist Award (RK).
Poster #M6
ALPHA-1 ADRENERGIC ANATOGNISTS FOR TREATMENT OF OBSTRUCTIVE URINARY SYMPTOMS IN PATIENTS WITH MULTIPLE SCLEROSIS
Daniel Raza, Medical Student1, Lauren Corona2, Giula Lane2, Paholo Barbeglio Romo2, Priyanka Gupta2, Quentin Clemens2, Anne Cameron2, John Stoffel2
1Tulane University School of Medicine, 2University of Michigan
Presented By: Daniel Raza

Introduction: Patients with multiple sclerosis (MS) are impacted by obstructive urinary symptoms and urinary retention, which affect quality of life. Although alpha-1 adrenergic antagonists (A1A) are frequently prescribed to treat obstructive symptoms in numerous pathologies, the efficacy of these medications for treating obstructive symptoms in MS has not been well studied. We investigated the efficacy of A1A in MS patients for reducing post-void residual (PVR) and lower urinary tract symptoms (LUTS).

Methods: We retrospectively reviewed MS patients treated with A1A as primary treatment for obstructive lower urinary tract symptoms (2006-2018). All patients had documented LUTS with or without urinary retention and had been evaluated by neuro-urology providers. PVR and quality of life measurements were compared for each patient prior to A1A treatment and again after at least one month of follow-up. Primary outcome was change in PVR at last follow-up after starting medication. Secondary measures included changes in urinary quality of life as measured by the Total American Urological Association Symptom Score (AUA-SS) and Total Michigan Incontinence Symptom Index (M-ISI) score at last follow up.

Results: We identified 25 MS patients treated with A1A. Mean patient age was 51 years, 64% were female and mean treatment time was 13 months (range 1-33 months). The mean pre-treatment PVR was 175 +/- 115cc. The mean reduction in PVR per individual after starting alpha blockers was 79 ml (95% CI 39 – 118, p < 0.001). Fifty-four percent of patients had a >50% reduction in PVR and 32% had a 25-50% PVR improvement after A1A treatment. Age, gender, BMI, location of the MS lesions, duration and stage of the disease were not predictive of >25% improvement of PVR. Total AUA-SS was reduced from mean 19 to mean 13 (p=0.007) after A1A treatment. M-ISI did not show significant improvement.

Conclusion: Alpha-1 adrenergic antagonist treatment for MS patients with bothersome LUTS significantly improved PVR and total AUA-SS in this cohort.

Funding: N/A
Poster #M7
SAFETY OF SUPRAPUBIC CATHETER INSERTION: A CONTEMPORARY NORTH AMERICAN SERIES
Jane T. Kurtzman, MD, Lunan Ji, MD, Shawn Mendonca, MD, Steven B. Brandes, MD, Doreen E. Chung, MD
Department of Urology, Columbia University Irving Medical Center, New York, NY
Presented By: Jane Kurtzman, MD

Introduction: Suprapubic catheter insertion (SPCI) is a common urologic procedure. Previous literature, though limited, reports a 10% intraoperative complication rate and a bowel injury rate of up to 2-3% in cystoscopic-guided SPCI. Our objective was to examine patient characteristics and complications of SPCI in neurogenic and non-neurogenic patients at a single North American tertiary care center where blind SPCI is common.

Methods: We retrospectively reviewed the charts of adult patients who underwent SPCI between January 2014 and June 2019. We analyzed patient characteristics, procedure parameters, and complications within 90 days.

Results: The patient population consisted of 13 (26%) females and 37 (64%) males, with median age 67.7 years (IQR 52.0-79.9) and median BMI 26.8 (IQR 22.2-29.1). A total of 50 SPCIs were performed by 11 attending urologists. 92% were performed in the operating room and 18% at bedside. 64% of the patients had previous abdominal or pelvic surgery and/or radiation. Only 36% of patients had urodynamics performed prior to SPCI and 38% had clinically documented neurogenic bladder.

Of all SPCIs, 34% were performed blindly. 46% were performed with cystoscopic-guidance, 12% open, 2% with Lowsley-retractor guidance and 2% with laparoscopic guidance. Median length of stay was 0 days (IQR 0-1).

We calculated a 6% perioperative complication rate (transfusion, continuous bladder irrigation, unanticipated hospital admission) among all patients and a 0% rate among those who underwent blind SPCI. There was an overall 0% intraoperative complication rate, which included bowel injuries. Within 90 days, 32% of patients experienced at least one SPC-related complication, with 80% experiencing tube malfunction (Clavien I) and 26% experiencing a symptomatic culture-proven UTI requiring antibiotics prescribed by a urologist (Clavien II). 16% of patients visited the ED and 8% were admitted to the hospital for an SPCI-related complaint within 90 days of SPCI.

Conclusion: In this multi-surgeon contemporary series, SPCI appeared to be a safe procedure with no intraoperative complications. In contrast to previous reports, the incidence of bowel injury was negligible, even in patients with blind SPCI. Congruent with previous reports, the incidence of UTI is high. Additional research is needed to identify risk factors for this complication and how to prevent UTIs in this population.

Funding: N/A
Poster #M8
EVALUATION OF INDEPENDENT PREDICTORS OF COMPLIANCE TO CONTINUED THERAPY WITH INTRADETRUSOR BOTOX INJECTION
Ramy Goueli, MD, MHS, Dayron Rodriguez, MD, MPH, Jonathan Hong, BS, Maude Carmel, MD, Gary Lemack, MD
Department of Urology, University of Texas Southwestern Medical Center
Presented By: Ramy Goueli, MD, MHS

Introduction: There is a paucity of literature examining predictors for continuing therapy with intradetrusor injections of onabotulinumtoxin A (Botox) for refractory urgency/urge incontinence (U/UI). The objective of this study was to examine demographic and urodynamic factors that would be predictive of continuing therapy.

Methods: Following IRB approval, we performed a retrospective review of patients who underwent Botox injections between December 2007 to September 2016 for U/UI. We considered ‘continuation of therapy’ if the patient was treated for over one year and received three or more Botox treatments. Patients were instructed to continue treatments only if they perceived significant benefit. We excluded patients with history genitourinary malignancy, genitourinary fistula/malformation or previous bladder augmentation. We examined pre-injection demographics, co-morbidities, medications, ambulatory status, bladder management, voiding/urodynamic parameters and Botox dosage. Multivariate logistic regression was used to identify independent predictors of continuing Botox therapy.

Results: A total of 941 injections were done over the study period. Of the 201 patients who underwent a Botox injection, 95 (45%) met our criteria for continued therapy. The average age of our entire cohort at first injection was 54.7±17.1 years, average BMI was 26.23±6.3, with 143 (71%) being female. At the time of injection, 87 patients (41.4%) were on an anticholinergic medication. Regarding bladder management, 94 patients (46.8%) were voiding, with 90 (44.8%) requiring clean intermittent catheterization (CIC) and 16 (8%) using an indwelling catheter. There were 58 patients (27.4%) diagnosed with idiopathic overactivity (iOAB), among those patients diagnosed with neurogenic overactivity (nOAB), 60 (28.3%) had a spinal cord injury, 59 (27.8%) had a diagnosis of either multiple sclerosis or transverse myelitis. On univariate analysis, Botox dosage and a diagnosis of nOAB were predictive of continuing therapy. On multivariate analysis, only a diagnosis of nOAB was a significant predictor of continuing Botox therapy. There were no urodynamic or symptom score predictors of continuing therapy (Table 1). No specific neurological diagnosis was associated with continuing therapy. The mean duration of treatment for those who continued therapy was 4.0±2.7 years.

Conclusion: There appears to be an appreciable attrition rate with continuing Botox therapy. A diagnosis of nOAB has been shown to be predictive of continuing Botox therapy.
### TABLE 1
Univariate and Multivariate logistic regression analysis of independent predictors of continuing Botox therapy

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Univariate Analysis</th>
<th>Multivariate Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio 95% CI</td>
<td>P value</td>
</tr>
<tr>
<td><strong>Age (+1 year)</strong></td>
<td>1.013 0.997 to 1.030</td>
<td>0.12</td>
</tr>
<tr>
<td><strong>BMI (+1 point)</strong></td>
<td>0.997 0.955 to 1.042</td>
<td>0.902</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.266 0.685 to 2.340</td>
<td>0.452</td>
</tr>
<tr>
<td><strong>UDI-6 Total (+5 points)</strong></td>
<td>1.011 0.989 to 1.034</td>
<td>0.318</td>
</tr>
<tr>
<td><strong>Bladder Management</strong></td>
<td></td>
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</tr>
<tr>
<td>Voiding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-voiding (CIC, Foley, SPT)</td>
<td>1.456 0.833 to 2.546</td>
<td>0.188</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idiopathic overactivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurogenic overactivity</td>
<td>2.329 1.202 to 4.513</td>
<td>0.012**</td>
</tr>
<tr>
<td><strong>Ambulatory Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheelchair independent</td>
<td></td>
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</tr>
<tr>
<td>Wheelchair dependent</td>
<td>1.286 0.702 to 2.356</td>
<td>0.415</td>
</tr>
<tr>
<td><strong>Botox Dosage (units)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 units</td>
<td>2.468 1.274 to 4.779</td>
<td>0.007**</td>
</tr>
<tr>
<td>MCC (&gt;10 cc)</td>
<td>1.000 0.998 to 1.002</td>
<td>0.963</td>
</tr>
<tr>
<td><strong>DESD Diagnosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>2.020 0.935 to 4.366</td>
<td></td>
</tr>
</tbody>
</table>

BMI: Body Mass index; UDI-6: Urinary distress inventory; CIC: Clean intermittent catheterization;
SPT: Suprapubic tube; MCC: Maximal cystometric capacity; DESD: Detrusor external sphincter dyssynergia

**Funding:** N/A
Poster #M9

UROFLOWMETRY ON POD #1 AFTER MIDURETHRAL SLING: A MEDIUM-TERM VOIDING DYSFUNCTION PREDICTOR

Fernanda Santis-Moya\textsuperscript{1,2}, Marcelo Mass-Lindenbaum\textsuperscript{3}, Javier Pizarro-Berdichevsky\textsuperscript{1,2}

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Presented By: Javier Pizarro-Berdichevsky, MD

**Introduction:** Midurethral slings (MUS) are the standard treatment for stress urinary incontinence (SUI). Voiding dysfunction (VD) can occur in up to 20\% of cases. Different parameters have been studied to predict its occurrence, without success. The most common is to use PVR<100ml before discharge. We hypothesize that PVR has high specificity but low sensitivity for medium-long term obstructive symptoms. Our goal is to determine if post-operative uroflowmetry can serve as a predictor of VD.

**Methods:** A retrospective study of a prospective database of our section was performed. All uroflowmetries were performed on POD #1 after TVT between 2016 and 2019. The discharge decision was made with a PVR<100ml as standard care, regardless of the uroflow results. The uroflow results were analyzed and correlated with the onset of symptoms of VD as defined by ICS/IUGA.

**Results:** 104 uroflowmetries were analyzed. 30.8\% had pure SUI, 59.6\% MUI, 73.1\% urgency, 27.9\% vaginal bulge and 24\% VD symptoms. 43.3\% had prolapse and 9.3\% occult SUI. On office cystometry 62.2\% had severe SUI and median PVR was 3ml (IQ 0-10). All patients had a retropubic MUS. Hysterectomy was associated in 27.8\%, colporrhaphy 13.4\%, vaginal apical suspension 17.3\%, sacrocolpopexy 5.7\% and colpocleisis 2.8\%. On POD #1, non-invasive uroflowmetry was performed: Average flow 8.6ml/sec±3.4, flow time 35.1sec±12.1, Qmax 20ml/sec±8.4, time to Qmax 11.8sec±6.6, voiding volume 275ml±62, voiding time 49.6sec±25.1 and PVR 21ml±36. 32.7\% of the patients presented an abnormal pattern (intermittent, flattened, sawed). Median follow-up time was 8 months (IQ: 1-17). 26.9\% reported VD symptoms (double voiding 14.4\%, incomplete bladder 11.5\% and spraying 10.6\%). 7.7\% required mesh resection due to VD. VD symptoms correlated with abnormal pattern, average flow, PVR and voided volume (Table 1). 95\% reported significant improvement of quality of life with no SUI symptoms.

**Conclusion:** PVR measurement are useful. It is important to highlight that VD was even associated to “normal” <100ml PVR. However some parameters of uroflowmetry (abnormal pattern, average flow and voided volume) after MUS placement could predict VD in a more sensitive way. Future studies are needed to understand which parameters are the most relevant and would be useful for early interventions before full integration of the mesh into the host tissue.

**Table 1. Correlation between voiding symptoms and POD #1 uroflowmetry (p values)**

<table>
<thead>
<tr>
<th>Any voiding dysfunction symptom</th>
<th>Abnormal pattern</th>
<th>Acceler.</th>
<th>Average Flow</th>
<th>Flow time</th>
<th>Qmax</th>
<th>PVR</th>
<th>Time to Qmax</th>
<th>Voided volume</th>
<th>Voiding time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow urine stream</td>
<td>0.296</td>
<td>0.822</td>
<td>0.019</td>
<td>0.381</td>
<td>0.247</td>
<td>0.003</td>
<td>0.501</td>
<td>0.007</td>
<td>0.742</td>
</tr>
<tr>
<td>Double voiding</td>
<td>0.078</td>
<td>0.698</td>
<td>0.195</td>
<td>0.585</td>
<td>0.764</td>
<td>0.042</td>
<td>0.229</td>
<td>0.295</td>
<td>0.557</td>
</tr>
<tr>
<td>Post void dribbling</td>
<td>0.381</td>
<td>0.542</td>
<td>0.086</td>
<td>0.236</td>
<td>0.340</td>
<td>0.142</td>
<td>0.591</td>
<td>0.713</td>
<td>0.939</td>
</tr>
<tr>
<td>Straining</td>
<td>0.484</td>
<td>0.076</td>
<td>0.226</td>
<td>0.408</td>
<td>0.285</td>
<td>0.962</td>
<td>0.127</td>
<td>0.271</td>
<td>0.839</td>
</tr>
<tr>
<td>Intermittent flow</td>
<td>0.849</td>
<td>0.345</td>
<td>0.107</td>
<td>0.409</td>
<td>0.062</td>
<td>0.066</td>
<td>0.878</td>
<td>0.007</td>
<td>0.792</td>
</tr>
<tr>
<td>Hesitancy</td>
<td>0.738</td>
<td>0.847</td>
<td>0.289</td>
<td>0.585</td>
<td>0.246</td>
<td>0.056</td>
<td>0.862</td>
<td>0.001</td>
<td>0.789</td>
</tr>
<tr>
<td>Position dependent voiding</td>
<td>0.980</td>
<td>0.425</td>
<td>0.034</td>
<td>0.035</td>
<td>0.063</td>
<td>0.644</td>
<td>0.053</td>
<td>0.178</td>
<td>0.747</td>
</tr>
<tr>
<td>Spraying</td>
<td>0.972</td>
<td>0.573</td>
<td>0.204</td>
<td>0.125</td>
<td>0.184</td>
<td>0.006</td>
<td>0.839</td>
<td>0.752</td>
<td>0.745</td>
</tr>
<tr>
<td>Incomplete voiding</td>
<td>0.052</td>
<td>0.458</td>
<td>0.088</td>
<td>0.208</td>
<td>0.822</td>
<td>0.934</td>
<td>0.905</td>
<td>0.055</td>
<td>0.412</td>
</tr>
</tbody>
</table>

**Funding:** N/A
TELEMEDICINE OPTIMIZES EARLY POST-OPERATIVE FOLLOW UP AFTER SYNTHETIC MID-URETHRAL SLING (MUS): A RANDOMIZED, MULTI-INSTITUTIONAL CONTROL TRIAL

Samir Derisavifard¹, Jessica Rueb¹, Neil Kocher¹, Laura Giusto¹, Patricia Zahner¹, Deyi Luo², Elodi Dielubanza¹, Jiayi Li³, Raphael de Jesus Moreira⁴, Alexander Gomelsky⁵, Matteo Balzarro⁶, Raymond Rackley¹, Sandip Vasavada¹, Courtenay Moore¹, Howard Goldman¹

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Presented By: Samir Derisavifard, MD

Introduction: The female stress urinary incontinence (SUI) American Urological Association (AUA) guidelines state physicians should communicate with patients soon after surgery. However if patients are doing well, do they need physical examination? We assessed whether telemedicine based follow up (TBFU) is equivalent to office based follow-up (OBFU) in the early post-operative period after routine synthetic mid-urethral placement with regards to unplanned events and patient reported outcomes.

Methods: We conducted a prospective, international, multi-institutional, randomized control trial from 2018-9. All patients underwent a MUS for documented SUI or stress-predominant mixed urinary incontinence. Patients were randomized 1:1 to 3-week postoperative OBFU or TBFU; patient-requested crossover between groups was permitted. OBFU at 3-5 months was recommended for all. The primary outcome was the rate of unplanned events by follow up method. Secondary outcomes included rate of patient satisfaction, crossover, and compliance with 3-5 month OBFU. Descriptive statistics and logistic regression analyses were used to assess our data.

Results: 222 patients were enrolled from 5 sites (TBFU:115 vs. OBFU: 107). Mean age was 56 years (Range: 34-87), and BMI was 26.3 (STD: 4.5). The majority of the sample was Asian (49%) or White (44.6%). No differences in demographics or medical comorbidities were noted between the study groups (p: 0.26-0.88). Comparing TBFU to OBFU, no differences were noted in unplanned events – hospital admission, emergency department visit, or unplanned office visit or call (15% vs. 15.7%, p=0.89) or adverse medical events (9.3% vs. 10.4%, p=0.83). TBFU patients were more likely to be “very satisfied” with their surgical outcomes (75.7% vs. 64.5%, p=0.32); these differences were not statistically significant. Predictors of satisfaction included non-white ethnicity (p<0.01; OR: 1.9, 95% CI: 0.94-4.0) and no college-level education (p=0.02; OR: 1.2, 95% CI: 0.25-6.2). Sixteen (14%) TBFU patients requested crossover to OBFU; age > 65 was predictive of crossover (p=0.04; OR: 3.3, 95% CI: 1.1-9.9). TBFU patients were more compliant with 3-5 month OBFU (93.8% vs. 84.6%, p=0.03)

Conclusion: After synthetic MUS placement, TBFU is a safe, feasible patient communication option 3 weeks postoperatively. Compared to OBFU, TBFU had no greater unplanned events, greater compliance with 3-5 month follow up, and trended towards higher satisfaction.

Funding: N/A
**Poster #M11**

**VIBEGRON STATISTICALLY SIGNIFICANTLY IMPROVES QUALITY-OF-LIFE MEASURES IN PATIENTS WITH OVERACTIVE BLADDER: EMPOWUR STUDY**

Jeffrey Frankel, MD¹, David Staskin, MD², Susann Varano, MD³, Denise Shortino, MS⁴, Rachael Jankowich, RN⁴, Paul N Mudd Jr, PharmD⁴

¹Seattle Urology Research Center, Seattle, WA, ²Tufts University School of Medicine, Boston, MA, ³Clinical Research Consulting, Milford, CT, ⁴Urovant Sciences, Inc., Irvine, CA

Presented By: Jeffrey M. Frankel, MD

**Introduction:** EMPOWUR evaluated the efficacy and safety of vibegron, a new β3-agonist, vs placebo with tolterodine (active control) in adults with overactive bladder (OAB). Vibegron had statistically significant adjusted mean reductions from baseline \((P<0.001)\) in daily micturitions and urge urinary incontinence (UUI) episodes vs placebo from Week 2 through Week 12. Patient-reported quality of life (QOL) data are presented here.

**Methods:** Patients aged \(\geq 18\) years with OAB (\(\geq 8\) micturitions/day) for \(\geq 3\) months, and OAB wet (\(\geq 1\) UUI episodes/day) or OAB dry (\(\geq 3\) urgency and <1 UUI episode/day) were randomized 5:5:4 to vibegron 75 mg, placebo, or tolterodine extended-release 4 mg. The Overactive Bladder Questionnaire Long Form (OAB-q LF) for a 1-week recall period was administered at baseline and Week 12 to assess QOL. A repeated measured-mixed effects model was used for analyses. Covariates included treatment, visit, sex, region, OAB type, baseline score, and treatment by study visit interaction.

**Results:** In total, 1518 patients were randomized (vibegron, 547; placebo, 540; tolterodine, 431). Groups were well-balanced: mean age was ~60 years, with ~85% women/15% men in each group. Vibegron 75 mg demonstrated statistically significant improvements in adjusted mean change from baseline on the Coping, Concern, Sleep, total HRQL, and Symptom Bother scores (Table 1). The \(P\) values include the missing item imputation (Table 1). Vibegron results were numerically better than tolterodine results for all scales. Treatment-emergent adverse events (>placebo and >2%) were headache (vibegron, placebo, tolterodine; 4.0%, 2.4%, 2.6%; respectively), nasopharyngitis (2.8%, 1.7%, 2.6%), diarrhea (2.2%, 1.1%, 2.1%), and nausea (2.2%, 1.1%, 1.2%). Notably, hypertension was 1.7% for vibegron and placebo, and 2.6% for tolterodine.

**Conclusion:** EMPOWUR demonstrated that vibegron 75 mg improves the symptoms of OAB (urgency, frequency, UUI) and increases the QOL of patients suffering from OAB.

**Table 1. Vibegron Significantly Improved Quality of Life at Week 12**

**Funding:** Urovant Sciences
Poster #M12
PREDICTIVE FACTORS OF PROGRESSION TO SURGICAL TREATMENT OF STRESS URINARY INCONTINENCE AFTER DETRUSOR BOTULINUM TOXIN INJECTION VS SACRAL NEUROMODULATION IN WOMEN WITH MIXED URINARY INCONTINENCE.

Kim Thai, MD\textsuperscript{1}, Ryan Morris, MS\textsuperscript{2}, Rachel High, DO\textsuperscript{3}, Erin Bird, MD\textsuperscript{1}, Jill Danford, MD\textsuperscript{3}
\textsuperscript{1}Department of Urology, Baylor Scott White, Temple, TX, \textsuperscript{2}Texas AM College of Health Sciences, Bryan College Station, TX, \textsuperscript{3}Department of Obstetrics and Gynecology, Baylor Scott White, Temple, TX

Presented By: Kim H. Thai, MD

Introduction: Mixed urinary incontinence (MUI) is a prevalent condition in women\textsuperscript{1}. Thirty-four percent of women with UI report MUI, while 49.8\% and 15.9\% report only stress urinary incontinence (SUI) and urge urinary incontinence (UUI), respectively\textsuperscript{2}. MUI can be difficult to treat as treatment options address SUI or UUI, but often not both. Treatments differ between SUI and UUI\textsuperscript{1,4}. Although urgency, frequency, UUI symptoms after treatment for SUI have been studied extensively, symptoms related to SUI haven’t been studied in patients after surgical treatment for UUI\textsuperscript{3}. We aim to characterize the effect of sacral neuromodulation (SNM) and bladder onabotulinumtoxin A injections (BTX) on the SUI component of MUI and determine the rate of progression to surgical treatment of SUI.

Methods: After IRB approval, a retrospective chart review was performed from, January 2013 through June 2019, on female patients, over age 18, who had historical MUI and underwent either SNM or BTX procedures. Patients who received BTX previously and switched to SNM were classified as SNM. Patients who previously had SNM but stopped, and most recently had BTX were classified in the BTX group. Patients with neurogenic bladder or possible concomitant use of SNM and BTX were excluded. Bivariate analysis of patient characteristics was completed.

Results: Total of 96 females were included, 56 with SNM, 40 with BTX. Prevalence of SUI surgery after receiving SNM or BTX was 9.1\% (8/96). There was no difference in progression to SUI surgery in patients who had SNM compared to BTX. Patients with SUI surgery were more likely to have diabetes mellitus (38\%) vs 5.6\% of those who did not undergo SUI surgery (p=0.0178). They were also more likely to have a history of hysterectomy (88\%) compared to 39\%, respectively (p=0.0192). Other characteristics did not significantly differ (see table).

Conclusion: Female patients with MUI who had surgical management of UUI have a low incidence of SUI surgery later. A history of diabetes mellitus or hysterectomy may be a risk factor in progression to SUI surgery. However, a history of BTX or SNM made no difference in patients who received a subsequent SUI surgery.
<table>
<thead>
<tr>
<th></th>
<th>SUI surgery (n=8)</th>
<th>No SUI surgery (n=88)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (median, range)</td>
<td>68 (21, 77)</td>
<td>64 (29, 88)</td>
<td>0.6090</td>
</tr>
<tr>
<td>BMI (median, range)</td>
<td>29 (24, 39)</td>
<td>31 (26, 35)</td>
<td>0.8758</td>
</tr>
<tr>
<td>Smoking history</td>
<td>0</td>
<td>11 (12.5%)</td>
<td>-</td>
</tr>
<tr>
<td>Medical History</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>4 (50%)</td>
<td>17 (19.3%)</td>
<td>0.0664</td>
</tr>
<tr>
<td>Chronic opioid therapy</td>
<td>0</td>
<td>9 (10.2%)</td>
<td>-</td>
</tr>
<tr>
<td>Medication dependent Diabetes</td>
<td>3 (38%)</td>
<td>5 (5.6%)</td>
<td>0.0178</td>
</tr>
<tr>
<td>Past Surgical History</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>7 (88%)</td>
<td>34 (39%)</td>
<td>0.0192</td>
</tr>
<tr>
<td>Prolapse surgery</td>
<td>2 (25%)</td>
<td>17 (19%)</td>
<td>0.6554</td>
</tr>
<tr>
<td>Prior SUI therapies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical</td>
<td>4 (50%)</td>
<td>24 (27%)</td>
<td>0.0624</td>
</tr>
<tr>
<td>Pelvic floor physical therapy</td>
<td>2 (25%)</td>
<td>29 (33%)</td>
<td>0.9999</td>
</tr>
<tr>
<td>Cough stress test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>2/4 (50%)</td>
<td>8/33 (24%)</td>
<td>0.2914</td>
</tr>
<tr>
<td>negative</td>
<td>2/4 (50%)</td>
<td>25/33 (76%)</td>
<td></td>
</tr>
<tr>
<td>Urodynamic stress incontinence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>1/6</td>
<td>13/41</td>
<td>0.6532</td>
</tr>
<tr>
<td>negative</td>
<td>5/6</td>
<td>28/41</td>
<td></td>
</tr>
<tr>
<td>Months of follow up (median, range)</td>
<td>15 (12, 60)</td>
<td>12 (13, 24)</td>
<td>0.3391</td>
</tr>
<tr>
<td>Treatment Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTX</td>
<td>3 (38%)</td>
<td>37 (42%)</td>
<td>0.999</td>
</tr>
<tr>
<td>SNS</td>
<td>5 (62%)</td>
<td>51 (58%)</td>
<td></td>
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</tbody>
</table>

**Funding:** N/A
Poster #M13

IS STRESS INCONTINENCE AND PELVIC ORGAN PROLAPSE SURGERY ASSOCIATED WITH THE DEVELOPMENT OF AUTOIMMUNE RHEUMATIC DISEASE? THE RESULTS OF A POPULATION-BASED COHORT STUDY

Humberto Vigil, MSc, MD, FRCSC¹, Rano Matta, MSc, MD², Arielle Mendel, MSc, MD, FRCP², Lesley Carr, MD, FRCSC³, Sender Herschorn, MDCM, FRCSC²
¹The Ottawa Hospital, Division of Urology, University of Ottawa, Ottawa, ON, ²Sunnybrook Health Sciences Centre, Division of Urology, University of Toronto, Toronto, ON, ³Mount Sinai Hospital, Division of Rheumatology, University of Toronto, Toronto, ON

Presented By: Humberto Vigil, MD, MSc

Introduction: Regulatory warnings for mesh-based stress urinary incontinence (SUI) and pelvic organ prolapse (POP) procedures have led to an unsupported claim that mesh directly stimulates the immune system and predisposes to autoimmune rheumatic disease (ARD). We sought to evaluate the association between SUI and POP on the development of ARD in Ontario, Canada.

Methods: Adult women who underwent surgery for SUI or POP between January 1, 2002 and December 31, 2015 were identified from an administrative database. Surgical codes were used to identify women undergoing mesh and non-mesh procedures. The remaining population of women during this period were divided into two control groups according to diagnostic codes: SUI or POP with no surgery and the general population. The primary outcome was a composite of any ARD diagnosis (rheumatoid arthritis, connective tissue disorders, seronegative spondyloarthopathies and vasculitis) developing at least 3-months following SUI or POP surgery or diagnosis. Secondary outcomes included the development of the individual ARDs. A 4-level categorical Cox-proportional hazards model was used to estimate the risk of primary and secondary outcomes with the general population as the reference group, adjusting for patient-level baseline covariates.

Results: 281,122 women were diagnosed with SUI or POP and did not undergo surgery. Of the 139,904 women who underwent surgery, 79,222 and 60,682 underwent repair with and without mesh, respectively. Median age was 43 (IQR 29-57). Overall, 84,992 (1.45%) women were diagnosed with an ARD. Compared to the general population, women with SUI or POP had an increased risk of ARD independent of treatment modality (mesh HR 1.17 [95%CI 1.13-1.21]; non-mesh HR 1.16 [95%CI 1.12-1.20]; no surgery HR 1.11 [95%CI 1.09-1.13]). In terms of ARDs, women with SUI or POP had the greatest risk of developing rheumatoid arthritis (mesh HR 1.28 [95%CI 1.21-1.34]; non-mesh HR 1.32 [95%CI 1.24-1.39]; no surgery HR 1.14 [95%CI 1.11-1.17]) and seronegative spondyloarthopathies (mesh HR 1.36 [95%CI 1.24-1.48]; non-mesh HR 1.23 [95%CI 1.11-1.36]; no surgery HR 1.19 [95%CI 1.12-1.25]).

Conclusion: SUI and POP are associated with an increased risk of ARD irrespective of management approach. Risk factors for SUI and POP may account for the increased risk of ARD; however, further work is required to clarify this novel finding.

Funding: N/A
Poster #M14
LIBERATE INTERNATIONAL: EVALUATION OF THE SAFETY AND EFFICACY OF THE VIVEVE TREATMENT FOR STRESS URINARY INCONTINENCE
Blayne Welk, MD, MSc, FRCSC1, Sean Peterson, MD, CCFP(EM), BASc2, Sender Herschorn, BSc, MDCM, FRCSC3
1Western University, 2Bluewater Clinical Research Group Inc., 3University of Toronto Sunnybrook Health Sciences Centre
Presented By: Blayne Kaili Welk, MD

Introduction: There is a gap between conservative and invasive treatment options for stress urinary incontinence (SUI), and this represents an unmet need in women’s healthcare. Energy-based vaginal treatments have been proposed as a non-invasive option to treat SUI, however, there is no high-quality evidence to support their efficacy. The primary objective of this study was to evaluate the efficacy of the Viveve treatment, SUI protocol (non-ablative, cryogen-cooled monopolar radiofrequency [RF]), in improving mild to moderate SUI in premenopausal women as measured with the 1-hour Pad Weight Test (PWT).

Methods: This was a randomized, double blind sham-controlled trial (RCT) of 6-months duration. 99 subjects, at 9 sites, with mild to moderate SUI meeting the inclusion/exclusion criteria were randomized 2:1 to either the active (90 J/cm2 RF and cryogen cooling) or sham (≤1 J/cm2 RF and cryogen cooling) group. Treatment involved delivering 220 intra-vaginal pulses in two circumferential rings at 0 & 2 cm proximal to the hymenal ring. At baseline and follow up visits, subjects completed the 1-hour PWT, additional objective endpoints, and patient-reported outcomes (PROs). Safety assessments were completed throughout the study. The primary endpoint was the change from Baseline (CFB) at 6 months post-treatment of the 1-hr PWT. The secondary endpoints were multiple objective measures and PROs as well as safety assessment of adverse events.

Results: Patient baseline demographics were similar in both groups. At 6 months post-treatment the active and sham groups both had clinically relevant, but not statistically different decreases in the 1-hour PWT of 77% and 81%, respectively (p=0.403). The active group reported greater improvements in all PROs over sham at 6 months, however this did not reach statistical significance (I-QOL, p=0.456; UDI-6, p=0.887; ICIQ-UI-SF, p=0.817). No device-related safety issues were reported.

Conclusion: Blinded RCTs are essential to obtain high-quality data to evaluate energy-based treatments for SUI. This trial was one of the first to report objective and subjective data in support of these treatments. The active group reported clinically relevant changes in leakage volume and SUI symptoms at 6 months post-treatment. However, due to the magnitude of the sham response, further studies are needed to determine the effect of cryogen cooling alone on vaginal tissue.

Funding: Viveve, Inc.
Poster #M15
NATIONAL PATTERNS OF FILLED PRESCRIPTIONS AND THIRD-LINE TREATMENT UTILIZATION FOR WOMEN WITH OVERACTIVE BLADDER
Nicole A Dodge1, Elizabeth B Habermann2, John B Gebhart3, Daniel S Elliott1, Holly K Van Houten2, Lindsey R Sangaralingham2, Brian J Linder1
1Mayo Clinic Rochester Department of Urology, 2Mayo Clinic Rochester Health Services Research, 3Mayo Clinic Rochester Department of OB/GYN
Presented By: Nicole Dodge, MD

Introduction: Overactive bladder (OAB) is a common diagnosis with multiple possible treatments, many of which require referral to a specialist. We aim to evaluate national patterns of care for women with overactive bladder in an administrative dataset and identify potential areas for improvement.

Methods: We performed an analysis using the OptumLabs® Data Warehouse, which contains de-identified administrative claims data from a large national U.S. health insurance plan. The study included women, over age 18, with a new OAB diagnosis from 1/1/2007-6/30/2017. We excluded those who had an underlying neurologic etiology, interstitial cystitis/painful bladder syndrome, were pregnant, or did not have continuous enrollment for 12 months before and after OAB diagnosis. Trends in management were assessed via Cochran-Armitage test. Time-to-discontinuation among medications was compared using t-test.

Results: Of 1.4 million women in the database during the study timeframe, 60246 (4%) were included in the study. Median age was 61 years (IQR 50-73), and median follow-up was 2.6 years (IQR 1.6-4.2). Overall, 37% were treated with anticholinergics, 5% beta-3 agonists, 7% topical estrogen, 2% pelvic floor physical therapy, 26% saw a specialist, and 2% underwent third-line therapy. Median time to cessation of prescription filling was longer for beta-3 agonists versus anticholinergics (median 4.1 months [IQR 1-15] vs 3.6 months [IQR 1-10];p <0.0001). Use of third-line therapies significantly increased over the study timeframe, from 1.1% to 2.2%(p<0.0001).

Conclusion: The majority of patients do not continue filling prescriptions for OAB medications and a minority of patients were referred for specialty evaluation. While third-line therapy use is increasing, it is used in a small proportion of women with OAB. Given these patterns, there may be underutilization of specialist referral and other OAB therapies.

Funding: N/A
Poster #M16
DO RATES OF MACROPLASTIQUE® REINJECTION AMONG PATIENTS WITH OR WITHOUT MIDURETHRAL SLINGS DIFFER?
Jacquelyn Gonka-Griffo, University at Buffalo, Teresa L. Danforth, University at Buffalo
Department of Urology, Buffalo, NY
Presented By: Jacquelyn Gonka-Griffo, MD

Introduction: Macroplastique® is a minimally invasive option for the treatment of stress urinary incontinence (SUI). One potential outcome from the procedure is the need for reinjection to achieve satisfactory continence. Studies have reported reinjection rates at around 30%. The aim of our study is to determine our rate of reinjection among patients with or without midurethral sling procedures.

Methods: We conducted a retrospective chart review of females who underwent Macroplastique® injection from 2007-2017 at our single center institution.

Results: A total of 287 females underwent Macroplastique® injection from 2007-2017. Our overall reinjection rate was 27.1%. A total of 144 (50%) patients underwent Macroplastique® injection with no history of midurethral sling prior to or after their injection. Of those patients 109 (75%) only had one injection with 35 (24.3%) of patients requiring at least one more injection. Of those requiring re-injection, 77%, required one reinjection, 17% required 2 reinjections, and 6% required 3 injections. None of our patients had more than three injections. 43% of our patients required reinjection within three months of their first injection. The shortest duration for reinjection was 1 month with the longest being 64 months. Analysis looking at patients who had history of midurethral sling and Macroplastique® injection revealed similar results. Those patients who had a history of a midurethral sling prior to their Macroplastique® injection, 30(25%) required at least one reinjection. 86% of these patients only required one reinjection, with 4(14%) requiring 2 reinjections. No one within our sling population required more than 2 reinjections. In the 4 patients that required two reinjections it was noted that the time from their sling placement to their first injection was greater than 4 years.

Conclusion: Our overall rate of reinjection among our entire patient population was 27.1%, which is similar to the current reinjection rate of 30%. Reinjection rates for patients who underwent Macroplastique® alone vs. mid-urethral sling prior to Macroplastique® injection did not differ 24.3% vs. 25%. Further analysis needs to be conducted looking at sling patients who go on to fail Macroplastique® injection.

Funding: N/A
Poster #M17
Bradley Garden, Tal Cohen, Alexandra R Siegal, Michael D Gross, Steven Weissbart, Jason Kim
Stony Brook Medicine Department of Urology
Presented By: Bradley Garden, MD

Introduction: In 2008, the U.S. Food and Drug administration (FDA) issued a warning regarding complications related to mesh in the treatment of pelvic organ prolapse and stress urinary incontinence (SUI). Prior studies have shown that these warnings affected the rates of transvaginal sling placements after their release. Urethral Bulking (UB) is a less invasive alternative for management of SUI and does not require mesh placement; however, retreatment is required, and long-term outcomes data is lacking. We sought to investigate the utilization of UB in relation to the 2008 FDA warnings among gynecologists, urologists, and female pelvic medicine trained physicians using a statewide database.

Methods: Urethral bulking procedures for SUI performed by New York state physicians between 2005 and 2014 were extracted from the New York Statewide Planning and Research Cooperative System (SPARCS) database utilizing CPT procedure codes (51715).

Results: Over the study period, a total of 3,876 UB procedures were performed (Figure 1). The number of UB procedures per year significantly increased from 335 in 2005 to 447 in 2014 (p = 0.01). In 2005, the number of UB procedures performed by FPMRS-urologists was 25; this increased to 129 in 2014 (p = 0.01). For both FPMRS-gynecologists and non-FPMRS gynecologists, there was no significant change in the number of UB procedures (Figure 1). Non-FPMRS urologists performed 65% of the total UB procedures over the study period, remaining relatively stable over the ten-year period (Figure 1).

Conclusion: In New York State, the utilization of urethral bulking for stress urinary incontinence has significantly increased since the 2008 FDA notification on transvaginal mesh. Specifically, the number of urethral bulking procedures performed by FPMRS-urologists significantly increased from 2008 to 2015. Non-FPMRS trained urologists accounted for the majority of urethral bulking procedures. Future studies are needed to investigate the role of FDA warnings and their influence on physician practices.
**Funding:** NA
Poster #M18
EXPOSURE TO FEMALE PELVIC MEDICINE AND RECONSTRUCTIVE SURGERY (FPMRS) AMONG AMERICAN UROLOGY RESIDENTS
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Presented By: Jacquelyn Gonka-Griffo, MD

Introduction: Female Pelvic Medicine and Reconstructive Surgery (FPMRS) as a specialty gained ACGME accreditation in 2013. There is a large amount of research looking at ObGYN residents’ exposure to FMPRS throughout their residency training, however there is little looking at Urology residents’ exposure to FPMRS. The purpose of our study is to assess urology residents’ exposure to FPMRS throughout residency from ACGME accredited urology programs.

Methods: A 10-question survey was developed and distributed using an online survey generator, SurveyMonkey®. A link to the survey was email to program directors and program coordinators for all ACGME accredited urology programs in the United States. Participation in the survey was voluntary, and all responses were de-identified.

Results: A total of 134 urology residents responded to the survey. 66% of respondents were male. All Post Graduate Year (PGY) levels from PGY1-PGY6 were represented within our survey. PGY-3 residents were the most represented at 23.13% and PGY6 the lowest at 4.4%. We received responses from all eight sections of the American Urological Association with the largest portion being from the North Central Section at 25.3%. 76.8% of respondents stated that their program has an FPMRS attending whom they train under. Residents were also questioned about their exposure to various FPMRS procedures. Residents had the most exposure to mid-urethral slings and sacral neuromodulation (Interstim®). 68.7% of participants stating they had scrubbed in on at least one mid-urethral sling and 78.2% stating they scrubbed in on at least one Interstim®. Those procedures that were the least represented were autologous fascial slings and robotic prolapse repair. 58.6% of residents responded that they had never scrubbed in on an autologous fascial sling, and 60.45% of residents stated that they had never scrubbed in on a robotic prolapse repair.

Conclusion: The majority of residents stated there is a FPMRS trained attending at their program. Most residents have exposure to mid-urethral slings and Interstim® placement. This is likely due to many urologists performing these types of procedures without any formal FPMRS training. Exposure to procedures that require further FPMRS training such as fascial slings and robotic prolapse repair are poorly represented among our study population.

Funding: N/A
Poster #M19
PROCEDURAL THERAPIES FOR THE MANAGEMENT OF BOTHERSOME LONG-TERM URINARY INCONTINENCE AFTER HOLMIUM LASER ENucleATION OF THE Prostate
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Department of Urology, Thomas Jefferson University, Philadelphia PA
Presented By: Thomas Hardacker, MD, MBA

Introduction: Bothersome urinary incontinence is a rare complication after Holmium laser enucleation of the prostate (HoLEP). Although rare, these symptoms can be debilitating for patients. In managing these patients, procedural therapies such as urethral bulking agents, sacral nerve stimulation, and intradetrusor Botox injections may be considered. Given the paucity of literature, we sought to determine the incidence and outcomes of patients receiving these therapies after HoLEP at our institution.

Methods: A retrospective review, from an IRB approved database, of all patients that underwent HoLEP at our institution between January 2013 and September 2019 was performed. 685 consecutive HoLEP cases in 670 patients were identified, with all cases performed by one surgeon (AD). Persistent urinary incontinence after HoLEP was defined as any leakage of urine lasting over 6 months after surgery. Data collected included demographics, type of post-operative urinary incontinence, procedural therapy utilized, and change in urinary incontinence.

Results: Of the 670 patients who underwent HoLEP, 11 (1.6%) had significant persistent urinary incontinence after surgery, requiring intervention. Of these, 7 (63.6%) had stress urinary incontinence (SUI) and 4 (36.4%) had urge urinary incontinence (UUI). All 7 patients with persistent SUI were managed with urethral bulking agents with 5/7 patients (71.4%) attaining successful symptom palliation. Interestingly, 1 of these patients had myasthenia gravis, a neurological comorbid condition, and required additional placement of an artificial urinary sphincter. Of the 4 patients with persistent UUI, all 4 were managed with intradetrusor Botox injections, with 3/4 patients (75%) requiring subsequent sacral nerve stimulation therapy. The remaining patient continues to find successful relief of symptoms from Botox injections alone. All 4 of these patients attained successful relief of symptoms.

Conclusion: Persistent urinary incontinence following HoLEP can be a debilitating complication. Utilization of procedural therapies may help relieve bothersome symptoms and improve quality of life in patients who experience persistent incontinence following surgery.

Funding: N/A
Poster #M20
PREDICTIVE VALUE OF URODYNAMICS FOR POST-OPERATIVE URINARY RETENTION AFTER ADVANCE® SLING PLACEMENT FOR POST-PROSTATECTOMY STRESS URINARY INCONTINENCE
Yu Zheng1, Goran Rac1, Nicholas Major1, Jennifer Rolef, Lauren Rittenberg, Arthur Mourtzinos2, Ouida Westney3, Mike Metro4, Caitlin Lim, Lindsey Cox, Ross Rames, Eric Rovner
1Medical University of South Carolina, 2Lahey Health, 3MD Anderson, 4Temple Health
Presented By: Yu Zheng, MD

Introduction: Urinary retention following AdVance® Sling placement for post-prostatectomy stress urinary incontinence (SUI) is a well-known complication with varying rates of 2.7-21.3%. We aim to identify risk factors for urinary retention following Advance® Sling placement using pre-operative urodynamic studies.

Method: Following IRB approval, a retrospective review of medical records of patients who underwent AdVance® Sling insertions across multiple institutions from the period of 2007-2019 was performed. 282 patients who had at least 1 post-operative visit were included in this study. Post-operative urinary retention was defined as complete inability to void or elevated PVR leading to foley placement or CIC teaching.

Results: Of the 282 patients included in this study, 46 (16.3%) had urinary retention at their first post-operative visit. By the second post-op visit, 37/46 (80.4%) had spontaneous resolution of urinary retention, and at the last recorded post-op visit, 6 patients (2.05%) had persistent urinary retention with a median follow up length of 460 days. On urodynamics, average Pdet (27 cmH20 vs 26.7 cmH20, p=0.77), Q max (15.6 ml/s vs 16.3 ml/s, p 0.51) were similar for patients with or without urinary retention following Advance® Sling. Patients with urinary retention had higher PVR on urodynamics (88 mL vs 38 mL, p 0.02). Univariate analysis showed those with increasing PVR on urodynamic studies (OR 1.003, CI 1.00-1.005, p=0.04) was associated with post-operative urinary retention as well. Pre-operative pad test (OR 0.99, CI 0.99-1.00, p=0.4), prior radiation (OR 2.22, CI 0.65-7.71, p=0.20), bladder neck contracture (OR 1.18, CI 0.33-4.19, p=0.79) were not significantly associated with risk of urinary retention. Patients with more subjective sensation of incomplete emptying based on the 1st question of AUA Symptom Score were also associated with post-operative urinary retention (OR 2.14, CI 1.11-4.15, p=0.02)

Conclusion: In our study, the rate of acute post-operative urinary retention after AdVance® Sling placement for post-prostatectomy was 16.3% but the long term rate of urinary retention was quite low at 2.05%. Elevated PVR during urodynamics and subjective sensation of incomplete emptying from AUA Symptom Score were associated with risk of urinary retention post-operatively while Pdet and Q max were not.

Funding: N/A
Poster #M21
DETRUSOR CONTRACTILITY IN WOMEN: COMPARISON OF EVALUATION USING BLADDER CONTRACTILITY INDEX (BCI), PROJECTED ISOVOLUMETRIC PRESSURE 1 (PIP1) AND VBN CONTRACTILITY PARAMETER (k).
Françoise VALENTINI¹, Brigitte MARTI¹, Gilberte ROBAIN¹, Philippe ZIMMERN², Pierre NELSON³
¹Hôpital Rothschild, Paris, France, ²UT Southwestern Medical Center, Dallas, TX, ³Hôpital Rothschild, Paris, France
Presented By: Francoise A. Valentini, MD, PhD

Introduction: In men, bladder contractility was evaluated from projected isovolumetric pressure (PIP) later renamed bladder contractility index (BCI): pdet.Qmax+5*Qmax [1-2]. For women, this index led to a great overestimation and a simple index PIP1=pdet.Qmax+Qmax has been introduced [3]. Recently a nomogram, based on the VBN mathematical model, has been proposed to evaluate detrusor contractility (parameter VBN k) from pdet.Qmax, Qmax and initial bladder volume (Vini) [4]. Our aims were to compare PIP-BCI, PIP1 and k for women referred for evaluation of various LUTS with the influence of age, complaint and urodynamic diagnosis.

Methods: Retrospectively 449 urodynamic tracings of non-neurologic women were analyzed. Post void residual volumes (PVR) were measured using a Bladder-scan. The initial bladder volume was Vini=voided volume+PVR.

Results: Main complaint was incontinence: stress (96 SUI), mixed (140 MUI), urge (118 UUI). Nighty five women had various complaints without incontinence.

1-Age
Sub-groups are defined as “reproductive (<45 y)”, “peri-menopause (46-65 y)” and “post-menopause (>65y), PIP-BCI, PIP1 and k decreased with ageing, each sub-group being different of the others.

2-Complaint
There was no significant difference in PIP-BCI except between MUI and Other (p= .0259) while PIP1 was significantly higher in UUI. Other (p=.0161) and k in UUI. SUI (p=0.0170). MUI (p=.0010). Other (p=.0224). 3-Urodynamic diagnosis (UD) (Figure)
UD was bladder outlet obstruction (BOO), detrusor overactivity with impaired contractility (DHIC), detrusor overactivity (DO), detrusor underactivity (DU). Some investigations were “normal” (N) and other related to urethral dysfunction (intrinsic sphincter deficiency (ISD) or voiding triggered by urethral relaxation (URA)). Surprising results: a) low value of PIP-BCI for BOO vs. DO while PIP1 and k values were high and similar for these two diagnoses. b) high value of PIP-BCI for DHIC close to the value for BOO while PIP1 and k were low.

Conclusion: An evaluation of detrusor contractility in women from data of intubated flow is easily obtained using indices PIP-BCI and PIP1 or using the nomogram giving VBN parameter k. Comparison of results show that PIP1 and parameter k give comparable and consistent results with diagnosis while PIP-BCI leads to inconsistencies.

VARIATIONS OF THE DIFFERENT INDICES VS. URODYNAMIC DIAGNOSIS

Funding: N/A
Poster #M22
IS INTERNATIONAL PROSTATE SYMPTOM SCORE PREDICTIVE OF URODYNAMICS FINDINGS IN MEN WITH MULTIPLE SCLEROSIS?
Hudson Pierce, Andrew Eidelberg, Ramy Goueli, Dominique Thomas, Bilal Chughtai
Weill Cornell Medicine-New York Presbytarian, Department of Urology, New York, NY
Presented By: Hudson Pierce

Introduction: Lower urinary tract symptoms (LUTS) are highly prevalent in patients with multiple sclerosis (MS) and have significant impact on quality of life. LUTS in this population represents a diagnostic challenge since urodynamics (UDS) findings are poorly correlated with clinical assessment, and there is little evidence outlining the optimal application of UDS. We sought to characterize LUTS in a cohort of men with MS and determine whether presenting urinary symptoms and International Prostate Symptom Score (IPSS) were predictive of UDS findings.

Methods: We analyzed a prospectively collected database of men with MS who presented with LUTS at a tertiary care facility. All men had persistent LUTS for over 6 months and underwent video-urodynamics (VUDS). Patients with culture-proven urinary tract infections, history of previous genitourinary surgery, or cancer were excluded from our study. Patients completed the AUA symptom score (SS) and Quality of Life (QOL) assessments.

Results: A total of 40 men were included with mean age 54.8 years. The most common presenting complaints were urinary frequency (N=24, 60%), urgency (N=20, 50%) and nocturia (N=14; 35%). The most common diagnoses were detrusor overactivity (N=27, 68%), bladder outlet obstruction (N=16, 40%), and incomplete bladder emptying (N=15, 38%). Eleven men had mild symptoms, 11 had moderate symptoms, and 18 had severe symptoms. The severe symptom group had lower mean volume of first sensation compared to men with mild symptoms (158 vs 282.5 mL, p = 0.016).

Increase in total AUA SS (r = -0.48, p = 0.0018), QOL score (r = -0.37, p = 0.019), and all subscores except nocturia were correlated with decreased volume of first filling sensation. Increased urgency subscore (r = -0.34, p = 0.032) and total AUA SS (r = -0.36, p = 0.024) were correlated with decreased volume of first urge. There were no significant correlations between IPSS and UDS diagnoses.

Conclusion: This study showed that IPSS scores are correlated with certain urodynamic parameters in men with MS, most notably increased filling sensation. However, use of the IPSS to assess LUTS in this population likely does not adequately encompass the complexity of disease. Much further research is needed to develop non-invasive clinical assessment tools specific to this population.

Funding: N/A
Poster #M23
CAN URODYNAMIC PARAMETERS PREDICT THE NEED TO CATHETERIZE AFTER INTRAVESICAL INJECTIONS OF ONABOTULINUM TOXIN A FOR OVERACTIVE BLADDER
Kristina Aleksejeva, Gemma Scrimgeour, Richard Axell, Habiba Yasmin, Raveen Saigal, Stephen Unterberg, Mehwash Nadeem, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
FFR Urology, University College London Hospital
Presented By: Kristina Aleksejeva

Introduction: Intravesical Onabotulinum Toxin A (Botox A) injections for refractory overactive bladder (OAB) symptoms have a well-known risk of post-operative urinary retention. We have assessed whether pre-operative UDS findings can predict the need to catheterize (intermittently or indwelling) after Botox A injections.

Methods: A retrospective review of 418 patients (median age 61 years, range 22-90, 128 men) having intravesical Botox A injections for refractory OAB symptoms between 2006 and 2018 was conducted. The outcome of Botox A was categorized by 5 point PGII when last seen or when contacted by telephone if last review was greater than 6 months previously. The need to self catheterize (ISC) or have an indwelling urethral (IDC) or suprapubic (SPC) catheter was noted and correlated with the urodynamic parameters.

Results: 49% of patients had had previous significant pelvic surgery. Urodynamic traces were available for review on 309 (74%) patients; 214 women median age 59 years (range 22-90) and 95 men median age 69 years (range 27-94) having Botox A during this time period under the care of 4 consultant surgeons. Catheterization was required by 131 (46%) of women and 76 (41%) of men post Botox A. Statistical analysis was by Students T-Test and Chi Square Test.

The outcomes are listed in Table 1:

<table>
<thead>
<tr>
<th>Urodynamic Parameter</th>
<th>Catheterization</th>
<th>No Catheterization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men N Tracing</td>
<td>40 (43%)</td>
<td>55 (57%)</td>
</tr>
<tr>
<td>Women N Tracing</td>
<td>104 (48%)</td>
<td>110 (52%)</td>
</tr>
<tr>
<td>Success (PGII 1 or 2) Women</td>
<td>81 *</td>
<td>72</td>
</tr>
<tr>
<td>Success (PGII 1 or 2) Men</td>
<td>32</td>
<td>26</td>
</tr>
<tr>
<td>DO Wet Women</td>
<td>45</td>
<td>37 **</td>
</tr>
<tr>
<td>DO Wet Men</td>
<td>12</td>
<td>27</td>
</tr>
<tr>
<td>Median Peak DO pressure Women (cmH20)</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Median Peak DO Pressure Men (cmH20)</td>
<td>53</td>
<td>60</td>
</tr>
<tr>
<td>Volume at 1st DO Women (ml)</td>
<td>240</td>
<td>252</td>
</tr>
<tr>
<td>Volume at 1st DO Men (ml)</td>
<td>175</td>
<td>240</td>
</tr>
<tr>
<td>BOO Women</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>BOO Men</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Duration Detrusor Contraction Women (s)</td>
<td>85</td>
<td>70</td>
</tr>
<tr>
<td>Duration Detrusor Contraction Men (s)</td>
<td>97</td>
<td>90.5</td>
</tr>
</tbody>
</table>

- *P=0.039
- **P=0.007

Conclusion: Intravesical Botox A was significantly more successful in women (71%) than men (61%). ISC or catheterization was required in 46% and was significantly more likely in women with DO wet (p=0.007). Other urodynamic parameters were not predictive of the need to ISC.

Funding: N/A
Poster #M24
THE ROLE OF PULSE WIDTH MANIPULATION COMPARED TO REPROGRAMMING ALONE FOR UNSATISFACTORY SACRAL NEUROMODULATION THERAPY: A RETROSPECTIVE ANALYSIS
Jessica Rueb, Michele Fascelli, Samir Derisavifard, Neil Kocher, Courtenay Moore, Raymond Rackley, Goldman Howard, Gill Bradley
Cleveland Clinic
Presented By: Jessica J. Rueb, MD

Introduction: Pulse width (PW) can modify sensation and efficacy in neuromodulation by its impact on the size and type of nerve fibers recruited. Sacral neuromodulation (SNM) devices default to 210us PW but can produce stimuli with PW ranging from 60-450us. A paucity of data regarding utilization of PW manipulation in SNM exists. This study described the indications and efficacy of PW manipulation for unsatisfactory SNM therapy.

Methods: Within a single institution, patients with \( \geq 1 \) outpatient SNM interrogation between 2010-2019 were retrospectively reviewed. Two cohorts of patients with unsatisfactory SNM therapy were created: those with PW changes, and a matched cohort who underwent reprogramming alone, as a control group. Reprogramming consisted of changing electrode assignments. Demographics, SNM indications, programming details, clinical effect, and lead revision rates were assessed. Clinical success was defined as patient reported improvement in urinary symptoms, pain, and/or continued use of the new stimuli for \( \geq 1 \) year. Patients lacking follow-up and non-InterStim II models were excluded. Basic statistical analyses were performed, as appropriate, with \( p < 0.05 \) indicating significance.

Results: Of 710 SNM interrogations, 147(20.7%) had PW changes and 80 met inclusion criteria. A matched cohort of 81 patients was generated. Gender, SNM indication, time from implant to reprogramming, and number of reprogramming encounters did not differ between cohorts. The PW change cohort utilized mostly shortened PW (N=61/80, 76.3%) and few underwent PW change alone (N=17/80, 21.3%) without reprogramming. The indication for PW manipulation differed significantly from the control group as painful stimulation was a major indication. In a subset analysis, painful stimulation was more likely to improve with a shortened, compared to an extended PW (N=14/15, 93.3% vs N=0/6, 0%, \( p < 0.01 \)). Rates of clinical success and eventual lead revision did not differ between groups. However the duration of trials differed with 26.3% of the PW cohort maintaining the change for >1 year, while only 8.6% did in the reprogramming only cohort. Botox use was higher in the control group.

Conclusion: Unsatisfactory SNM can be salvaged prior to revision surgery with troubleshooting maneuvers that include PW manipulation. These findings begin to elucidate the role of PW in salvaging SNM, particularly in painful stimuli, and warrant prospective investigation into the role of PW to optimize SNM.
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<th>Table of Contents</th>
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**Clinical Science Abstracts**

**Funding:** N/A
Poster #M25
SACRAL NEUROMODULATION SENSORY RESPONSE STABILIZES EARLY AFTER IMPLANTATION
Hayden Jahn, MD, Bryan Savage, Colin Goudelocke, MD
Ochsner Medical Center
Presented By: Hayden E. Jahn, MD, BS

Introduction: Sensory response is an important means of assessing lead status following Sacral Neuromodulation (SNM) implant. Impedance between electrodes likely changes over time as a result of the formation of a fibrotic capsule surrounding the implanted lead. Accurately determining impedance at low stimulation thresholds can be challenging but sensory threshold may provide a useful surrogate. Further, this may provide insight into the theoretical advantages of constant-current devices. We sought to quantify the changes in SNM sensory response over time.

Methods: This prospective study looks at changes in sensory threshold over the first year after implantation to determine the time to stabilization of sensory thresholds. Sensory threshold is defined as the lowest amplitude producing sensation at each of the first four “standard” program configurations. All measures were taken in a seated position. Sensory threshold was assessed post-operatively, at 6 weeks and at 3, 6, and 12 months. Patients were included if threshold data were available for at least 6 months. Removal or revision for failure of therapy efficacy was also tracked.

Results: A total of 41 patients were tracked for an average follow up of 12.3 months [range: 6-14 months]. The mean amplitude of sensory threshold for each of the four recorded programs increased between 0 and 6 weeks (0.78 to 1.02, p=0.013; 0.70 to 0.91, p=0.01; 0.68 to 0.92, p=0.003; 0.87 to 1.02, p=0.34). Beyond 6 weeks, there was no further increase above the 6-week threshold (Figure 1). Further analysis found no significant difference in sensory threshold stabilization for leads removed or revised.

Conclusion: For most program configurations, there is a significant change from implant to 6 weeks but no additional change in sensory threshold is observed beyond 6 weeks. No difference was found between leads with continued success compared to those removed for efficacy failure, though the number of those leads may not be sufficient to detect a difference. There may not be a clinically significant change in impedance, as reflected by sensory threshold, beyond 6 weeks after device implantation.

Funding: N/A
Poster #M26
PREVALENCE OF ABNORMAL IMPEDANCE IN SACRAL NEURMODULATION DEVICES OVER TIME AND IMPLICATIONS FOR PRACTICE: A CASE-CONTROL STUDY
Michele Fascelli, Jessica Rueb, Samir Derisavifard, Neil Kocher, Courtenay Moore, Raymond Rackley, Sandip Vasavada, Howard Goldman, Bradley Gill
Glickman Urological and Kidney Institute, Cleveland Clinic, Cleveland, OH
Presented By: Michele Fascelli, MD

Introduction: Impedance changes over time, or “impedance drift”, in neuromodulation can influence the need for device reprogramming, lead revision, and battery replacement. Abnormal electrical impedance (AEI) has been relatively understudied with respect to its impact on sacral neuromodulation (SNM). This study assessed SNM longevity in individuals with and without AEI and its impact on revision procedures.

Methods: Patients with one or greater SNM interrogations in the office were identified. Those implanted from 2003 to present were included. Follow-up within the first 10 years of device implantation was analyzed. All patients with AEI were identified as cases and the remaining patients who underwent device interrogation were controls. Time intervals collected included: implant to device interrogation encounter, device interrogation to surgical revision, and original implant to surgical revision. Revision included surgical interventions for the lead and/or pulse generator. Device longevity, or time from original implant to surgical revision, was analyzed by Kaplan-Meier survival analysis.

Results: Of 710 patients with device interrogations, 132 (18.6%) were ‘cases’ and had an AEI within the first 10 years of follow-up (Figure 1A). Of these, 11 (1.5%) were short circuits (<50Ω) and 121 (17%) were open circuits (>4,000Ω). The remaining 578 patients were ‘controls’ and had normal impedances. Amongst patients with AEI, 41% (N=50/121) underwent revision, 58% (N=70/121) received device reprogramming, and 0.8% (N=1/121) pursued device removal. Operative intervention was avoided in 54% (N=38/70) of the patients undergoing reprogramming. A 21% (N=121/578) revision rate was noted in the control group. Device longevity did not differ between cases and controls with regard to time from implant to revision (p=0.24, Figure 1 B). Interval from implant to device interrogation (AEI: 27.6 vs control: 23.3 months, p=0.16) nor interval from SNM interrogation to revision (AEI: 7.6 vs control: 9.8 months, p=0.24) differed between cases and controls. Cases with AEI that underwent reprogramming achieved a mean additional 17.3 months of device longevity prior to revision.

Conclusion: The prevalence of abnormal electrode impedance in sacral neuromodulation increases with duration of follow-up, however device reprogramming can avoid the need for surgical revision in many cases.
Funding: N/A
Poster #M27
AN OBJECTIVE METHOD TO CONFIRM NERVE RECRUITMENT THROUGHOUT ELECTRICAL STIMULATION IN SUBJECTS WITH OAB
John Barnard, MD¹, Stanley Zaslau, MD¹, Samir Arora, MD², Jessica Spear², Mingming Zhang, PhD³, Laura LeScoezec³
¹West Virginia University, ²Aventiv Research, ³Avation Medical, Inc.
Presented By: John T. Barnard II, MD

Introduction: Tibial nerve stimulation has been found to be an effective therapy to treat overactive bladder (OAB). However, current methods of confirming nerve recruitment are subjective, can be unreliable, and are typically done only at the beginning of a stimulation session. It is important to have an objective method of ensuring the target nerve is being stimulated. This study evaluated the usability of evoked electromyographic (EMG) signals or M-waves as a means of confirming the recruitment of the tibial nerve throughout a stimulation session.

Methods: 40 subjects previously diagnosed with OAB completed the study. Stimulation electrodes were placed on the skin over the tibial nerve and recording electrodes were placed on the bottom of the foot. Stimulation was applied using different frequencies, amplitudes, pulse widths, and electrode locations. EMG signals were observed, and the waveforms were recorded.

Results: Evoked EMG signals were observed in 82.5% of the subjects (Figure 1). In five subjects, stimulation was at the highest level and was still tolerable, but no evoked EMG signals were observed. During the study, 95.0% of the subjects were able to tolerate transcutaneous stimulation. An example of the recorded evoked EMG signals is shown in Figure 2a. As the stimulation was increased, the strength of the evoked EMG signals was also found to increase (Figure 2b). Based on the evoked EMG signals with the lowest stimulation amplitude across all subjects, an optimal location was identified, which can be used for effectively stimulating the posterior tibial nerve with transcutaneous electrical stimulation.

Conclusion: Evoked EMG signals are an objective means of confirming the recruitment of the tibial nerve. We were able to consistently and non-invasively record evoked EMG signals from the bottom of the foot in response to transcutaneous stimulation of the tibial nerve. In addition, by using these signals we were able to identify the optimal location for stimulation. A long-term study is needed to determine the reliability of evoked EMG signals as both a detection and control method.
Funding: Financial support for this study provided by Avation Medical, Inc.
Poster #M28
INTERSTIM SACRAL NEUROMODULATION FOR INTRACTABLE URINARY VOIDING DYSFUNCTIONS (SOUNDS): RESULTS OF EFFECTIVENESS, QUALITY OF LIFE, PATIENT-REPORTED OUTCOMES AND SAFETY IN A FRENCH MULTICENTER OBSERVATIONAL STUDY
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Presented By: Emmanuel J. Chartier-Kastler, MD, PhD, FEBU

Introduction: The objective of SOUNDS is to evaluate clinical effectiveness, Quality of Life (QoL) and safety of InterStim™ Sacral Neuromodulation (SNM) for urinary voiding dysfunctions during 5 years of follow-up in real-life as required by the French Authority for Health. Here we report on effectiveness, QoL, patient-reported outcomes (PROs) and safety.

Methods: Patients suffering from intractable urinary voiding dysfunctions were enrolled including overactive bladder (OAB), either wet (urinary urge incontinence, UI) or dry (urgency-frequency, UF) and non-obstructive urinary retention (NOUR). Decision to implant a permanent system was at the discretion of each site and adjuvant medical treatments were allowed per hospital standard of care. Site selection ensured representativeness of the French market regarding volume and type of institution. For effectiveness, QoL and PROs we present data for two follow-up visits: follow-up 1 with a mean (sd) duration of 3.2 (2.7) months and follow-up 2 with a mean duration of 10.1 (3.8) months. Safety data is based on a mean (sd) duration of 24.3 (7.3) months for implanted patients. Data is presented based on a complete case analysis which is similar to intention-to-treat without missing data imputation.

Results: Overall 320 patients were enrolled at 25 sites and 247 were permanently implanted, including 182 de-novo and 65 replacements. Patients were predominantly female (84%) with a mean (sd) age of 60.5 (15.1) years. Conversion rate from test to final system was 77% among de-novo patients. Enrolled patients suffered from OAB (91%) or NOUR (9%). Fourteen percent of all enrolled patients had double incontinence (DI). Effectiveness, QoL, PROs and safety data are shown in Table 1. A significant reduction in both leaks and voids/day was seen for de-novo and replacement patients at both follow-ups. QoL and NRS score improved significantly and safety data is similar to previous publications except for the higher rate of Serious Adverse Device Effects which is due to hospitalization procedures in France.

Conclusion: SOUNDS confirms the clinical effectiveness, safety and positive effect of SNM with InterStim™ on QoL and PROs for the treatment of OAB patients in a real-world setting in France. Results for NOUR and DI have to be interpreted cautiously due to the lower number of treated patients.
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#### CLINICAL SCIENCE ABSTRACTS

<table>
<thead>
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<th>Baseline</th>
<th>Follow-up 1</th>
<th>Follow-up 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>U2 de-novo</td>
<td>5.4 (4.4)</td>
<td>3.4 (2.4)*</td>
<td>3.3 (3.4)*</td>
</tr>
<tr>
<td>U2 replacement</td>
<td>5.4 (4.4)</td>
<td>3.3 (3.4)*</td>
<td>3.3 (3.4)*</td>
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<tr>
<td>Complete confidence (%)</td>
<td>26%</td>
<td>40%</td>
<td>40%</td>
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<tr>
<td>U1 de-novo</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>U1 replacement</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Vials per day</td>
<td>12 / (4.6)</td>
<td>7.3 (3.3)*</td>
<td>5.6 (2.0)*</td>
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<tr>
<td>U2 de-novo</td>
<td>11.5 (4.9)</td>
<td>9.0 (2.2)*</td>
<td>7.9 (2.2)*</td>
</tr>
<tr>
<td>U2 replacement</td>
<td>3.5 (2.4)</td>
<td>0.5 (1.8)*</td>
<td>0.0 (1.8)*</td>
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<tr>
<td>N10 catheterization/delay</td>
<td>0.0 (1.7)</td>
<td>0.0 (1.7)</td>
<td>0.0 (1.7)</td>
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<tr>
<td>N10 catheterization/delay</td>
<td>0.0 (1.7)</td>
<td>0.0 (1.7)</td>
<td>0.0 (1.7)</td>
</tr>
<tr>
<td>DI Wimmer score device</td>
<td>13.4 (5.2)</td>
<td>6.6 (4.9)*</td>
<td>7.2 (3.2)</td>
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<tr>
<td>DI Wimmer score replacement</td>
<td>50.4 (5.7)</td>
<td>9.9 (1.7)</td>
<td>8.4 (1.8)</td>
</tr>
</tbody>
</table>

### QoS and PIQS: UAB patients (mean ± sd)

| U10nic: UAB de-novo | 24.4 (1.3) | 20.8 (1.7)* | 22.0 (1.3) |
| U10nic: UAB replacement | 22.0 (1.3) | 25.2 (1.9)* | 22.0 (1.3) |
| M10: UAB de-novo | 7.9 (1.6) | 3.2 (1.9)*  | 3.0 (2.0)*  |
| M10: UAB replacement | 7.0 (1.6) | 3.7 (1.8)*  | 4.3 (2.0)*  |
| G10: UAB de-novo | N/A | 40% responders | 50% responders |
| G10: UAB replacement | N/A | 40% responders | 50% responders |

### Safety: all tested implanted patients

| Adverse device effects (overall) | 6% (9/150) |
| Implant site pain | 5% (2/39) |
| Implant site infections | 4% (1/26) |
| Surgical revisions (post-implant) including explantation (post-implant) | 6% (1/26) |

### Funding: Medtronic
Poster #M29
REAL WORLD RETROSPECTIVE STUDY OF THE PROSTATIC URETHRAL LIFT
Daniel Jaffee, MD¹, Gregg Eure, MD², Steven Gange, MD³, Douglas Grier, MD⁴
¹Affiliated Urologists, ²Urology of Virginia, ³Summit Urology Group, ⁴Sound Urological Associates
Presented By: Daniel C. Jaffee, MD

Introduction: The Prostatic Urethral Lift (PUL) is a minimally invasive surgical therapy (MIST), which utilizes transprostatic implants to mechanically widen the prostatic fossa. The procedure has been shown to safely and significantly improve LUTS in BPH patients. The true test of clinical applicability, however, is how the real-world experience compares to results from controlled studies. Here we examine PUL effectiveness through retrospective analysis of commercial PUL cases across multiple centers.

Methods: Retrospective analysis of 1,413 consecutive PUL patients in North America and Australia was performed. Baseline demographics and symptom outcomes of real-world retrospective (RWR) subjects were compared to subjects in the randomized L.I.F.T. study. IPSS, QoL and Qmax were evaluated at 1, 3, 6, 12 & 24-months post-procedure for all non-urinary retention subjects (Group A) and retention subjects (Group B). Within Group A, outcomes were further analyzed using paired t-tests and 95% mean confidence intervals for the following parameters: IPSS baseline ≥ 13, age, prostate size, site of service, prostate cancer treatment, and diabetic status. Interventions, adverse events, and catheterization rates were summarized.

Results: RWR subjects were older, had lower baseline IPSS and QoL and higher Qmax compared to those from the L.I.F.T. study. Following PUL, mean IPSS for Group A improved significantly from baseline by at least 8.1 points throughout follow up and 84% of subjects required no catheter. No significant differences were observed between Group A and B absolute symptom scores. Within Group A cohorts, subjects with an IPSS baseline ≥ 13 behaved similarly to L.I.F.T (Figure 1). Age (<50 vs ≥50yr), prostate volume (<30cc or ≥80cc), site of service, prior cancer treatment and diabetic status did not significantly impact PUL effectiveness outcomes. Previous prostate cancer treatment did not elevate adverse events of high concern such as incontinence and infection. When completed in a clinic office, PUL resulted in less side effects and catheter placement compared to other sites of service.

Conclusion: This is the largest study of a MIST procedure for BPH in a real-world setting and confirms clinical study results. Patients not previously examined (e.g. in retention, with large prostates, history of diabetes and prostate cancer) can be treated safely and effectively with PUL.

Funding: NeoTract/Teleflex Inc.
Poster #M30
SAFETY AND LEGAL ENVIRONMENT FOR VAGINAL LASERS: UNCOVERING THE EVIDENCE BEHIND THE FDA SAFETY COMMUNICATION
Julia Z. Guo, BA1, Colby P. Souders, MD2, Lynn McClelland, JD3, Jennifer T. Anger, MD MPH2, Karyn S. Eilber, MD2, A. Lenore Ackerman, MD PhD2
1David Geffen School of Medicine University of California, Los Angeles, 2Cedars-Sinai Medical Center, 3University of California Los Angeles
Presented By: Colby Perkins Souders, MD

**Introduction:** Genitourinary syndrome of menopause (GSM) is a chronic progressive condition secondary to hormonal deficiency, manifesting as vaginal dryness and dyspareunia. Energy-based vaginal treatments show promise as an effective, nonhormonal alternative for GSM therapy. Multiple studies have reported improvements in sexual function and vaginal comfort following laser therapies without serious safety concerns. Despite these benefits, the FDA issued a safety communication in 2018 warning against the use of vaginal lasers, including the indication of GSM. To understand this disconnect, we performed a literature review, surveyed the FDA Manufacturer and User Facility Device Experience (MAUDE) database, and reviewed the Bloomberg Law database to examine evidence for possible risks associated with laser treatment for GSM.

**Methods:** A comprehensive literature review of PubMed and Google Scholar identified articles published prior to 2019 including terms: vaginal laser, rejuvenation, and complications. The FDA MAUDE database was searched by name for 24 vaginal laser devices from 2009-2019 to identify any safety claims. The Bloomberg Law database was also searched to identify product liability claims filed against any laser device manufacturers prior to 2019.

**Results:** The literature search revealed only three publications detailing 34 reported complications (Figure). Fifteen cases (44.1%) reported minimal change from baseline after laser treatments, which were classified as no treatment effect. Five cases (14.7%) reported an increased number of symptoms after laser treatments, while 14 cases (41.2%) did not report sufficient information to determine the effects of laser treatments. The MAUDE database search revealed 120 complaints: 78 (67%) related to device malfunction with no patient harm, 13(11%) complaining of pain (baseline pain unknown) and 10 (9%) alleging burns. No claims were identified from the Bloomberg law database asserting harm from device use.

**Conclusion:** There is no strong evidence to support significant patient risk for vaginal laser treatment of GSM. To address this knowledge gap, future studies using vaginal lasers should carefully catalogue any complications, such as burns. The majority of complications detailed, however, suggest that reported “adverse events” represent a lack of treatment effect, which may require better patient pre-treatment counseling regarding expected efficacy. Given the benefits seen in many patients, off-label use of laser therapy for GSM is reasonable with patient counseling.

<table>
<thead>
<tr>
<th>Category</th>
<th># of Cases</th>
<th>Complaint/Complication(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal Change</td>
<td>15</td>
<td>No benefit, dyspareunia, vaginal/vulvar pain, urinary incontinence, vaginal dryness, vaginal burning</td>
</tr>
<tr>
<td>More Symptoms</td>
<td>5</td>
<td>Heavy post coital bleeding, dyspareunia, vaginal bleeding, vaginal dryness, pelvic floor hypertonicity, vaginal wall scarring, urinary frequency, lichen sclerosis, yeast infection</td>
</tr>
<tr>
<td>Not Enough Baseline Data to Evaluate Interval Change</td>
<td>14</td>
<td>Dyspareunia, vaginal dryness, burning, itching, decreased rugae, crescent shaped fibrous band, Bartholin’s Cyst, bladder pain, UTI, bacterial vaginosis, blurry vision, eye irritation, facial pain</td>
</tr>
</tbody>
</table>

**Funding:** N/A
Poster #M31

USING PAIN MECHANISM SCORES TO CHARACTERIZE PATIENTS WITH UROLOGIC CHRONIC PELVIC PAIN SYNDROME (UCPPS): NEW FINDINGS FROM THE MAPP RESEARCH NETWORK

David Williams, PhD¹, J. Richard Landis, PhD², Bruce D. Naliboff, PhD³, H. Henry Lai, MD⁴, J. Quentin Clemens, MD, MSC⁵, Christopher Mullins, PhD⁶, Andrew D. Schrepf, PhD¹, John T. Farrar, MD, PhD², Eric D. Strachan, PhD⁶, Robert M. Moldwin, MD⁷, Bayley J. Taple⁸, Michel A. Pontari, MD⁹

¹University of Michigan, ²Perelman School of Medicine at the University of Pennsylvania, ³University of California, Los Angeles, ⁴Washington University School of Medicine, ⁵DKUHD.NIDDK, NIH, ⁶University of Washington, ⁷Hofstra University School of Medicine, ⁸Northwestern University Feinberg School of Medicine, ⁹Lewis Katz School of Medicine at Temple University

Presented By: Michel Arthur Pontari, MD

Introduction: Pain perception may be characterized as arising from three potential mechanisms: nociceptive (e.g. acute pain), neuropathic (e.g., nerve damage) or nociplastic (CNS augmented pain processing). In any given individual one or more mechanisms may contribute to pain perception. The relative contribution of each factor to pain experienced by patients with Urologic Chronic Pelvic Pain Syndrome (UCPPS) is unknown.

Methods: Baseline data from the Symptom Patterns Study (SPS) within the MAPP-II Research Network were utilized to classify 578 UCPPS patients (n=385 females, n=193 males). The commonly used cutoff of 12 for the Pain Detect (PD) Score (0-38) was used to classify patients at baseline into the category of nociceptive pain (≤ 12) vs neuropathic pain (> 12). The median of 7 on the fibromyalgia (FM) Score (0-31) (a measure of pain centralization (PC)) was used to classify patients into a low (≤7) vs high (>7) CNS category, indicating the degree of central augmentation on the pain experience. These binary thresholds were then used to cross-classify each patient into one of four (2 x 2) possible pain mechanism categories.

Results: At baseline, among n=557 UCPPS patients with non-missing PC and PD data, the PC score is significantly correlated with the PD Score (r=0.47, p<0.0001) (Figure 1). Overall 235 patients (42.2%) were classified as low PD/low PC, 155 (27.8%) were low PD/high PC, 44 (7.9%) were high PD/low PC, and 123 (22.1%) were high PD/high PC. Females were comparable to males for neuropathic pain prevalence (32.0% vs 24.9%; p=0.079), but much more likely to be classified high CNS augmentation compared to males (57.4% vs 35.0%; p<0.0001).

Conclusion: These data indicate that patients with UCPPS can be sub-classified based on potential pain mechanisms. Females were more likely to exhibit pain that is neuropathic with augmented central processing features. These data may be useful for separating patients into clinically relevant subgroups, or clusters, that might respond differentially to treatment based upon pain mechanisms, which can be tested in future clinical trials.

Fig 1. Association of Pain Centralization Score (0 – 31) by Pain Detect Score (0 – 38)
Funding for the MAPP Research Network was obtained under a cooperative agreement from National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Institutes of Health (NIH) (DK82370, DK82342, DK82315, DK82344, DK82325, DK82345, DK82333, and DK82316.)
Poster #M32
FOSFOMYCIN CAN DECREASE THE NEED FOR IV ANTIBIOTIC THERAPY IN THE ADVANCED MANAGEMENT OF MENOPAUSAL WOMEN WITH RECURRENT URINARY TRACT INFECTIONS
Timothy F. Carroll, BS1, Alana L. Christie, MS2, Bonnie Prokesch, MD3, Philippe Zimmer, MD1
1U.T. Southwestern Medical Center, Urology, 2U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center, 3U.T. Southwestern Medical Center, Infectious Disease
Presented By: Timothy Field Carroll, BS

Introduction: To evaluate the role of oral fosfomycin (Monurol™) as an alternative to intravenous (IV) antibiotic therapy in menopausal women with recurrent urinary tract infection (RUTI) complicated by antibiotic allergies and/or multi-drug resistant organisms.

Methods: Following internal review board (IRB) approval, retrospective chart review of menopausal women prescribed fosfomycin (FOS) for antibiotic-recalcitrant RUTI at our institution was performed. Excluded were women who never took the prescribed FOS. Data collected included demographics, baseline voiding function/urological anatomic abnormalities, IV antibiotic administration for RUTI, surgical procedures to address RUTI (bladder fulguration, cystectomy), antibiotic allergies, and urine culture results before and after taking FOS including organism resistance profile. FOS success was defined as no need for IV antibiotics or surgery for RUTI following FOS treatment course. Secondary outcomes included factors predicting FOS success and urine culture changes after completion of FOS therapy.

Results: Between 2013 and 2019, 104 women met inclusion criteria. FOS success rate was 60% at a median follow-up of 1.5 years. No factors were identified that were significantly predictive of FOS success versus failure. Of the 42 patients who failed FOS, failure was followed by IV antibiotic treatment in 24 (57%) of patients, while the remainder received bladder electrofulguration first. When including treatment overlap in these same 42 failures, 27 (64%) of patients received treatment with IV antibiotics, 24 (57%) underwent bladder electrofulguration, and 2 patients required cystectomy. Escherichia coli was the most commonly isolated organism, with 94% of these isolates being extended spectrum beta-lactamase producers and 40% of all isolates meeting criteria for multi-drug resistance. All but 3 women had repeat urine culture following FOS treatment, and 26 of these cultures were sterile. Of the 68 women with monomicrobial growth at baseline and documented non-sterile urine cultures after taking FOS, 36 were infected with the same organism isolated at baseline while 32 were infected with a different organism. The remaining 10 patients had baseline urine cultures that grew more than one organism.

Conclusion: FOS durably avoided the need for IV antibiotic therapies/surgery in the management of RUTI in a majority of women with multi-drug resistant organisms and/or antibiotic allergies.
Figure 1. Fosfomycin Exclusions with Success Criteria.

Fosfomycin Prescribed (N=116)

Take Fosfomycin?

Yes

N=104

IV antibiotics or Surgery after FOS?

Yes

Failure N=42 (40%)

*FOS=Fosfomycin.

No

Success N=62 (60%)

Excluded (N=12)

- 8 did not take fosfomycin
- 1 received intramuscular therapy
- Unclear if 3 patients took fosfomycin

Funding: N/A
Poster #M33
IS UREAPLASMA TRULY A URINARY TRACT PATHOGEN?
Victoria Scott, MD, Colby Souders, MD, Muhammed Khalique, M.S., James Ackerman, MA, A. Lenore Ackerman, MD, PhD
Cedars-Sinai Medical Center, Dept. of Surgery
Presented By: Colby Perkins Souders, MD

Introduction: The clinical significance of M. hominis, Ureaplasma urealyticum, and U. parvum is unclear. These species are found in symptomatic and asymptomatic individuals; treatment of symptomatic individuals does not necessarily improve their symptoms. Testing for these organisms has increased due to widespread access to PCR assays. Given the absence of clear benefit for treating these organisms and risk of antimicrobial resistance, European STI Guidelines 2018 position statement recommended against “routine testing and treatment of asymptomatic or symptomatic men and women for M. hominis, U. urealyticum and U. parvum.” To understand the relationship between presence of these organisms in the urinary tract and symptoms, this work examined the prevalence of these organisms in asymptomatic individuals as well as the association with multiple urologic symptoms.

Methods: Using a case-control design, clean-catch urine samples were obtained from 170 subjects, 108 women (F) and 62 men (M). 16S Next-Generation Sequencing (NGS) was performed to identify Mycoplasma and Ureaplasma populations, with confirmatory quantitative PCR analyses quantitating the DNA levels for each species identified. The Genitourinary Pain Index (GUPI) (M&F) was used to characterize painful and voiding symptoms. All patients had negative urine bacterial cultures. Linear regression analysis was used to explore the associations between microbial content and symptomatology.

Results: Of 170 subjects, 61 F (56%) and 43 M (69%) had pain >3 on a Likert scale (0-10). By NGS, both relative abundance and overall prevalence of detectable Ureaplasma were greater in controls than symptomatic patients. By qPCR, U. parvum was present in 25% F and 5% M subjects, but only three patients displayed detectable U. urealyticum, all of whom were in the asymptomatic group. Ureaplasma concentrations, determined by qPCR, were negatively associated with all symptoms assessed: overall pain, urinary frequency, urethral pain, dysuria, and bother (Figure). Mycoplasma species were not present in adequate amounts to allow for analysis.

Conclusion: Ureaplasma spp. are negatively associated with lower urinary tract symptoms, and unlikely to be a significant cause of genitourinary pain. Given a high prevalence in asymptomatic subjects, screening for atypical organisms will result in significant overtreatment, leading to unnecessary disruption of the genitourinary microbiome of these patients and increased risk of development of antimicrobial resistance.
Figure 1. Ureaplasma concentrations are inversely correlated with lower urinary tract symptoms. Domains on the Genito-urinary Pain Index (GUPI) as well as the total GUPI score are plotted against the log of the concentration of Ureaplasma DNA determined by quantitative PCR. In all outcomes assessed, correlation coefficients demonstrated a negative correlation between ureaplasma and symptoms, which was significant for all domains except quality of life (bother) outcomes, in which no significant relationship could be seen.

**Funding:** N/A
Poster #M34
A COMPARISON OF OUTCOMES FOR PELVIC ORGAN PROLAPSE SURGERY BETWEEN NURSING HOME RESIDENTS AND COMMUNITY-DWELLING OLDER ADULTS
Anne Suskind, MD, MS, FACS, Shoujun Zhao, PhD, W. John Boscardin, PhD, Kenneth Covinsky, MD, MPH, MS, Emily Finlayson, MD, MS
UCSF
Presented By: Anne M. Suskind, MD, MS

Introduction: The effects of frailty on surgical outcomes in older women undergoing surgery for pelvic organ prolapse (POP) are unknown. The purpose of this study is to compare short- and long-term surgical outcomes between nursing home residents (who are by definition frail) and matched community-dwelling older adults undergoing surgery for POP.

Methods: This is a retrospective cohort study of women >65 years of age undergoing different types of POP repairs (anterior/posterior repairs, apical repairs and colpocleisis procedures) between 2007 and 2012 using Medicare claims and the Minimum Data Set for Nursing Home Residents. Long-stay nursing home residents were identified and propensity score matched (1:2) to community dwelling older individuals based on procedure type, age, race, and Charlson Score. Linear regression models were created to determine the relative risk of hospital length of stay >3 days and 30-day complications between the two groups. Kaplan Meier curves were created comparing 1-year mortality between groups.

Results: There were 804 nursing home residents and 1606 matched community-dwelling older adults who underwent POP surgery and were included in our analyses. Nursing home residents demonstrated statistically significant increased relative risks for hospital length of stay >3 days [40.5% vs 19.8%, adjusted RR 2.20 (95% CI 1.78-2.30)] and 30-day complications [16.2% vs 3.9%, aRR 4.11 (95% CI 3.08-5.48)] compared to community-dwelling older adults. Kaplan Meier curves illustrating significantly higher 1-year mortality for nursing home residents are shown in the Figure (p<0.0001).

Conclusion: Despite matching on several demographic characteristics, nursing home residents demonstrated worse outcomes compared to community-dwelling older adults, suggesting that frailty adds additional surgical risk in this population.

Funding: NIH NIA R01AG058616
Poster #M35

EARLY POSTOPERATIVE COMPLICATIONS AND FACTORS ASSOCIATED WITH EARLY VERSUS LATE DISCHARGE OF PATIENTS UNDERGOING SURGERY FOR PELVIC ORGAN PROLAPSE. A NATIONAL REPORT

Mahmoud Khalil, MD1, Naleen Raj Bhandari, PhD2, Nalin Payakachat, PhD2, Rodney Davis, MD1, Omer Raheem, MD3, Ehab Eltahawy, MD1

1Department of Urology, University of Arkansas for Medical Sciences, Little Rock, USA, 2Division of Pharmaceutical Evaluation and Policy, Department of Pharmacy, University of Arkansas for Medical Sciences, Little Rock, USA, 3Department of Urology, Tulane University, New Orleans, Louisiana

Presented By: Ehab Eltahawy, MD, MRCS

Introduction: The number of outpatient surgeries is increasing. Literature regarding perioperative morbidity of outpatient pelvic organ prolapse (POP) surgeries is scarce. This study determined the factors that were associated with early (≤1 day) versus late (>1 day) discharge following colporrhaphy, and also compared 30-day postoperative complications between the two groups.

Methods: The National Surgical Quality Improvement Program database was queried from 2005-2016 to identify female patients receiving colporrhaphy (either anterior, posterior, or combined) with same day hospital discharge (early/OPG) or discharged >1 day (late/IPG). Patient characteristics, pre-operative labs, and whether colporrhaphy was received with concomitant sling procedure, operating time, and 30-day post-colporrhaphy complications were recorded. Descriptive statistics were used to compare patient characteristics and complications between the two groups. Multivariable logistic regressions determined factors associated with “OPG” and the likelihood of having 30-day complication in OPG vs. IPG patients. Adjusted odds ratios (aOR) and 95% CIs were reported.

Results: Of 11,652 females receiving colporrhaphy, 32% were early-discharged (OPG) and 68% were late-discharged (IPG). Most OPG females were aged 18-54 years, had ASA class I/II, and received colporrhaphy in/After year 2013 compared to IPG. Fewer OPG versus IPG women were white, had abnormal hematocrit, received combined colporrhaphy, and received concomitant sling. Hypertension and diabetes were the most prevalent comorbidities in the study cohort, which were significantly greater in IPG. Mean OPTIME (minutes) was shorter in OPG vs. IPG (55±34 vs. 78±47, p<0.001). The factors independently associated with a lower likelihood of early discharge included age ≥55 (vs. 18-54), white race (aOR=0.69 [0.57–0.84]), current smoker (aOR=0.75 [0.64–0.87]), ASA class III vs. I/II (aOR=0.48 [0.24–0.97]) and 10-minute increment of OPTIME (aOR=0.85 [0.83–0.86]). However, receiving colporrhaphy in/After year 2013 (aOR=2.40 [2.20–2.64]) and receiving posterior colporrhaphy vs. combined (aOR=1.2 [1.07–1.33]) increased the likelihood of being early-discharged. The overall 30-day morbidity (3.7% vs. 6.2%, aOR=0.67 [0.55–0.82]), reoperation (0.8% vs. 1.4%, OR=0.59 [0.39–0.90]), and readmission (0.9% vs. 2.4%, OR=0.40 [0.26–0.90]) were significantly lower in OPG versus IPG.

Conclusion: Women receiving posterior colporrhaphy versus combined and surgical year ≥2013 were independently associated with a higher likelihood of being early-discharged. Additionally, outpatient colporrhaphy was associated with lower morbidity compared to inpatient.

Funding: N/A
Poster #M36
TOTAL HYSTERECTOMY IS MORE COMMON THAN SUPRACERVICAL HYSTERECTOMY AT THE TIME OF CONCURRENT SACROCOLPOPEXY
Emily Slopnick, MD1,2, Graham Chapman, MD1,2, Sangeeta Mahajan, MD1, David Sheyn, MD1,2, Kasey Roberts, MD1,2, Adonis Hijaz, MD1
1University Hospitals Cleveland Medical Center, Dept. of Urology, Cleveland, OH, 2MetroHealth Medical Center, Dept. of Ob/Gyn, Cleveland, OH
Presented By: Emily Slopnick, MD

Introduction: Hysterectomy is often performed with sacrocolpopexy (SCP) for pelvic organ prolapse. Total and supracervical hysterectomy have unique risks and benefits, but supracervical hysterectomy has a lower risk of mesh exposure. Our objective was to describe national practice patterns in the type of hysterectomy with concurrent SCP.

Methods: We used the National Surgical Quality Improvement Program database with targeted hysterectomy data for this retrospective cohort study. We identified cases of SCP from 2014-2016 that included a concurrent benign hysterectomy. Patients were stratified into supracervical hysterectomy (SCH) or total hysterectomy (TH), including open, laparoscopic, and vaginal approaches. We performed Chi-square analyses and backward stepwise logistic regression to identify patient and surgeon factors associated with hysterectomy type and compare complication rates.

Results: 4,615 women underwent SCP with hysterectomy: 84.4% laparoscopic surgeries and 15.6% open. The mean patient age was 56.5 +/- 11.7 years. Overall, 55.8% had a TH and 44.2% had a SCH (Figure 1). Gynecologists represent 96.3% of surgeons, and 51.2% were urogynecologists. Urogynecologists were more likely to perform a SCH than generalists (58.1% vs. 43.4%, p<0.001).

On multivariable logistic regression, TH was associated with younger age (aOR 0.98 per year, CI 0.97-0.99, p<0.001) and greater uterine weight (aOR 1.05 per 10g, CI 1.03-1.06, p<0.001). The median operative time of SCH was 58 minutes longer than TH (211 vs 153 minutes, p<0.001). Blood transfusion was more common with TH (1.1% vs 0.5%, p=0.025), while no differences were observed between groups for other individual complications or the composite complication rate (TH 5.6% vs SCH 5.3%, p=0.689).

In a subgroup analysis of laparoscopic SCP, TH was associated with a history of pelvic surgery (aOR 1.26, CI 1.01–1.56, p=0.036), greater uterine weight (aOR 1.06 per 10g, CI 1.04–1.08, p<0.001) and younger age (aOR 0.97 per year, CI 0.96 – 0.98, p<0.001). There was no difference in the composite complication rate (SCH 5.1% vs. TH 5.0%, p=0.824).

Conclusion: At the time of SCP, TH is more common than SCH and is associated with younger age and greater uterine weight. When performed by a urogynecologic specialist, SCH is more common than TH. The overall risk of complications was low and similar between hysterectomy type.
Funding: N/A
Poster #M37
VENOUS THROMBOEMBOLISM PROPHYLAXIS IN VAGINAL SURGERY FOR PELVIC ORGAN PROLAPSE: PREDICTORS OF HIGH RISK IN A LOW RISK POPULATION
Christina Escobar¹, Alejandro Gomez-Viso¹, Surhbi Agrawal¹, Nirit Rosenblum², Benjamin Brucker², Scott Smilen¹, Dominique Malacarne Pape¹
¹New York University, Department of Obstetrics and Gynecology, New York, NY, ²New York University, Department of Urology, New York, NY
Presented By: Christina Escobar, MD

Introduction: The rate of venous thromboembolism (VTE) in vaginal surgery for pelvic organ prolapse (POP) is low. However, within this low risk population, predictors of higher risk of VTE are not well studied. The aim of this study was to evaluate specific risk factors for VTE in patients undergoing vaginal repair of POP.

Methods: Cases of vaginal repair of POP between 2014 and 2017 were extracted from the American College of Surgeons National Surgical Quality Improvement Program database using Current Procedural Terminology codes. Patient and operative characteristics were collected. VTE was defined as pulmonary embolism or deep vein thrombosis 30 days from surgery. Statistical analysis was performed using student t-tests for continuous variables and chi-squared test for categorical variables. A multivariate logistic regression analysis was used to control for confounding variables.

Results: Of 44,207 women who underwent vaginal repair of POP, there were 69 cases of VTE for a rate of 0.16%. Patient and operative characteristics in the total population, VTE group and no VTE group are compared in table 1. VTE rates for obliteratorative (0.15%) and functional (0.16%) vaginal repair of POP were not significantly different (p= 0.616). VTE rates for POP repairs with hysterectomy (0.17%) and POP without hysterectomy (0.12%) were not significantly different (p=0.216). A multivariate analysis demonstrated predictors for post-operative VTE to be American Society of Anesthesiology (ASA) Physical Status Classification of 3 or higher (OR, 1.99; 95% CI,1.2-3.5; P= 0.014), length of stay greater than 75th percentile (OR 2.01; 95% CI, 1.2-1.3; P=0.007), operative time greater than 3 hours (OR 2.24; 95% CI 1.3-4.0; P=0.007) and dyspnea (OR 3.26, 95% CI, 1.5-7.3; P=0.004).

Conclusion: While the incidence of VTE after vaginal POP repair is low, patients with ASA physical status classification of 3 or more, length of stay greater than 75th percentile, operative time greater than 3 hours and dyspnea were at higher risk for VTE. It is important to look at standard VTE risk assessment tools in light of these risk factors as vaginal surgery for POP repair may have independent risk factors for VTE not captured in these tools.
<table>
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<td>LOS (days), mean (SD)</td>
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*Statistically significant

Table 1: Patient and operative characteristics of vaginal pelvic organ prolapse repairs

**Funding: N/A**
Poster #M38
SPINE STRUCTURE COMPARISON IN SUBJECTS WITH AND WITHOUT PELVIC ORGAN PROLAPSE
Alexandra Marasco¹, Scott Doyle², Frank Mendel², Steven Lewis³, Anne Stoklosa¹, Victoria Gosy¹, Katelyn Benson¹, Ellen Piccillo¹, Tova Ablone⁴
¹Jacobs School of Medicine and Biomedical Sciences, Buffalo, NY, ²Jacobs School of Medicine and Biomedical Sciences, Dept. of Pathology and Anatomical Sciences, Buffalo, NY, ³Jacobs School of Medicine and Biomedical Sciences, Dept. of Computational Cell Biology, Anatomy and Pathology, Buffalo, NY, ⁴Jacobs School of Medicine and Biomedical Sciences, Dept. of Obstetrics and Gynecology, Buffalo, NY
Presented By: Alexandra Marasco

Introduction: It is difficult to predict who will develop clinically significant pelvic organ prolapse. In our prior study, we noted a decrease in pressure at the hollow of the sacrum when the cadaver was standing. We hypothesized that the normal curvature of the lumbar spine toward the abdominal wall and the formation of a hollow created by the angle of the sacrum acted as an oasis, protecting the pelvic organs from intra-abdominal forces. The objective of this study was to test this hypothesis by using computational modeling to compare the degree of lumbar lordosis and sacral tilt found in women with and without prolapse.

Methods: We sampled 63 female UBMD OB|GYN clinic patients, all of whom were at least 40 years of age, and had a pelvic CT scan in the past 10 years. Their history and physical was reviewed to determine if they were diagnosed with pelvic organ prolapse. The women were then divided into those with pelvic organ prolapse, and those without.

The pelvic CT images were uploaded into 3D Slicer 4.10. Landmarks of the pelvis were identified including the superior iliac spine, anterior pubic symphysis, posterior ischium, lumbar vertebrae, sacral vertebrae, and coccyx (see figure, top). Fifteen measurements, including both distances and angles, were made by at least two independent researchers who were blinded to the diagnosis.

The 15 measurement features for all subjects were saved as a .csv file. The dataset was randomly split into training (n=35) and testing (n=28) groups, in both groups the patients’ prolapse vs no-prolapse labels were hidden. Isometric mapping was used on the training data to learn a low-dimensional clustering of the data, after which the subject labels (prolapse versus no prolapse) were revealed. The testing data was then processed using this learned mapping (see figure, bottom). Our model was implemented in the Python programming language.

Results: The model was able to accurately cluster prolapse versus no-prolapse in 24 out of 28 patients in our testing set (86%).
Conclusion: Our pilot study supports the hypothesis that the normal curve of the lumbar spine and angle of the sacrum may protect the pelvic viscera from normal increases in intra-abdominal pressure.

Funding: N/A
Poster #M39
VALIDATION OF THE PELVIC FLOOR AWARENESS AND KNOWLEDGE SURVEY (PFAKS)
Claire Burton¹, Melissa Markowitz², Falisha Kanji³, Carrie Stewart³, Victoria Scott³, Karyn S. Eilber³, A. Lenore Ackerman³, Jennifer T. Anger³
¹Department of Urology, University of California Los Angeles, Los Angeles, CA, ²David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, ³Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA
Presented By: Claire Burton, MD

Introduction: Pelvic floor disorders are prevalent conditions affecting up to 50% of women. Yet, women have a poor understanding and low rates of care utilization for these disorders. Previous studies have shown that knowledge of disease increases patient involvement and compliance with treatment. We sought to develop a knowledge questionnaire about pelvic organ prolapse (POP), stress urinary incontinence (SUI), and overactive bladder (OAB). The Pelvic Floor Awareness and Knowledge Survey (PFAKS) was developed by expert consensus and qualitatively and quantitatively analyzed via cognitive interviews and survey administration.

Methods: The PFAKS is a 31-item knowledge questionnaire tailored to an eighth-grade reading level with three domains: POP (11 items), SUI (10 items) and OAB (10 items) with questions on condition pathophysiology, management, and quality of life. Ten experts developed the content and reviewed the draft questionnaire. Cognitive interviews were conducted with ten to gather feedback on the survey’s structure and content. The survey was distributed to three groups in order to assess discriminate validity: Non-FMPRS urologists, patients in a FPMRS clinic, and a general population sample (SurveyMonkey Audience). Scores were stratified by disease history, menopausal status, birth history, and level of education, and two-tailed t tests were performed to assess survey validity.

Results: Total score was significantly different between groups (25.77±3.1 for urologists (n=35), 10.54±6.8 for patients (n=49), and 12.36±7.7 for the general population (n=155), p<0.01). Among the general population and patient groups combined, women who had previously been diagnosed with a PFD scored better than those who did not (13.3 vs 11.1, p=0.05), and women with a given PFD scored better on the respective subscales (Figure). Postmenopausal women tended to score higher overall, but this was not statistically significant (12.9 vs. 10.9, p=0.07).

Conclusion: The discriminant validity and qualitative advantages of the PFAKS emphasize its potential to serve as a tool to uncover patient misconceptions about POP, SUI and OAB. The higher subscale scores of women with their respective PFDs fit expectations, as these groups are more likely to have experienced and been counseled on their respective disorders, thus validating the PFAKS as a reliable tool to assess for pelvic floor disorder knowledge.
Funding: N/A
Poster #M40
POST-OPERATIVE VOIDING DYSFUNCTION IN THE MANAGEMENT OF FEMALE URETHRAL STRICTURE: A DETAILED ANALYSIS
Didi Theva, MD, Mohamed Etafy, MD, Angelo Gousse, MD
Bladder Health Reconstructive Urology Institute
Presented By: Didi Theva, MD

Introduction: Female urethral stricture is a debilitating and uncommon condition that causes significant obstructive symptoms and voiding dysfunction. At our institution, operative management includes endoscopic urethral dilation or direct vision internal urethrotomy (DVIU) and reconstructive repair with buccal mucosal graft urethroplasty (BMG-U) versus vaginal rotational flap urethroplasty (VRF-U). Our aim is to describe the voiding patterns of females with urethral strictures before and after different management options.

Methods: We retrospectively reviewed female patients who presented or were diagnosed with urethral stricture disease from May 2010 to July 2016 and were managed with surgical treatment by a single surgeon (AEG). Women with a history of neurogenic voiding dysfunction, or who underwent office dilation were excluded from the study. We identified 16 patients who met our criteria and assessed factors including demographics, surgical repair details, pre-operative and post-operative voiding function and re-treatment rates.

Results: Of the 16 patients who underwent surgical management of urethral strictures, 8 (50%) were due to idiopathic causes, 2 (12.5 %) from pelvic trauma, 6 (37.5%) from iatrogenic causes. 2 (12.5%) of the patients had strictures associated with erosion of synthetic mesh into the urethra. The median age of patients at surgery was 52.5 years, followed for a median of 19.7 months. Six patients underwent primary endoscopic management with urethral dilation (N=5, 31.3%) and DVIU (N=1, 6.3%) and 10 patients underwent reconstructive repair with BMG-U (N=7, 43.8%) and VRF-U (N = 3, 18.8%). Pre-operative urge incontinence associated with obstruction resolved in 5/5 patients (100%) and stress incontinence persisted in only 1 patient who had prior hair-bearing reconstruction at another institution.

Four of 10 patients who had initial reconstructive surgery required re-treatment, either with repeat urethroplasty (N=3) or endoscopic dilation (N=1), achieving clinical success in 100% of cases. Of the 6 patients who underwent primary endoscopic management, 2 (33%) underwent successful re-treatment with urethroplasty.

Conclusion: Our experience suggests both endoscopic and reconstructive treatments can be considered for management of urethral strictures in women, understanding that re-treatment may be necessary. Urge incontinence improved post-operatively and stress incontinence was managed with anti-incontinence procedure in one patient. Satisfaction rates are high and long-term and multi-institutional studies are needed to support this observation.

Funding: N/A
Poster #M41
FACTORS IMPACTING URETERAL INJURY LITIGATION PROCEEDINGS: SETTLEMENT AND ARBITRATION VERSUS JURY TRIAL
Raevti Bole, MD\textsuperscript{1}, Ajay Gopalakrishna, MD\textsuperscript{1}, Ruby Kuang, MD\textsuperscript{2}, Ashton Schatz, JD\textsuperscript{1}, Brian Linder, MD\textsuperscript{1}, Boyd Viers, MD\textsuperscript{1}
\textsuperscript{1}Mayo Clinic, Rochester, MN, \textsuperscript{2}UCLA
Presented By: Raevti Bole, MD, MA

\textbf{Introduction:} Ureteral injury is a recognized complication of abdominopelvic surgery at a prevalence of 8\% [1] and requires surgical management or reconstruction to avoid further morbidity. Litigation involving ureteral injury is prevalent however there is a paucity of data published on this topic. Therefore we sought to examine factors associated with iatrogenic ureteral injury litigation resolved outside the courtroom versus those that proceeded to jury trial.

\textbf{Methods:} The national legal database WestLaw was queried for all dockets with the complaint of iatrogenic ureteral injury at state and federal levels. Dockets were mined for plaintiff and defendant demographics, litigation outcomes and clinical factors. Descriptive statistics and chi-square test of independence were used for categorical predictors while Wilcoxon rank-sum test was used to examine continuous variables. Statistical analyses were performed using RStudio Version 1.2.1335.

\textbf{Results:} A total of 522 cases were identified between the years 1961 to 2019. 470 cases went to trial and 52 were settled or arbitrated. A higher proportion of institution-only cases were resolved outside of court at 15.4\% versus MD-only at 7.3\% (p=0.006). There was also a difference between defendant specialties with nonsurgeons and general surgeons more likely to go to trial than other surgeons (p=0.014). A claim of inadequate consent was less likely than other claims to be resolved out of court at 3.4\% versus 11.3\% (p=0.03). Patient outcome also differed with 42.9\% of cases involving plaintiff death being settled versus 6.4\% of lost renal units and 10.7\% of cases of no loss of organ or life (p=0.0002). Academic institutions were more likely to handle litigation outside of court at 19.7\% versus private practice at 7.1\% (p=0.006). There was no significant difference in plaintiff gender, state or timing of litigation, surgical approach or procedure, need for urinary drainage, or delay to repair.

\textbf{Conclusion:} Institutional defendants, academic practice, physician specialty and plaintiff loss of life were significantly associated with resolution outside of court versus in front of a jury. Claims related to inadequate consent were more likely to go to jury trial. These findings may reflect broad trends in medicolegal decision-making in ureteral injury litigation and is relevant to reconstructive as well as general urologists.

\textbf{Funding:} N/A
Poster #M42

ROBOTIC BUCCAL MUCOSA GRAFT URETEROPLASTY FOR BENIGN URETERAL STRicture DISEASE; IS OMENTAL FLAP INTERPOSITION ALWAYS NECESSARY?

Humberto Villarreal, David Koslov, Paul Maroni, Ty Higuchi, Alan Quach, Kirk Redger, Brian Flynn
University of Colorado, School of Medicine, Department of Surgery, Division of Urology
Presented By: Alan Quach

Introduction: Robotic buccal mucosal graft ureteroplasty was initially described in 2015 with increasing utilization over the past 4 years. An omental flap has commonly been used to reinforce the anastomosis. Our institution has utilized buccal mucosa for the reconstruction of benign ureteral stricture disease since 2017. In this study, we review this experience and report on outcomes.

Methods: A retrospective analysis was performed in patients undergoing robotic buccal mucosal graft ureteral reconstruction since 2017 at a single institution by two surgeons. Data including stricture etiology, location of injury, length of stricture, surgical management, length of follow-up, success rate, complications, and the need for secondary procedures was obtained.

Results: Twelve patients underwent robotic buccal mucosal graft augmented ureteral reconstruction based on attending preference and stricture complexity, excluding patients with primary repair for UPJ obstruction or external traumatic injury. 10 patients (83%) were managed preoperatively with a stent or nephrostomy tube. 10 patients (83%) had undergone prior endoscopic intervention. Mean number of prior endoscopic treatments for ureteral stricture was 3 (range 0-6). Mechanism of injury included recurrent stricture after prior reconstruction (50%), stone disease (33%), and iatrogenic injury during pelvic surgery (17%). Location of injury was proximal (83%) and distal (17%). Average stricture length was 4 cm. The type of repair included ureteral reimplant with buccal mucosa augmentation (n=1), pyeloplasty with BMG augmentation (n=3), and BMG ureteroplasty (n=8). Mean operative time was 366 minutes. Mean length of stay was 4 days. At the time of this study, 9 patients had completed follow-up and their outcomes are as follows. At a mean follow-up of 5 months, primary success rate was 89%, with the one failure planning to undergo nephrectomy instead of additional reconstructive surgery. Time to failure was 120 days. There was one major complication (defined as a Clavien-Dindo grade 3 or higher) in a patient that suffered a post-op cryptogenic ischemic stroke.

Conclusion: Robotic buccal mucosa graft ureteral reconstruction has been an important addition to our reconstructive treatment algorithm for benign ureteral strictures. Utilization of this minimally-invasive technique has decreased the need for ureteral reconstruction using bladder or omental flap-based repairs or ileal interposition.

Funding: N/A
Poster #M43
SEXUAL FUNCTION AFTER PENILE INVERSION VAGINOPLASTY
Virginia Li, Resident, Amanda Chi, Urologist, Melissa Poh, Plastic Surgeon, Polina Reyblat, Urologist
Kaiser Permanente Los Angeles
Presented By: Virginia Y. Li, MD

Methods: All patients who underwent a penile inversion vaginoplasty at Kaiser Permanente Southern California 2017-2019 were contacted by telephone. Patients satisfied criteria for GAS per World Professional Association for Transgender Health (WPATH) guidelines. In particular, clitoral sensation, vaginal sensation, sexual satisfaction/Ability to orgasm, genital appearance satisfaction scale, and decisional regret were recorded.

Results: The first 57 consecutive vaginoplasties were reviewed. All patients were followed for a minimum of 3 months prior to survey. Besides one patient with prior stroke, all were treated with hormone therapy for at least 2 years. A total of 30 patients (58%) answered the survey. Majority of patients report clitoral sensation (97%) and vaginal sensation (92%) after the surgery; interested patients have also reported orgasm from clitoral stimulation (73%) along with vaginal manipulation (59%). Satisfaction regarding functional and cosmetic outcomes of surgery are high, with most patients reporting satisfied to very satisfied. Patients report no regret about surgery using the Decision Regret Scale.

Conclusion: GAS within an integrated system allows comprehensive follow-up of patients. One stage vaginoplasty in our first cohort of patients show good sexual function and satisfaction overall. There is very low decisional regret after this surgery.

Funding: N/A

Poster #OM1
WITHDRAWN
Poster #OM2
CYCLOSPORINE FOR THE TREATMENT OF HUNNER’S LESION INTERSTITIAL CYSTITIS
Lauren Tennyson¹, Kate Turner¹, Annah Vollstedt¹, Kenneth Peters¹,²
¹Beaumont Health, Royal Oak, ²Oakland University William Beaumont School of Medicine
Presented By: Annah Vollstedt, MD

Introduction: Cyclosporine A (CyA) is a fifth-line therapy for interstitial cystitis (IC). It has been shown to be effective in Hunner’s lesion interstitial cystitis (HLIC), but literature remains sparse. We treat only HLIC with CyA. The aim of this study was to evaluate our experience and increase urologist awareness of CyA.

Methods: We retrospectively reviewed the records of patients with cystoscopy-confirmed HLIC treated with CyA from August 2012-present. Patients completed a Global Response Assessment (GRA) and the Interstitial Cystitis Symptom Index and Interstitial Cystitis Problem Index (ICSIPI). Responders were those with moderately or markedly improved GRA scores. Clinicodemographic variables, the number of previous IC therapies, associated diagnoses, ICSIPI score, average bladder pain, daytime urinary frequency and nocturia before and after CyA were tested for association. Wilcoxon rank test was used for the continuous variables and Fisher exact test for the categorical variables.

Results: 51 patients were identified and 37 completed the questionnaires and were included in analysis (73% responder rate). 28/37 (76%) were female, mean age was 68 years (range 51-84). An average of 8 previous therapies were tried prior to CyA. 31/37 (84%) were considered CyA responders. Prior to starting CyA patients reported an average of 8/10 bladder pain, daytime frequency x 11-20 and nocturia x 7. Responders vs. non-responders had decrease in bladder pain (1/10 vs. 5/10), frequency (≤ 10x/day vs. 11-20x/day) and nocturia (x2 vs. x5). Responders had lower ICSIPI score (9 vs. 21 p= .001). 9/37 (24%) of patients developed new or worsening hypertension, all were maintained on CyA but the dose was decreased in 3, and 6 had a change in their BP medication. 89% of patients reported they would rather add additional HTN treatment than stop CyA. 4/37 patients discontinued CyA, the reasons were lack of efficacy (n=2), drug interaction (n=1) and abdominal pain (n = 1). Baseline eGFR and eGFR 3 months after starting medication remained stable.

Conclusion: In patients with Hunner’s Lesion Interstitial Cystitis, CyA significantly improved bladder pain and normalized urine frequency / urgency. CyA is well tolerated and should be considered earlier than 5th line therapy in this subgroup.

Funding: N/A
Poster #OM3
OUTCOMES OF PROSTATIC URETHRAL LIFT IN A MEDICALLY COMPLEX US MILITARY VETERAN POPULATION
Shreeya Popat, MD, Katherine Utech, BS, Jennifer Taylor, MD, MPH, Jeffrey Jones, MD, MS
Baylor College of Medicine
Presented By: Shreeya Popat, MD

Introduction: Prostatic urethral lift (PUL) is a minimally-invasive intervention for symptomatic benign prostatic hyperplasia (BPH). PUL is recommended for bilobar prostatic hyperplasia, 30-80cc in size, in patients who are not catheter dependent. Here, we report outcomes utilizing PUL within a US military veteran population employing a wider range of procedural indications.

Methods: Charts of patients who underwent PUL at our institution from 2013 to present were reviewed, noting baseline patient characteristics and operative details. Pre- and post-operative International Prostate Symptom Score (IPSS), uroflowmetry, and post-void residual (PVR) were recorded. Statistical comparisons were performed using simple t-tests.

Results: From 2013 to 2019, 91 patients underwent PUL at our institution. Mean age was 70 (range 55-92) years. The vast majority of our patients classify as American Society of Anesthesiologists (ASA) class 3 versus the general population at ASA class 2. Mean prostate size, as measured on transrectal ultrasound, was 40 (range 14-115) cc. Three patients had prostates larger than 80cc. Three patient had bladder stones, necessitating concomitant cystolithalopaxy. Fifty-three procedures were performed under general anesthesia, 35 with intravenous sedation and intravesical/urethral lidocaine, and 3 under spinal anesthesia. Average number of implants was 5 (range 2-13).

Post-operatively, IPSS decreased by an average of 43% (23 to 13, p < 0.001). Of note, IPSS worsened over the course of follow-up, though not to a statistically significant degree (p=0.08). There was a mean 41% decrease in PVR (179 to 101cc, p=0.009), which was durable for a follow-up of up to 54 months. Maximum urinary flow rate improved by an average of 32% (9.3 to 12.3 cc/s, p=0.003), which was also durable throughout follow-up.

Forty-four patients required catheterization pre-operatively: 26 used clean intermittent catheterization (CIC), and 18 had indwelling catheters. Of these patients, 16 (38.6%) required catheterization post-operatively: 13 (29.5%) performing CIC and 4 (9%) requiring indwelling catheters. Therefore, 27 patients (61.4%) were rendered catheter-free by PUL.

Thirty-nine patients were taking antiplatelet medications peri-operatively, and 13 took anticoagulants. Only one patient (on warfarin) experienced hematuria requiring re-admission with catheter placement.

Conclusion: PUL produced effective and generally durable results in our veteran population, including in patients requiring catheterization, those with bladder stones, and those on antiplatelets/anticoagulants.

Funding: N/A
Poster #OM4
PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR GAMMA AGONIST AS A NOVEL TREATMENT FOR INTERSTITIAL CYSTITIS: A RAT MODEL
Craig Comiter, Department of Urology, Amandeep Mahal, Department of Urology, Amy Dobberfuhl, Department of Urology
Stanford University School of Medicine
Presented By: Craig Vance Comiter, MD

Introduction: Interstitial cystitis (IC) is characterized by urothelial changes including decrease of urine-bladder barrier proteins including uroplakin and unique production of Frizzled-8 protein-related glycoprotein (antiproliferative factor). These changes lead to disruption of the bladder lining in addition to slowing of the reparative process of the bladder wall, which is usually restored by cell replication and differentiation of basal cells. We believe that peroxisome proliferator-activated receptor gamma (PPAR-γ) agonists may offer a potential therapeutic benefit by way of restoring the urothelial integrity. In cell culture, PPAR-γ agonists have been shown to drive urothelial cells to differentiation and production of barrier proteins including uroplakin. We investigate the use of a PPAR-γ agonist, pioglitazone, as a potential reparative treatment for IC, which may offer a treatment option that would target a known defect in urothelial architecture seen in patients with IC.

Methods: Using a previously described animal model for IC, Sprague-Dawley rats were treated with biweekly cyclophosphamide injections (35mg/kg) to induce cystitis. Animals were divided into 4 groups (n=6 for each group): IC plus daily sham saline gavage (IC+Pio-), IC plus daily pioglitazone gavage (15mg/kg) (IC+Pio+), normal rats with daily pioglitazone (IC-Pio+), and normal rats with neither IC nor pioglitazone (IC-Pio- or Control). At the end of four weeks, urinary frequency and bladder capacity were measured. Histologic examination of urothelial integrity was also performed.

Results: Average voids per hour were significantly lower in IC+Pio+ (4 ±1.87) vs. IC+Pio- (10 ± 2.44) rats (p<0.01) and were similar to IC-Pio+ (6±1.41) and IC- Pio- (6±1.52) controls. Cystometric capacity was significantly higher in IC+Pio+ (0.945 ±0.122 ml) vs. IC+Pio- rats (0.588 ±0.165 ml, p=0.01) and was comparable to IC-Pio- capacity (0.82 ± 0.20 ml) and IC-Pio+ capacity (0.94 ± 0.19 ml). Urothelial structural integrity was improved in IC+Pio+ rats versus IC+Pio- rats upon histologic observation.

Conclusion: Pioglitazone, a PPAR-γ agonist, improved bladder function in cyclophosphamide-induced cystitis by both observed urinary frequency and measured cystometric capacity. Urothelial structural integrity was also improved. Pioglitazone, due to a propensity to cause bladder mucosal proliferation, may prove useful for treating interstitial cystitis, and deserves further investigation.
Comparison of H&E (magnification, ×40). Loss of normal urothelium and barrier thinning (arrow) is appreciated in the IC+Pio- group (left). The treated cystitis (IC+Pio+) group shows amelioration of the urothelium (right).

Funding: Dean’s Office, Stanford University School of Medicine
Poster #OM5
INTRAVESICAL BOTULINUM TOXIN INJECTIONS FOR DETRUSOR OVERACTIVITY IN PATIENTS SUFFERING FROM MULTIPLE SCLEROSIS; APPROPRIATE CLINICAL PRACTICE FOR RETAINING THIS POPULATION
Michael Goltzman¹, Brendan Gontarz², Gerard Pregenzer²
¹UConn Health, Farmington, CT, ²Saint Francis Hospital and Medical Center, Hartford, CT
Presented By: Michael Emanuel Goltzman, MS, MD

Introduction: The multi-organ system effects from multiple sclerosis (MS) generates a significant disease burden for an already vulnerable population. Management is optimized by recognizing boundaries preventing patient adherence to effective treatment and promoting the physician-patient relationship. Neurogenic detrusor overactivity (NDO) is the most frequently reported urodynamic abnormality of MS; when refractory to antimuscarinic medication, botulinum toxin-A (BTX-A) injections may be a reasonable alternative to improving bladder function. Clinically, intradetrusor injection of BTX-A has been found to decrease urinary incontinence and improve quality of life. BTX-A is an ideal therapy due to its effectiveness and long duration of action, reproducibility of results on repeated administration, and low incidence of complications. This study was conducted to assess adherence among MS patients who initiated BTX-A injection therapy with intent to identify the patient characteristics, comorbidities, or complications related to treatment cessation.

Methods: After IRB approval, a retrospective chart review of patients identified through a multidisciplinary MS care center were analyzed. Patients received at least 1 BTX-A detrusor injection treatment between August 2016 and October 2018. BTX-A treatment consisted of multiple trigone-sparing detrusor injections consisting of 200 to 300 units of BTX-A under cystoscopic guidance.

Results: A total of 276 BTX-A treatments were performed on 76 patients. Of those patients, 13 received 1 injection (17%), 12 received 2 treatments (16%), and 51 received 3 or more treatments (67%). The median time between successive treatments was 7.6 months (SD 2.4). Of the patients who failed to return for subsequent treatment, the primary reasons reported for nonadherence were progression to alternative treatment (i.e. suprapubic catheter placement, sacral nerve stimulation), or infectious complications. The majority of patients who received multiple injections reduced or even stopped taking anticholinergic drugs.

Conclusion: Poor patient adherence is a salient consideration in outcomes research and healthcare cost. Despite substantial sequelae, there is limited research substantiating best practices for engaging and retaining the MS population. The majority of patients have improved symptom control with successive BTX-A therapy. Close and directed follow-up allows for improved disease management and identification of individuals who progress to alternative therapies. Appreciation of the high adherence rate to BTX-A underscores the importance of multidisciplinary collaboration and thorough education efforts.

Funding: N/A
Poster #OM6
POSTOPERATIVE COMPLICATIONS AND FACTORS ASSOCIATED WITH EARLY VERSUS LATE DISCHARGED MALES FOLLOWING URETHROPLASTY
Scotty McKay, MS1, Mahmoud Khalil, MD1, Naleen Raj Bhandari, PhD2, Rodney Davis, MD1, Nalin Payakachat, PhD2, Omer Raheem, MD3, Ehab Eltahawy, MD1
1Department of Urology, University of Arkansas for Medical Sciences, Little Rock, USA, 2Division of Pharmaceutical Evaluation and Policy, Department of Pharmacy, University of Arkansas for Medical Sciences, Little Rock, USA, 3Department of Urology, Tulane University, New Orleans, Louisiana
Presented By: Ehab Eltahawy, MD, MRCS

Introduction: We investigated factors that were associated with a likelihood of early discharge (≤1 day) versus late (>1 day) following urethroplasty. We also compared 30-day postoperative complications between the two groups.

Methods: The National Surgical Quality Improvement Program database (NSQIP) was queried from 2005-2016 to identify male patients who underwent urethroplasty with same day discharge and those who stayed >1 day. Patients’ age, BMI, race, current smoking status, American Society of Anesthesiologists (ASA) classification, and admission year (<2011 or ≥2011), preoperative WBC and hematocrit, specific type of urethroplasty performed, and operating time (OPTIME) were collected. Additionally, occurrences of complications within 30 days of receiving urethroplasty were recorded. Patients’ characteristics and complications were compared between the two groups using student t or Chi-square tests. Multivariable logistic regressions were used to determine factors associated with “early discharge” (vs. late) and the likelihood of having each 30-day complication among those who were discharged early. Adjusted odds ratios (OR) and 95% CIs were reported.

Results: Of 1,435 males who received urethroplasty in 2005-2016, 396 (27.6%) were discharged early and 1,039 (72.4%) were discharged late. The majority were ≥45 years old (57%), of the white race (59%) and had ASA Class I/II (72%). Unadjusted analysis suggested that patients in both groups differed significantly on OPTIME (p<0.001), age (p=0.010), race (p<0.001), pre-operative WBC count (p<0.001) and hematocrit (p<0.001), year of surgery (p<0.001), type of urethroplasty (p=0.003), and tissue transfer (p<0.001). Patients of the white race (OR=2.21 [1.44, 3.38]), patients who received urethroplasty after the year 2011 (OR=4.23 [2.51, 7.15]), and had anterior urethroplasty without tissue transfer (1.65 [1.17, 2.34]) were more likely to be discharged early. However, increased OPTIME (10-minute increment) (OR=0.88 [0.86, 0.90]) were associated with a lower likelihood of early discharge. In comparison of 30-day postoperative complications between the two groups, early discharged patients were 65% less likely to be readmitted (OR=0.35 [0.14, 0.88]) compared to those discharged late. Rates of mortality, complications, or reoperation between the two groups were similar.

Conclusion: Among factors investigated, patients of white race, anterior urethroplasty without tissue transfer versus posterior without tissue transfer, shorter OPTIME, and year of surgery after 2011 were significantly associated with “early discharge”.

Funding: N/A
Poster #OM7
“MIXED” MOTOR SACRAL NEUROMODULATION LEAD PLACEMENT RESULTS IN HIGHER IMPLANT RATES
Kristen Gurtner, MD, Anastasia Couvaras, MD, Colin Goudelocke, MD
Ochsner Clinic Foundation
Presented By: Kristen E. Gurtner, MD

Introduction: Motor response is recognized as an important guide to sacral neuromodulation (SNM) lead placement as many leads are placed under sedation that alters sensory response. While there is scarce data on optimal characteristics of placement, several publications have explored ideal location, number of electrodes eliciting a response, amplitude of motor threshold and type of motor response associated with successful implantation. Optimized leads have been considered to: provoke response at low amplitudes, utilize all electrodes and prompt a bellows before a toe response. Emerging data may affect what is considered an optimized lead.

Methods: This represents an analysis of a prospective database examining the relationships among motor threshold characteristics, patient reports of sensation and the success and durability of SNM therapy. Leads were placed between November 2017 and August 2019 by a single surgeon with high-volume SNM experience. The amplitude of both toe and bellows motor threshold was recorded for each electrode. This analysis includes patients undergoing staged lead testing for urgency symptoms and voiding dysfunction including non-obstructive urinary retention. Patients having simultaneous pulse generator and lead placement or those undergoing lead revision were excluded. Leads were classified as “bellows” or “toe” when the lowest motor threshold on all four electrodes was uniform while “mixed” leads showed equal or alternating amplitudes across the lead. All leads demonstrated motor response on 4 electrodes.

Results: A total of 102 staged leads were placed with 82/102 (80%) of patients implanted. Distribution of leads were: bellows (22/102; 22%), toe (8/102; 8%) and mixed (72/102; 70%). Implantation rate for mixed leads was 88% (63/72) but only 68% (15/22; p<0.03) for bellows. Toe-dominant leads were implanted at 50% (4/8; p<0.006). Analysis suggests that distal electrode response may be paramount as leads with distal electrodes having equal bellows and toe thresholds had an implant rate of 100% (17/17) vs 72% (31/43; p<0.02) for those with bellows lowest. No differences were seen with proximal electrodes.

Conclusion: While bellows response has traditionally been sought as the “first” motor response for SNM lead implantation, our data suggest that a mixed pattern of response appears to result in higher rates of implantation.

Funding: N/A
Poster #OM8
PREVALENCE OF COITAL URINARY INCONTINENCE IN NULLIPAROUS WOMEN
Siobhan Hartigan, MD¹, Sophia Goodridge, MD², Leah Chisholm¹, Elizabeth Rourke, DO¹, Roger Dmochowski, MD¹, Melissa Kaufman, MD, PhD¹, W. Stuart Reynold, MD¹
¹Department of Urology, Vanderbilt University Medical Center, Nashville, TN, ²Urology, WellStar Medical Group, Roswell, GA
Presented By: Siobhan M. Hartigan, MD

Introduction: Coital urinary incontinence (CUI) is a clinical problem with significant impact on quality of life, yet continues to be infrequently studied and under-diagnosed. CUI has been shown to have a prevalence of 10-66% in women with urinary incontinence but it has not been well-studied in a nulliparous population. The aim of our study was to examine the prevalence and associated factors of CUI in nulliparous women.

Methods: An IRB approved, cross-sectional survey was administered to women ≥ 18 years old with a secondary analysis aimed to evaluate coital incontinence. We included all non-pregnant, nulliparous, female participants who completed the survey. We queried the prevalence of CUI and associated risk factors in nulliparous women. An additional sub-analysis was performed to examine the association of diabetes and CUI in our total population of nulliparous and parous women.

Results: Our cohort included 2036 nulliparous women, mean age 34.7 years (SD 13.8, range 18-87) and mean BMI 24.7, of which 8.21% had CUI. There were no significant differences in age, BMI, race, education, smoking status, or hysterectomy status between nulliparous women with and without CUI. Only 7.56% of nulliparous women without diabetes had CUI compared to 21.05% of women with diabetes (p<0.002). In our extended cohort of both nulliparous and parous women(n=2,703), similar results were seen with the association of CUI and diabetes as 9.57% of women without diabetes had CUI compared to 21.11% of women with diabetes (p<0.000).

Conclusion: A low but significant percentage of nulliparous women experience CUI. There does not appear to be an association between CUI and increasing BMI or hysterectomy status in nulliparous women however, CUI was found to be associated with the presence of DM. This association was also seen among all women, both nulliparous and parous. Further research is needed to study CUI in this population in order to identify risk factors, degree of bother, and treatment strategies for an under-diagnosed condition.

Funding: CTSA award No. UL1 TR002243 from the National Center for Advancing Translational Sciences
Poster #OM9
MEDIUM TERM FOLLOW UP OF PATIENTreported outcomes following complete removal of trans-obturator midurethral sling
Eva Fong¹, Sum Sum Lo¹, Andrew Graydon²
¹Urology Department, Waitemate District Health Board, Auckland, New Zealand, ²Paediatric Orthopaedic Department, Starship Children’s Hospital, Auckland, New Zealand
Presented By: Sum Sum Lo, MB ChB

Introduction: We evaluate early and mid-term outcomes of complete removal of trans-obturator (TOT) midurethral sling (MUS) removal by a urologist-orthopaedic team. We reviewed complications and patient reported early-medium term outcomes.

Methods: We performed a retrospective chart review of 30 patients who had TOT-MUS removal between 2014-2018. The Clavien-Dindo classification and Female National Institutes of Health-Chronic Prostatitis Symptom Index (NIH-CPSI) were used accordingly. In December 2018, questionnaires including International Consultation on Incontinence Questionnaire Urinary Incontinence Short Form (ICIQ-UI SF), Urogenital Distress Inventory (UDI-6), Pelvic Floor Impact Questionnaire (PFIQ-7), two questions from Pelvic Organ Prolapse Incontinence Sexual Questionnaire (PISQ), Patient Global Impression of Improvement (PGI-I) and 3 free text questions were sent. Ethics approval has been obtained for this study to continue till 5 years post-sling removal with a goal of 50 patients.

Results: Problems following the index surgery included voiding dysfunction, early mesh exposure and urinary retention with prolonged catheterization at 37%, 27% and 23% respectively. 47% of patients had up to 3 previous sling interventions. Median time insertion:removal was 60 months. 19 patients underwent 3D US pre-removal, with 12 abnormal studies. Mean length of sling removed was 16.3 cm. No Clavien-Dindo grade 3 or 4 complications were recorded. At 6 weeks, pain and quality of life scores improved from 6.7 to 1.95 and 5.6 to 2 respectively (Female NIH-CPSI). 87% percent of patients filled in the questionnaires with mean follow-up of 16 months (Table 1). Two thirds of patients were not sexually active with pain or bowel/bladder incontinence rated highly as impacting on this. 1/3 were sexually active with a mean rating of 2.55/5 for frequency of pain during intercourse(where 5 is a good rating). In free text questions, 70% of patients reported pain of some type/severity. The majority of patients expressed the sentiment that they were satisfied to have had the mesh removed.

Conclusion: Complete TOT MUS removal can be performed safely. However medium term follow-up shows significant urinary morbidity and ongoing pain precluding and during sexual intercourse.

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Funding: N/A
CHARACTERIZATION OF URETHRAL DIVERTICULA IN FEMALES
Rohan Vaidya, Resident, Kathleen Olson, Resident, Christopher Wolter, Assistant Professor of Urology, Aqsa Khan, Assistant Professor of Urology
Mayo Clinic Arizona, Department of Urology, Phoenix, AZ
Presented By: Rohan Vaidya

Introduction: Urethral diverticula are a complex problem for the female pelvic surgeon.[1] The aim of our study is to characterize the women that have been seen for this condition across the three Mayo Clinic locations.

Methods: Chart analysis was performed using a search through medical records for patients across all three Mayo Clinic sites (Rochester, Arizona, Florida) that had International Classification of Diseases codes corresponding to urethral diverticulum (ICD-9 code: 599.2; ICD-10 code: N36.1). In addition, we performed a search for those patients that underwent urethral diverticulectomy via CPT code (53235). Data was available for patients that were seen within the Mayo Clinic system from 6/1/2003 through 10/5/2018. Patients were classified by age, etiology, presenting symptomatology, location, treatment, pathology, and post-operative outcomes.

Results: 447 women met the initial coding search criteria for urethral diverticula. Of these, 228 women had documented urethral diverticula. The most common presenting complaint in these women were irritative voiding symptoms (93) and infections (92). The most common diagnostic modality was radiographic imaging (198/228) with MRI accounting for 157 cases. The etiology was unknown in the majority of cases (181/228). Of the women that were diagnosed, 172 went on to have urethral diverticulectomy. 51 patients had concurrent urethral sling placement at the time of diverticulectomy. The vast majority of patients had benign pathology with only 2 cases of malignancy identified (1 CIS, 1 adenocarcinoma). Post-operative follow-up ranged from 0 months to 15 years (Mean = 1.4 years; Median = 4 months). 43 patients had persistent urinary symptoms following diverticulectomy, with incontinence being the most common finding. 14 patients had recurrence of their diverticulum. There were several major reasons why patients did not undergo diverticulectomy following their diagnosis, including asymptomatic nature of the diverticulum and no further followup pursued by the patient.

Conclusion: This appears to be the largest reported series on urethral diverticulum in female, which is a rare yet important entity that requires special consideration.
## Presenting Symptoms

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## Diagnosis Method

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## Postop Testing

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## Complications

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**Funding:** N/A
Poster #OM11
THE THREE-LEVEL RECONSTRUCTION OF ADVANCED PELVIC ORGAN PROLAPSE WITH THE USE OF ULTRAMINIMESH
Dmitry Shkarupa, PhD, Nikita Kubin, PhD, Ekaterina Shapovalova, MD, Alexander Petrov, MD
Saint-Petersburg State University Clinic of advanced medical technologies n.a. Nikolay I. Pirogov, Saint-Petersburg, Russia
Presented By: Nikita Kubin, PhD

Introduction: According to J.O. DeLancey Theory the supporting structure of the pelvic floor has three levels of support. The majority of existing treatment methods of pelvic organ prolapse (POP) is aimed at I and II levels. At the same time according to the modern data the structures of the 3 level allow to break the excessive tension from the ligaments/fascias and is a kind of the basis of the above located levels of support. Besides, the question of minimizing the use of permanent synthetic materials in vaginal surgery is very acute. The purpose of this study was to evaluate the efficiency and safety of the integrated three-level reconstruction of advanced pelvic organ prolapse using ultraminimesh.

Methods: This prospective study involved 209 women suffering from POP (stage III-IV, POP-Q), who underwent transvaginal reconstruction of all levels of support (according to J.O. DeLancey): unilateral sacrospinous fixation using apical sling (level 1), anterior subfascial colporrhaphy (level2) and posterior colpoperineorrhaphy (level3). The 12 months follow-up period included: assessment of POP according to the POP-Q system and completion of validated questionnaires (PFDI-20, PISQ-12, VAS).

Results: Mean operation time was 44.6 ± 1.4 minutes. No intraoperative bladder injuries or clinically significant bleeding were observed. Postoperative data were obtained in 185 (88.2%) patients. The anatomical success rate (stage ≤ I, POP-Q) of follow-up was 95.1%. Anatomical recurrence was determined at the apical level (C> -1) in 1 (0.5%) patient, and in the anterior compartment (Ba≥-1) in 8 (4.3%) patients. During the observation period, only one case of extrusion of suture material was recorded. None of the patients complained of pain in the area of surgery. However, one woman noted de novo dyspareunia. SUI de novo developed in 6 (3.2%) patients. Most of the patients reported a significant improvement in the quality of life after treatment. Satisfaction with the treatment outcome according to questionnaires was 94.7%.

Conclusion: The reconstruction of the all levels of support of the pelvic floor allows to distribute the bearing load between the compartments evenly and therefore, to reduce the amount of used synthetic material while maintaining the high efficiency and safety of transvaginal surgical reconstruction of POP.

Funding: N/A
AXIS™ ALLOGRAFT DERMIS FOR FEMALE PELVIC ORGAN PROLAPSE REPAIR: A POST-MARKET STUDY
Kristene Whitmore, MD1, Neha Rana, MD2, Tess Crouss, MD3, Xibei Jia, MD4, Peter Rosenblatt, MD5, Vincent Lucente, MD6, G. Willy Davila, MD7, Douglas Van Drie, MD8
1Drexel University, 2University of Pennsylvania, 3Cooper University Health Care, 4University of Massachusetts, 5Harvard Medical School, 6The Institute for Female Pelvic Medicine, 7Cleveland Clinic Florida Department of Gynecology, 8Female Pelvic Medicine Urogynecology Institute of Michigan
Presented By: Kristene E. Whitmore, MD

Introduction: Recent FDA actions stopped the manufacturing of synthetic mesh for vaginal prolapse repair. Native tissue prolapse repair is effective, but can be associated with higher recurrence rates. The efficacy of dermis grafts for prolapse repair is less studied.

Methods: This is a prospective, single arm, multi-center, post-market study to evaluate the efficacy of Axis™ Allograft Dermis used for anterior, posterior or combined prolapse repair in adult females with POP-Q ≥ stage 2. The primary objective was to assess POP-Q stage improvement from baseline at 12 months postoperatively, categorized as cured (POP-Q stage reduced to 0 or 1, or improved by 2 stages), improved (POP-Q stage >1, but improved by 1 stage from baseline), or failed (POP-Q stage stayed the same or increased in severity). The secondary objectives involved measures of patient satisfaction.

Results: Sixty-eight patients received the Axis™ Allograft Dermis implant and three-year follow-up was achieved for 43 (63%). Mean age was 60.4 years and mean BMI was 27.9 kg/m2. Ninety-six percent were parous, 47.1% had a prior hysterectomy and 79.4% were postmenopausal. Of 42 subjects who underwent an anterior repair, 37 (88.1%) received the implant, and 29 (69%) had a concomitant apical repair. Out of the 50 patients who underwent a posterior repair, 37 (74%) received the implant, and 17 (34%) had a concomitant apical repair. Overall, 60.3% of subjects underwent concomitant apical repair.

The overall cure rates for those implanted were 76.1% (35/46) at 12 months, 78.3% (36/46) at 24 months, and 62.8% (27/43) at 36 months. At 36 months, 88.1% of subjects reported Very Much or Much Improved on the PGI scale. For all time points, there was a significant change from baseline of the Pelvic Floor Impact Questionnaire and the Pelvic Floor Disability scores that persisted to 36 months (-44.9± 70.8, p<0.001) and (-62.7± 71.3, p<0.001) respectively. Adverse events were rare. Three patients (4.4%) experienced surgical site infections, 3 experienced pain lasting > 6 weeks postoperatively, and 3 experienced wound dehiscence.

Conclusion: Patients with symptomatic stage 2 or greater pelvic organ prolapse who undergo repair with the Axis™ Allograft Dermis implant experience both subjective and objective improvement that persists at three years.

Funding: Yes, Coloplast
Poster #OM13
THE TIME BURDEN OF SPECIALTY CLINIC VISITS FOR PERSONS WITH NEUROLOGIC DISEASE - A CASE FOR UNIVERSAL TELEMEDICINE COVERAGE
Christopher Elliott¹, Daniel Solomon², Ben Dirlikov², Kazuko Shem²
¹Santa Clara Valley Medical Center Division of Urology, Stanford University Medical Center Department of Urology, ²Santa Clara Valley Medical Center Department of Physical Medicine and Rehabilitation
Presented By: Christopher Stephen Elliott, MD, PhD

Introduction: Those with neurologic disease are often burdened not only by the condition itself, but also an increased need for subspecialty medical care at centers of excellence. For some, this requires that long distances be traveled, while for others, even small distances can be a hardship secondary to mobility and transportation issues. In recent years, to bridge geographic gaps, telemedicine has been introduced to provide more convenient and improved patient care, however, telemedicine is not universally covered by some insurance carriers, including Medicare. We sought to examine the burden of time associated with clinical visits for those with neurologic disease and their family/caregivers.

Methods: Over a 3-month period, all patients presenting to medical visits with a physical medicine and rehabilitation or neurourology provider were questioned using a short survey. Patients’ estimates of distance from home, travel time, and need for caregiver assistance to attend visits were examined.

Results: A total of 208 unique patients were surveyed during the time period, of whom approximately 40% were covered by Medicare. Most patients (75%) lived within 25 miles of our clinics and experienced an average roundtrip travel time of 79.4 minutes, though 9.7% required 3 hours or more. Additional family/caregiver assistance was required for 76% of patients, which resulted in an inclusive average commute time of 138.2 minutes per patient. Many patients (42%) perceived it difficult to attend their clinic visit with transportation difficulties, commute time, and changes to their daily schedule being the most commonly cited reasons.

Conclusion: Telemedicine has the potential to substantially improve time savings for those requiring subspecialty care for their neurologic disease. Even if factoring the cost of a brand-new mobile device like an iPad ($329) for each person, the cost per minute of patient and family/caregiver time saved would be $2.38 for a single visit with greater cost savings for additional visits. Increased emphasis on telemedicine coverage for those with neurologic disability should be considered.

Funding: N/A
Poster #OM14
PREOPERATIVE URODYNAMIC FINDINGS AMONG MEN UNDERGOING TRANSOBTURATOR MALE SLING
M. Francesca Monn, 1, Michael E Chua, 1, Jack M Zuckerman, 1, Jessica M DeLong, 1, Ramon Virasoro, 1, Kurt McCammon
Eastern Virginia Medical School
Presented By: Maria Francesca Monn, MD, MPH

Introduction: The reliability of the transobturator male sling (TMS) is well established; however, the relationship between pre-operative urodynamics and outcomes following TMS is unknown. We sought to evaluate pre-operative urodynamics findings in patients undergoing TMS.

Methods: A retrospective cohort study identified all TMS performed from 8/2006-6/2012 by a single surgeon. Patients without urodynamics were excluded (n=31). The primary variables of interest were pre-operative urodynamics parameters and success of the surgery. Success was defined as zero pads or >50% improvement and satisfaction without further intervention. A multiple logistic regression was used to evaluate the impact of urodynamics findings on overall success.

Results: 184 patients were identified for inclusion in the study. The mean (SD) age was 67.9 (8.1) years and mean (SD) BMI was 28.4 (3.7). Thirty-nine (21.2%) patients had a history of radiation. 90.8% had prior prostatectomy. 54 (29.4%) patients had mild SUI (≤2PPD), 74 (40.2%) had moderate SUI (3-4ppd), and 56 (30.4%) had severe SUI (≥5ppd).

On urodynamics, 62 (33.7%) patients demonstrated detrusor overactivity (DO). The mean (SD) Valsalva leak point pressure was 56.2 (31.7). Mean (SD) maximum detrusor pressure was 25.2 (18.4). Mean (SD) max flow 16.2 (11.5). 176 (95.7%) had normal compliance. Mean (SD) post void residual (PVR) was <100mL in 172 (93.5%). Following TMS, 134 (73.2%) patients reported improvement and were classified as a success.

On multiple logistic regression adjusting for age, prior procedure for vesicourethral anastomosis stenosis, severity of SUI, presence of DO, max detrusor pressure, normal compliance, and elevated pre-operative PVR. DO was associated with significant decreased odds of success (OR 0.32, 95% CI 0.15-0.71, p=0.005). Severe SUI was associated with a non-statistically significant decreased odds of success (OR 0.41, 95% CI 0.15-1.10, p=0.077). The remaining variables were not predictive of success or failure.

Conclusion: Men undergoing TMS have variable findings on pre-operative urodynamics. Presence of DO is associated with failure of the TMS. Identifying men with DO through the use of urodynamics and treating these patients prior to surgery may improve outcomes and better identify which patients are at higher risk of failure. Urodynamics should be strongly considered in any patient with a component of urgency during evaluation.

Funding: N/A
Poster #OM15
PREDICTIVE FACTORS OF PNE SUCCESS IN A CONTEMPORARY SERIES: A SINGLE INSTITUTION EXPERIENCE
Neil Kocher, MD, Samir Derisavifard, MD, Jessica Rueb, MD, Michele Fascelli, MD, Raymond Rackley, MD, Courtenay Moore, MD, Sandip Vasavada, MD, Howard Goldman, MD
Cleveland Clinic
Presented By: Neil John Kocher, MD

Introduction: Peripheral nerve evaluation (PNE) permits a trial of sacral neuromodulation to determine candidates for permanent system implant in a single operation. Pre-fluoroscopy PNE success rates with unipolar leads are typically quoted at 40-50%, whereas staged procedures with tined quadripolar leads have an estimated 77% success rate. With the availability of in-office fluoroscopy and improved technique over time, more contemporary data on PNE success rates appear limited. This study evaluated a recent series of PNE patients to determine predictive factors toward PNE screening success and persistent functional response following full system implant.

Methods: A retrospective review of all patients who underwent PNE at a large academic center from 2015-2019 was performed. All unipolar leads were placed percutaneously in-office under local anesthesia utilizing fluoroscopy by one of four FPMRS fellowship-trained providers. Patients with urgency-frequency, urge incontinence, and/or fecal incontinence were included, while those with chronic urinary retention were excluded. Rates of full system implant after successful PNE trial and continued improvement at ≥1-month following permanent implant were reviewed. Multivariable logistic regression determined predictors of PNE success and continued functional success at follow-up.

Results: 102 PNE patients (87 females and 15 males) were included. Mean age was 65.9 years and BMI was 29.4. Median ASA score was 3. Bilateral leads were placed in 95 patients (93.1%). 78 patients (76.5%) were PNE responders (>50% symptom improvement). On multivariate analysis, patient predictors of PNE success included younger age (p=0.014), urge incontinence (p=0.021), fecal incontinence (p=0.017), and absence of a neurologic diagnosis (p=0.04). PNE factors associated with satisfactory screening included presence of bellows and plantar toe flexion (p=0.038), and perineal sensation (p=0.027) (Table). 68 of the 78 PNE responders (87.2%) had a successful working implant at ≥1-month follow-up. Absence of a neurologic diagnosis was predictive of a successful implant on long-term follow-up (p=0.013).

Conclusion: This contemporary series of PNE patients revealed screening rates equivalent to available reports on staged implant. Predictors of PNE success included younger age, urge incontinence, fecal incontinence, and absence of a neurologic diagnosis. Conversion from successful screening test to permanent implant may not be the ideal outcome and evaluation for persistent improvement should be considered as an indicator of successful screening.
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#### Clinical Science Abstracts

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<thead>
<tr>
<th>Patient Factors</th>
<th>PNE response</th>
<th>PNE no response</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean</td>
<td>64.2 (SD 16.3, range 24-87)</td>
<td>71.4 (SD 12.6, range 39-89)</td>
<td>0.014</td>
</tr>
<tr>
<td>Gender, n(% Female)</td>
<td>66 (84.6)</td>
<td>21 (87.5)</td>
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<tr>
<td>BMI</td>
<td>29.7 (SD: 3.4)</td>
<td>28.6 (SD: 3.6)</td>
<td>0.12</td>
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<tr>
<td>ASA, median</td>
<td>3</td>
<td>2.5</td>
<td>0.16</td>
</tr>
<tr>
<td>Hx of CAD, n(%)</td>
<td>13 (16.7)</td>
<td>3 (12.5)</td>
<td>0.36</td>
</tr>
<tr>
<td>Hx of OMI, n(%)</td>
<td>2 (2.6)</td>
<td>1 (4.0)</td>
<td>0.44</td>
</tr>
<tr>
<td>Hx of HTN, n(%)</td>
<td>47 (60.3)</td>
<td>13 (54.3)</td>
<td>0.25</td>
</tr>
<tr>
<td>Hx of HLD, n(%)</td>
<td>94 (43.4)</td>
<td>10 (41.7)</td>
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</tr>
<tr>
<td>Hx of COPD, n(%)</td>
<td>7 (8.9)</td>
<td>0 (0)</td>
<td>0.30</td>
</tr>
<tr>
<td>Hx of DM, n(%)</td>
<td>25 (26.7)</td>
<td>2 (8.8)</td>
<td>0.21</td>
</tr>
<tr>
<td>Hx of CVA, n(%)</td>
<td>8 (10.3)</td>
<td>3 (12.5)</td>
<td>0.42</td>
</tr>
<tr>
<td>Hx of OSA, n(%)</td>
<td>22 (28.2)</td>
<td>9 (12.7)</td>
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</tr>
<tr>
<td>Hx of Neurologic Diagnosis, n(%)</td>
<td>5 (6.4)</td>
<td>8 (33.3)</td>
<td>0.04</td>
</tr>
<tr>
<td>Hx of UI, n(%)</td>
<td>69 (88.5)</td>
<td>19 (79.9)</td>
<td>0.021</td>
</tr>
<tr>
<td>Hx of FLD, n(%)</td>
<td>11 (14.5)</td>
<td>0 (0)</td>
<td>0.817</td>
</tr>
<tr>
<td>Current Smoker, n(%)</td>
<td>4 (5.1)</td>
<td>0 (0)</td>
<td>0.27</td>
</tr>
</tbody>
</table>

### PNE Factors

| Bilateral Feet, n(%) | 72 (92.3) | 23 (95.6) | 0.37 |
| At Least Bilateral, n(%) | 67 (85.9) | 21 (87.5) | 0.41 |
| At Least Toe Plantar Flexion, n(%) | 43 (80.8) | 20 (83.3) | 0.056 |
| Bilateral and Toe, n(%) | 63 (82.8) | 19 (79.2) | 0.038 |
| Sensation, n(%) |
| Rectal | 20 (25.6) | 9 (37.5) |
| Perineal | 55 (70.5) | 14 (60.0) |
| None | 3 (3.9) | 4 (16.7) |

**Funding:** N/A
Poster #OM16  
**USING A HUMAN FACTORS APPROACH TO DEVELOP INTERVENTIONS AIMED AT IMPROVING PATIENT EXPERIENCE WITH SACRAL NEUROMODULATION***

Tara Cohen, PhD¹, Claire Burton, MD², Kate Cohen, BA³, A. Lenore Ackerman, MD, PhD¹, Karyn Eilber, MD¹, Jennifer Anger, MD¹

¹Cedars-Sinai Medical Center, ²UCLA David Geffen School of Medicine

Presented By: Claire Burton, MD

*2017 Neuromodulation Grant Recipient

**Introduction:** Despite being a minimally invasive procedure, patients sometimes consider sacral neuromodulation (SNM) therapy as complex and overwhelming. Human factors research is the study of the interaction between humans and complex systems. In surgery, this approach can be applied to focus on optimizing the patient experience through improved system design. We used a human factors approach to conduct a needs analysis investigating patient preparedness, education, device usability and satisfaction regarding all stages of SNM to understand and improve the patient experience. Results were compared from the pre- and post-intervention groups to evaluate the success of our interventions.

**Methods:** We observed ten patients pre- and post-intervention development and implementation. Candidates for SNM were recruited to participate prior to undergoing staged SNM. Patients who enrolled in the study were observed during each stage of their procedure from pre-op care until discharge and were administered questionnaires focused on preoperative preparedness and post-operative satisfaction and usability. Baseline data were then used to develop interventions.

**Results:** Patients generally had difficulty understanding the risks of the planned procedure, did not know what to expect postoperatively and were unsatisfied with the preoperative materials. Patients struggled with adjusting the settings for their implant devices and usability was considered “below average”. Despite the overall objective success, 30% of patients indicated that they would not recommend this treatment to friends/family. Using this information, we developed and implemented four interventions: (1) a patient educational video and (2) informational sheet (sent to patients prior to their procedure); (3) updated discharge instructions for patients; (4) a nursing in-service on SNM and PACU instructions. Following the implementation of our interventions, preoperative preparedness scores (stage 1: t(14) = -7.159, p =.000; stage 2: t(12) = -2.887, p =.014) and postoperative satisfaction scores (stage 1: t(14) = -11.235, p =.000; stage 2: t(12) = -3.302, p = .000) increased significantly. Device usability scores also increased but were not significant.

**Conclusion:** These findings highlight the value of implementing a human factors approach to identify and mitigate challenges to positive patient experience with SNM. Through the implementation of systems-level interventions (i.e., interventions that impact the non-clinical aspects of surgery such as patient/staff education) improvements can be made.

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Pre-Intervention Mean (SD)</th>
<th>Post-Intervention Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative Preparedness</td>
<td>Stage 1: 4.13 (.605)</td>
<td>Stage 2: 5.617 (.441)</td>
</tr>
<tr>
<td></td>
<td>Stage 2: 4.29 (.944)</td>
<td>Stage 2: 5.59 (.397)</td>
</tr>
<tr>
<td>Postoperative Satisfaction</td>
<td>Stage 1: 3.77 (.407)</td>
<td>Stage 2: 5.91 (.282)</td>
</tr>
<tr>
<td></td>
<td>Stage 2: 3.47 (.558)</td>
<td>Stage 2: 4.46 (.478)</td>
</tr>
<tr>
<td>Systems Usability Scale</td>
<td>Stage 1: 53.50 (21.35)</td>
<td>Stage 2: 69.58 (16.91)</td>
</tr>
<tr>
<td></td>
<td>Stage 2: 41.25 (25.11)</td>
<td>Stage 2: 66.25 (16.39)</td>
</tr>
</tbody>
</table>

**Funding:** 2017 SUFU Research Foundation grant for the Study of Neuromodulation funded by Medtronic (T.C.): “Improving Patient Experience with Sacral Neuromodulation: A Human Factors Approach.”
Poster #OM17

SOURCES OF CONFUSION: MEDIA COVERAGE OF THE UNITED STATES FOOD AND DRUG ADMINISTRATION BAN ON TRANSVAGINAL MESH FOR PELVIC ORGAN PROLAPSE

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¹Oregon Health and Science University, Portland, OR, ²Virginia Mason, Seattle, WA

Presented By: Poone Shoureshi, MD

Introduction: On April 16, 2019, the United States Food and Drug Administration (FDA) announced a ban on the use of transvaginal mesh for the treatment of pelvic organ prolapse. The objective of this study was to assess online user behavior on pelvic-mesh related articles after the April 2019 FDA ban on transvaginal mesh for pelvic organ prolapse (POP).

Methods: We used Google Trends© to identify the terms related to pelvic mesh that experienced increased activity after the FDA ban. The terms identified were “pelvic mesh”, “FDA mesh”, “transvaginal mesh”, “vaginal mesh”, and “surgical mesh”. The latter was excluded as the related articles were not solely focused on POP. The four terms were analyzed for worldwide social media engagement (Facebook, Twitter, Pinterest, and Reddit) between April 16th and April 19th, 2019. We analyzed the top ten lay press articles shared for each term, and then examined the top ten Google search results for each term on June 6th, 2019 in the United States, to evaluate what information was available after peak interest subsided.

Results: Thirty unique articles with peak activity after the FDA ban were identified. Twenty-six articles were from news/journalist organizations and four from healthcare related entities. Two (6.7%) did not mention the April 2019 FDA announcement. Seven (23%) discussed mesh for stress urinary incontinence (SUI) without clarifying the difference between SUI and POP mesh. Eighteen (69%) mentioned lawsuits or negative individual experiences without clarifying the type of pelvic mesh used. Google identified 26 unique articles for the four terms when searched on June 6th: twelve from news/journalist organizations, 8 healthcare related, 5 governmental, and 1 law firm. Seven (27%) did not mention the FDA announcement, 3 (12%) mentioned mesh for SUI, and 11 (42%) discussed lawsuits or negative individual experiences.

Conclusion: Internet search patterns and social media behavior following the April 2019 FDA ban on transvaginal POP mesh reveal that some of the most disseminated information did not accurately or thoroughly distinguish the type of mesh discussed. Surgeons performing surgery for SUI and POP must provide adequate time during preoperative counseling to clarify differences between types of mesh impacted by the ban and those not affected.

Funding: N/A
Poster #OM18
CLINICAL SIGNIFICANCE OF 5-A REDUCTASE INHIBITOR AND ANDROGEN DEPRIVATION THERAPY IN BLADDER CANCER INCIDENCE, RECURRENCE, AND SURVIVAL: A META-ANALYSIS AND SYSTEMIC REVIEW
Aram Kim¹, Moon Ki Jo², YongTae Kim³, Hong Yong Choi⁴, Hyun Woo Kim⁵, Myung-Soo Choo⁶, Hyeong Gon Kim¹
¹Department of Urology, Konkuk University Medical Center, Konkuk University School of medicine, Seoul, Korea, ²Department of Urology, Korea Cancer Center Hospital, Seoul, Korea, ³Department of Urology, Hanyang university Hospital, Hanyang University School of medicine Seoul, Korea, ⁴Department of Urology, Hanyang university Guri Hospital, Hanyang University School of medicine Seoul, Korea, ⁵Department of Urology, Eunpyeong St.Mary's Hospital, The Catholic University of Korea, Seoul, Korea, ⁶Department of Urology, Asan Medical Center, Ulsan University School of medicine, Seoul. Korea
Presented By: Aram Kim

Introduction: To investigate the effect of AST, comprising a of 5-α reductase inhibitor (5-ARi) and androgen deprivation therapy (ADT), on the risk of bladder cancer incidence, recurrence, and mortality.

Methods: We used the PRISMA statement to report the methods and results of this meta-analysis. Bladder cancer incidence, recurrence, and mortality after 5-ARi treatment and ADT were assessed using risk ratios (RRs) and hazard ratios (HRs) with 95% confidence intervals (CIs).

Results: We analyzed nine studies (n=377,427) assessing the secondary effect of AST, with a mean follow-up period of 6 years (range, 2–13 years). Our result showed that the incidence of bladder cancer was significantly reduced when 5-ARi treatment and were initiated before diagnosing bladder cancer. When treatment was initiated after diagnosing bladder cancer, 5-ARi treatment reduced cancer-specific mortality, whereas ADT reduced bladder cancer recurrence.

Conclusion: This study corroborates that the use of 5-ARi and ADT could be helpful in managing bladder cancer and should not be limited to prostatic abnormalities.

Fig. 1 Subgroup analysis of the suppressive effect of 5-ARi on bladder cancer.

Funding: N/A
**Poster #OM19**

**URINARY TRACT INFECTION AFTER MID-URETHRAL SLING: RATES AND RISK FACTORS**

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¹Cedars-Sinai, Division of Urology, Los Angeles, CA, ²Tulane University School of Medicine, New Orleans, LA, ³Northwestern University Feinberg School of Medicine, Chicago, IL, ⁴University of Michigan School of Medicine, Ann Arbor, MI

Presented By: Kai B. Dallas, MD

**Introduction:** We aimed to assess the rates of and risk factors for urinary tract infection (UTI) after mid-urethral sling (MUS) as literature exploring this topic is limited.

**Methods:** Women who underwent MUS placement (2013-2017, at least two years follow-up) by three surgeons at a large academic center were included. Patient demographics, history of UTI (including recurrent UTI: > two UTIs in six months, or >3 in a year), urinary retention (inability to void post-operatively or PVR > ¾ bladder capacity), perforation (trocars visible in bladder on cystoscopy, managed with indwelling catheter for 2-days) and use of post-operative antibiotics (one surgeon routinely provided a 3-day course of post-operative antibiotics) were explored for associations with UTI after MUS. All patients received appropriate prophylaxis and had negative pre-operative urine cultures (or were treated). Univariate analysis was performed with the t or Chi-Square/Fisher’s tests and multivariate analysis was performed with logistic regression modeling.

**Results:** Of the 425 patients undergoing MUS placement, 34 had a history of UTI prior to surgery (14 had recurrent). The 30-day post-operative UTI rate was 17.9% (97% culture proven) and was higher with post-operative retention (31.6% vs. 18.2%, p=0.01) and bladder perforation (31.4% vs. 16.7%, p=0.03). Retention managed with CIC (versus indwelling catheter) decreased this risk (12.5% vs. 24.3%, p=0.04). A history of at least one UTI pre-op (versus none) did not significantly increase 30-day UTI risk (25.8% vs. 17.3%, p=0.23), although recurrent UTI history was associated with higher recurrent UTI rates post-op (30.5% vs. 10.7%, p<0.01). Routine use of post-operative antibiotics was associated with lower 30-day UTI rates (9.8% versus 25%, p<0.01). On multivariate analysis perforation, urinary retention and not using routine post-operative antibiotics, were associated with increased 30-day UTI rates, however, routine post-operative antibiotics was associated with an increased risk of developing recurrent infections (Table 1).

**Conclusion:** The UTI rate after MUS was 17.6%. Perforation, retention and no routine post-operative antibiotics (although their use increased the risk of recurrent infections) were independently associated with increased 30-day UTI rates. Retention managed with CIC had lower rates of UTI. Future research should explore strategies to reduce UTI rates after MUS, with special attention paid to those at increased risk.

**Funding:** N/A

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**Table 1: Multivariate associations of risk of UTI within 30 days and recurrent UTI after sling**

<table>
<thead>
<tr>
<th>Variable</th>
<th>UTI within 30 days OR (95% CI)</th>
<th>p-value</th>
<th>Recurrent UTI OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concomitant Surgery</td>
<td>0.82 (0.42-1.59)</td>
<td>0.55</td>
<td>0.58 (0.26-1.26)</td>
<td>0.16</td>
</tr>
<tr>
<td>History of UTI</td>
<td>0.42 (0.09-1.99)</td>
<td>0.27</td>
<td>2.33 (0.24-11.72)</td>
<td>0.24</td>
</tr>
<tr>
<td>History of recurrent UTI</td>
<td>3.24 (0.85-12.33)</td>
<td>0.08</td>
<td>3.04 (0.78-11.79)</td>
<td>0.17</td>
</tr>
<tr>
<td>No routine post-operative antibiotics</td>
<td>3.75 (2.05-6.86)</td>
<td>&lt;0.01*</td>
<td>0.54 (0.29-0.99)</td>
<td>0.04*</td>
</tr>
<tr>
<td>Perforation</td>
<td>2.30 (1.02-5.22)</td>
<td>0.04*</td>
<td>1.93 (0.76-4.89)</td>
<td>0.17</td>
</tr>
<tr>
<td>Post-Operative Retention</td>
<td>2.10 (1.17-3.79)</td>
<td>0.01*</td>
<td>1.92 (1.01-3.70)</td>
<td>0.05</td>
</tr>
<tr>
<td>Virulent Organism</td>
<td>NA</td>
<td></td>
<td>18.21 (4.06-81.79)</td>
<td>&lt;0.01*</td>
</tr>
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</table>

*statistical significance at 0.05 threshold*
Poster #OM20
SLEEP FRAGMENTATION DUE TO BENIGN PROSTATIC OBSTRUCTION RELATED NOCTURNAL FREQUENCY IS RELATED TO ERECTILE DYSFUNCTION
Dongsup Lee, Associate Professor, Dongwan Sohn, Professor, Hyun Woo Kim, MD
The Catholic University of Korea
Presented By: Dongsup Lee

Introduction: There is a debate as to whether nocturia due to benign prostatic obstruction (BPO) is associated with erectile function. We aimed to evaluate lower urinary tract symptoms (LUTS) and erectile function in BPO patients and investigate the correlation between those parameters.

Methods: A urodynamic study and transrectal ultrasonography were used to detect BPO. The frequency-volume chart was reviewed to exclude nocturnal polyuria, and serum testosterone was measured to exclude hypogonadism. Finally, the nocturnal tumescence test (NPT) was applied to all patients to evaluate the occurrence of sleep-related erection (SRE). Two questionnaires, international prostate symptom score (IPSS) and international index of erectile function (IIEF) were used.

Results: In total, 50 patients were registered over 4 years in a single center. The mean age (years), BMI (kg/m2), prostate size (ml), IPSS score, and IIEF score were 68.08±5.60, 24.80±2.83, 64.0±21.59, 25.24±7.81, and 8.73±7.24, respectively. The total IPSS score was significantly correlated with the total IIEF score (p = 0.003, Spearman’s rho = -0.415). Among the IPSS subscores, item number 7, indicating ‘nocturia’, was most significantly related to the total IIEF score (p = 0.002, Spearman’s rho = -0.438). The total amounts of rigidity and tumescence activity units in the NPT test were inversely correlated with nocturia (n=29, R2 = 0.247~0.354). More severe nocturia was correlated with less frequent SRE (p = 0.001, Spearman’s rho = -0.603) and a shorter duration of SRE (p < 0.001, Spearman’s rho = -0.625) (Figure). In many patients with severe nocturia (21 of 50), for whom a signal could not be detected during the NPT test, their IPSS scores, including the frequency of nocturia and IIEF score, were lower than the scores in those with a successful NPT test. The total IIEF score was significantly correlated with each NPT parameter.

Conclusion: Sleep fragmentation due to BPO-related nocturnal frequency could decrease the frequency and duration of SRE, which decreases the total amount of SRE and reflects the patient’s relevant erectile function.

Funding: N/A
Poster #OM21
‘PERSISTENCY’: A NOVEL URINARY SYMPTOM MEASURE ECOMPASSING THE MYOFASCIAL COMPONENT OF LUTS
A. Lenore Ackerman, MD PhD¹, Ashley Caron, M.S.¹, James Ackerman, MA¹, Jennifer Anger, MD, MPH¹, Karyn Eilber, MD¹, Melissa Kaufman, MD, PhD²
¹Cedars-Sinai Medical Center, Dept. of Surgery, ²Vanderbilt University Medical Center, Dept. of Urology
Presented By: A. Lenore Ackerman, MD, PhD

Introduction: Significant diagnostic confusion exists for patients with lower urinary tract symptoms (LUTS). Given symptomatic overlap between overactive bladder (OAB) and interstitial cystitis (IC/BPS), we created an algorithmic nomogram capable of diagnosis using 6 validated questions. Applying this nomogram to unselected patients with storage LUTS identified a new, highly bothered group that lacks clear bladder pain or urgency incontinence and demonstrated comorbid voiding complaints and pelvic floor hypertonicity. To refine our previous nomogram, we sought to define this population by comparing their self-reported symptoms to subjects unequivocally categorized as OAB or IC/PBS.

Methods: We performed a univariate analysis comparing responses on the female Genitourinary Pain Index (fGUPI), OAB Questionnaire (OAB-q) and O’Leary–Sant Indices (ICSI/ICPI) in a cohort of 541 female patients with a range of LUTS. Ten unique questions described symptomatic features distinguishing this group from the IC/BPS and OAB groups. We combined scores on the 3 most predictive questions to define a novel ‘Persistency’ composite index and updated our LUTS nomogram to distinguish this new myofascial classification.

Results: Screening of 541 patients with urgency, frequency, incontinence, bladder discomfort, or nocturia with a diagnostic nomogram revealed a group of highly bothered patients lacking the classical features associated with IC/BPS or OAB. Patient-reported measures positively associated with this group variably described bothersome urinary frequency, sensation of incomplete emptying or straining to void, and sensation of needing to void unrelieved by urination. In a retrospective review of 100 charts, 74/78 (94%) patients with a documented pelvic exam exhibited painful pelvic floor hypertonicity or trigger points. Qualitative review revealed additional, common features, e.g. no effect of fluid intake on symptom severity and small-volume insensate incontinence. A novel measure, designated the Persistency Composite Index, uses a weighted combination of three questions assessing the key features identified for addition to the LUTS diagnostic algorithm.

Conclusion: Division of LUTS patients into OAB and IC/BPS groups inadequately describe all patients. A new symptomatic feature, ‘persistency’, defines a category of patients with sensory frequency associated with voiding symptoms (straining frequency) and myofascial hypertonicity on exam. The updated diagnostic nomogram including the Persistency Composite Index may provide better discrimination of patient subgroups to guide more appropriate patient treatment.
Figure. Scoring by Composite Indices for the LUTS Diagnostic Algorithm of an Unselected Population of patients with urinary symptoms. A) Symptomatic patients from our population were separated from controls by a bother index. The remaining patients were well categorized into three groups by measurement of three composite indices: the previously described bladder pain composite index (BPCI in B) and urgency incontinence composite index (URCI in D) and a new persistency composite index (PCI in C), a measure that correlates well with myofascial tenderness and sensory frequency. IC/BPS: Interstitial Cystitis/Bladder Pain Syndrome; PFH: Pelvic Floor Hypertonicity; OAB: Overactive Bladder.

Funding: N/A
Poster #OM22
PILOT PROSPECTIVE STUDY FOR THE EFFICACY OF DEEP BRAIN STIMULATION IN CONTROLLING URINARY SYMPTOMS
Sanchita Bose¹, Yi-Hsien Yeh², Brian Dalm, Department of Neurosurgery³, Rose Khavari³
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Presented By: Sanchita Bose, MD

Introduction: We sought to determine the changes in urinary symptoms and urodynamic parameters of patients with neurologic disease after deep brain stimulation (DBS). Our hypothesis is that DBS can improve objective and subjective outcomes of lower urinary tract function in patients with Parkinson disease and essential tremor. Although studies have evaluated outcomes with questionnaires, this is the first study performing objective pre- and post- DBS urodynamic evaluations.

Methods: We prospectively recruited patients with a neurologic diagnosis amenable to treatment with DBS. Only patients with moderate urinary symptoms (AUA-SS > 8) were enrolled in the study. Before and 2 months after surgery, demographic data, validated questionnaires and UDS were obtained. Patients were followed 12 months after surgery.

Results: A total of eight patients were enrolled in the study. Five of the eight patients (63%) had Parkinson disease and three patients (47%) had essential tremor as the underlying reason for seeking DBS. All patients had urinary incontinence as their main urologic complaint. Patients had DBS electrodes implanted in the ventral intermediate nucleus of the thalamus on both the left and right by a single neurosurgeon.

Four of eight patients (50%) completed the post-DBS surgery AUA symptom questionnaire. The mean pre-surgical AUA-SS for this subgroup was 18 with mean QoL 4.5. Pre-DBS, storage symptoms were worse (mean score 9.25) than the voiding symptoms (mean score 7.875). Mean AUA-SS after surgery was 18.5 with mean QoL 3.

Four patients had urodynamics 8 weeks post-DBS. All patients had UDS performed once they achieved stable settings on DBS. Two of these 4 patients had detrusor overactivity both pre- and post-DBS surgery, and only 1 patient had detrusor overactivity with leak post-surgery with DLPP 84. F-test of post-void residuals (PVR) showed significant less variance in PVR in post-surgical patients. The attached diagram outlines the differences in UDS parameters pre- and post-DBS.

Conclusion: Our study examined changes in urinary metrics in patients with neurologic disease who underwent DBS surgery. A significant limitation of this study was low patient numbers. However, this was the first study of its kind examining both subjective and objective data on urinary symptoms in patients with moderate to severe LUTS pre- and post-DBS surgery.
Funding: R. Khavari reports that she is partially supported by K23DK118209, by National Institute of Heath, NIDDK.
Poster #OM23
IS THE 50% IMPROVEMENT THRESHOLD ADEQUATE FOR PROGRESSION TO IMPLANTATION IN SACRAL NEUROMODULATION?
David Charles, MD, Ross Everett, MD, Zachary Prebay, Truman Landowski, R. Corey O’Connor, MD, Michael Guralnick, MD
Medical College of Wisconsin, Dept. of Urology
Presented By: David K. Charles, MD

Introduction: A >50% subjective improvement in urinary symptoms during sacral nerve stimulation testing (SNSt) is currently used as indication for progression to stage two implantation (St2i). While approximately 66-75% of patients will have successful SNSt and proceed to St2i, some deterioration in efficacy over time has been reported. It is unclear if this is related to the initial degree of improvement. We sought to determine if >50% improvement after SNSt is sufficient to predict long-term success.

Methods: The records of 213 patients who underwent SNSt for overactive bladder (OAB). Subjects were divided into those who reported 50-75% improvement and >75% improvement after SNSt who went on to St2i. Differences in clinical variables including patient-reported outcome measures, diary and pad test information, and urodynamic characteristics were compared between groups. Cox proportional hazard regression was performed to assess for associations between these variables, reported improvement after SNSt, and long-term success with SNS after St2i.

Results: Of 213 OAB patients who underwent St1i, 86 (40.3%) reported 50-75% improvement and 76 (88.3%) of those progressed to St2i (group 1) whereas 68 patients (31.9%) reported >75% and 59 (86.8%) of those moved to St2i (group 2). Baseline characteristics (comorbidities, symptom scores, bladder diaries, pad usage and urodynamic parameters) were not significantly different between groups except that neuropathy was more prevalent in group 1 (48% vs 27%, p=0.02). After SNSt, improvements in symptom scores and diary/pad usage were not significantly different between groups apart from a greater improvement in AUASS bother score in group 2 (5.4 (n= 5) vs. 1.6 (n=5), p=0.01). After St2, group 2 patients were more likely to report a >75% improvement (71.2% vs 34.2%, p<0.01). With a mean follow-up of 46 months, 52/76 group 1 patients and 44/62 group 2 patients still had a functioning device providing symptomatic benefit with no significant difference found between groups on regression (chi2=0.1, p=0.75).

Conclusion: We found no significant differences in the majority of baseline characteristics and clinical data after SNSt between patients with a 50-75% improvement and those with >75% improvement. Furthermore, there was no difference between groups in long-term device functionality. These findings suggest a >50% improvement threshold is adequate for progression to St2i.

Funding: N/A
Poster #OM24
CAUSES OF SACRAL NEUROMODULATOR REVISION BETWEEN SPECIALTY AND FELLOWSHIP TRAINED PROVIDERS: A 16-YEAR STATE-WIDE ANALYSIS
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¹Department of Urology, Stony Brook Medicine, Stony Brook, NY, ²Urology and Renal Transplantation, Virginia Mason, Seattle, WA
Presented By: Michael Hung

Introduction: First adopted for the treatment of voiding dysfunction in 1997, sacral neuromodulation (SNM) continues to be widely used for treatment of overactive bladder. Trends in both the rate and cause of device revision have recently been studied, demonstrating as much as a 38% re-intervention rate.¹ We aim to investigate the specific causes of these re-interventions with a focus on specialty and fellowship training.

Methods: We utilized the Statewide Planning and Research Cooperative System (SPARCS) all-payer database to query all SNM generator revisions or removals from 2000-2015 in New York State. Patients were linked via encrypted patient identifier and followed over time. Binomial logistic regression was used to analyze the association between specialty, fellowship training, and indication for revision.

Results: The search yielded 1,772 revisions over the study period. Among gynecologists and urologists, urologists performed the majority of revisions (75%). The most common reason for revision was device malfunction (39.0%) followed by continued symptoms such as frequency and urgency (36.7%). Median time to revision was 83 weeks (IQR 32-176). The implanting and revising physician was the same in 83.2% of cases. The most common reasons for revision remained similar when stratified by specialty and fellowship training. Revisions performed for device malfunction were 1.49 times as likely to be performed by an FPMRS trained provider (p<0.001). Device removal for pain comprised 2.6% of all revisions. Urologists were significantly less likely to attribute pain as the cause of revision as compared to gynecologists (OR 0.27, p<0.001).

Conclusion: The most common reason for device removal among both urologists and gynecologists is continued symptoms and device malfunction. Even in experienced hands by providers with FPMRS training, up to 37% of device revision is due to the persistence of bothersome symptoms. Revisions performed for adjustments were more likely to be performed by FPMRS trained providers. Urologists were 75% less likely to attribute pain as the reason for revision and performed a higher proportion of revisions for continued symptoms. This work highlights the limitations in ambiguous coding directives for this procedure as well as the need for further studies of device efficacy.

**Funding:** N/A
Poster #OM25

POST VOID RESIDUAL VOLUME AND RATES OF CLEAN INTERMITTENT CATHETERIZATION WITH SPONTANEOUS AND NON-SPONTANEOUS VOIDING AFTER ONABOTULINUMTOXINA TREATMENT: POOLED ANALYSIS OF TWO PHASE 3 STUDIES

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Presented By: Michael J. Kennelly, MD

Introduction: OnabotulinumtoxinA is a well-tolerated and effective treatment for overactive bladder (OAB). Transient increases in post void residual volume (PVR) have been reported following onabotulinumtoxinA treatment with some cases requiring clean intermittent catheterization (CIC). Increases in PVR after onabotulinumtoxinA treatment may be a driver for follow-up and initiation of CIC in real-world practice. The rate of the complete inability to void has not previously been reported. This analysis in patients with OAB sought to evaluate maximum PVR (maxPVR) after onabotulinumtoxinA 100U treatment, subsequent CIC use, and rates of spontaneous versus non-spontaneous voiding.

Methods: This was a pooled post hoc analysis of two phase 3 studies. Patients (males and females) were stratified based on maxPVR measured within 12 weeks after initial onabotulinumtoxinA 100U treatment into groups of 100 mL increments (0-100 mL, 101-200 mL, 201-300 mL, 301-400 mL, 401-500 mL, 501-600 mL, and ≥601 mL). Rates of clean intermittent catheterization (CIC) were assessed at each maxPVR category and rates of spontaneous and non-spontaneous voiding were calculated. Per phase 3 protocols, CIC was initiated if PVR was ≥200 to <350 mL with relevant associated symptoms assessed by the investigator, or if PVR was ≥350 mL regardless of symptoms.

Results: This analysis included 551 patients treated with onabotulinumtoxinA. Most patients had a maxPVR ≤200 mL (494/551, 89.7%) and few patients had a maxPVR ≥201 mL (57/551, 10.3%). Most episodes of significantly raised PVR occurred within the first 6 weeks. In total, 36/551 (6.5%) patients receiving onabotulinumtoxinA required CIC throughout the study and was highest in patients with maxPVR >300 mL (25/30, 83.3%) versus ≤300 mL (11/521, 2.1%). No consistent trend in mean CIC duration was observed across the PVR subgroups (39-106 days). Of the 551 patients treated with onabotulinumtoxinA, one patient (0.2%) was unable to spontaneously void, this patient had a PVR ≥601 mL (Figure).

Conclusion: This analysis suggests that the vast majority of patients (99.8%) receiving onabotulinumtoxinA do not develop a complete inability to void; seen here in only one patient. All other patients that initiated CIC were still able to spontaneously void and so did not meet the International Continence Society’s definition of urinary retention (inability to pass urine despite persistent effort).
**Funding:** Allergan plc.
Poster #OM26
VAGINAL RETAINED FOREIGN OBJECTS: APPLYING A HUMAN FACTORS PERSPECTIVE
Colby Souders, MD, Tara Cohen, PhD, Kai Dallas, MD, Kate Cohen, Falisha Kanji, Carrie Stewart, MD, Jennifer T. Anger, MD MPH
Cedars-Sinai Medical Center
Presented By: Colby Perkins Souders, MD

Introduction: Retained foreign objects (RFO) after surgery are a serious and preventable issue. Gawande et al (2003) found that the incidence of RFOs in 22 hospitals ranged from 1 in 8,801 to 1 in 18,760 and that retained vaginal sponges accounted for 22% of all retained foreign bodies. Although rare, these events can have severe consequences for both the patients, providers, and hospitals, and can often lead to litigation. We performed a human factors analysis, which is the discipline of studying the interactions of humans and systems, to understand and develop interventions that may help prevent vaginal RFOS.

Methods: We analyzed the safety events reported to our internal tracking system from January 1, 2000 - May 21, 2019 and filtered specifically by potential and actual vaginal RFOs. These events were then categorized into vaginal RFO “Near Misses” (RFO identified before patient leaves the OR) and “Sentinel Events” (RFO not identified before patient leaves the OR). The event reports were then analyzed by three trained human factors researchers. The conditions surrounding each event were analyzed and categorized into the Human Factors Analysis and Classification System (HFACS).

Results: 45 events were reported in the 19-year period. The majority of the events analyzed were categorized as “near misses.” The most common items in question (53.33%) were Raytecs, vaginal packing, and vaginal sponges. However, another common instance was breaking of an instrument (20.20%) while operating in the vagina. The majority of cases were laparoscopic hysterectomies or vaginal deliveries. Based on our human factors analysis, the most common contributing factor involved skill-based errors, such as counting errors, followed by issues with communication and shortcomings in the design of tools/technologies (see Table 1).

Conclusion: Fortunately, the occurrence of vaginal RFOs is rare. According to our analysis, the top two contributing factors are skill-based errors and communication, neither of which would have been addressed without the application of a human factors approach. Moreover, both types of errors can be addressed and improved with human factors interventions such as simulation and teamwork training to streamline workflow to reduce the opportunity for errors.

<table>
<thead>
<tr>
<th>Contributing Factor Name</th>
<th>Examples</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill-Based Errors</td>
<td>inaccuracy, memory issues, forgetting to count or do something</td>
<td>37.33%</td>
</tr>
<tr>
<td>Communication</td>
<td>Inadequate communication, ineffective communication, incorrect terminology, failure to share information</td>
<td>16.00%</td>
</tr>
<tr>
<td>Tools/Technology</td>
<td>Usability issues, poor design of equipment, poor design of medical record/chart</td>
<td>12.00%</td>
</tr>
<tr>
<td>Task</td>
<td>Emergency cases or situations that introduce challenges/complexities</td>
<td>9.33%</td>
</tr>
<tr>
<td>Coordination</td>
<td>Failure to plan and work together as a team to accomplish a shared goal</td>
<td>6.67%</td>
</tr>
<tr>
<td>Operational Process</td>
<td>Poor process in place, lack of process in place</td>
<td>5.33%</td>
</tr>
<tr>
<td>Mental State</td>
<td>Attention issues, lack of knowledge where knowledge should be known</td>
<td>2.67%</td>
</tr>
<tr>
<td>Leadership</td>
<td>Failure to appropriately lead team</td>
<td>2.67%</td>
</tr>
<tr>
<td>Decision errors</td>
<td>Making a decision not to count, making a decision not to do a wound sweep</td>
<td>2.67%</td>
</tr>
<tr>
<td>Routine Violations</td>
<td>Failure to comply with rules, regulations, guidelines - however this failure is common and oftentimes supported by supervisors</td>
<td>2.67%</td>
</tr>
<tr>
<td>None of the Above</td>
<td>Patient factors</td>
<td>2.67%</td>
</tr>
</tbody>
</table>

Funding: N/A
Poster #OM27  
**Sacrospinous Ligament Fixation with or Without Apical Tape for Pelvic Organ Prolapse. Does it Matter?**

Mauricio Plata, Chairman Department¹,², Jessica Santander, Research assistant³, Laura Zuluaga, Research assistant³, Julian Azuero, Urologist³

¹Hospital Universitario Fundación Santa Fe de Bogotá, Bogotá D.C., Colombia, ²Universidad de los Andes, Bogotá, Colombia, ³Hospital Universitario Fundación Santa Fe de Bogotá, Bogotá D.C., Colombia

Presented By: Mauricio Plata, MD, MSc, FACS

**Introduction:** Vaginal repair of pelvic organ prolapse with fixation to the Sacrospinous ligament (SLF) is one of the most widely used surgical techniques. It’s a standard procedure with a known effectiveness. There is lack of homogeneity in the surgical procedure that can lead to confusing outcomes. The aim of this study is to describe the objective and subjective cure rates of a commercially available fixation anchoring system, complications rates and describe differences if an apical mesh sling is used.

**Methods:** This is a prospective cohort analysis of 91 patients who underwent SLF using anchors with or without an apical tape, between January 2009 and July 2019. Demographic features and degree of prolapse using the POP Q systems were recorded. A descriptive analysis were carried out and inferential non parametric statistics was determined to make comparisons among groups. Definition of subjective cure was the patient’s ability to see or feel a vaginal bulge. Objective cure was defined when all anatomic support was proximal to the hymen. Retreatment rates was also measured.

**Results:** The longest follow-up time was 236 months. Average follow-up was 39.4 months. Table 1 summarizes the demographic data. The main complaint was vaginal bulge (n=53, 58.2%), 80 subjects (87.9%) were postmenopausal and 42 (46.2%) had hysterectomy. Most of the patients had multicompartimental defects, 34 (37%) had concurrent urinary incontinence and 23 patients had occult stress urinary incontinence. All the patients had bilateral SLF. 47(51%) patients underwent to SLF without apical sling. Subjective cure rate was achieved in 87/91 subjects (95.6%), objective cure was reached by 70/91 (76.9%). Each patient was its own control, this differences were statistically significant (rank sum test, p<0.0001). 4 patients in the SLF alone group required reintervention. Surgical time and postoperative pain were not different between groups.

**Conclusion:** SLF with or without sling, is a safe and efficient procedure with low intraoperative complications. Apical sling placement while performing SLF was not significantly different in terms of anatomic, outcomes or complications. However, it seems that patients have lower reintervention rates when an apical sling is used. Further studies with a larger sample sizes and longer follow up are needed to support these findings.
<table>
<thead>
<tr>
<th>Table 1: Socio-demographic characteristics.</th>
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<tbody>
<tr>
<td><strong>n = 91</strong></td>
</tr>
<tr>
<td><strong>Age (years)</strong>: 67.2 ± 9.9</td>
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<tr>
<td><strong>BMI (kg/m²)</strong>: 25.36 ± 5.5</td>
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<tr>
<td><strong>Relevant medical history</strong></td>
</tr>
<tr>
<td>Diabetes mellitus: 15 (16.9)</td>
</tr>
<tr>
<td>Anticoagulation: 4 (4.4)</td>
</tr>
<tr>
<td>Antihypertensive: 11 (12.2)</td>
</tr>
<tr>
<td>Smoking: 6 (6.6)</td>
</tr>
<tr>
<td><strong>Obstetric and gynecologic history</strong></td>
</tr>
<tr>
<td>Pregnancy rate: 3.79 ± 2.2</td>
</tr>
<tr>
<td>Vaginal delivery rate: 3.06 ± 1.88</td>
</tr>
<tr>
<td>Cesarean section rate: 0.19 ± 0.59</td>
</tr>
<tr>
<td>Post-menopausal: 80 (87.8)</td>
</tr>
<tr>
<td>Years to menopause*: 11.90 ± 12.4</td>
</tr>
<tr>
<td>Hydrolaparotomy: 42 (46.2)</td>
</tr>
<tr>
<td><strong>POP-Q stage</strong></td>
</tr>
<tr>
<td>Anterior Compartment</td>
</tr>
<tr>
<td>Stage 0: 1: 6 (6.6)</td>
</tr>
<tr>
<td>Stage 2: 13 (12.2)</td>
</tr>
<tr>
<td>Stage 3: 73 (80.2)</td>
</tr>
<tr>
<td>Stage 4: 1 (1.1)</td>
</tr>
<tr>
<td>Middle Compartment</td>
</tr>
<tr>
<td>Stage 0: 1: 0 (0)</td>
</tr>
<tr>
<td>Stage 2: 2 (2.2)</td>
</tr>
<tr>
<td>Stage 3: 86 (94.7)</td>
</tr>
<tr>
<td>Stage 4: 1 (1.1)</td>
</tr>
<tr>
<td>Posterior Compartment</td>
</tr>
<tr>
<td>Stage 0: 1: 81 (88)</td>
</tr>
<tr>
<td>Stage 2: 3 (3.3)</td>
</tr>
<tr>
<td>Stage 3: 5 (5.5)</td>
</tr>
<tr>
<td>Stage 4: 1 (1.1)</td>
</tr>
<tr>
<td><strong>Main complaint</strong></td>
</tr>
<tr>
<td>Stress urinary incontinence (SUI): 2 (2.2)</td>
</tr>
<tr>
<td>Urgency urinary incontinence (UUI): 3 (3.3)</td>
</tr>
<tr>
<td>Mixed urinary incontinence (MUI): 4 (4.4)</td>
</tr>
<tr>
<td>Vaginal bulge: 50 (55.6)</td>
</tr>
<tr>
<td>Urinary tract infection: 8 (8.8)</td>
</tr>
<tr>
<td>SUI and uncomfortable bulge: 14 (15.4)</td>
</tr>
<tr>
<td>UUI and uncomfortable bulge: 7 (7.7)</td>
</tr>
<tr>
<td>MUI and uncomfortable bulge: 7 (7.7)</td>
</tr>
</tbody>
</table>

* Reported as median ± standard deviation
+ Reported as mean ± standard deviation

**Funding:** N/A
Poster #OM28
COMPLEX FEMALE PANURETHRAL STRicture DISEASE MANAGED WITH DORSAL AND VENTRAL DUAL BUCCAL MUCOSAL GRAFT ONLAY URETHROPLASTY
M. Francesca Monn, 1, Michael Chua, 1, Jessical DeLong, 1, Melanie Aube, 1, Ramon Virasoro, 1, Kurt McCammon
Eastern Virginia Medical School
Presented By: Maria Francesca Monn, MD, MPH

Introduction: Panurethral stricture disease in women is considered a surgical challenge; which involves the complexity of the anatomical involvement and the limited amount of local tissues that can be mobilized for reconstruction. We present a novel surgical approach of dorsal and ventral dual buccal mucosal graft (BMG) onlay urethroplasty, including an evaluation of the intermediate-term surgical outcomes.

Methods: All cases of female urethroplasty performed at our institution between 2014 and 2017 were reviewed. Cases of panurethral stricture managed with the dual dorsal and ventral BMG procedure were identified. Patient demographic, clinical and perioperative data were collected and summarized. All patients had an office cystourethroscopy performed at 6 to 7 months post-operatively then yearly to assess urethral lumen size and patency. Successful outcome was defined as absence of need for further instrumentation (including self-catheterization, dilation, urethrotomy or further surgical repairs) at last recorded clinic follow-up. Post-operative complications were also reviewed.

Results: A total of three patients with a median 33-month (range 7-45) follow-up period were identified and reviewed for peri-operative characteristics and intermediate-term surgical outcomes. Median patient age at time of surgery was 61 years-old (range 50-62), and median body mass index was 34 (range 32-34.1). All patients had at least one failed urethral dilation prior to definitive reconstruction. Other intraoperative variables included: median BMG surface area harvested of 12 cm² (range 10-12.5), median estimated blood loss of 150 mL (range 150-200), and median total procedure time of 152 minutes (range 145-165). Length of stay was 48 to 72 hours, and an indwelling urethral catheter was left in place for 3 weeks. All patients were found to have a patent urethral lumen – able to accommodate 18 to 20Fr caliber – and no patient required further urethral instrumentation by their last clinic follow-up visit. The only reported morbidity was BMG harvest site tightness, which did not require further intervention.

Conclusion: We present a case series of successful intermediate-term outcomes for female panurethral stricture disease managed with novel approach of dorsal and ventral dual buccal mucosal graft onlay urethroplasty. Overall results are promising and complication rates are low. Larger studies must be performed to confirm the efficacy of this procedure.

Funding: N/A
Poster #OM29
DO IMPROVEMENTS IN UPPER EXTREMITY MOTOR FUNCTION AFFECT CHANGES IN BLADDER MANAGEMENT AFTER SPINAL CORD INJURY?
Caleb Seufert¹, Dimitar Zlatev¹, Kazuko Shem², Evginy Kreydin³, Christopher Elliott⁴,¹
¹Stanford University Medical Center Department of Urology, ²Santa Clara Valley Medical Center Department of Physical Medicine and Rehabilitation, ³University of Southern California Department of Urology, ⁴Santa Clara Valley Medical Center Division of Urology
Presented By: Christopher Stephen Elliott, MD, PhD

Introduction: Clean intermittent catheterization (CIC) is considered the gold standard bladder management for patients with bladder dysfunction after spinal cord injury (SCI). One of the most important predictors of CIC adoption after SCI is upper extremity (UE) motor function at the time of discharge from rehabilitation. It is not clear however if improvements in UE motor function after rehabilitation discharge affect future bladder management decisions.

Methods: We assessed the National Spinal Cord Injury Data Set for the years 2000-2016. Our cohort consisted of persons with cervical SCI, who underwent complete motor examination at discharge from rehabilitation and again at 1-year follow-up. Patients were stratified based on a previously described algorithm which categorizes a patient’s ability to independently perform CIC based upon UE motor scores. Improvements in the predicted ability to self-catheterize over the first year after rehabilitation discharge were evaluated in relation to possible changes in bladder management.

Results: Of the 1191 patients meeting inclusion criteria, improvements in the predicted UE motor function necessary to independently catheterize were observed in 36.7% over the first year. Overall, fewer patients converted from non-CIC to CIC (68/548=12.4%) as compared to transitioning from CIC to non-CIC (175/643=27.2%, p<.001). Improvements in upper extremity motor function did not affect changes in bladder management as those converting from "less than able" to "able" to independently catheterize and those without UE motor improvement both transition from CIC to non-CIC (7/55=12.7% versus 24/266=9.0%, p=.717) and non-CIC to CIC (24/70=34.2% versus 78/257=30.3%, p=.952) at similar rates.

Conclusion: In the first year after rehabilitation, more patients transition away from CIC than convert to CIC. Contrary to our hypothesis, significant improvements in UE motor function during the first year after rehabilitation discharge do not appear to affect bladder management decisions and highlight our poor understanding of how patients choose to manage their neurogenic bladder.

Funding: N/A
Poster #OM30
SHOULD WE REMOVE THE PSEUDO-CAPSULE AT TIME OF REVISION FOR SACRAL NERVE STIMULATORS? RATE OF MICROBIAL COLONIZATION.
Yaejee Hong, MD, Ayman Mahdy, MD
University of Cincinnati
Presented By: Yaejee H. Hong, MD

Introduction and Objective:
Surgical Site Infection (SSI) after Sacral Nerve Stimulation (SNS) occurs in 3-10% of patients. Although relatively uncommon, SSI usually prompts device explantation. In other medical devices such as cardiac pacemakers and deep brain stimulators, the pseudo-capsule that forms has been shown to play a role in infectious complications. To our knowledge, the role of pseudo-capsule in SSI after SNS has never been studied. The aim of this study is to evaluate the rate of pseudo-capsule microbial colonization at time of SNS revision or removal.

Methods: We performed a retrospective chart review from January 2018 to March 2019 of consecutive patients with no signs of acute infection who underwent SNS revision or removal. The device pseudo-capsule was excised and tested. Patients with active acute infections were excluded from study. All tissue specimens were tested for gram stain and tissue culture, including aerobic, anaerobic and fungal cultures. Demographic information was collected including age, gender, history of smoking, diabetes mellitus and immunosuppression. In patients who underwent revision, we followed our standard protocol with a five day post-operative course of antibiotics.

Results: Twenty patients were included; six had SNS revision and 14 had SNS removal. All except one patient were female. Median age was 55.5 (range 26-75) years old. Sixteen patients (80%) had initial implant performed in a staged approach. Seven were active smokers (35%), 4 were on immunosuppressive medication (20%), and 3 were diabetics (15%). Three patients (15%) were found to have positive tissue culture growing Coryneform bacillus (2/3) and Cutibacterium acnes (1/3). There was no statistically significant association between positive culture and proposed risk factors including diabetes (p = 0.59), immunosuppression (p=0.91), and active smoking (p=0.25).

Conclusion: In our series, we found a low rate of capsule colonization at 15%. Culture organisms identified were Coryneform bacillus and Cutibacterium acnes. There was no statistically significant association between positive pseudocapsule culture and proposed risk factors. This study suggests that capsule excision may not have clinical impact. Further evaluation in a larger patient series is warranted to determine if these findings are reproducible.
<table>
<thead>
<tr>
<th>Table 1. Patient Demographics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total (n)</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>Gender (%)</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1 (5)</td>
</tr>
<tr>
<td>Female</td>
<td>19 (95)</td>
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<tr>
<td><strong>Median Age (range)</strong></td>
<td>55.5 (22-75)</td>
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<tr>
<td><strong>Indication (%)</strong></td>
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<tr>
<td>Need for MRI</td>
<td>7 (35)</td>
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<tr>
<td>Pt Request</td>
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<tr>
<td>Revision</td>
<td>6 (30)</td>
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<tr>
<td>Site discomfort</td>
<td>3 (15)</td>
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<tr>
<td>Neuropathic pain</td>
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<tr>
<td>Failed Stage 1</td>
<td>1 (5)</td>
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<tr>
<td><strong>Infection Risk Factor (%)</strong></td>
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<tr>
<td>Diabetes Mellitus</td>
<td>3 (15)</td>
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<tr>
<td>P= 0.59</td>
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<td>Immunosuppression</td>
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<td>P= 0.91</td>
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<td>Smoker</td>
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<td>P= 0.25</td>
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<td><strong>Culture Result (%)</strong></td>
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<td>3 (15)</td>
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<td>Negative</td>
<td>17 (85)</td>
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**Funding:** N/A
Poster #OM31

EVALUATION OF A NON-IMPLANTED, TRANSVAGINAL, ELECTRICAL STIMULATION CONTINENCE DEVICE FOR OVERACTIVE BLADDER: EVANESCE-OAB.

Suzette E. Sutherland, MD, MS, FPMRS1,2, Michael J. Kennelly, MD, FPMRS3,4,5,6,7, Steven W. Siegel, MD, FPMRS8

1Director, Female Urology, UW Medicine Pelvic Health Center, 2Associate Professor, Department of Urology, University of Washington School of Medicine, Seattle, WA, 3Director, McKay Urology, 4Director, Charlotte Continence Center at Carolinas Medical Center, 5Director of Urology, Carolinas Rehabilitation Hospital, 6Co-Director, Women's Center for Pelvic Health, 7Professor, Surgery, Urology, Gynecology at Carolinas Medical Center and North Carolina School of Medicine, Charlotte, NC, 8Director, Center for Female Urology and Continence Care, Minnesota Urology, St. Paul, MN

Presented By: Suzette E. Sutherland, MD, MS, FPMRS

Introduction: The FemPulseÔ device is a wearable vaginal ring that delivers neuromodulation therapy through the vaginal wall adjacent the cervix to autonomic nerves and plexuses between the bladder and CNS to treat overactive bladder (OAB). In a previous acute clinical evaluation this novel, non-significant risk device demonstrated safety and suggested clinical benefit. Objectives of the current feasibility study were to evaluate safety, wearability, and potential clinical utility of FemPulse stimulation in women with OAB in an ambulatory setting.

Methods: A prospective, randomized control sham trial including women with a history of OAB diagnosis was performed. Subjects completed 3 days of baseline bladder diaries and QOL instruments, including UDI-6, OAB-ss, and the modified OAB-q short form. During the 3-day evaluation period, subjects were randomized 2:1 in a blinded fashion to receive active, subsensory stimulation (Treatment) or no stimulation (Control). The evaluation of safety included patient written reports, interview, pelvic exam before and after the therapy period, and evaluation of heart rate and blood pressure during stimulation testing before home use of the device.

Results: Nineteen subjects were randomized and evaluated for safety. There were no Unanticipated or Serious device-related adverse events or other safety concerns. Subjects wore the device comfortably during the protocol period. Seventeen subjects completed the protocol. On an Intent-to-Treat basis, results were comparable between the Treatment group (n=12) and the Control group (n=5). An Efficacy Analysis Cohort of 9 subjects was defined that excluded subjects who reported feeling stimulation and were thus essentially unmasked and subject to bias. In this cohort (6 Treatment, 3 Control), the number of voids per day (VPD) decreased by -3.2 ± 1.2 in Treatment subjects vs -1.0 ± 0.2 in Control subjects (mean ± SEM). Reduction of > 1 VPD associated with urgency was experienced by 83% of Treatment subjects vs 33% of Control subjects. UUI-related QOL was improved in 67% of Treatment subjects vs. 33% of Control subjects.

Conclusion: In a controlled clinical trial, the wearable FemPulseÔ neuromodulation device is safe, comfortable and provides a promising bioelectronic alternative for the treatment of OAB.

Funding: FemPulse
Introduction: Overactive bladder (OAB) is diagnosed clinically based on symptoms. The prevalence of OAB among US women has been estimated at 25%. ATP is released from the urothelium and levels tend to be higher in animal models and patients with OAB, yet little is known about the effect of third line treatments, such as onabotulinum toxin A (BTX-A) on ATP levels. The objective of this study was to quantify changes in voided urine ATP levels and correlate with OAB-V8 symptom scores in patients before and after BTX-A injection.

Methods: Urine samples were collected from women prior to and after BTX-A treatment, aliquoted into 1 ml tubes, immediately frozen on dry ice, and stored in a -80ºC freezer. Urine ATP levels were quantified using the luciferin-luciferase luminescent assay (Invitrogen Molecular Probes ATP Determination Kit). OAB-V8 questionnaires were administered before and after BTX-A treatment. Urinalysis was checked to rule out infection at time of sample collection. ATP levels before and after treatment were compared and correlated with OAB-V8 Scores.

Results: 11 patients were included. Median age was 56 (IQR: 50-63). 1 and 10 of patients had neurogenic and idiopathic OAB respectively. 3 patients had chronic pain disorders, such as fibromyalgia, peripheral neuropathy, or migraines. 1 patient had Type 2 diabetes. 8 patients had prior pelvic surgery such has hysterectomy. Urine ATP levels decreased in 7 out of 11 urine samples collected after BTX-A injection, compared to pre-treatment values. There was an observed decrease in OAB-V8 scores in 9 out of 11 patients at the first follow-up appointment.

Conclusion: Urine ATP levels corresponded with symptomatic improvement after BTX-A injection. This may be the result of a direct or indirect effect of BTX-A on mechanisms of urothelial ATP release and signaling. Quantification of urine ATP may provide a valuable tool to assess treatment response and guide further management.
Poster #OM33
PROLAPSE SURGERY IN THE ELDERLY AND FRAIL: COMPARING SAFETY OF RECONSTRUCTIVE VERSUS OBLITERATIVE SURGERY
Graham Chapman, MD1,2,3, Susan Wherley, MD1,2, Kasey Roberts, MD1,2,3, Emily Slopnick, MD1,2,3, Jeffrey Mangel, MD1,3, Adonis Hijaz, MD1,2
1Case Western Reserve University, 2University Hospitals Cleveland Medical Center, 3Metrohealth Medical Center
Presented By: Graham Chapman, MD

Introduction: In the growing population of elderly and frail patients, perioperative safety surrounding elective surgery for pelvic organ prolapse is of significant importance. The objective of this study was to compare 30-day complication rates after reconstructive versus obliterator surgery for pelvic organ prolapse in the elderly and frail population.

Methods: The American College of Surgeons' National Surgical Quality Improvement Program (NSQIP) database was used to identify elderly patients who underwent vaginal or laparoscopic apical suspension (reconstructive group) or colpocleisis (obliterator group) for pelvic organ prolapse from 2010 to 2017. All patients age 80 and older were included. Those with gynecologic malignancy or who underwent abdominal surgery were excluded. Three cohorts of patients were individually analyzed: all patients, frail-patients only, and a propensity-score matched cohort. Frailty was assessed using the NSQIP modified frailty index-5. Pairwise comparison and multivariable logistic regression was performed for each of the three cohorts. The primary outcome was a composite of all serious complications and mortality.

Results: We analyzed 1,654 patients who met inclusion criteria; 941 (56.9%) underwent reconstructive surgery and 713 (43.1%) underwent obliterator surgery. Mean age was 83.4±3.0 years, 75.7% were Caucasian, and 16.6% were considered frail. The propensity-score matched cohort was comprised of 828 patients (58.2% reconstructive, 41.8% obliterator). Patients in the reconstructive group were slightly older (83.1 vs 82.5 years, p=0.002) and more likely to undergo concomitant posterior colporrhaphy (43.6% vs 34.6%, p=0.008) or hysterectomy (31.3% vs 20.5%, p<0.001). Groups were otherwise similar in regards to demographics, tobacco use, independence, medical comorbidities, and incidence of frailty. The composite complication rate for reconstructive versus obliterator surgery was similar for the cohort of all patients (9.3% vs 9.8%, p=0.7), frail-patients only (10.4 vs 11.4%, p=0.9), and the propensity-score matched cohort (8.3% vs 10.1%, p=0.4). Individual complication rates and mortality rates did not differ between groups. On multivariable logistic regression, reconstructive surgery compared to obliterator surgery was not associated with composite complications in any of the three cohorts (Table 1).

Conclusion: In this national cohort, reconstructive surgery was equally safe as colpocleisis for surgical repair of pelvic organ prolapse in the elderly and frail patient populations.

<table>
<thead>
<tr>
<th></th>
<th>Reconstructive Surgery</th>
<th>Obliterator Surgery</th>
<th>aOR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients (n=1,654)</td>
<td>9.3%</td>
<td>9.8%</td>
<td>0.96 (0.7-1.4)</td>
<td>0.85</td>
</tr>
<tr>
<td>Frail patients only (n=274)</td>
<td>10.4%</td>
<td>11.4%</td>
<td>0.73 (0.3-1.7)</td>
<td>0.47</td>
</tr>
<tr>
<td>Propensity-score matched cohort (n=828)</td>
<td>8.3%</td>
<td>10.1%</td>
<td>0.76 (0.5-1.2)</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Funding: N/A
Poster #OM34
FRAILTY IS ASSOCIATED WITH WORSE LOWER URINARY TRACT SYMPTOMS IN A DIVERSE UROGYNECOLOGIC POPULATION
Stephanie Zuo, MD¹, Jaden Kohn, MD, MPH², Harley Roberts, MA², Laura Tellechea, MD¹, Ava Leegant, MD¹, Nitya Abraham, MD³, Chi Chiung Grace Chen, MD, MHS², Melissa Laudano, MD³
¹Albert Einstein College of Medicine/Montefiore Medical Center, Department of Obstetrics and Gynecology, ²Johns Hopkins School of Medicine, Department of Gynecology and Obstetrics, ³Albert Einstein College of Medicine/Montefiore Medical Center, Department of Urology
Presented By: Stephanie Wang Zuo, MD

Introduction: To examine whether frailty is associated with lower urinary tract symptoms (LUTS) in a racially and ethnically diverse urogynecologic population.

Methods: We conducted a dual-center, prospective observational cross-section study of new patients presenting to outpatient urogynecology clinics at Montefiore Medical Center (Bronx, NY) and Johns Hopkins Medical Center (Baltimore, MD) from November 2018 to September 2019. Validated surveys were administered to patients to determine severity of LUTS (OAB-V8, UDI-6). The Edmonton Frail Scale (EFS), a validated measure of frailty, was administered, and the Timed Up and Go Test (TUGT) was performed at the initial clinic visit. Standard statistical analyses were used.

Results: 179 patients were recruited over a 10-month period with median age 67.5 years (IQR 51-69). 44.1% were White, 32.0% were Black, 19.6% were Hispanic, and 2.8% were Asian. Most women were not considered to be “frail” by EFS (73.4%). 16.1% were considered to be “vulnerable,” 9.1% had mild frailty, 1.4% had moderate frailty, and no patients were severely frail. Black and Hispanic women were more likely to have higher EFS scores than White women (p<0.01). 89.0% of women had significant overactive bladder symptoms (OAB-V8 ≥8, defined as “probable OAB”), with Black and Hispanic women experiencing more severe OAB than White women (p<0.01). When controlling for age and race, women with higher EFS were more likely to complain of worse LUTS (OAB-V8, 95% CI [0.01,0.08]; UDI-6, 95% CI [0.47, 5.47]).

Median TUGT time was 9.24 seconds (IQR 8-12; n = 138). TUGT was highly correlated to EFS score (p<0.001). ROC analysis of TUGT showed greatest accuracy with relationship to frailty as measured by EFS score ≥8 at a time of 11.5 seconds (AUC=0.745). There were racial/ethnic differences in TUGT with Black women performing slower than Hispanic and White women (p<0.05). TUGT was not significantly associated with OAB-V8 or UDI-6 score.

Conclusion: Frailty is associated with worse LUTS and should be considered in the diagnosis and management of urinary symptoms. TUGT is easily implemented in the urogynecology clinic, with patients taking greater than 11.5 seconds considered to be “frail.” Although TUGT is a helpful proxy for frailty, patient characteristics associating LUTS with frailty are better assessed by EFS.

Funding: N/A
Poster #OM35
PSYCHOSOCIAL INTERVENTION FOR INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME (IC/BPS): PATIENT NEEDS AND AN EXAMINATION OF GENDER DIFFERENCES
Lindsey McKernan¹, Sula Windgassen², Roger Dmochowski¹, Leslie Crofford¹, Michael Finn¹, Stuart Reynolds¹
¹Vanderbilt University Medical Center, ²King's College London
Presented By: Sula Windgassen

Introduction: Interstitial cystitis/bladder pain syndrome (IC/BPS) is a debilitating condition with extensive psychosocial burden, yet psychological treatment for IC/BPS is little studied. We do not know whether patients are receptive to this form of treatment nor if psychosocial treatment would address concerns specific to the population. Further, men and women may experience symptoms and their impact differently and have different needs in terms of IC/BPS management. Examining patient-reported needs and acknowledging diversity in pain experiences can inform patient-centered interventions for IC/BPS. This project characterized the experience of living with IC/BPS in both men and women and patient perceptions of needs in its treatment, with the goal of informing patient-centered treatment for IC/BPS.

Method: Using a mixed methods approach, 27 females and 10 males with IC/BPS participated in a single timepoint focus group assessing the impact of IC/BPS and treatment needs. Participants also completed validated self-report assessments evaluating urinary symptoms, pain, and emotional functioning. Focus groups were recorded, transcribed, coded and then analyzed for content themes using an iterative inductive/deductive approach. Linear regression models evaluated the relationship between psychological functioning and symptom severity.

Results: We conducted eight focus groups between 8/2017-9/2019. Five major themes emerged from qualitative analysis: managing physical symptoms, emotional symptoms, impact on daily life and socio-contextual factors, responding to illness, and addressing needs in treatment. The physiological and emotional consequences of IC/BPS were reported, highlighting their impact on interpersonal relationships and challenges obtaining appropriate treatment for IC/BPS. Quantitative analysis showed anxiety and depression were significantly associated with symptom severity (rPROMIS(29) = .51, p = .003; rPHQ-9(29) = .66, p < .001). Further, depression levels were significantly associated with worsened IC/BPS symptomology in women, after controlling for known confounding factors such as age and time since diagnosis (B =.85, SE = .19, t = 4.47, p < .001, R² = .44). Preliminary evaluation of differences between genders indicates genders differ in coping with and communicating about illness.

Conclusion: Individuals with IC/BPS could benefit from tailored psychological interventions focusing on pain management, emotion regulation, communication skills, sexual dysfunction and intimacy fears. Men and women may have varying needs in the psychosocial treatment of IC/BPS.

Funding: Provided by the National Institute of Diabetes and Digestive and Kidney Diseases (1 K23 DK118118-R01A1); British Psychological Society
Poster #OM36
ASSOCIATION BETWEEN SOCIOECONOMIC STATUS AND OUTCOMES OF BENIGN PROSTATIC HYPERPLASIA SURGICAL INTERVENTIONS
Navin Sabharwal, BA, Daniel Shoskes, MD, Khaled Fareed, MD, James Ulchaker, MD, Bradley Gill, MD, MS
Cleveland Clinic Glickman Urological and Kidney Institute
Presented By: Navin Sabharwal, BA

Introduction: This study investigated the relationship between socioeconomic status (SES) and benign prostatic hyperplasia (BPH) procedure outcomes.

Methods: Retrospective review was conducted of all first-time transurethral resection of the prostate (TURP) and laser prostatectomy (LP) procedures by high volume surgeons (>75 procedures) from 2001-16 in a large academic medical system. SES quartiles were generated from patient zip code median income. Following univariate screening (ANOVA or Chi-Square / Fisher Exact) and adjusting for covariates identified, multiple logistic regression examined the association between SES quartile and outcomes: hospitalization length >1 day, 30-day mortality, postoperative transfusion, subsequent transurethral surgery, overactive bladder (OAB), and urologic medication discontinuation. For robustness, analyses were also completed treating income as a continuous variable.

Results: Analyses included 2,880 procedures with small variations in patient demographics across SES quartiles (Table 1). Adjusting for covariates, higher SES was generally associated with OAB (adjusted OR 1.54, 95%CI 1.12-2.12, p=0.01) diagnoses. Other outcomes were not associated with SES (Table 3). Analyses of median income as a continuous variable identified no significant associations with outcomes.

Conclusion: Major outcomes of endoscopic BPH surgery were not associated with SES.
### Table 1. Patient demographics

<table>
<thead>
<tr>
<th>SES Quartile (median income range)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean±SD)</td>
<td>70.7±9.9</td>
<td>70.8±9.9</td>
<td>70.6±9.0</td>
<td>71.4±8.4</td>
<td>0.08</td>
</tr>
<tr>
<td>Smoking (%)</td>
<td>5.42</td>
<td>5.83</td>
<td>5.28</td>
<td>3.75</td>
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<tr>
<td>Alcohol abuse (%)</td>
<td>13.33</td>
<td>16.39</td>
<td>23.47</td>
<td>18.61</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>Type 2 diabetes (%)</td>
<td>22.36</td>
<td>15.56</td>
<td>14.58</td>
<td>14.72</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>Coronary artery disease (%)</td>
<td>22.22</td>
<td>22.50</td>
<td>26.53</td>
<td>26.53</td>
<td>0.06</td>
</tr>
<tr>
<td>Hypertension (%)</td>
<td>57.36</td>
<td>48.19</td>
<td>52.64</td>
<td>53.26</td>
<td>0.007*</td>
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<td>COPD (%)</td>
<td>13.75</td>
<td>9.72</td>
<td>12.92</td>
<td>11.67</td>
<td>0.09</td>
</tr>
<tr>
<td>Asthma (%)</td>
<td>14.31</td>
<td>9.31</td>
<td>12.50</td>
<td>10.00</td>
<td>0.01*</td>
</tr>
<tr>
<td>Stroke (%)</td>
<td>11.39</td>
<td>10.97</td>
<td>10.42</td>
<td>12.92</td>
<td>0.48</td>
</tr>
<tr>
<td>Peripheral vascular disease (%)</td>
<td>6.11</td>
<td>5.00</td>
<td>4.31</td>
<td>4.72</td>
<td>0.44</td>
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<tr>
<td>Proc (%)</td>
<td>32.78</td>
<td>30.14</td>
<td>28.89</td>
<td>31.25</td>
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<tr>
<td>LP (%)</td>
<td>67.22</td>
<td>69.86</td>
<td>71.11</td>
<td>68.75</td>
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</table>

*significant at α=0.05

### Table 2. Unadjusted outcomes across SES

<table>
<thead>
<tr>
<th>SES Quartile</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of stay &gt; 1 day</td>
<td>10.68</td>
<td>8.69</td>
<td>7.72</td>
<td>8.62</td>
<td>0.32</td>
</tr>
<tr>
<td>Transfusion during admission</td>
<td>0.42</td>
<td>0.42</td>
<td>0.55</td>
<td>0.59</td>
<td>0.94</td>
</tr>
<tr>
<td>30-day mortality</td>
<td>0.00</td>
<td>0.00</td>
<td>0.28</td>
<td>0.14</td>
<td>0.82</td>
</tr>
<tr>
<td>Repeat urologic operation</td>
<td>17.36</td>
<td>17.64</td>
<td>17.50</td>
<td>20.00</td>
<td>0.51</td>
</tr>
<tr>
<td>OAB (%)</td>
<td>10.56</td>
<td>11.81</td>
<td>15.00</td>
<td>12.78</td>
<td>0.07</td>
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<tr>
<td>Alpha-blocker discontinuation</td>
<td>65.87</td>
<td>70.69</td>
<td>66.96</td>
<td>66.20</td>
<td>0.32</td>
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<tr>
<td>5α-reductase inhibitor discontinuation</td>
<td>73.87</td>
<td>79.24</td>
<td>71.90</td>
<td>73.56</td>
<td>0.82</td>
</tr>
</tbody>
</table>

*significant at α=0.05

### Table 3. Multivariate comparison of outcomes across SES

<table>
<thead>
<tr>
<th>SES Quartile</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of stay &gt; 1 day</td>
<td>Adj OR (95% CI)</td>
<td>0.83 (0.56-1.23)</td>
<td>0.71 (0.48-1.06)</td>
<td>0.81 (0.55-1.20)</td>
<td>0.19</td>
</tr>
<tr>
<td>Admn translation</td>
<td>Adj OR (95% CI)</td>
<td>1.00 (0.52-2.04)</td>
<td>0.99 (0.59-1.67)</td>
<td>1.59 (0.85-2.20)</td>
<td>0.07</td>
</tr>
<tr>
<td>30-day mortality</td>
<td>Adj OR (95% CI)</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Repeat operation</td>
<td>Adj OR (95% CI)</td>
<td>0.99 (0.76-1.30)</td>
<td>0.96 (0.73-1.26)</td>
<td>1.15 (0.88-1.51)</td>
<td>0.07</td>
</tr>
<tr>
<td>OAB (%)</td>
<td>Adj OR (95% CI)</td>
<td>1.16 (0.85-1.54)</td>
<td>1.14 (1.12-2.12)</td>
<td>1.29 (0.93-1.78)</td>
<td>0.005</td>
</tr>
<tr>
<td>α-blocker discontinuation</td>
<td>Adj OR (95% CI)</td>
<td>1.20 (0.93-1.54)</td>
<td>0.99 (0.77-1.27)</td>
<td>1.07 (0.83-1.37)</td>
<td>0.003</td>
</tr>
<tr>
<td>5α-reductase inhibitor discontinuation</td>
<td>Adj OR (95% CI)</td>
<td>1.07 (0.74-1.54)</td>
<td>0.81 (0.63-1.06)</td>
<td>0.99 (0.70-1.41)</td>
<td>0.49</td>
</tr>
</tbody>
</table>

*significant at α=0.05
**unable to determine OR due to n=0

**Funding:** N/A
**Poster #OM37**

**ESTIMATION OF URINARY FREQUENCY: DOES QUESTION PHRASING MATTER?**

Rachael Sussman, MD1, Christina Escobar, MD2, Dora Jericevic, MD2, Cheonguen Oh, PhD2, Alan Arslan, PhD2, Ricardo Palmerola, MD2, Victor Nitti, MD3, Scott Smilen, MD2, Dominique Pape, MD2, Nirit Rosenblum, MD2, Benjamin Brucker, MD2

1MedStar Georgetown University Hospital, 2New York University, 3UCLA

Presented By: Rachael Dana Sussman, MD

**Introduction:** While voiding diaries (VD) are recommended in the evaluation of LUTS, they can be burdensome and labor intensive. Treatment decisions are often based on information obtained during the history, as a VD is not always available. When eliciting information on urinary frequency, clinicians may receive varied estimations and there is no standardized way that these questions are phrased. To our knowledge, no study has looked at how clinician phrasing of questions regarding frequency may elicit different responses.

**Methods:** We conducted a randomized, prospective, single-center study looking at the reliability of a patient interview in assessing urinary frequency when compared to a 3-day VD. Prior to completing a VD patients were asked about daytime and nighttime frequency in 3 different ways: 1) how many times they voided 2) how many hours they waited in between voids, and 3) how many times they voided over the course of 4 hours. Randomization determined the order with which the questions were asked. Estimation from each question was compared to then VD.

**Results:** 71 patients completed study questionnaires and the VD. Demographic data is seen in Table 1. There were no statistical differences in correlation of estimates form questions 1, 2 and 3 to VD frequency. All questions performed better at predicting nighttime frequency when compared to daytime, with spearman’s correlation coefficients of 0.596, 0.575, and 0.460 for day and 0.751, 0.754 and 0.670 for night for questions 1, 2 and 3 respectively. When compared to the VD, Question 1 (“how many times…”) underestimated (8.5 vs 9.7, p=0.014) while Question 2 (“how many hours…”) overestimated daytime frequency (11.8 vs 9.7, p=0.027). All questions overestimated nighttime frequency with 2.6, 2.9 and 3.9 predicted voids for questions 1, 2 and 3 compared to 1.6 voids per night on the VD (p <0.001).

**Conclusion:** Asking patients how many times they urinate during the daytime underestimated, and asking patients how many hours they wait between urinations overestimated the number of voids reported on the VD, which is often considered the gold standard. Regardless of question phrasing patients overestimate nighttime urination on history compared to that recorded on a VD.
### Table 1: Patient Demographics

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<th>Age</th>
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<tr>
<td>40-59</td>
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<td>24</td>
<td>33.8</td>
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<tr>
<td>≥ 80</td>
<td>7</td>
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<tr>
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<tr>
<td>African American</td>
<td>6</td>
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<td>Asian/Pacific Islander</td>
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<td>8.5</td>
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<tr>
<td>Female</td>
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<td>Nocturia</td>
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<td>Obstructive Symptoms</td>
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<tr>
<td>Urgency</td>
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<td>69.0</td>
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<tr>
<td>Frequency</td>
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<td>Incontinence</td>
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<tr>
<th>American Urologic Association Symptom Score</th>
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<tr>
<td>Mild</td>
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<td>11.3</td>
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<tr>
<td>Moderate</td>
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<td>Severe</td>
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<table>
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<tr>
<th>Overactive Bladder Questionnaire (OAB-q) Short Form (0-100)</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
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<tr>
<td>OAB-q Health Related Quality of Life (0-100)</td>
<td>42.8</td>
<td>26.1</td>
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<td></td>
<td>67.6</td>
<td>25.3</td>
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**Funding:** NA
Poster #OM38
DEVICE SURVIVAL AND QUALITY OF LIFE OUTCOMES FOLLOWING ARTIFICIAL URINARY SPHINCTER PLACEMENT
Timothy Boswell, MD1, Nicole Dodge, MD1, Daniel Elliott, MD1, Laureano Rangel, PhD2, Brian Linder, MD1
1Department of Urology, Mayo Clinic, Rochester, MN, 2Health Sciences Research, Mayo Clinic, Rochester, MN
Presented By: Timothy C. Boswell, MD

Introduction: Artificial urinary sphincter (AUS) placement is the standard for treatment of severe male stress urinary incontinence (SUI). While there is evidence to suggest satisfactory device survival, there is a paucity of data addressing long-term quality of life outcomes.

Methods: We identified patients who underwent primary AUS placement from 1983-2016. We assessed rates of secondary surgery (overall, device infection/erosion, urethral atrophy, malfunction) and factors associated with these endpoints. Quality of life was evaluated by pad usage and Patient Global Impression of Improvement (PGI-I) at various time points from primary surgery. Follow-up was obtained in clinic or by phoned/mailed correspondence.

Results: Overall, 1154 patients were included in the study. Patients had a median age of 70 years (IQR 65-75) and median follow up of 5.4 years (IQR 1.6-10.5). Secondary surgery-free survival was 72% at 5 years, 56% at 10 years, 41% at 15 years, and 33% at 20 years. On univariate analysis, variables associated with need for secondary surgery were prior cryotherapy (HR 2.7, 95% CI 1.6-4.6; p < 0.01) or radiation therapy (HR 1.4, 95% CI 1.1-1.7; p = 0.01). On multivariate analysis, only cryotherapy remained significantly associated (HR 2.4, 95% CI 1.3-4.2; p < 0.01). While 36% and 24% of patients 5-10 years out from surgery and >10 years out from surgery, respectively, reported using a security pad or less per day, 78% and 81% of those patients, respectively, reported their PGI-I as at least “much better.”

Conclusion: AUS placement has excellent long-term outcomes, and is associated with sustained improvement in patient quality of life.

Funding: N/A
Poster #OM39
SINGLE INSTITUTIONAL EXPERIENCE WITH SINGLE-STAGED SACRAL NEUROMODULATION: COST SAVINGS AND OUTCOMES IN A CONTEMPORARY CASE SERIES
Wai Lee¹, Daniel Artenstein², Christopher F Tenggardjaja², Una J Lee¹, Alvaro Lucioni¹, Polina Reyblat², Kathleen C Kobashi¹
¹Virginia Mason, Seattle, WA, ²Kaiser Permanente, Los Angeles, CA
Presented By: Wai Lee, MD

**Introduction:** Sacral neuromodulation (SNM) is traditionally performed in two stages. Studies have projected that single-staged SNM is cost effective if the conversion rate is \(\geq 61.3\%\). We present the first case series evaluating the cost of single-stage SNM. The objective of our study was to evaluate the outcomes and analyze the cost from our institutional experience with single-staged SNM.

**Methods:** We retrospectively analyzed 15 consecutive patients who underwent single-staged SNM from November 2015 to January 2018. All procedures were performed at a self-insured integrated healthcare institution. Cost data were determined using 2019 Medicare reimbursement rates from Current Procedural Terminology codes 64581, 64585, 64590, and 64595. Median operative times were derived from actual institutional data.

**Results:** A total of 15 patients underwent single-stage SNM implantation. Their median follow up was 14.6 mos (IQR 6.9-22.5 mos). A total of 14/15 (93.3\%) patients had success, defined as \(\geq 50\%\) improvement from their baseline. Total reimbursement for the 15 patients undergoing single-stage implantation was $329,430. If these patients had undergone traditional 2 stage implantation with equivalent outcomes, the overall reimbursement was determined to be $414,796. Single-stage SNM implantation afforded a calculated total cost savings of $85,366 (\(p<0.01\)). Moreover, a projected 233 minutes in operative room time was saved by undergoing single-stage SNM (\(p<0.01\)). However, when reimbursement rates were adjusted for device expenses and estimated operating room costs, the net collections for the institution favored a 2-stage SNM ($130,892) over single-stage SNM ($40,979, \(p<0.01\)).

**Conclusion:** This study demonstrates the potential healthcare savings from a single-stage SNM procedure. At an institution with its own integrated insurance policy, savings from each procedure will benefit the system and the institution. However, at a traditional institution depending on insurer reimbursements, the lower reimbursement rate for single-stage SNM is not offset by the savings in OR time ($561 per case). It appears changes to reimbursement policies are needed before single-stage SNM can widely be adopted. Hopefully, benefits to the patient, such as safety from less sedation, fewer infections, lower narcotic needs, decreased antibiotic usage, and potentially improved response rates can influence policy makers.
Funding: N/A
Poster #OM40
ELEVATED URINARY PRONGF TO NGF RATIO IN OVERACTIVE BLADDER SYNDROME IN AN AGING FEMALE POPULATION
Abubakr Mossa¹, Samer Shamout², Philippe Cammisotto¹, Lysanne Campeau²
¹Lady Davis Institute, McGill University, Montreal, Quebec, Canada, ²Lady Davis Institute, McGill University
Urology Department, Jewish General Hospital, Montreal, Quebec, Canada
Presented By: Abubakr H. Mossa, MD, MSc

Introduction: The use of the ratio of urinary NGF/creatinine as a biomarker for overactive bladder syndrome (OAB) diagnosis has been a matter of debate. The immature form of nerve growth factor (proNGF) was found recently to play degenerative roles in different tissues by signalling through p75NTR with higher affinity than the mature form (NGF). In the present study, we aimed to identify the changes in the nerve growth factor, its precursor (proNGF) and the enzymes involved in their proteolysis in the urine of an aging female population with OAB.

Methods: Urine samples of 20 females of 50-80 years of age with OAB and of 20 controls of the same age group were analyzed by highly specific ELISA and enzymatic kits. Participants completed a clinical evaluation and validated self-reported questionnaires of lower urinary tract symptoms as well as a one-day voiding diary.

Results: Specificity of NGF ELISA kit was confirmed. The ratio proNGF/NGF was significantly increased in the urine of OAB subjects. Urinary enzymatic activities of plasmin and matrix metalloproteinase 7 (MMP-7), the two main enzymes responsible for extracellular processing of proNGF to NGF were similar between controls and OAB when normalized to their inhibitors, respectively α2-antiplasmin inhibitor and TIMP-1. On the other hand, the activity of metalloproteinase 9 (MMP-9), responsible for the proteolysis of NGF into peptides, was markedly increased even when normalized to TIMP-1. Nitric oxide and PGE2, two factors that increase expression and activity of MMP-9, also displayed higher concentrations in urine of OAB patients.

Conclusion: Our study suggests that the ratio ProNGF/NGF could be more reliable as a potential biomarker for OAB rather than NGF level alone. Furthermore, the increase of this ratio might originate from MMP-9 overactivity enhancing NGF proteolysis in OAB and suggest that MMP9 inhibitors could constitute a new therapeutic target to treat OAB patients.

Funding: Quebec Network for Research on Aging
Poster #OM41
CONTINUING EDUCATION FOR THE UROLOGY CLINICAL STAFF: FOCUSED TRAINING FOR OUR FRONTLINE
Wai Lee, Jason Frankel, Pansy Uberoi, Neha Patel, Alvaro Lucioni, Una J Lee, Kathleen C Kobashi
Virginia Mason, Seattle, WA
Presented By: Wai Lee, MD

Introduction: The urology outpatient setting is a complex environment with a broad range of clinical challenges and patient needs. To address the increasing demands, a network of team members work together to provide comprehensive patient care. To improve the efficiency and quality of care, we implemented a continuing education curriculum for the urology section of a multispecialty health care organization, including customer service representatives (CSR), surgery schedulers, medical assistants (MA), and nurses (RN). Our objective is to report our experience with implementing a pilot curriculum for the urology staff and its impact on knowledge and confidence during patient interactions, as well as overall job satisfaction.

Methods: An initial needs assessment was performed and staff were queried on which educational topics would be most beneficial. A six session pilot module on the topics of urinary tract infection, medical and surgical management of nephrolithiasis, hematuria, urinary catheters and diversions, and benign prostatic hypertrophy/urinary retention was developed. Pre- and post-test assessment was performed to measure urological knowledge (3 questions), confidence addressing patient concerns, and overall job satisfaction. A Likert scale (1-5) was used to determine confidence and satisfaction. Mann-Whitney U test was used for statistical analysis of pre- and post-test comparisons.

Results: Each educational session was approximately 20 minutes. Attendance ranged from 17 to 24 staff members. Each didactic session was led by a urology fellow, in either female pelvic medicine and reconstructive surgery or oncology. There was overall significant (p=0.01) improvement in staff confidence scores from pre- (3.02, STD 1.13) to post-test (3.57, STD 0.90). However, there was no change in staff overall job satisfaction (p=0.98). On average, the number of participating staff members correctly answering knowledge-based questions improved by 12.75% after each course.

Conclusion: Based on the results of our six-session pilot, staff confidence and clinical knowledge demonstrated improvement. While general feedback directed at the educational initiative was overwhelmingly positive, our measured overall staff job satisfaction did not improve. Our findings however, have been encouraging and future curricula are planned. To meet the demands of a busy urology office, targeted education for our clinical staff can only improve day-to-day operations and quality of care.
### Table of Contents

<table>
<thead>
<tr>
<th>Didactic Session</th>
<th>Urology Staff Confidence Pre-Test Mean</th>
<th>Urology Staff Confidence Post-Test Mean</th>
<th>Urology Staff Satisfaction Pre-Test Mean</th>
<th>Urology Staff Satisfaction Post-Test Mean</th>
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<td>3.3</td>
<td>3.1</td>
<td>2.9</td>
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<td>2. Medical management of nephrolithiasis</td>
<td>3.6</td>
<td>4.0</td>
<td>2.6</td>
<td>2.9</td>
</tr>
<tr>
<td>3. Surgical management of nephrolithiasis</td>
<td>3.2</td>
<td>3.8</td>
<td>3.3</td>
<td>3.7</td>
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<tr>
<td>4. Urinary catheters and diversions</td>
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<td>4.4</td>
<td>3.1</td>
<td>3.0</td>
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<tr>
<td>5. Hematuria</td>
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<td>3.1</td>
<td>3.1</td>
<td>3.3</td>
</tr>
<tr>
<td>6. Benign prostatic hypertrophy / urinary retention</td>
<td>3.8</td>
<td>3.7</td>
<td>3.6</td>
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**Total (STD)**

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<tr>
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<th>Pre-Test Mean</th>
<th>Post-Test Mean</th>
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<tr>
<td><strong>STD (STD)</strong></td>
<td>3.02 (1.13)</td>
<td>3.57 (0.90)</td>
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<tr>
<td></td>
<td>0.01</td>
<td>0.82 (0.87)</td>
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<tr>
<td><strong>p</strong></td>
<td>3.09 (0.98)</td>
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[Funding: N/A]
Poster #OM42
ARE THE OUTCOMES OF SURGICAL TREATMENT OF WOMEN WITH RECURRENT STRESS URINARY INCONTINENCE (SUI) AS GOOD AS THOSE IN WOMEN WITH PRIMARY SUI?

Huriye Kocadag, Gemma Scrimgeour, Anu Ranasinghe, Bogdan Toia, Lisa Smyth, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
University College London Hospital
Presented By: Huriye Gizem Kocadag

Introduction: Recent publications have indicated worse outcomes in women having surgery for recurrent or persistent stress urinary incontinence (SUI) as compared with women having surgery for primary SUI. We have assessed and compared outcomes in all women having surgery for SUI in our unit.

Methods: A retrospective notes review was performed for 316 women who had SUI surgery from 2007 to 2017 with a minimum of 12 months follow-up. 12 months follow up data with patient global impression of improvement PGII (as a 5 point Likert score with 1 being much better and 5 much worse) was available on 260 women with a median age 54 years (range 17-81). Statistical analysis of was by Chi Square test, T-test and Mann Whitney U Test with significance determined as P<0.05.

Results: 140 women (median age 55 years) had surgery for recurrent or persistent SUI whilst 120 women (median age 53 years) had surgery for primary SUI. Procedures performed were: Sling(57), Colposuspension(46), Transobturator Mid-Urethral Tape(MUT)(91), Retropubic MUT(12), Artificial Urinary Sphincter(16), Bladder Neck Closure (5), Intra-Urethral Bulking(26) and Miscellaneous(7). Median (mean, range) PGII at 12-months following recurrent SUI surgery was 2(1.97, 1-5). This was not significantly different (P>0.05) from median (mean, range) PGII 12-months following primary SUI surgery, which was 1(1.4, 1-5). The outcomes when viewed as success or failure are detailed in the table.

Conclusion: The success rate of surgery for primary SUI is significantly higher than that of recurrent SUI surgery. Whilst PGII scores at 12 months following recurrent SUI surgery are higher than that following primary SUI surgery it is not significantly so and the majority of women rate themselves as better or much better following all types of SUI surgery.

<table>
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<tr>
<th>SUI Diagnosis</th>
<th>Success (PGII 1 and 2)</th>
<th>Failure (PGII ≥3)</th>
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<tr>
<td>Primary</td>
<td>103 (85.9%)</td>
<td>17 (14.1%)</td>
</tr>
<tr>
<td>Recurrent/Persistent</td>
<td>98 (70%)</td>
<td>42 (30%)*</td>
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Funding: N/A
Poster #OM43
DO PREOPERATIVE DEMOGRAPHICS OR SYMPTOMS PREDICT RECURRENCE IN PATIENTS FOLLOWING COMBINED SURGICAL REPAIR FOR PELVIC ORGAN PROLAPSE AND RECTAL PROLAPSE?
Raveen Syan¹, Shannon Wallace², Brooke Gurland³, Ekene Enemchukwu⁴
¹University of Miami, Department of Urology, ²Stanford University, Department of Urogynecology, ³Stanford University, Department of General Surgery, ⁴Stanford University, Department of Urology
Presented By: Shannon Leigh Wallace, MD

Introduction: Growing evidence suggests combined surgical repair for pelvic organ prolapse (POP) and rectal prolapse (RP) is safe and effective, however recurrence rates of POP and/or RP following combined surgery are poorly described. We sought to characterize demographics and presenting symptoms in patients undergoing combined repair and determine pre-operative predictors of recurrence.

Methods: We performed a retrospective review of women who underwent combined RP and POP surgery at a single tertiary center from 2008-2019. Patient demographic data and preoperative symptoms were collected. Patients with recurrent POP (≥Stage 2 anatomic prolapse) and/or RP on examination were identified.

Results: Sixty-three women with a mean follow up time of 1.1 years were evaluated. Five patients were lost to follow up. Mean age at the time of surgery was 65, and the majority patients were Caucasian (62%) and non-smokers (51%) (Figure 1A). The most commonly reported symptoms related to POP were overactive bladder (OAB) (73%) and vaginal bulge (79%), while the most commonly reported symptoms related to RP were obstructive defecation (51%) and fecal incontinence (FI) (68%) (Figure 1A). Postoperatively, 71% of patients with OAB and 87% of patients with vaginal bulge symptoms reported improvement in symptom. Similarly, 81% of patients with obstructive defecation and 79% of patients with FI reported improvement in symptoms. Of thirteen patients (22%) with recurrent POP and/or RP, 7 patients had recurrent POP and 10 had recurrent RP. Increasing age, pulmonary disease, obesity, obstructive urination and obstructive defecation were associated with recurrent POP and/or RP (Figure 1B). After adjusting for confounders, age (OR 1.10 [1.03-1.22]), obesity (OR 25.97 [2.56-623.14]), and obstructive defecation (OR 6.57 [1.03-69.57]) remained statistically significant (Figure 1B).

Conclusion: The majority of patients who undergo combined POP and RP surgery have improvement in symptoms related to RP and POP. Older, obese, women with pre-operative obstructive defecation may have a higher risk of prolapse recurrence following a combined POP and RP procedure. This study contributes to the growing literature on combined RP and POP surgery and can help clinicians provide appropriate counseling on expected outcomes.

Funding: N/A
Poster #OM44  
A COMPARISON OF ARTIFICIAL URINARY SPHINCTER OUTCOMES AFTER PRIMARY IMPLANTATION AND FIRST REVISION SURGERY
Kevin Hebert, Brian Linder, Griffin Morrison, Daniel Elliott  
Mayo Clinic, Dept. Urology, Rochester, MN  
Presented By: Kevin J. Hebert, MD

**Introduction:** The artificial urinary sphincter (AUS) is the gold standard for severe male stress urinary incontinence, although specific predictors for device outcomes are sparse. We sought to compare outcomes between primary and revision AUS surgery for non-infectious failures.

**Methods:** We identified 2045 consecutive AUS surgeries at Mayo Clinic (Rochester, MN) from 1983-2013. Of these, 1079 were primary AUS implantations and 281 were initial revision surgeries and comprised our study group. Device survival rates, including overall and specific rates for device infection/erosion, urethral atrophy and mechanical failure, were compared between primary AUS placements versus revision surgeries. Patient follow-up was obtained through office examination, written correspondence, or telephone correspondence.

**Results:** During the study period 1079 patients (79.3%) had a primary AUS placement and 281 patients (20.7%) underwent a first revision surgery for mechanical failure or urethral atrophy. Patients undergoing revision surgery compared to primary AUS surgery were found to have adverse 1 and 5-year AUS device survival on Kaplan-Meier analysis, 85% vs. 90% and 61% vs. 74%, respectively (p<0.001). Specifically, revision surgery was associated with a significantly increased cumulative incidence of explantation for device infection/urethral erosion, (7.5% vs. 4.2% at 1 year; p=0.02). Similar rates of repeat surgery for mechanical failure (p=0.43) and urethral atrophy (p=0.77) were noted.

**Conclusion:** Our findings suggest a significantly higher rate of overall device failure following revision AUS surgery, which is likely secondary to an increased rate of infection/urethral erosion events.

**Funding:** N/A
Poster #OM45
GENDER IMPACT ON BLADDER-RELATED OUTCOMES AND QUALITY OF LIFE AFTER PARAPLEGIC SPINAL CORD INJURY
Sara Lenherr, MD, MS1, Jennifer S. Herrick, MS1, Odinachi Moghalu, MD, Sean P Elliott, MD, MS2, Angela P Presson, PhD, MS1, John T Stoffel, MD3, Blayne Welk, MD, MSc4, Jeremy B Myers, MD1
1University of Utah, 2University of Minnesota, 3University of Michigan, 4Western University
Presented By: Sara M. Lenherr, MD, MS, FPMRS

Introduction: Females with spinal cord injury (SCI) have been collectively analyzed along with males with SCI, despite the fact that women have fundamentally different genitourinary anatomy. We hypothesized that women have different patient reported outcomes and quality of life (QoL) related to their neurogenic bladder dysfunction.

Methods: The Neurogenic Bladder Research Group (NBRG) SCI Registry is a multicenter prospective observational study designed to assess bladder-related symptoms and QoL after SCI. Outcomes included the Neurogenic Bladder Symptom Score (NBSS) total score and a global satisfaction with urinary function question (NBSS-QoL). Bladder management was categorized as: clean intermittent catheterization without prior bladder surgery (CIC), indwelling catheter (urethral or suprapubic), surgical (bladder augmentation, catheterizable channel, urinary diversion), or voiding (condom catheter, involuntary leaking, volitional). Multivariate linear regression analysis was conducted controlling for age, obesity, years since injury, chronic pain, UTI burden (>4 per year), severe bowel dysfunction, SCI-QoL bladder management difficulties and SCI-FI fine motor score.

Results: 1479 participants (894 male and 585 female) were identified. Mean age of 44 ± 13 years and mean 16 ± 12 years since SCI. SCI level was: 57% paraplegia & 43% tetraplegia. Among paraplegic participants (470 male, 373 female), females who had a bladder surgery (n=71) reported a better total NBSS score (adjusted difference (AD) -3.35, 95% CI -5.85 to -0.85, p=0.009) and better bladder-related QoL (AD -0.71, 95% CI -1.03 to -0.39, p<0.0001) compared to those using intermittent catheterization (n=198). In contrast, males who had surgery (n=30) did not have a statistically different total NBSS total score (AD 1.77, 95% CI 2.01 to 5.55, p=0.36) compared to those using intermittent catheterization (n=327) but bladder-related QoL was improved (AD -0.59, 95% CI -1.11 to -0.07, p=0.03).

Conclusion: There are differences in neurogenic bladder symptoms based on gender after spinal cord injury. Women with paraplegia experience worse bladder-related symptoms and have more opportunity for improvement with surgery. Educational efforts to improve bladder-related outcomes should be tailored to address gender-specific concerns.

Funding: PCORI CER14092138
Poster #OM46
IMPACT OF SURGEON'S EXPERIENCE IN LONG-TERM OUTCOME OF SACRAL NEUROMODULATION
Dean Elterman, Seyed Hossein Saadat, Valentine Shabataev
Presented By: Dean S. Elterman, MD, MSc, FRCSC

Introduction: Management of overactive bladder symptoms, non-mechanical urinary retention, and pelvic/bladder pain can be refractory to modalities such as pelvic floor physiotherapy, oral medications and intravesical injections/instillations. Sacral Neuromodulation (SNM) has shown to be a very effective treatment option for these refractory symptoms. Although this treatment modality has been available for decades, to our knowledge there is no data on the impact of surgeon’s experience on long-term outcomes of SNM.

Methods: Patients who had received SNM implants for the management of LUTS, including bladder and pelvic pain were reviewed. All surgeries were performed by a single surgeon. Initial failure rates during the first two visits. Short term outcomes (during the first 540 days of follow-up) and Long-term results (after 540 days of follow-up) were studied and compared in three groups of patients, based on the surgeons experience as Group A (Implantations during the first 12 months of experience), Group B (Implantations 12-18 months of experience) and Group C (Implantations 18-24 months of experience). Duration of study was limited to December 2015 to allow for a minimum of 3 years follow-up. Failure was defined as < 50% improvement despite conservative management, or revision of the implant due to bothersome symptoms resulting from the implant or inefficacy.

Results: A total of 84 patients were included with at least 3 years of follow-up. The demographic data were similar in the two groups. Of these 23 patients were in group A while the number of implants in groups B and C were 31 and 29 respectively. Mean duration of surgery in groups A and B were 57 minutes and 45 minutes respectively (p=0.004) while this was only 35 minutes in group C (p=0.0006). Initial failure rates (during the first two post-op visits), were higher during the first year than the subsequent two 6 months (13.04% vs 9.67 vs 6.8%) however this was not statistically significant (p=0.23). Short-term and Long-term outcomes were not statistically different in groups A and B. Despite similar Short-term outcomes in group A and group C, Long-term outcomes were significantly better group C (p=0.04).

Conclusion: Surgeons’ experience can play a significant role in long-term outcome of SNM implantation.

Funding: N/A
Poster #OM47
DISCUSSING URINARY INCONTINENCE WITH PROVIDERS IN THE NURSES' HEALTH STUDIES
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Presented By: Giulia Ippolito Lane, MD

Introduction: Urinary incontinence (UI) occurs in up to 60% of women, increases with age and its effects on quality of life can be profound. However, few women discuss UI with medical providers. We aimed to evaluate the prevalence of reported discussions of UI with healthcare providers among two cohorts in the Nurses’ Health Study that span a wide age range, to evaluate potential generational differences between the cohorts.

Methods: Data from the Nurses’ Health Study (NHS I) in 2012, which enrolled women aged 30 to 55 in 1976, and NHS II in 2013, which enrolled women between 25 and 42 years old in 1989 was used to evaluate the role of age and other factors in participant discussions of UI with their healthcare providers. We used multivariable-adjusted logistic regression to estimate odds ratios (OR) of reported provider discussions across relevant characteristics.

Results: Among 94,692 women with UI whose age ranged from 48 to 93, 34% reported discussing UI with their provider. Age was not associated with talking to one’s doctor until age was greater than 80 years (OR 0.81 95% CI (0.73, 0.89)). Provider discussions were directly associated with UI frequency and severity. The odds of women with daily UI to discuss UI with their providers were 4.4 times greater than women who had UI less than once per month (OR =4.36, 95% CI 4.06-4.69). Similarly, women with severe UI (combining high frequency with high volume of urine loss) were twice as likely to discuss UI with their providers compared to women with mild UI (OR=2.01, 95% CI 1.88, 2.16). Greater baseline healthcare utilization was also associated with increased odds of discussing UI with a provider. Factors that decreased odds of discussion included obesity (NHS II: OR=0.88, 95% CI 0.84-0.92), smoking (NHS II OR=0.68, 95% CI 0.61-0.76 and NHS I OR=0.63, 95% CI 0.56-0.71) and age >80 years.

Conclusion: This study finds that only about ⅓ of women with UI discuss this with their health provider across most age groups. Women with more frequent and severe UI were at increased odds of discussing UI with providers. Whereas, women who were elderly, smokers, or obese had decreased odds of discussing UI.
**Funding:** NIDDK, NCI grants

| Table 1. Odds ratios* and 95% confidence intervals for the report of talking with a provider about their HT among women in the Nurses’ Health Studies with among incidence of HT in 2013-2015 according to demographics, Health behaviors, Health status, and HT symptoms |
|---------------------------------------------|------------------|------------------|
| **Demographic Factors**                    | **Nurses’ Health Study I** | **Nurses’ Health Study II** |
| Demographic Factors, %                     | (HT: N=109, Inc: N=799) | (HT: N=109, Inc: N=799) |
| White race, %                              | 1.04 (0.46, 2.32)   | 1.62 (0.68, 3.75)   |
| Income, %                                  | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Employment outside the home or retired     | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Health Behaviors                           |                    |                  |
| Leading home                               | 0.90 (0.40, 1.96)   | 0.90 (0.40, 1.96)   |
| Paid                                      | 0.99 (0.98, 1.00)   | 0.99 (0.98, 1.00)   |
| Retired                                   | 0.99 (0.98, 1.00)   | 0.99 (0.98, 1.00)   |
| Health Status                             |                    |                  |
| Obesity (BMI ≥ 30 kg/m²)                   | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Diabetes                                  | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Ever smoker                                | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Low Systolic Blood Pressure                | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Low Fasting Glucose Level                  | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| **Reported prevalence by category in the last 2 years** |                  |                  |
| Non smoker                                | 0.98 (0.99, 1.00)   | 0.99 (0.99, 1.00)   |
| Current smoker                            | 0.99 (0.99, 1.00)   | 0.99 (0.99, 1.00)   |
| **Uterine Factors**                       |                    |                  |
| Uterine menopausal                        | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Ovarian removal                            | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| **Other Factors**                         |                    |                  |
| Endometrial cancer                         | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Other                                      | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| **HR and 95% CI**                          |                    |                  |
| Non smoker                                | 0.99 (0.99, 1.00)   | 0.99 (0.99, 1.00)   |
| Current smoker                            | 0.99 (0.98, 1.00)   | 0.99 (0.99, 1.00)   |
| **Odds ratios and 95% CI**                 |                    |                  |
| Non smoker                                | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |
| Current smoker                            | 1.00 (0.00, 1.00)   | 1.00 (0.00, 1.00)   |

*Odds ratios include 95% confidence intervals.**
Poster #OM48
HIGH-DENSITY SURFACE ELECTROMYOGRAPHIC ASSESSMENT OF PELVIC FLOOR HYPERTONICITY IN IC/BPS PATIENTS
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Presented By: Yingchun Zhang, PhD

Introduction: Pelvic floor hypertonicity (PFH) is a debilitating symptom of interstitial cystitis/bladder pain syndrome (IC/BPS). The diagnosis and assessment of PFH are based on subjective pelvic examinations, and results between examiners may vary. Precise assessment and localization are critical to the clinical diagnosis and management of PFH. This study aims to provide innovative techniques to objectively and minimally-invasively assess neurogenic PFH in women with IC/BPS using intra-vaginal high-density surface electromyography (HD-sEMG) probe.

Methods: Seven female subjects (44±13 yr.) with a prior diagnosis of IC/BPS were recruited. A full pelvic exam was administered to identify hypertonic muscles. Intra-vaginal HD-sEMG was then acquired at rest from a novel 64-channel HD-sEMG probe, as shown in Figure 1(a). Z-scores were calculated using the subjects without hypertonicity as a reference population, as shown in Figure 1(b). Root-mean-squared (RMS) amplitude during resting state was calculated for each channel to define a hypertonicity index and hypertonic zone. Innervation zones (IZs) were identified from the bipolar mapping of decomposed signals and summarized into an IZ distribution mapping.

Results: Of the 7 subjects recruited, 5 had normal pelvic floor muscle tone and 2 exhibited hypertonicity upon muscle palpation. Women with PFH demonstrated a much higher hypertonicity index (12.6±3.5 vs. 4.5±1.2). The hypertonic zone defined by the 64-channel RMS mapping coincided with the digital hypertonic muscle assessment, as shown in Figures 1(c) and 1(d) for two subjects without hypertonicity, and Figures 1(e) and 1(f) for the two subjects with hypertonicity. On average 4±0.8 motor units were decomposed, and the corresponding IZs were localized, as shown in Figures 1(g) and (h) for two women without hypertonicity, and Figures 1(i) and (j) for the women with hypertonicity, where each red or blue represents an innervation zone near, or away from the hypertonic region, respectively.

Conclusion: This study represents the first effort to employ intra-vaginal HD-sEMG to assess PFH in women with IC/BPS. Our results demonstrate the feasibility of HD-sEMG to provide a quantitative analysis of PFH and provide precise localization of hypertonic muscles and IZs. The proposed HD-sEMG based techniques provide promising tools for clinical diagnosis and treatment of PFH, such as the personalized guidance of BoNT injections.
This study received funding support from the SUFU Foundation and NIH DK113525.
Poster #OM49
PATIENT SATISFACTION IMPROVED WHEN PATIENTS SEEN BY MULTIPLE PROVIDERS AT A MULTIDISCIPLINARY PELVIC HEALTH CENTER
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Presented By: Jacqueline M. Speed, MD

Introduction: Patient satisfaction is an important metric in the American healthcare system. While multidisciplinary clinics have been suggested to improve the care of patients with pelvic floor dysfunction, there is a paucity of data looking at patient satisfaction in this setting. Our aim is to compare patient satisfaction rates among patients with pelvic floor dysfunction who were seen by multiple providers versus a single provider at the Stanford Pelvic Health Center (SPHC).

Methods: Patients who had an appointment at the SPHC from August 2018 to August 2019 were sent a Press Ganey satisfaction survey to assess their clinic experience. Domains of the survey included ease of access to the clinic, care by ancillary staff, care by physicians, and likelihood to recommend the provider and the practice. Survey results were compiled and compared between patients who saw one provider versus patients who saw more than one provider during the visit. Chi square tests were used to compare proportions of patients who gave the most favorable survey answer (i.e. “top box”) score.

Results: We identified 314 unique survey responses, 92 (29%) from patients who had seen multiple providers and 222 (71%) from patients who had seen a single provider. Patients seen by multiple providers answered the top box score more frequently than single provider patients for “Amount of time the care provider spent with you” (87.1% versus 72.9%, p<0.05), “Your confidence in the care provider” (89.0% versus 75.9%, p<0.05), and “Concern the care provider showed for your questions or worries” (91.3% versus 74.3%, p<0.05) amongst other questions. Notably, while patients seen by multiple providers were more likely to recommend the practice (93.2% versus 74.2%, p<0.05), there was no difference in likelihood of recommending the provider (86.7% versus 78.3%, p=0.09). Additionally, there was no difference in ability to schedule appointments (p=0.67).

Conclusion: Patients with pelvic floor dysfunction seen at SPHC by multiple providers during a visit had generally higher satisfaction rates regarding their care by physicians and were more likely to recommend the practice than patients seen by a single provider. There was no difference in ability to schedule appointments. Multidisciplinary clinics, when possible, may optimize the patient experience.
Funding: N/A
POSTER #NM1

ULTRASOUND-DEFINED BLADDER SHAPE PARAMETERS FOR IMPROVED OVERACTIVE BLADDER PHENOTYPING: A REPEATABILITY STUDY USING HEALTHY VOLUNTEERS

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Presented By: Kaitlyn Maddra, MD

Introduction: Recent studies highlight the potential value of non-invasive ultrasound imaging which has used to quantify bladder shape and its association with overactive bladder. However, the determination of bladder shape has been based on manual tracing of bladder perimeters using ultrasound-obtained images. Therefore, the objective of this study was to assess the repeatability of bladder shape parameters from ultrasound images obtained from multiple fills and visits.

Methods: Healthy individuals were recruited to complete an oral hydration study with two visits approximately one week apart, each with two consecutive bladder fill-empty cycles, for a total of four fills per participant. During each fill, 3D ultrasound images were recorded every 5 minutes and analyzed using GE 4D View software. Perimeters were manually traced in six cross-sectional planes, each 30° apart, generating measurements that were then interpolated to standard bladder volumes of 200, 300, and 400ml. To quantify repeatability, the intraclass correlation coefficient (ICC) and the normalized mean absolute difference were calculated for each perimeter at each volume with moderate repeatability defined as ICC ≥ 0.5 and good defined as ICC ≥ 0.75.

Results: Data from 16 healthy participants (9 females and 7 males) were analyzed. The ICCs at 200, 300, and 400ml (n=11, 12 and 10) were respectively 0.52, 0.40, 0.60 for the transverse perimeters, 0.20, 0.42, 0.64 for the sagittal perimeters, and 0.48, 0.69, 0.81 for the coronal perimeters. Five of nine ICCs showed moderate or good repeatability (ICC ≥ 0.5). Furthermore, the mean absolute difference/mean ratio was ≤4% for all three perimeter measurements at all three volumes, indicating that perimeter repeatability was consistent through multiple fills and visits.

Conclusion: This study provides initial evidence that bladder shape diagnostics may be repeatable and might be feasible as a non-invasive means to improve OAB phenotyping.

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Poster #NM2
GETTING PATIENTS WITH OAB ADEQUATELY TREATED - ATTRITION RATES AND THIRD LINE THERAPIES IN A CONTEMPORARY PRACTICE
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Presented By: David Abramowitz, MD

Introduction: Overactive bladder (OAB) is very common and has been shown in the literature to be often times under treated. This is likely multifactorial however many patients do not return for follow-up visits to their Urologist. Instituting a multimodal care pathway for OAB patients is thought to help patients have goal directed care and increase patient compliance. Herein we describe our attrition rates as well as progression to third line therapies for before and after implementing a standardized care pathway.

Methods: A retrospective chart review from January 1, 2016 to July 31, 2019 was completed from a single Female Urologist for OAB visits. The attrition rate as well as rates of third line therapies were evaluated. A care pathway was implemented in the end of 2017.

Results: A total of 1,703 unique patients were seen for OAB over the study period. Before implementation of the care pathway, 44.3% went on to having a second visit and 16.2% of patients had five visits. After care pathways were implemented, the rates making it to a second and fifth visit were 40.3% and 13.5% respectively. Progression to third line therapy before and after care pathways being started were 24.5% and 30.7% respectively.

Conclusion: High attrition rates are seen in the contemporary practice treating OAB patients. Care pathways do not seem to improve the rates of patients returning for successive visits in our experience. However, there was an increase in rates of third line therapies received by patients after implementation of care pathways. This could be due to an improved patient experience navigating through the progress of their symptomatology for a subset of patients.

Funding: N/A
**Poster #NM3**
**DECISION AIDS IMPROVE PATIENT-REPORTED SHARED DECISION MAKING: AN ANALYSIS OF SURGICAL CONSUMER ASSESSMENT OF HEALTHCARE PROVIDERS AND SYSTEMS (CAHPS) DATA**

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Presented By: Giulia Ippolito Lane, MD

**Introduction:** Shared Decision Making (SDM) is a process of making medical decisions that balances the best available evidence with patients' preferences and values. While SDM can include the use of decision aids (DA), it is unclear whether use of DA correlates with SDM. The purpose of this study was to examine whether the use of DA was associated with improved patient-reported SDM or increased satisfaction with their surgeon.

**Methods:** We performed a secondary analysis of prospectively collected Surgical Consumer Assessment of Healthcare Providers and Systems (S-CAHPS) surveys from adults undergoing elective, pelvic reconstructive surgeries between 2011-14 by 7 urologists. S-CAHPS is a standardized 45-question tool used to assess patient satisfaction around one episode of surgical care. For this study we created a novel SDM composite score from 3 items related to SDM. DA use and patients' satisfaction with surgeons were based on patients' response to one question items. (Figure) Ordinal logistic regression was performed to assess factors influencing patients' evaluation of shared decision making and overall satisfaction with their surgeon.

**Results:** A total of 430 surveys (34%) were returned. Respondents were mostly Caucasian (94%) females (54%) with a mean age of 60 years. Among respondents, 59% reported DA use during preoperative visits and the majority (71%) achieved a maximum score (3) on the SDM composite. We found that utilizing a DA increased the odds of SDM (OR 1.77, 95% CI 1.07, 2.93) when controlling for patient age, time to survey response, surgeon, patient education rating, ethnicity, race, gender, and overall patient satisfaction with surgeon. However, there was no association between DA use nor SDM composite scores with patient reported satisfaction with their surgeon.

**Conclusion:** Our findings suggest that that decision aids increase the odds of patients reporting higher levels of shared decision making during pre-surgical counseling. However, neither DA use nor SDM composite scores were associated with patient reported satisfaction with their surgeon.

**Funding:** N/A
Poster #NM4
EFFECT OF PREOPERATIVE 5ALPHA-REDUCTASSE INHIBITORS TREATMENT ON THE EFFICIENCY OF THULIUM:YAG(REVOLIX®) VAPORESECTION FOR BENIGN PROSTATIC HYPERPLASIA
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Presented By: Sung Dae Kim

Introduction: Preoperative use of 5a-reductase inhibitors (5ARIs) may cause fibrosis of the prostate tissue and reduce the efficiency of thulium laser surgery for treating benign prostate hyperplasia (BPH). Thus, we investigated the effects of preoperative 5ARI use in this setting.

Methods: This retrospective study examined 184 patients who underwent thulium laser surgery for BPH during 2012–2017. Patients were grouped according to their 5ARI use in order to compare their preoperative and intraoperative characteristics and subsequent outcomes. Surgical efficiency was assessed using vaporesection efficiency. The total operation time, vaporesection time and prostate volume change were measured.

Results: The 5ARI+ group included 83 patients (45.1%) and the 5ARI– group included 101 patients (54.9%). There were no significant differences in the two groups' preoperative characteristics, postoperative prostate size, thulium laser energy use, or prostate volume reduction rate. However, relative to the 5ARI– group, the 5ARI+ group had a significant shorter total operative time (65.0 min vs. 70.0 min, P=0.013) and a significantly shorter vaporesection time (48.0 min vs. 54.0 min, P=0.014), which resulted in significantly higher vaporesection efficiency in the 5ARI+ group (0.66 mL/min vs. 0.51 mL/min, P < 0.001). Both groups exhibit significant improvements in their quality of life score and International Prostate Symptom Score during the 12-month follow-up.

Conclusion: In contrast with our expectations, the preoperative use of 5ARI increased the efficiency of thulium laser surgery for BPH. Thus, it may not be necessary to stop 5ARI treatment before performing thulium laser surgery in this setting.

Funding: N/A
Poster #NM5
VALIDATION OF THE DIAGNOSTIC ACCURACY OF DIAGNOSTIC GROUPINGS OF PATIENTS WITH STORAGE LOWER URINARY TRACT SYMPTOMS GENERATED BY MACHINE LEARNING ALGORITHMS
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Presented By: Kai B. Dallas, MD

Introduction: Irritative lower urinary tract symptoms (LUTS), which include urinary urgency, frequency, nocturia, painful urination, and bladder discomfort, represent a set of overlapping, poorly defined conditions that are both difficult to define and treat. We previously used machine learning algorithms to identify and classify bothersome LUTS into a diagnostic system using patient reported symptoms alone prior to physician assessment. The major refinements of this classification schema separated the common diagnoses of interstitial cystitis and overactive bladder into four, more specific symptom clusters of urgency incontinence, bladder pain syndrome, pelvic floor dysfunction and non-urologic pelvic pain. Although this grouping is optimal statistically and represent logical phenotypes, we aim here to validate the diagnostic accuracy of this new classification.

Methods: For 514 consecutive patients presenting to an FPMRS specialty clinic between June and December 2017, patient clinical diagnosis was validated by review by two FPMRS specialists in a manner independent and blinded from the clustering algorithm. These diagnoses included three groups: overactive bladder, interstitial cystitis/bladder pain syndrome, pelvic floor dysfunction and all others. Random forest models were created to predict both the diagnoses created by the clustering algorithm and the physician. The accuracy and reproducibility of each was then assessed with 10-fold cross validation.

Results: The diagnostic accuracy was 89.8% (Kappa 0.869) for the clustering algorithm diagnosis and 79.0% (Kappa 0.641) for specialist physician diagnosis. There were differences in the variables most important for prediction for each group, with patient age, weight and height being the most important predictive factors for physician diagnosis (Figure 1a) in contrast to survey responses for the clustering algorithm diagnosis (Figure 1a).

Conclusion: Machine learning algorithms cluster patients in logical phenotypic-specific groups based on validated questionnaires. The clustering algorithm grouping has greater diagnostic accuracy than specialist physician diagnosis. Furthermore, this grouping relies only on validated questionnaire response and patient demographics, and thus can be assigned without assessment by a subspecialized physician, to which access can be limited. Thus, this novel LUTS classification algorithm is accurate, validated, and corresponds with logical, frequently encountered patient phenotypes. Future directions will be to assign treatment plans based on this new grouping system to assess its prognostic utility in a clinical setting.
Figure 1: Predictive importance* of different variable for the physician assigned grouping, a.), and the clustering algorithm grouping, b.)

Funding: N/A
Poster #NM6

A NOCTURNAL URINE TRAJECTORY INDEX FOR NOCTURNAL POLYURIA
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Presented By: Thomas F. Monaghan

Introduction: Recent research has shown that patients with idiopathic nocturnal polyuria (NP), termed “nocturnal polyuria syndrome” (NPS), demonstrate a unique surge in diuresis during the early hours of sleep, whereas patients with secondary causes of NP (e.g., obstructive sleep apnea [OSA], congestive heart failure [CHF], and chronic kidney disease [CKD]), are more likely to experience a peak diuresis rate during the late nocturnal period. However, the relative contributions of early and late nocturnal urine volumes to the total nocturnal urine volume (NUV) remains unclear. This study compares the first nocturnal voided volume (FNVV) to the nocturnal average voided volume (NAVV) in patients with NPS and secondary NP.

Methods: A database of voiding diaries from men treated at a Veterans Affairs urology clinic was analyzed to identify first complete diaries from patients ≥18 years with ≥2 nocturnal void(s) who met the criteria for NP. Two separate analyses were performed using different criteria for NP: NUV >90 mL/h and nocturnal polyuria index (NPI; NUV/24-h volume) >0.33. Patients with diabetes insipidus were excluded. Patients were divided into 2 groups: secondary NP (OSA, CHF, CKD, edema, or diuretic use) and NPS (absence of the aforementioned comorbidities). FNVV was defined as the volume of urine produced during the first nocturnal episode. NUV was defined as the sum of volumes from all actual nocturnal voids (ANV) + the first daytime voided volume. NAVV was defined as (NUV/[ANV+1]). The nocturnal urine trajectory index (NUTi) was defined as FNVV/NAVV. A Wilcoxon rank-sum test was used to compare groups.

Results: At NUV >90 mL/h, the NUTi was 1.10 (0.86-1.33 [IQR]) in patients with NPS (n=63) and 0.98 (0.74-1.14) in patients with secondary NP (n=42) (p=0.023). At NPI >0.33, the NUTi was 1.09 (0.88-1.31) in patients with NPS (n=83) and 1.00 (0.83-1.16) in patients with secondary NP (n=56) (p=0.045).

Conclusion: In patients with NPS, the volume of urine produced at the time of the first nocturnal void is significantly greater than the volume of subsequent nocturnal voids. The disproportionate contribution of FNVV to NUV suggests that the NUTi is a possible means of monitoring treatment response in patients undergoing behavioral or pharmacologic interventions for nocturia owing to idiopathic NP.

Funding: N/A
Poster #NM7
ARE NOCTURNAL POLYURIA AND 24-HOUR POLYURIA MUTUALLY EXCLUSIVE?

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Presented By: Thomas F. Monaghan

Introduction: The most recent lower urinary tract symptoms (LUTS) terminology report from the International Continence Society (ICS) eliminated the distinction between nocturnal polyuria (NP) and global polyuria (GP) by removing “GP” and replacing it with “Polyuria (global symptom),” with related subcategories “NP” and “Diurnal Poluria” (DP). This study aims to determine the overlap between 24-h polyuria, NP, and DP in a urology clinical population.

Methods: A frequency-volume chart (FVC) database of men treated for LUTS at an outpatient urology clinic was analyzed to identify FVCs completed by patients ≥18 years with ≥1 nocturnal void(s). Three separate analyses were performed using different urine production hourly criteria for 24-h polyuria, NP, and DP: 1) urine volume >1.67 mL/kg/h (extrapolated from the ICS definition for 24-h polyuria [>40 mL/kg/24-h]); 2) urine volume >125 mL/h (extrapolated from an alternative definition for 24-h polyuria [3000 L/24-h]); and 3) urine volume >90 mL/h (extrapolated from a proposed definition for NP [nocturnal urine volume >90 mL/h]). For each analysis, patients were included if their nocturnal urine production (volume/sleeping hours) and/or diurnal urine production ([24-h volume – nocturnal volume]/[24 – sleeping hours]) exceeded the cutoff. Patients were then categorized as having 1 of 5 mathematically permissible phenotypic combinations: 1) isolated NP, 2) isolated DP, 3) 24-h Polyuria + NP, 4) 24-h Polyuria + DP, and 5) 24-h Polyuria + NP + DP. (As uniform volume/hour cutoffs were applied for 24-h Polyuria, NP, and DP for each analysis, neither a phenotype of 24-h Polyuria without NP or DP, nor NP + DP without 24-h Polyuria, were possible.)

Results: A total of 50 patients were included at >1.67 mL/kg/h; 80 patients were included at >125 mL/h; and 141 patients were included at >90 mL/h (Table 1).

Conclusion: Multiple patients met the criteria for all possible phenotypic combinations at all volume cutoffs applied. Our findings suggest considerable overlap between 24-h Polyuria, NP, and DP among nocturia patients.
**Table 1: Nocturnal Polyuria, Diurnal Polyuria, and 24-hour Polyuria Phenotypes**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Distribution of Phenotypes</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1.67 ml/kg/h</td>
<td>Nocturnal Polyuria n=31</td>
</tr>
<tr>
<td></td>
<td>24-h Polyuria n=10</td>
</tr>
<tr>
<td></td>
<td>Diurnal Polyuria n=0</td>
</tr>
<tr>
<td>&gt;125 ml/h</td>
<td>Nocturnal Polyuria n=38</td>
</tr>
<tr>
<td></td>
<td>24-h Polyuria n=11</td>
</tr>
<tr>
<td></td>
<td>Diurnal Polyuria n=0</td>
</tr>
<tr>
<td>&gt;90 ml/h</td>
<td>Nocturnal Polyuria n=50</td>
</tr>
<tr>
<td></td>
<td>24-h Polyuria n=22</td>
</tr>
<tr>
<td></td>
<td>Diurnal Polyuria n=0</td>
</tr>
</tbody>
</table>

**Funding:** N/A
Poster #NM8
RATES OF TERTIARY PROCEDURES AMONG WOMEN REFERRED FOR URINARY INCONTINENCE
Claire Burton¹, Gabriela Gonzalez², Falisha Kanji³, Ashley Caron³, Catherine Bresee⁴, Karyn S. Eilber³, A. Lenore Ackerman³, Jennifer T. Anger³
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Presented By: Claire Burton, MD

Introduction: Urinary incontinence (UI) is common, affecting 20% of women, but surgical rates for women with both stress UI (SUI) and urge UI (UUI) have been reported to be as low as 5-10% (Anger 2009, Moskowitz 2018). Additionally, primary care providers (PCPs) may believe that women with UI require diagnostic procedures such as urodynamics or cystoscopy. We sought to evaluate whether there were any patient factors that could predict who may require a procedure in order to help guide PCPs optimize specialist referrals.

Methods: Women consecutively referred by their PCPs for new or worsening bothersome UI to FPMRS group practices at two academic institutions between March 2017 and July 2018 were identified. We collected data on the care received in the twelve months prior to referral as well as the specialist care provided in follow-up until June 2019 and compared patient characteristics in those who did or did not receive a procedure.

Results: Of 200 women referred, 35 (18%) underwent a diagnostic procedure with either urodynamics or cystoscopy. An additional four (2%) were recommended to have a diagnostic procedure but did not proceed. Forty-eight (24%) underwent a therapeutic intervention including 33 mid-urethral slings (MUS), 5 bulking agents, 14 intravesical Botox, 3 posterior tibial nerve stimulation, and 1 sacral neuromodulation. An additional eight (4%) were recommended to undergo a procedure. Patients were more likely to receive a diagnostic procedure if they were referred for urgency symptoms (32%, p=0.04), and more likely to have a therapeutic intervention if referred for stress symptoms (37%, p = 0.01). There were no differences in age, ethnicity, insurance type, BMI, or whether the UI symptoms were new compared to worsening in those who received diagnostic or therapeutic procedures. There was also no difference in surgical rates among those who had been previously recommended behavioral management or not.

Conclusion: The majority of women referred for new or worsening UI do not require diagnostic or therapeutic intervention. Among women who saw a specialist, there were no factors that were associated with who required or received an intervention. The best way to optimize referrals may be to ask if the patient is interested in an intervention prior to referral.

Funding: R56DK117261 (JA)

Poster #NM9
WITHDRAWN
TRIAMCINOLONE ACETONIDE INJECTIONS FOR THE TREATMENT OF RECALCITRANT POST-RADICAL PROSTATECTOMY VESICOURETHRAL ANASTOMOTIC STENOSIS - A LARGE MODERN-DAY SERIES

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Presented By: Sarah R. Ferrara, MD, BScH, FRCSC

Introduction: Vesicourethral anastomotic stenosis (VUAS) is a recognized complication of radical prostatectomy (RP). Recalcitrant VUAS can be difficult to manage, often requiring multiple treatments. We sought to evaluate the success of bladder neck injections of triamcinolone at the time of transurethral bladder neck incision (BNI) for prevention of recurrent or recalcitrant post-RP VUAS.

Methods: Patients with recurrent or recalcitrant VUAS post RP +/- radiation were offered triamcinolone injections at the time of BNI. VUAS was diagnosed after RP by symptoms followed by cystoscopy or urethrography. The outpatient procedures were done under general anesthesia. Cold knife incisions were made at the 3 and 9 o’clock bladder neck (BN) positions, followed by triamcinolone injections (4mg/mL) into the incision sites. Post-operative catheterization was 5-7 days. Treatment outcomes were determined by clinical follow-up and cystoscopy.

Results: A total of 18 men underwent 25 procedures over a 4-year period. Mean age at diagnosis of VUAS was 64, and mean time to VUAS was 13.8 months after RP. Fourteen patients (77.8%) had undergone some form of radiation treatment. The men had undergone 128 prior unsuccessful VUAS treatments, with a mean of 7.1 failed treatments per patient. Failed treatments included dilation, BNI, BN injection of Mitomycin C, or ALLIUM stent placement. The overall success rate after a mean of 16.2 months from the time of triamcinolone injection was 83.3%. Six patients went on to have successful incontinence surgery. Five patients (27.8%) had treatment complications (bleeding, urinary tract infection, pain, and urinary extravasation). The three patients who did not respond to treatment are stable and awaiting re-treatment with triamcinolone injection.

Conclusion: Triamcinolone bladder neck injection for post-RP VUAS is a useful and safe treatment for recurrent or recalcitrant stenosis. Associated incontinence can subsequently be treated.

Funding: N/A
Poster #NM11
NUMERACY IN FUNCTIONAL UROLOGY
Rachael Sussman, MD\(^1\), Christina Escobar, MD\(^2\), Dora Jericevic, MD\(^2\), Cheonguen Oh, PhD\(^2\), Alan Arslan, PhD\(^2\), Ricardo Palmerola, MD\(^2\), Victor Nitti, MD\(^3\), Scott Smilen, MD\(^2\), Dominique Pape, MD\(^2\), Nirit Rosenblum, MD\(^2\), Benjamin Brucker, MD\(^2\)
\(^1\)MedStar Georgetown University Hospital, \(^2\)New York University, \(^3\)UCLA
Presented By: Rachael Dana Sussman, MD

**Introduction:** Numeracy, or the ability to understand and work with numbers is an important part of health literacy. To our knowledge, no studies have evaluated numeracy in a functional urology population, or the impact of one’s numeracy on his/her estimation of urinary frequency.

**Methods:** We conducted a prospective, single center study at a metropolitan, academic, tertiary care referral center for functional urology. Eligible patients included those asked to complete a 3-day voiding diary (VD). The Lipkus Numeracy Scale, a previously validated tool, was used to assess numeracy; scores ranged 0-3 with those scoring \(\leq 1\) considered to be innumerate. Prior to VD completion, patients estimated daytime and nighttime frequency using 3 question types: 1) how many times they voided 2) how many hours they waited in between voids, and 3) how many times they voided over the course of 4 hours. Estimated number of voids was compared to that recorded on the VD.

**Results:** 114 patients completed study questionnaires and 71 of those completed the VD. Fifty-five percent of patients were considered innumerate with 22%, 33%, 25% and 19% scoring 0, 1, 2 and 3 on the Numeracy Scale respectively. Our population consisted of 21% males and 79% females; numeracy was not different between men and women (1.67 (1.05) vs 1.36 (1.03) \(p=0.193\)). Sixty-six percent of our population held a Bachelor’s degree or higher, and those patients with higher education were 8 times more likely to be numerate than those without (OR 8.15 95% CI 2.86-27.18). There was no difference in the numeracy of patients who completed the VD and those who did not (1.32 (1.08) v 1.58 (0.960) \(p=0.201\)). For every question type, the predicted voids of numerate patients were more correlated to the VD than those of innumerate patients, although this did not reach statistical significance (Table 1). In a logistic regression analysis, innumeracy was associated with overestimating daytime frequency for questions 2 and 3.

**Conclusion:** Patients in our functional urology clinic population have limited numeracy, with over half considered to be innumerate. While not statistically significant there is a trend towards better estimation of urinary frequency as reported on a VD for numerate patients.

**Funding:** NA
Poster #NM12
A SYSTEMATIC REVIEW OF THE EVIDENCE LINKING LOW BACK PAIN AND URINARY SYMPTOMS.
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Presented By: Blayne Kaili Welk, MD

Introduction: To conduct a systematic review to identify epidemiological studies of mechanical low back pain and urinary dysfunction, and to identify potential evidence supporting a mechanism for this relationship.

Methods: A systematic online search was conducted of EmBASE, Medline, CINAHL and PEDro. We excluded studies where an obvious link between low back pain and urinary dysfunction exists (such as cauda equina syndrome). Two reviewers used a priori inclusion/exclusion criteria to screen the titles, abstracts, and full text. Study results, and limitations of the relevant studies were identified and extracted and summarised with a narrative review. Study quality was assessed using the NIH quality assessment tools.

Results: A total of 22/930 studies were included. There were 12 studies that addressed the epidemiological link between low back pain and urinary symptoms. They all demonstrated that there was a significant association between urinary incontinence/urinary symptoms and low back pain, with adjusted odds ratios varying from 1.1 to 3.1. The majority assessed non-differentiated urinary incontinence. Two cohort studies demonstrated that baseline incontinence or low back pain increased the risk of the new development of the other condition. Results were consistent when stratified by gender, age, and when more complex adjustments for confounders was done. Study quality was generally low to moderate. There were 8 studies that reported on an assessment/intervention related to pelvic floor function, urinary symptoms and low back pain. Pelvic floor dysfunction was common in women with low back pain, however randomized studies and pre-post studies reported mixed results for pelvic floor physiotherapy improving low back pain. Study quality was generally low. No other studies reporting assessments/interventions of potential mechanisms to explain the association of low back pain and urinary symptoms were identified.

Conclusion: Low back pain and urinary incontinence are associated in large epidemiological studies, and the presence of one condition seems to predispose the patient to the development of the other. There is limited evidence to suggest pelvic floor interventions are useful to treat low back pain in this patient population, therefore the most likely mechanism for this relationship is still unclear. Further study is needed to determine if there is a causal relationship between back pain and urinary symptoms.

Funding: N/A
Poster #NM13

CLINICAL EPIDEMIOLOGY OF BOO SUBTYPES IN MEN WITH LOWER URINARY TRACT SYMPTOMS AND NORMAL DETRUSOR CONTRACTION (CONTRACTILITY) DURING VOIDING

Peter F.W.M. Rosier, MD PhD
Department of Urology, University Medical Center Utrecht
Presented By: Peter Rosier, MD, PhD

Introduction: Bladder outflow obstruction (BOO) is present in a significant percentage of men with symptoms of LUT dysfunction. The urodynamic pressure flow (p/Q) graph (Griffiths distensible-collapsible tube –flow controlling zone -hydrodynamics-theory) shows distension and collapse of the bladder outlet during voiding, associated with the prostate passive mass-volume effect on the outlet. Apart from this compressive BOO-type the existence of a constrictive type and also a ‘dis-elastic’ or ‘prostate middle lobe’ type is described earlier. These subtypes may become relevant for selection out of modern minimally invasive (little mass resecting) surgical methods.

Methods: We selected 876 measurements out of ±2500 consecutive male patients with LUTD aged 21 -105 mean 66,5 years that underwent urodynamic testing and voided representatively at least 100mL during p/Q with a normal –strength of- detrusor contraction.

Results: 241 (27,5%) of the men had no BOO; 211(24,1%) had intermediate/equivocal BOO and 424 (48,4%) had BOO, according to the ICS nomogram. Almost all patients without BOO or with intermediate BOO had a normal compressive type of pressure flow curve in only 11 of these patients (2,4%), had a constrictive type of BOO with a low foot-point. 49,5% of the patients with BOO had a constrictive type of obstruction, (with a steeper pressure flow curve). This indicates that the distension (not mass effect) is the flow limiting element. Of the patients with a compressive type of obstruction there was urodynamic evidence of prostate middle lobe kinking in 24,3%.

Conclusion: We have evaluated the prevalence of 3 sub types of BOO; the compressive, the constrictive and the middle lobe type, in a large cohort of men with normal bladder contractility. Urodynamic staging and grading of dysfunction in men with signs and symptoms, not only leads to diagnosis of detrusor overactivity, detrusor underactivity and or absence of BOO but also to grading of BOO. Classification of BOO type may be of further help to individualize management, to reduce harm and or unnecessary interventions and be valuable to improve outcome of management when BOO is (one of the) cause(s) of the symptoms.

Funding: N/A
**Poster #NM14**  
**FACTORS ASSOCIATED WITH POST-OPERATIVE URINARY RETENTION IN PATIENTS UNDERGOING IMPLANTATION OF INFLATABLE PENILE PROSTHESIS: A SINGLE CENTER EXPERIENCE**  
Johnathan Drevik, MD\(^1,2\), Jacob Lucas, DO\(^1,2\), Shishir Gupta, BS\(^1\), Jay Simhan, MD\(^1,2\), Joshua Cohn, MD\(^1,2\)  
\(^1\)Department of Urology, Einstein Healthcare Network, Philadelphia, PA, \(^2\)Department of Urology, Fox Chase Cancer Center, Philadelphia, PA  
Presented By: John Drevik, MD

**Introduction:** Post-operative urinary retention (POUR) is dependent on patient, surgical, and anesthetic-related risk factors. The rates of POUR following inflatable penile prosthesis (IPP) are not well defined but are of interest given the potential implications for length of stay and feasibility of outpatient surgery. Herein we attempt to characterize and identify potential risk factors for POUR after IPP.

**Methods:** We reviewed all patients who underwent IPP implantation by a single surgeon (JS) from August 2014 to December 2018 with data regarding POUR. All procedures were performed under general anesthesia. A Foley catheter was placed at the start of each case and the bladder emptied prior to removal at the end of the procedure. Post-void residuals (PVR) were checked after the first void post-operatively, and indwelling catheterization or intermittent catheterization performed for PVR >350 mL or symptomatic retention at lesser volumes. We compared patients who experienced post-operative urinary retention (POUR), defined as need for urinary catheterization at any time postoperatively, to patients who did not experience post-operative urinary retention (N-POUR).

**Results:** Complete data was available for 135 patients, of whom 35 (26%) experienced POUR and 100 (74%) did not. Among those with POUR, median catheterization volume was 479 mL (IQR 345-675 mL). Among men with POUR, 71% (25/35) had resolution prior to discharge; the remaining 29% (10/35) successfully passed a void trial within 72 hours of surgery. There were no significant differences in age, race, BMI, or history of BPH or preoperative usage of alpha-blockers among men with and without POUR (Table 1). The rate of POUR was significantly lower in men who were post prostatectomy (7% vs 35%, \(p<0.001\)), who were significantly less likely to be diabetic (19% vs. 47%, \(p=0.04\)). On multivariable analysis, absent history of prostatectomy was significantly associated with POUR (OR 8.02, 95% CI 2.03-31.6, \(p=0.003\)).

**Conclusion:** Among men undergoing IPP placement, one-quarter experienced POUR, which was significantly less frequent among those with a history of prostatectomy. Men who were post-prostatectomy were less likely to be diabetic, suggesting both anatomy (i.e. absent prostatic obstruction) and function (i.e. detrusor underactivity) may contribute significantly to POUR after IPP.

| Table 1. Basic patient demographics in patients undergoing implantation of inflatable penile prosthesis |
|-----------------------------------------------|-----------------------------------------------|-----------------|---|
| Age, years, mean(SD) | 60.3 (8.2) | 62.0 (8.5) | 0.30 |
| Race, n (%) | | | 0.73 |
| African American | 18 (51.4) | 49 (49.0) | 0.62 |
| Asian | 1 (2.9) | 1 (1.0) | |
| Hispanic White | 15 (42.9) | 44 (44.0) | |
| BMI, mean (SD) (kg/m\(^2\)) | 31.0 (5.3) | 32.1 (5.9) | 0.31 |
| Diabetes mellitus, n (%) | 14 (40.0) | 35 (35.0) | 0.66 |
| Hypertension, n (%) | 21 (60.0) | 62 (62.0) | 0.84 |
| Hyperlipidemia, n (%) | 7 (20.0) | 28 (28.0) | 0.55 |
| Urethral stricture, n (%) | 1 (2.9) | 2 (2.0) | 0.99 |
| Radical prostatectomy, n (%) | 3 (8.6) | 40 (40.0) | <0.001 |
| Prior alpha-blocker use, n (%) | 4 (11.4) | 11 (11.0) | 0.99 |
| Operative Time, median (25-75 IQR) (mins) | 124.0 (116.0-143.0) | 125.0 (110.0-152.0) | 0.34 |

**Funding:** N/A
Poster #NM15
APPLICATION OF MACHINE LEARNING ALGORITHMS TO CLASSIFY STORAGE LOWER URINARY TRACT SYMPTOMS
Kai Dallas, Ashley Caron, Jennifer Anger, Karyn Eilber, A. Lenore Ackerman
Cedars-Sinai, Division of Urology, Los Angeles, CA
Presented By: Kai B. Dallas, MD

Introduction: Lower urinary tract symptoms (LUTS) form a set of complex and poorly understood symptoms that encompass problems with normal holding of urine (storage) and bladder emptying (voiding). The storage subset of LUTS, including urinary urgency, frequency, nocturia, painful urination, and bladder discomfort, contributes to a heavy burden of illness and are categorized into several conditions with sizable symptomatic overlap (e.g. interstitial cystitis/painful bladder syndrome (IC/PBS) and overactive bladder (OAB)). As no objective diagnostic criteria exists to differentiate these conditions, we aimed to apply machine learning algorithms to generate novel diagnostic groupings of these patients.

Methods: 514 patients referred to a urogynecology clinic at a tertiary referral center completed the Interstitial Cystitis Symptom and Problem Indices (ICSI/ICPI), Overactive Bladder Questionnaire (OABq), Genitourinary Pain Index (GUPI), and Pelvic Floor Disability Index (PFDI-20) regardless of referring diagnosis. The most common complaints at presentation were bladder or pelvic pain, urinary frequency, incontinence, and hematuria. The response to the questionnaires and patient demographics were subjected to machine learning unsupervised clustering algorithms (k-means) to categorize the patients into groups based on similar patient phenotype (ie the computer grouped the patients based on their characteristics and not physician diagnoses, see Figure 1). All analysis was performed in R version 3.6.1.

Results: The algorithm identified five unique patient clusters. These clusters represented 142 controls (asymptomatic scores on all indices), 85 patients with a broad range of high responses (Bladder Pain Syndrome-BPS), 55 patients with urgency and urge incontinence (UUI), 111 with vaginal/pelvic pain unrelated to voiding (Non-Urologic Pelvic Pain-NUPP) and 121 with pelvic floor dysfunction (PFD) (Figure 1). The specific groupings can be compared in depth with our interactive application: https://drlackerman-lab.shinyapps.io/luts-kmeans/

Conclusion: The use of machine learning algorithms to cluster patients in logical phenotypic-specific groups based on validated patient-reported outcomes refines our classic diagnostic scheme of LUTS to more specifically define OAB, IC/PBS, and asymptomatic patients and distinguish these from new groups of pelvic floor myofascial-derived urgency/frequency and non-urologic pelvic pain. This new diagnostic grouping is a promising novel approach to categorizing patients with LUTS that is likely to have prognostic implications, which we will explore in prospective studies to follow.
**Funding:** N/A
Poster #NM16
WHY DON'T WOMEN USE THE RESTROOM? A MIXED-METHODS STUDY ON PERCEIVED LIMITATIONS TO WORK AND PUBLIC RESTROOM USE
Siobhan Hartigan, MD1, Leah Chisholm1, Casey Kowalik, MD2, Kemberlee Bonnet3, Elizabeth Rourke, DO1, Roger Dmochowski, MD1, David Schlundt, PhD3, W. Stuart Reynolds, MD1
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Presented By: Leah Chisholm

Introduction: Environmental, psychological, and historical experiences can influence an individual’s toileting behaviors, both at work and in public, which may ultimately lead to repercussions on bladder health. Our objectives were to identify predominant themes underlying women’s attitude towards using restrooms and to develop a conceptual model incorporating these constructs to inform future research or interventions in an effort to improve bladder health.

Methods: A secondary, planned analysis from a cross-sectional, survey-based study investigating associations between LUTS, toileting behavior, and access to public and work restrooms in adult women was performed. If a participant answered affirmatively to limiting restroom use at work or in public, she was offered a stem question to delineate between limited availability, poor quality, restrictions, or other and then a free-text form to record perceived limitations. A mixed-methods approach using cross tabulation analysis was used to assess responses.

Results: Of the 106,000 potential subjects, 7,892 began the survey (response rate 7.4%). With regard to limitations at work/school/volunteer locations, there were 1,758 unique responses. At work, the commonly cited reasons for limiting restroom use were privacy concerns, cleanliness, and availability. There were 6,329 responses for limiting restroom use in public, of which the most common reasons for limitation were distance/findability, cleanliness, and availability. In addition, the qualitative analysis identified several common themes that contributed to limited restroom use at work and in public. These included environmental context (such as quality and accessibility), personal context (history of assault or trauma or biological concerns such as digestive or bladder conditions), emotional and cognitive antecedents, barriers (such as time constraints, distance, or crowding), and compensation strategies (such as managing sounds, restricting fluids, or planning ahead). The common themes were used to develop the conceptual model of limited restroom use at work/school and in public (see figure).

Conclusion: Adult women avoid restroom use at work/school and in public for multiple reasons from several common constructs. It is important to identify barriers to restroom use in order to improve and address these factors and ultimately improve bladder health.

Funding: N/A
Poster #NM17
SCREENING AND MANAGEMENT OF URINARY RETENTION IN MEDICAL AND SURGICAL PATIENTS
Kristin Chrouser, MD, MPH1,2, Ted Skolarus, MD, MPH1,3, Karen Fowler, MPH3, Jason Mann, MSA4, Steven Burstein, MD, MPH3,4,5, Jennifer Meddings, MD, MS3,4,6
1Department of Urology, University of Michigan, 2VA Ann Arbor Healthcare System, 3VA Center for Clinical Management Research, VA Ann Arbor Healthcare System, 4Division of General Medicine, Department of Internal Medicine, University of Michigan, 5Department of Health Management and Policy, School of Public Health, University of Michigan, 6Division of General Pediatrics, Department of Pediatrics and Communicable Diseases, University of Michigan
Presented By: Kristin Chrouser, MD, MPH

Introduction: Urinary retention is common for post-operative and medical patients. The most appropriate bladder management approaches remain unclear due to low levels of evidence. For these reasons, we used the RAND/UCLA Appropriateness Method to assess the appropriateness of strategies for screening and management of acute urinary retention in post-operative and medical patients after catheter removal.

Methods: Using a standardized, multi-round rating process from March through May 2015, an 11-member multi-disciplinary panel reviewed a summary of the relevant literature and rated 34 clinical scenarios designed to determine how and when to screen for retention after catheter removal, as well as how to treat once retention was diagnosed. Actions were categorized as appropriate (i.e., benefits outweigh risks), inappropriate, or of uncertain appropriateness. Clinical scenarios varied according to time since last void, urine output volumes, history of prior urinary retention, presence of symptoms of retention, and number/frequency of straight catheterization.

Results: Using a bladder scanner to screen patients for urinary retention was rated appropriate for all scenarios when symptoms were present (e.g., discomfort, straining). Bladder scanning was also rated appropriate in asymptomatic patients without urine output for ≥3 hours after catheter removal. If a bladder scanner was available, catheterization to screen for urinary retention was considered inappropriate. Treatment of symptomatic urinary retention with intermittent catheterization was appropriate for bladder scan volumes ≥300 milliliters (ml). Intermittent or indwelling catheter use for 1 night was appropriate for symptomatic patients with volumes ≥400 ml and for asymptomatic patients with volumes ≥500 ml. In patients with repeated intermittent catheterization volumes >500 ml every 4 hours, it was rated appropriate to transition to an indwelling urinary catheter.

Conclusion: We defined clinically-relevant guidance for the appropriate screening and management of urinary retention in post-operative and medical patients after catheter removal. Given the prevalence of urinary retention and lack of evidence to guide practice in this setting, our multi-disciplinary findings can be used to improve the consistency of care in this population.

Funding: N/A
Poster #NM18
LOWER URINARY TRACT DISEASE PREVENTION STRATEGIES RECOMMENDED ON SOCIAL MEDIA PLATFORMS: MIXED CORRELATION WITH EVIDENCE
Claire Burton¹, Gabriela Gonzalez², Christopher Almario³, Corey Arnold⁴, Brennan M.R. Spiegel³, Jennifer T. Anger⁵
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Presented By: Claire Burton, MD

Introduction: Although pelvic floor disorders are common, women do not feel comfortable discussing their condition with others, including providers. Many turn to online support groups for prevention and treatment recommendations. To date we lack information about the quality of evidence behind recommendations on online forums. We sought to evaluate the level of evidence behind these recommendations.

Methods: We conducted a large-scale digital analysis of anonymous online posts. A total of 97,975 posts from social media sites were collected by Treato, a social media data mining service. 200 posts about Pelvic organ prolapse (POP), stress urinary incontinence (SUI), overactive bladder (OAB), urinary tract infection (UTI), and interstitial cystitis (IC) were randomly selected. We evaluated these posts for recommendations for the prevention of these diseases. Prevention strategies were then compared to current recommendations in available clinical guidelines and analyzed for level of evidence.

Results: A total of 239/1000 posts contained prevention strategies. For POP there were 41 strategies identified, 29 (70%) of which had either Level 4 or no evidence, including changing posture, breathing techniques, and limiting exercise. For UTI there were 14/58 (29%) had no evidence, including recommendations for dietary modifications and urinary alkalization. For OAB 8/28 (29%) had level 4 or no evidence, such as avoiding carbonated beverages and magnesium supplementation. For SUI, 15/34 (44%) of prevention strategies had low or no evidence such as nutmeg supplementation, laser rejuvenation, and bladder training. IC had the highest number of prevention strategies, and most were low or non-evidence based (70/79, 89%), including aloe vera and herbal supplements.

Conclusion: Prevention strategies are common in online discussions of pelvic floor disorders, but at least a third of these recommendations have little to no evidence behind them. To the contrary, some prevention strategies with strong evidence are notably lacking, such as weight loss for POP. The lack of evidence suggests that there is a role for further education of evidence based prevention strategies as well as a need to conduct more research on holistic or natural strategies as there is clearly a high demand and use of these approaches.
Funding: Funded by a pilot grant from NIDDK Prevention of Lower Urinary Tract Symptoms (PLUS) Research Consortium
Poster #NM19
DEVELOPMENT OF POST-OPERATIVE URINARY RETENTION AFTER MIDURETHRAL SLING PLACEMENT: CAN WE COUNSEL PATIENTS ON DURATION?
Paige Kuhlmann, MD1, John Masterson, MD1, Kai Dallas, MD1, Kyle Tsai2, Amit Reddy3, Peris Casteneda4, A. Lenore Ackerman, MD PhD1, Karyn Eilber, MD1, Jennifer Anger, MD MPH1
1Cedars Sinai Medical Center, 2Northwestern University Feinberg School of Medicine, 3Tulane University School of Medicine, 4University of Michigan Medical School
Presented By: Paige Kuhlmann, MD

Introduction: Urinary retention following midurethral sling placement is a frustrating experience for patients, particularly since there is a paucity of data to inform when normal voiding function with return. We previously reported that there is an increased risk of post-operative retention in patients undergoing midurethral sling placement at the time of combination surgery for pelvic organ prolapse. While this information is useful for pre-operative counseling, we sought to describe duration of retention to assist with post-operative guidance.

Methods: A retrospective chart review of all patients who underwent a midurethral sling procedure performed at our institution between 2014-2017 by one of three FPMRS surgeons (JA, LA, KE) was completed. Patient demographics, perioperative factors, and intraoperative details were explored for associations with rate and duration of retention. Urinary retention was defined as a single failed voiding trial post-operatively.

Results: Of 425 patients undergoing midurethral sling placement, 88 developed retention (20.7%). The majority of these patients (n=80; 91%) passed their first voiding trial. Of the remaining 8 patients, 6 (7%) of them passed their second voiding trial, and 2 (2%) passed their third. The most common management for retention was indwelling foley catheter (n=78; 89%), while some patients opted for clean intermittent catheterization (CIC) (n=10; 11%). For those who failed a void trial, the average duration of time before passing a voiding trial was 3.7 days. Most patients who developed retention did so on post-operative day (POD) 0 (n=54; 61%) in the PACU. About half as many developed retention on POD 1 (n=24; 27%). Ten patients (11%) developed retention on POD 2 or later. Of note, those who developed post-operative retention were 2.1 times more likely to develop a UTI within 30 days of surgery. Choosing CIC to manage retention decreased this risk compared to an indwelling catheter (12.5% vs 24.3%, p=0.04).

Conclusion: Post-operative retention was high among our population at 20.7%, possibly due to more sling tensioning. Most patients who develop retention after sling placement will pass their first voiding trial. Patients should be counseled on the chance of needing a temporary indwelling catheter or CIC. CIC, compared to indwelling catheter, decreases the risk of post-operative UTI.

Funding: N/A
Poster #NM20

FREQUENCY OF UTIs PREDICTS POOR QUALITY OF LIFE AFTER SPINAL CORD INJURY

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Presented By: Katherine M. Theisen, MD

Introduction: Urinary tract infections (UTIs) are a major source of morbidity after spinal cord injury (SCI). People with SCI attribute a variety of symptoms to UTI; but up to 60% of the time urine culture is inconsistent with a UTI. Unfortunately, negative cultures can lead providers to dismiss the symptoms rather than search for other causes. We hypothesize that patient-reported symptoms of a UTI have a major impact on quality of life (QOL) and warrant further investigation and amelioration, regardless of urine culture results.

Methods: The Neurogenic Bladder Research Group SCI registry asked 1475 SCI participants about neurogenic bladder-related QOL. Eligibility included: age >18 years and acquired SCI. UTI frequency over the past year was by patient report and classified as 0, 1-3, 4-6, or >6. Four UTI QOL questions were administered, including: 1) UTIs limited daily activities (Limit), 2) UTIs caused increased spasms (Spasm), 3) UTIs would not go away (Go Away), and 4) UTIs caused me to avoid going out (Avoid). A 5-point Likert scale of responses ranged from “never” to “always”. Multivariable regression was performed to identify independent risk factors for poor QOL, controlling for demographic and clinical factors.

Results: At enrollment, patient-reported UTI frequency over the prior year was 0 in 388 patients (26%), 1-3 in 677 (46%), 4-6 in 223 (15%), and more than 6 in 190 (13%). All four measures of UTI QOL were inversely related to the number of UTIs experienced (Figure 1). When controlling for confounders, we found that increasing UTI frequency significantly increased the odds of worse QOL across all four questions (p<0.01). When comparing patients with >6 UTIs to those who had 0, there was a 13x increased odds of limiting daily activities, 18x increased odds of worsening spasms, 50x increased odds of perceiving a UTI would not go away, and 13x increased odds of avoiding going out.

Conclusion: The frequency of patient-reported UTIs is independently associated with worse QOL. Even if a urine culture proves to be negative, providers should be address the symptoms that led to the evaluation; others causes of these symptoms should be considered and addressed in order to improve the QOL of this population.

Funding: Patient Centered Outcomes Research Institute
Poster #NM21
THE TIME BURDEN OF BLADDER MANAGEMENT IN INDIVIDUALS WITH SPINAL CORD INJURY
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1Stanford University Medical Center, Department of Urology, 2Western University, Division of Urology, 3University of Southern California, 4University of Utah, Division of Urology, 5Santa Clara Valley Medical Center, Department of Physical Medicine and Rehabilitation, 6Santa Clara Valley Medical Center, Department of Physical Medicine and Rehabilitation
Presented By: Kyla Nichole Velaer, MD

Introduction: Despite clean intermittent catheterization (CIC) being considered the gold standard in bladder management for those unable to volitionally void after spinal cord injury (SCI), a large proportion of the SCI population choose alternative management strategies in the long-term. To date, the burden of time related to bladder management and how it might affect long term choices has been incompletely evaluated.

Methods: An electronic questionnaire focusing on time spent performing bladder management was sent to prior participants in the Neurogenic Bladder Research Group (NBRG) SCI Registry, a national quality of life study of individuals with SCI. We evaluated patient demographics, level of spinal cord injury, prior urologic surgery, bladder management technique, number of times attended to each day, caregiver assistance, and the time associated with each bladder management type.

Results: Eighty-seven individuals responded to the survey. Fifty-six percent of the respondents were female with the mean age of participants being 51 years (range 21 to 74) and the mean time from injury being 20 years (range 2-50 years). Clean intermittent catheterization was the most common bladder management technique (76%). Longer catheterization times were associated with female gender (13 minutes per catheterization versus 8.8 minutes for males), cervical spine injury (12.4 minutes per catheterization), and need for caregiver assistance (19 minutes per catheterization). Females with catheterizable stomas had shorter times per catheterization than females performing CIC through their native urethra (8 minutes versus 13 minutes). Seventy-two percent of males on CIC were classified as overweight or obese but only 17% females on CIC were overweight or obese. Obese and overweight women had longer CIC times than normal weight females (14.5 minutes versus 7 minutes). To the contrary, the time to catheterize was the same for normal weight, overweight and obese males (all ~8 minutes). Patients with indwelling catheters (suprapubic or urethral) spent less than a third of the time managing their bladder per day compared to patients performing intermittent catheterization (17 minutes vs 53 minutes per day).

Conclusion: Management of neurogenic bladder after SCI, specifically in those performing CIC, is time consuming and may play a role in long-term bladder management decisions.

Funding: N/A
Poster #NM22
MIRABEGRON UTILIZATION IN THE UNITED STATES - AN INCREASING TREND
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1Rutgers Robert Wood Johnson Medical School Division of Urology, 2Columbia University Medical Center Department of Urology
Presented By: Kevin Chua, MD

Introduction: Mirabegron was FDA approved in 2012, and it is the first beta-3 agonist to treat overactive bladder (OAB). The objective of this study was to examine how prescribing habits have changed since the release of mirabegron.

Methods: Using the 2013-2017 Medicare Part D Public Use File, we identified all prescribers of OAB medications including oxybutynin, tolterodine, trospium, darifenacin, solifenacin, fesoterodine and mirabegron. The number of claims for each medication was trended over time.

Results: In 2013, 124,702 prescribers (8,476 urologists and 116,226 non-urologists) made 6,312,157 OAB medication claims. By 2017, 131,474 prescribers (8,705 urologists and 122,769 non-urologists) made 6,956,005 OAB medication claims. From 2013 to 2017, the number of claims and % of OAB medication claims for mirabegron rose each year. In 2013, 140,401 claims were made for mirabegron which was 2.2% of OAB medication claims. In 2017, 1,617,439 claims were made for mirabegron which was 23.3% of OAB medication claims. Among all providers, from 2013 to 2017, oxybutynin was consistently the most commonly prescribed OAB medication comprising of 43% of all OAB medications in 2017. For urologists alone, oxybutynin was the most commonly prescribed OAB medication from 2013-2015. Interestingly, starting in 2016 the most commonly prescribed OAB medication by urologists was mirabegron (31% of OAB medication claims) vs. oxybutynin (27% of OAB medication claims). (Figure 1) Additionally, for all providers and urologists alone, claims for solifenacin decreased each year.

Conclusion: Mirabegron use has risen each year since it entered the market and has become the most commonly prescribed OAB medication by urologists. Meanwhile, oxybutynin continues to be the most commonly prescribed OAB medication when considering all physicians.

Figure 1 - Trend of OAB medication prescribing for all physicians and for urologists alone
Funding: N/A
**Poster #NM23**

**UTILIZATION OF THIRD LINE THERAPY IN THE UROLOGIC MANAGEMENT OF PATIENTS WITH MULTIPLE SCLEROSIS**

Lee Baumgarten, MD, Vicki Irish, NP, Samantha Raffee, MD, Humphrey Atiemo, MD

Henry Ford Hospital

Presented By: Lee C. Baumgarten, MD

**Introduction:** Multiple sclerosis (MS) is a demyelinating neurologic condition affecting approximately 2 million people worldwide. Lower urinary tract symptoms (LUTS) affect up to 50-90% of MS patients. Urodynamic (UD) evaluation for these patients often shows evidence of Neurogenic Detrusor Overactivity (NDO). Treatment strategies include behavioral and physical therapy, oral medications, and third line therapies (intravesical botox, Interstim, PTNS). We sought to characterize MS patients with NDO, measure changes in urinary quality of life with treatment, and evaluate for any factors predictive of progression to third line therapies.

**Methods:** Using a prospectively collected, routinely updated database of MS patients within a single neuro-urologist practice between 2013-2019, patient demographics, UD data, treatment variables, and pre- and post-treatment patient-reported questionnaire responses were recorded. We present descriptive characteristics of the patients with NDO within this cohort. We grouped these patients into two groups: those who progress to third line therapy and those who remain on medical therapy. We evaluate for any differences in UD characteristics between these groups and compare the degree of change in symptom and quality of life scores. Urodynamic and quality of life data were compared using chi-square and Wilcoxon rank sum statistics, respectively.

**Results:** Our cohort of 182 patients with MS, averages 55 years of age, is 84% female and 45% Caucasian. Nearly 50% of these patients are diagnosed with relapsing remitting MS. Eighty percent of our patients underwent UD, with findings showing detrusor sphincter dyssynergia (DSD) in 24% and NDO in 45% (66 patients). Nearly 40% of patients with NDO progress to third line therapy with intravesical botox being the most common in our cohort (89%). As seen in the Table, there were no demographic or UD factors predictive of progressing to third line therapy. However, patients who undergo third line therapy show larger improvements in symptom score than those who do not.

**Conclusion:** NDO is a common cause for LUTS in patients with MS. 40% of our MS patients with NDO progress to third line therapy with no UD factors predictive of progression. Symptom improvements are greater those patients who undergo third line therapies compared to those who remain on medical therapy.
### MS Patients with Neurogenic DI

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<th>Third Line Therapy</th>
<th>Medical Therapy</th>
<th>P-Value</th>
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<tbody>
<tr>
<td>No. Pts</td>
<td>27</td>
<td>40</td>
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</tr>
<tr>
<td>Average age (years)</td>
<td>53</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
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<tr>
<td>Female</td>
<td>24 (89%)</td>
<td>28 (70%)</td>
<td>P=0.068</td>
</tr>
<tr>
<td>Male</td>
<td>3 (11%)</td>
<td>12 (30%)</td>
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<tr>
<td>No. Race</td>
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<tr>
<td>Caucasian</td>
<td>7 (26%)</td>
<td>12 (30%)</td>
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<tr>
<td>African American</td>
<td>19 (70%)</td>
<td>24 (60%)</td>
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<tr>
<td>Other</td>
<td>1 (4%)</td>
<td>4 (10%)</td>
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</tr>
<tr>
<td>Type of MS</td>
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<tr>
<td>Relapsing Remitting</td>
<td>14 (52%)</td>
<td>24 (60%)</td>
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<tr>
<td>Primary Progressive</td>
<td>7 (26%)</td>
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<tr>
<td>Secondary Progressive</td>
<td>4 (15%)</td>
<td>6 (15%)</td>
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<tr>
<td>NOT SPECIFIED</td>
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<td>7 (17.5%)</td>
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<td>Urodynamics</td>
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<tr>
<td>No UDC (IQR)</td>
<td>3 (1-5)</td>
<td>3 (2-5)</td>
<td>P=0.323</td>
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<tr>
<td>Average UDC volume (cc) ± SD</td>
<td>166 ± 97</td>
<td>179 ± 90</td>
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<tr>
<td>Bladder capacity (cc) ± SD</td>
<td>205 ± 117</td>
<td>232 ± 104</td>
<td>P=0.325</td>
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<tr>
<td>PVR (cc) ± SD</td>
<td>88 ± 102</td>
<td>48 ± 66</td>
<td>P=0.055</td>
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<tr>
<td>Management</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>CIC</td>
<td>15 (55%)</td>
<td>11 (27%)</td>
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<tr>
<td>SPT</td>
<td>8 (29.5%)</td>
<td>3 (8%)</td>
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<tr>
<td>Diversion/Augmentation</td>
<td>2 (7.5%)</td>
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#### Symptom Scores

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<tr>
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<th>P-value</th>
<th>P-value</th>
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<tbody>
<tr>
<td>Change in AUA-SS</td>
<td>-6.7 ± 3.7</td>
<td>0.03*</td>
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<tr>
<td>Change in AUA-SS QOL</td>
<td>-1.5 ± 0.7</td>
<td>0.03*</td>
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<tr>
<td>Change in ISI</td>
<td>-4.6 ± 2.6</td>
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<tr>
<td>Change in ISI Bother</td>
<td>-0.7 ± 1.2</td>
<td>0.68</td>
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**Funding:** N/A
Poster #NM24
LOWER URINARY TRACT SYMPTOMS IN WOMEN WITH SPINAL PATHOLOGIES: A PROSPECTIVE PREVALENCE STUDY
Samantha Raffee, MD1, Meghan Griffin, DO2, Lara Massie, MD3, Azam Basheer, MD3, Kelly Tundo, RN, BSN3,
Amanda Brown, MPA3, Ellen Air, MD, PhD3, Humphrey Atiemo, MD1
1Henry Ford Vattikuti Urology Institute, Detroit, MI, 2Henry Ford Department of OBGYN, Detroit, MI, 3Henry Ford Department of Neurosurgery, Detroit, MI
Presented By: Samantha M. Raffee, MD

Introduction: The relationship between spinal pathologies and lower urinary tract symptoms (LUTS) is largely unknown. The incidence of LUTS in patients with lumbar disk disease has been estimated to be between 27% and 92%. Further, the effect of spine surgery on lower urinary tract symptoms has not been definitively established.

The objective of this study was to determine the prevalence of urinary dysfunction among female patients with spinal pathologies and to evaluate the effects of spinal surgery on these symptoms using validated questionnaires.

Methods: After IRB approval, women with lower spine complaints were identified in the neurosurgery clinic. Patients were asked to fill out the Pelvic Floor Distress Inventory (PFDI-20) and Pelvic Floor Impact Questionnaire (PFIQ-7) at their initial visit. Exclusion criteria included primary spinal pathology in the cervical spine. If the patient elected to undergo spine surgery after their initial evaluation, questionnaires were obtained at 6 weeks and 6 months post-operatively. Patient demographics, medical and surgical history were obtained through a review of the electronic medical record.

Results: A total of 169 patients were recruited between April 2017 and July 2019. See Table 1. At baseline, 72.7% answered “yes” to at least one question on the Urinary Distress Inventory (UDI-6). The average score was 23.5/100. Those with higher UDI-6 scores were strongly correlated to higher Urinary Impact Questionnaire (UIQ-7) score (Pearson correlation coefficient= 0.69). Colorectal-Anal Distress Inventory (CRADI-8) was also evaluated with 64.3% presenting with some level of bowel complaints. The average score was only 14.4/100. Higher baseline UDI-6 and CRADI-8 scores were observed for patients with a history of a prior hysterectomy, use of stool softeners, and a spinal pathology including L3 (P<0.05). Post-operative questionnaires were obtained from 22 women at 6 weeks and 8 women at 6 months, with the average UDI-6 scores being 19.9/100 and 31.2/100, respectively.

Conclusion: Though the majority of women presented with some level of urinary bother, quality of life impact appeared low. More significant bother was seen in patients that had L3 spinal involvement at their initial assessment. At this point, there was no demonstrable influence of surgery on urinary symptoms, though the number of patients followed post-operatively was small.
Funding: N/A

<table>
<thead>
<tr>
<th>Table 1: Patient Characteristics</th>
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<tr>
<td>Number of patients recruited</td>
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<tr>
<td>Patients excluded</td>
<td>15</td>
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<tr>
<td>Mean age</td>
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<td>BMI</td>
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<td>Race</td>
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<tr>
<td>- Caucasian</td>
<td>95</td>
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<td>- African American</td>
<td>39</td>
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<tr>
<td>- Other</td>
<td>20</td>
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<tr>
<td>Presenting Complaint</td>
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<tr>
<td>- Pain</td>
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<tr>
<td>- Neurologic Dysfunction</td>
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<tr>
<td>- Both</td>
<td>30</td>
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<td>- Other</td>
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<td>Involved Spinal Level</td>
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<td>Thoracic Spine</td>
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<td>Lumbar Spine</td>
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<tr>
<td>- L1</td>
<td>11</td>
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<tr>
<td>- L2</td>
<td>25</td>
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<td>- L3</td>
<td>53</td>
</tr>
<tr>
<td>- L4</td>
<td>102</td>
</tr>
<tr>
<td>- L5</td>
<td>112</td>
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<tr>
<td>Sacral Spine</td>
<td>71</td>
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Poster #NM25
PREDICTORS OF REHOSPITALIZATION IN PATIENTS WITH SPINAL CORD INJURY: USING DATA FROM MODEL SPINAL CORD INJURY SYSTEMS
Karthik Tanneru, Fellow, Shiva Gautam, Daniel Norez, Jazayeri Seyedbehzad, Jatinder Kumar, Umar Alam, Balaji KC, Joseph Costa
university of florida, Jacksonville
Presented By: Karthik Tanneru

Introduction: Spinal cord injury (SCI) is one of the most devastating injuries not only to the patient but also to the family and society. Genitourinary (GU) complications, namely urinary tract infections (UTIs) are among the top reasons for emergency department (ED) visits and readmissions to the hospital among SCI patients. We analyzed the data from the Model Spinal Cord Injury Systems (MSCIS) to find whether various factors may be contributing to rehospitalization with GU-related factor and to lead us to early identification and aggressive management of patients to decrease the rehospitalizations.

Methods: MSCIS is a prospectively maintained publicly available multicenter database that has been collecting data from 1975 across various institutes. We used the available data from 2000-2015 for all patients enrolled in MSCIS. Data from 2000-2010 were used for initial encounter and the data from 2000 to 2015 with 1, 5, 10, and 15 years intervals were used for follow-up. We specifically investigated and analyzed rehospitalization events for patients enrolled in the study to identify any contributing factors to readmission with GU-related cause such as sex, race, education, insurance, level of injury, ASIA score (American Spinal Injury Association), and bladder management.

Results: At initial encounter, 6338 patients were available. Of which 5597, 4203, 1978, and 278 patients were available at 1, 5, 10, and 15 years follow-up, respectively. At the time of injury 77% were males, majority of patients were of Caucasian race (68%) and within the 15 to 29 years age group (38%). Cervical was the most common level of injury (50%) and 39% had the ASIA grade A. Genitourinary (GU) cause was the most common diagnosis for readmission across all years of follow-up. Multi-regression analysis revealed that bladder management was the most significant variable that predicted rehospitalization across all follow-up periods. Higher ASIA score was associated with increased rehospitalization with GU cause at 1 and 5 years follow-up.

Conclusion: GU cause was the most common etiology for rehospitalization at all years of follow-up. Although people with normal micturition increased over time, rehospitalization rate with GU cause remained stable. More aggressive bladder management strategies will be required to reduce the rehospitalization with an underlying GU event.

Funding: N/A
Poster #NM26

PELVIC FLOOR SYMPTOMS IN PATIENTS WITH MULTIPLE SCLEROSIS: AN OBSERVATIONAL STUDY

Elia Bassini¹, Mauro Zampolini², Matteo Balzarro, Dept. of Urology³, Emanuele Rubilotta, Dept. of Urology³, Silvano Baratta², Francesco Corea²
¹University of Perugia, ²Foligno Hospital, ³AOUI Verona, Verona Italy

Presented By: Elia Bassini

Introduction: To assess in patients with Multiple Sclerosis (MS): (i) the most common symptoms of pelvic floor dysfunctions (PFD) and their prevalence; (ii) the rehabilitation plan applied; (iii) the impact on quality of life (QoL).

Methods: We included 34 patients (18-65 y.o.) with relapsing-remitting MS and secondarily progressive of mild group A (EDSS ≤ 3) and moderate grade group B (EDSS> 3-7). Exclusion criteria were: EDSS ≥7, primarily progressive MS, progressive relapsing and clinically isolated syndrome forms, indwelling catheter, severe cognitive disorders. The evaluation of pelvic floor symptoms (PFS) was performed using: IQOL and ICIQ-SF (>1) for urinary incontinence (UI); overactive bladder (OAB) V8 for urinary urgency and frequency; WEXNER Score (>1) for fecal incontinence (FI); ODS Score (> 5) for obstructed defecation syndrome (ODS); MC.GILL PAIN Questionnaire, to evaluate chronic pelvic pain (CPP); WHODAS-12 for perceived health status. Pelvic floor (PF) muscle assessment was assessed with: external evaluation of PF contraction (central fibrous nucleus) and PC test. The result was recorded using the PERFECT method and the OXFORD Scale (< 3).

Results: Rate of PFD symptoms was (33/34) 97.05%. PFS, QoL are reported in figure 1. OAB V8 score was positive in 33 patients: persistent pelvic pain for more than 6 months in 11, of these, 2 reported dyspareunia. As for FI, 11 subjects tested positive on the Wexner score. There is a linear correlation between ICIQ and IQOL, with relative impact on the QoL. ODS score > 5 was found in 17 patients. OAB was found in 33/34, UI in 26/34, Fl in 18/34, ODS in 17/34.Muscle assessment showed a valid contraction in the 35.4%, with Oxford score ≥ 3 in 11/31, and there was no correlation between Oxford score and PFS. According to WHODAS-12, there was a non-proportional correlation between perceived health and clinical status. Only 2/33 symptomatic patients received a previous PF rehabilitation.

Conclusion: In MS patients the prevalence of PFS is very high and underestimated, and the analysis and treatment of pelvic dysfunctions is neglected although it should be part of the therapeutic priorities. CPP symptoms were less frequent. Untreated cases could generate clinical complications, increase the disability and strongly interfere with QoL.

Funding: N/A
IMPLEMENTATION OF A PRIMARY CARE INTERVENTION TO IMPROVE CARE FOR WOMEN WITH URINARY INCONTINENCE

Claire Burton¹, Eric Lo², Falisha Kanji², Ashley Caron², Tara Cohen³, David Miller⁴, Neil Wenger⁵, Victoria Scott², A. Lenore Ackerman², Karyn S. Eilber², Jennifer T. Anger²

¹Department of Urology, University of California Los Angeles, Los Angeles, CA, ²Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA, ³Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA, ⁴Department of Urology, University of Michigan, Ann Arbor, MI, ⁵Department of Medicine, University of California Los Angeles, Los Angeles, CA

Presented By: Claire Burton, MD

Introduction: The AUA/SUFU OAB Guidelines suggest conservative management of women with urinary incontinence (UI) may be undertaken by primary care physicians (PCPs), and only when that fails and patients desire further intervention should a specialist referral be initiated. In an effort to improve UI care and decrease unnecessary referrals, we sought to develop a multimodal intervention targeted to PCPs.

Methods: Two primary care offices were randomized to receive the intervention or the control arm (n=12 providers each). The controls received a lecture on recurrent UTIs. The intervention received a lecture on management of UI, were given a pocket-card treatment algorithm, a list of previously developed Quality of Care Indicators (QIs) for UI, and a list of the possible pharmaceutical options for UUI. Additionally ‘smart sets’ were incorporated into the electronic medical record for ‘UI history’ and ‘UI Plan.’ We reviewed five baseline charts per PCP of women diagnosed with UI in the preceding three years and scored them on their QI compliance. We conducted one-on-one ‘academic detailing’ with each PCP to review these charts and discuss areas for improvement. This time was also utilized to answer any questions and reinforce the QIs. All female patients of the participating PCPs were then screened prior to their PCP visit and asked if they had new or worsening bothersome UI. If patients screened positive they were instructed to fill out the UDI-6 and the IIQ7. Providers were alerted via email prior to the visit if their patient screened positive for UI, and the care they provided was then measured against the same set of QIs.

Results: We collected a baseline of 50 charts per arm. After the intervention lecture was given, academic detailing occurred over a two-month period. All female patients of the participating PCPs were then prospectively recruited on weekly basis. Although only 18% of women who screened positive discussed UI with their PCP, our pilot data showed that PCPs improved their management of UI and more readily prescribed OAB medication when indicated.

Conclusion: This pilot intervention demonstrates the feasibility of improving PCP care for UI. The ultimate goal is to reduce unnecessary use of specialty care for UI.

Funding: R56DK117261 (JA)
Poster #NM28

POSITIVE ASSOCIATION BETWEEN LOWER URINARY TRACT SYMPTOMS AND COITAL URINARY INCONTINENCE IN NULLIPAROUS WOMEN

Siobhan Hartigan, MD1, Sophia Goodridge, MD2, Leah Chisholm1, Elizabeth Rourke, DO1, Melissa Kaufman, MD, PhD1, Roger Dmochowski, MD1, W. Stuart Reynolds, MD1

1Department of Urology, Vanderbilt University Medical Center, Nashville, TN, 2Urology, WellStar Medical Group, Roswell, GA

Presented By: Siobhan M. Hartigan, MD

Introduction: Coital urinary incontinence (CUI) is a clinical problem with significant impact on quality of life, yet continues to be infrequently studied and underdiagnosed. CUI has been shown to have a prevalence of 10-66% in women with urinary incontinence but it has not been well-studied in a nulliparous population, where the presence of CUI may be particularly distressing. The objective of our study was to examine the association of CUI and other lower urinary tract symptoms (LUTS) in nulliparous women (NW).

Methods: An IRB approved, cross-sectional electronic survey was administered to women ≥ 18 years old with a secondary analysis aimed to evaluate the association between LUTS and CUI. We included all non-pregnant, nulliparous, female participants who completed the survey. Using responses to validated questionnaires including the ICIQ-FLUTS, we queried the prevalence of urgency, urgency urinary incontinence (UUI), stress urinary incontinence (SUI), overactive bladder (OAB), and CUI. Descriptive summary statistics were tabulated and Chi-squared tests were used to identify associations.

Results: Our cohort included 1,533 NW, of which 121(7.9%) reported CUI. The mean age was 31.2 years (SD 10.9) and mean BMI 24.7 (SD 5.5). There were no significant differences in age, BMI, race, education, smoking, or hysterectomy status between NW with and without CUI. In NW women with diabetes, 21.05% reported CUI, compared to 7.56% of NW without diabetes (p=0.002). Compared to NP without CUI, NP with CUI were more likely to have stress urinary incontinence (10.91% vs 39.67%, p<0.000), urge urinary incontinence (8.36% vs 23.97%, p<0.000), overactive bladder (18.27% vs 42.15%, p<0.000), and urinary urgency (14.80% vs 32.23%, p<0.000).

Conclusion: A low but significant percentage of nulliparous women experience CUI. The presence of LUTS with or without incontinence in NP was found to have a strong positive association with CUI. Further research is needed in this population in order to identify degree of bother and treatment strategies for CUI in order to better address this under-diagnosed condition.

Funding: CTSA award No. UL1 TR002243 from the National Center for Advancing Translational Sciences
Poster #NM29
IS DIGITAL ETHNOGRAPHY THE FOCUS GROUP OF THE FUTURE? FOCUS GROUPS VS. SOCIAL MEDIA ANALYSIS OF WOMEN'S EXPERIENCE WITH OVERACTIVE BLADDER (OAB)
Paige Kuhlmann, MD1, Gabriela Gonzalez2, Yuliya Zektser2, Corey Arnold, PhD3, Christopher Almario, MSHPM1, Brennan Spiegel, MD, MSHS1, Jennifer Anger, MD, MPH1
1Cedars Sinai Medical Center, 2David Geffen School of Medicine UCLA, 3University of California, Los Angeles
Presented By: Paige Kuhlmann, MD

Introduction: Qualitative methods assessing women’s perspectives on living with OAB have traditionally been obtained via focus groups and interviews. Now, a plethora of cyber forums have emerged, allowing women to discuss their OAB experiences anonymously. The aim of this study was to compare patient perceptions of OAB generated through focus groups to those gleaned from online social media. Comparing the results from these methods will validate and enhance providers’ understanding of women’s experiences with OAB.

Methods: For the digital ethnography analysis, 2,618 posts pertaining to OAB from 203 social media sites were identified by using keywords as search terms in a Java-based natural language processing platform and a social media data mining service. Of these, 200 posts were randomly selected for inclusion.

The focus groups included were conducted previously (Anger et al, 2011). Women evaluated in urology clinic for OAB symptoms were recruited to participate in one of five focus groups, totaling 33 patients. Data from both methods were analyzed using grounded theory methodology. The data sets were coded independently and then compared.

Results: Each major theme that emerged from focus group data was echoed in the themes uncovered in analysis of social media posts. While major themes were generally similar, several unique subthemes were identified in each group (Table 1). The subthemes unique to the focus groups were centered on symptoms and management. The subthemes unique to the social media group were more personal, reflecting a sense of comfortability with sharing private insights anonymously. A new major theme was identified in the digital ethnography analysis: Online Community Engagement. The subthemes under this theme highlighted that women are pursuing self-education via online resources instead of relying on information from providers.

Conclusion: This study highlights the reliability of qualitative data collected through social media compared to focus groups, as well as social media’s ability to procure personal, unbiased information. Digital ethnography provides immediate access to data on a large, diverse population, obviating the logistics required for focus groups. It presents an opportunity for providers to gain awareness of their patients’ perceptions, as well as what information their patients seek, facilitating a more effective patient-provider relationship.
### Themes & Subthemes

<table>
<thead>
<tr>
<th>Social Media</th>
<th>Impact of OAB on Quality of Life</th>
<th>Focus Groups</th>
</tr>
</thead>
</table>
| Emotional challenges | - Leaking / urgency in public | - Nocturia  
- Inability to fall back asleep  
- Fatigue during the day  
- Many triggers for incontinence |
| Anxiety, fibromyalgia | Lack of Understanding of Etiology of OAB | - Confusion with other pelvic disorders  
- Defecatory symptoms  
- Misconceptions of definitions of incontinence  
- Small bladder, weak bladder |
| Birth trauma | Patient-Physician Interactions | - Miscommunication between patients and providers over Kegel exercises and medications  
- Lack of understanding of diagnostic tests that physicians order |
| Non-patient-centered care | Medications & Side Effects | - Intolerable side effects  
- Ineffective in controlling wetness |
| Distrust in physicians / alleged mismanagement | - Confusion about the different tiers of treatment  
- Questions regarding third line therapies |
| Delays in specialty referral | - Lack of symptom validation |
| Lack of symptom validation | Alternative Therapies for Controlling Symptoms | - Wearing pads |
| - Strengthening abdominal muscles | | - Kegel exercises  
- Bladder habits / training  
- Fluid restriction, diet changes |
| Homeopathy | Online Community Engagement | |
| Belly breathing | | |
| Mona Lisa | | |
| Physical therapy | | |
| - Seeking advice prior to medical visit | Table 1. Comparison of themes identified through digital ethnography evaluation of women’s perspectives of OAB to themes identified through focus group discussions including women with OAB | |
Poster #NM30
TREATMENT FOR URINARY INCONTINENCE IN THE NURSES' HEALTH STUDY
Giulia Lane, MD¹, Elisabeth Ereksen, MD, MPH², Vatche Minassian, MD³, Francine Grodstein, ScD⁴, Julie Bynum, MD, MPH¹
¹University of Michigan, ²Dartmouth Geisel School of Medicine, ³Brigham and Women's Hospital, ⁴Brigam and Women's Hospital
Presented By: Giulia Ippolito Lane, MD

Introduction: Urinary incontinence (UI) is common, however treatment rates among symptomatic women are largely unknown. For this study, we link data from the Nurses' Health Study (NHS) to Medicare to assess treatment rates in older women with self-reported UI and factors associated with treatment.

Methods: Women who participated in the 2012 NHS survey, responded to UI questions and were enrolled in Medicare (2011-4) were included. We used multivariable logistic regression to estimate the odds ratio (OR) of treatment (pharmacotherapy, pessary, physical therapy (PT), or surgical treatment) for UI.

Results: 18,508 NHS participants with UI were linked with Medicare data. Mean age was 77 years and most (98%) were Caucasian. Only 6% (1,138) of the cohort had any treatment for UI during the year before or two years following the survey. Of the women who underwent treatment, the majority were prescribed pharmacotherapy (86.5%), while 9% had surgery, and 4.5% had pessary or PT.

Using multivariable logistic regression, those with moderate (OR 1.8, 95% CI 1.3-2.5) or severe (OR 3.2, 95% CI 2.2-4.7) symptoms had higher odds of any treatment. Those with urge (OR 2.9, 95% CI 2.4-3.8) or mixed (OR 2.5, 95% CI 1.9-3.2) UI were more likely to be treated compared to stress UI. Newly reported UI (OR 1.5, 95% CI 1.2-1.8), higher Elixhauser comorbidity score (OR 1.38, 95% CI 1.2-1.6) and current replacement hormone therapy (OR 1.7, 95% CI 1.4-2.0) were also associated with higher odds of treatment. (Table 1)

Lack of preventative health screening was associated with lower odds of treatment (OR 0.4, 95% CI 0.18-0.86). There was no association between age, race, smoking status, obesity, physical or mental health scores with being treated for UI.

Conclusion: We find that only 6% of women with self-reported UI received any treatment over a three-year period. Pharmacotherapy was the most common treatment (88%). Severity of symptoms, incontinence type and duration of incontinence were associated with treatment.
Table 1. Odd Ratios$^1$ and 95\% CI for any urinary incontinence (UI) treatment (pharmacotherapy, pressey, physical therapy or surgery) versus no treatment based on Nurses’ Health Study participants with UI in 2012/2013 according to demographics, health behaviors, status and UI symptoms

<table>
<thead>
<tr>
<th>Demographic/Factors</th>
<th>Any Treatment for UI</th>
<th>N= 113B (%)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, years</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66-75</td>
<td>–</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>76-85</td>
<td>–</td>
<td>0.87 (0.76-1.00)</td>
<td></td>
</tr>
<tr>
<td>&gt;85</td>
<td>–</td>
<td>0.88 (0.72-1.07)</td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>1126 (99%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>12 (1%)</td>
<td>0.68 (0.38-1.23)</td>
<td></td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not employed outside the home</td>
<td>888 (78%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Employed outside the home (part time)</td>
<td>62 (5%)</td>
<td>0.69 (0.53-0.91)</td>
<td></td>
</tr>
<tr>
<td>Employed outside the home (full time)</td>
<td>16 (1%)</td>
<td>1.00 (0.99-1.00)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>172 (15%)</td>
<td>1.69 (0.84-3.41)</td>
<td></td>
</tr>
<tr>
<td><strong>Health Behaviors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Smoker</td>
<td>1105 (97%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Not current smoker</td>
<td>33 (3%)</td>
<td>0.70 (0.49-1.00)</td>
<td></td>
</tr>
<tr>
<td><strong>Health Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Obese</td>
<td>739 (65%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Obese (BMI $\geq$ 39 kg/m2)</td>
<td>302 (27%)</td>
<td>1.08 (0.53-1.25)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>97 (9%)</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td><strong>Comorbidities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eihauer 0</td>
<td>206 (18%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Eihauer 1-2</td>
<td>–</td>
<td>1.22 (1.05-1.46)</td>
<td></td>
</tr>
<tr>
<td>Eihauer 3+</td>
<td>–</td>
<td>1.38 (1.17-1.64)</td>
<td></td>
</tr>
<tr>
<td><strong>Physical Function$^1$</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>640 (56%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>498 (44%)</td>
<td>1.05 (0.51-1.22)</td>
<td></td>
</tr>
<tr>
<td><strong>Mental Health Score$^2$</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1028 (90%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>110 (10%)</td>
<td>1.02 (0.57-1.51)</td>
<td></td>
</tr>
<tr>
<td><strong>Preventative health screening in last 2 years</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>966 (85%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>172 (15%)</td>
<td>0.38 (0.38-0.86)</td>
<td></td>
</tr>
<tr>
<td><strong>Current Post-menopausal hormone use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>792 (70%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>164 (14%)</td>
<td>1.68 (1.40-2.02)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>182 (16%)</td>
<td>1.71 (1.03-3.18)</td>
<td></td>
</tr>
<tr>
<td><strong>Urinary incontinence symptoms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>once/month</td>
<td>70 (6%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>2-3/month</td>
<td>137 (12%)</td>
<td>0.84 (0.62-1.13)</td>
<td></td>
</tr>
<tr>
<td>once/week</td>
<td>218 (19%)</td>
<td>0.68 (0.49-0.93)</td>
<td></td>
</tr>
<tr>
<td>once/day</td>
<td>713 (63%)</td>
<td>1.15 (0.85-1.58)</td>
<td></td>
</tr>
<tr>
<td><strong>UI Severity (Sandvik Severity Index)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>50 (4%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>248 (22%)</td>
<td>1.79 (1.29-2.48)</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>740 (65%)</td>
<td>3.21 (2.21-4.67)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>100 (9%)</td>
<td>3.10 (2.08-4.60)</td>
<td></td>
</tr>
<tr>
<td><strong>UI Type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>87 (8%)</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Urge</td>
<td>494 (43%)</td>
<td>2.98 (2.36-3.77)</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>438 (38%)</td>
<td>2.51 (1.97-3.19)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>87 (8%)</td>
<td>2.24 (1.21-4.82)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>230 (20%)</td>
<td>2.30 (1.65-3.05)</td>
<td></td>
</tr>
</tbody>
</table>

$^1$ Adjusted for all variables included in the table. $^2$ Low: SF-12 score $\leq$ 33, High: $>34$. $^3$ Low: Geriatric Depression. 

Funding: National Institute of Diabetes and Digestive and Kidney Diseases ( R01 DK105050 ). The Nurses’ Health Study is funded by grants from the National Cancer Institute ( UM1 CA186107 and P01 CA87969 ).
Poster #NM31
TRENDS IN FEMALE AUTHORSHIP WITHIN UROLOGIC LITERATURE: A COMPARISON OF 2012 AND 2017
Mei Tuong, MD¹, Nickhil Patel², Jay Shah², Jacqueline Zillioux¹, David Rapp¹
¹University of Virginia Health System, Department of Urology, ²University of Virginia School of Medicine
Presented By: Mei Nicole E Tuong, MD, MS

Introduction: While there has traditionally been an overrepresentation of men within urology, a significant increase in women entering urologic training and the workforce has occurred over the past two decades. To evaluate trends in female representation in academic urology, we assessed gender and authorship in recent urologic literature, comparing the years 2012 to 2017.

Methods: We examined all articles published in 2012 and 2017 from 5 urologic journals: The Journal of Urology (JU), Journal of Endourology (JE), Neurourology and Urodynamics (NU), Urologic Oncology (UO), and Urology (UR). Gender was recorded for first and last authors. If any supplemental authors were female, supplemental authorship was recorded female. Articles were further categorized by subspecialty. Chi-square tests with bonferroni correction and multiple logistic regression modeling were used to assess for differences in female authorship by year, journal, and article subspecialty.

Results: 1,433 and 1,374 articles were published in 2012 and 2017, respectively. There was a significant increase in all female authorship categories between the years: first (19% to 25%), supplemental (58% to 63%), and last (12% to 16%)(p<0.01, all comparisons). Articles without any female authorship decreased in 2017 versus 2012 (33% to 23%, p<0.001). In assessment of journal and subspecialty, for both years the highest proportion of articles with any female author was in NU (80%, 2012; 85% 2017), General (78%, 2012) and FVPI (85%, 2017). There was a significant increase between 2012 and 2017 of female first authors in female urology/voiding dysfunction articles (33% to 44%, p<0.01). The vast majority of remaining individual journals and subspecialties had no statistically significant change in female authorship between years. Multiple logistic regression modeling further revealed varied effects of journal and subspecialty on likelihood of female authorship (Table 1).

Conclusion: Female authorship in urologic literature was higher in 2017 compared to 2012. Although isolated journals or subspecialties were associated with female representation in specific authorship types, our analysis suggests that journal and subspecialty do not explain the sustained increase seen across all authorship types. Rather, this trend may simply reflect generalized increase in women entering the field.
### Table 1. Multiple Logistic Regression of Female Authorship

<table>
<thead>
<tr>
<th>Year</th>
<th>First Author</th>
<th>Last Author</th>
<th>Any Author</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>p</td>
<td>OR</td>
</tr>
<tr>
<td>2012</td>
<td>REF</td>
<td>--</td>
<td>REF</td>
</tr>
<tr>
<td>2017</td>
<td>1.28</td>
<td>0.013</td>
<td>1.20</td>
</tr>
</tbody>
</table>

#### Journal

<table>
<thead>
<tr>
<th>Journal</th>
<th>First Author</th>
<th>Last Author</th>
<th>Any Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>JU</td>
<td>REF</td>
<td>--</td>
<td>REF</td>
</tr>
<tr>
<td>UR</td>
<td>0.83</td>
<td>0.13</td>
<td>0.97</td>
</tr>
<tr>
<td>UO</td>
<td>1.08</td>
<td>0.70</td>
<td>1.19</td>
</tr>
<tr>
<td>JE</td>
<td>0.58</td>
<td>0.03</td>
<td>0.66</td>
</tr>
<tr>
<td>NU</td>
<td>1.41</td>
<td>0.07</td>
<td>1.17</td>
</tr>
</tbody>
</table>

#### Specialty

<table>
<thead>
<tr>
<th>Specialty</th>
<th>First Author</th>
<th>Last Author</th>
<th>Any Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>REF</td>
<td>--</td>
<td>REF</td>
</tr>
<tr>
<td>Endo</td>
<td>0.75</td>
<td>0.29</td>
<td>0.55</td>
</tr>
<tr>
<td>FVPI</td>
<td>2.06</td>
<td>0.001</td>
<td>1.28</td>
</tr>
<tr>
<td>Oncology</td>
<td>0.89</td>
<td>0.60</td>
<td>0.55</td>
</tr>
<tr>
<td>Peds</td>
<td>1.63</td>
<td>0.04</td>
<td>0.76</td>
</tr>
<tr>
<td>Infertility</td>
<td>1.19</td>
<td>0.55</td>
<td>0.72</td>
</tr>
<tr>
<td>Recon</td>
<td>1.22</td>
<td>0.48</td>
<td>0.29</td>
</tr>
</tbody>
</table>

JU, Journal of Urology; UR, Urology; UO, Urologic Oncology; JE, Journal Endourology; NU, Neurourology Urodynamics; Endo, endoscopy; Peds, Pediatrics; Recon, Reconstruction. FVPI, female/voiding dysfunction/prolapse/incontinence

**Funding:** N/A
Poster #NM32  
COMPLICATIONS REPORTED TO THE FOOD AND DRUG ADMINISTRATION - A COMPARISON OF MIDURETHRAL SLING PRODUCTS  
Amanda Artsen, MD, Jessica Sassani, MD, Pamela Moalli, MD, Megan Bradley, MD  
University of Pittsburgh Medical Center  
Presented By: Amanda Artsen, MD

**Introduction:** Mesh complications after midurethral slings (MUS) reported to the United States’ Food and Drug Administration (FDA) Manufacturer and User Facility Device Experience (MAUDE) database inform the FDA, influence public opinion and provide data for litigation. We aimed to compare the proportion of the most common adverse events reported to the FDA between currently available MUS products.

**Methods:** A comparison of MUS products was performed in a cross-sectional analysis of medical device reports (MDRs) reported to the FDA from 1/2004-3/2019 using The Reed Tech Navigator (LexisNexis, Horsum PA). This is a software that compiles and codes MDRs. Chi2 tests with a Dunn-Sidak correction were used to compare complication proportions.

**Results:** Available mesh MUS devices listed in the MAUDE database included 3 trans-obturator slings: Gynecare TVT Obturator System (Ethicon, Bridgewater NJ, N=11604 MDRs), Gynecare TVT Abbrevo Continence System (Ethicon, N=437) and Aris (Coloplast, Humlebaek Denmark, N=48) and 4 retropubic slings: Gynecare TVT Retropubic System (Ethicon, N=5444), Gynecare TVT Exact Continence System (Ethicon, N=667), Advantage Fit (Boston Scientific, Boston MA, N=1063), and Supris (Coloplast, N=86). Two products were single incision slings: Solyx SIS (Boston Scientific, N=552) and Altis SIS (Coloplast, N=362) and one product, Desara Blue Sling System (Caldera Medical, Agora Hills CA, N=673) can be placed via a retropubic or trans-obturator approach.

The most common events were pain, erosion, infection and unspecified injury but also included cardiac, pulmonary, hematologic, neurologic, gynecologic, autoimmune and psychiatric complaints.

Gynecare TVT Obturator System had the highest proportion of erosion and pain complaints (P<0.001, Figure). The three other Gynecare slings had higher proportions of pain and erosion complaints than the other available slings (P<0.001). Advantage Fit had the lowest proportion of infection complaints.

When combined, trans-obturator slings had a higher proportion of erosion and pain complaints than retropubic and single incision slings (P<0.001). Retropubic slings had a higher proportion of infection complaints (P<0.001).

**Conclusion:** Complication profiles may differ by product but are also affected by market share, time on the market and surgical placement trends. Comparative studies are needed. In addition, the quality of reports to the FDA on MUS varies widely, and event adjudication is needed prior to use of these reports in litigation.
Funding: N/A
Poster #NM33
CONCURRENT GYNECOLOGIC ONCOLOGIC SURGERY AND URETHRAL SLINGS: AN UNDERUSED MODALITY
Claire Burton1, Catherine Bresee2, Colby Souders3, Jennifer T. Anger3, Karyn S. Eilber3
1Department of Urology, University of California Los Angeles, Los Angeles, CA, 2Department of Biostatistics and Bioinformatics, Cedars Sinai Medical Center, Los Angeles, CA, 3Division of Urology, Department of Surgery, Cedars Sinai Medical Center, Los Angeles, CA
Presented By: Claire Burton, MD

Introduction: Up to 30% of women with gynecologic malignancies have stress urinary incontinence (SUI). Women with malignancies and SUI report worse quality of life (QOL) than those without SUI. We evaluated the temporal trends of concurrent urethral sling and gynecologic oncology surgery and compared complication rates between procedures with and without a sling using the National Inpatient Sample (NIS).

Methods: The NIS contains approximately 20% of all hospital admissions in the United States from a stratified sample. We identified women who had a diagnosis of a gynecologic malignancy (ICD-9 179.X-184.X) and underwent hysterectomy or oophorectomy with or without a concurrent incontinence procedure, as identified by ICD-9 procedure codes between 2010-2014.

Results: An estimated total of 220,990 women underwent hysterectomy or oophorectomy for a malignancy and 1,567 (0.71%) women had concurrent gynecologic oncologic surgery and urethral sling in the study period of 2010-2014. Numbers of concurrent surgery decreased from 573 in 2010 to 145 in 2014 (p<0.001). Those with concurrent sling procedures were more likely to be older and Caucasian. They had shorter length of stay (LOS) and fewer overall complications. There was no associated mortality in the concurrent procedure group, and there was no difference in total hospital charges between the two groups.

Conclusion: Women undergoing concurrent procedures for a gynecologic malignancy and SUI showed no increase in codes for complications, LOS, or hospital charges. Women with less aggressive disease, or better health overall, may be more likely to be considered candidates for a QOL operation such as a urethral sling. The decrease in concurrent slings from 2010 to 2014 may reflect the negative attention to mesh. However, given the high prevalence of concurrent SUI and gynecologic malignancy and the decreased QOL, many more patients may benefit from concurrent procedures without risk of increased complications, LOS, or hospital charges.
Table 1: Univariate analysis

<table>
<thead>
<tr>
<th></th>
<th>Gyn Onc Surgery Alone (n=220,223)</th>
<th>Gyn Onc Surgery + SUI Procedure (n=1,567)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, years</strong></td>
<td>60.6 +/- 0.09</td>
<td>63.4 +/- 0.7</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>145,625 72.4%</td>
<td>1,107 78.5%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>African American</td>
<td>21,098 10.5%</td>
<td>45 3.2%</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>19,088 9.5%</td>
<td>155 11.0%</td>
<td></td>
</tr>
<tr>
<td>Other / Missing</td>
<td>15,428 7.7%</td>
<td>103 7.3%</td>
<td></td>
</tr>
<tr>
<td><strong>LOS, days</strong></td>
<td>4.35 +/- 0.04</td>
<td>3.10 +/- 0.20</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Died</strong></td>
<td>1,111 0.50%</td>
<td>0 n/a</td>
<td></td>
</tr>
<tr>
<td><strong>Any Complications</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac</td>
<td>2,344 1.06%</td>
<td>14 0.89%</td>
<td>0.76</td>
</tr>
<tr>
<td>Vascular</td>
<td>39 0.02%</td>
<td>0 n/a</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>19,058 8.65%</td>
<td>117 7.49%</td>
<td>0.56</td>
</tr>
<tr>
<td>Digestive</td>
<td>24,410 11.08%</td>
<td>150 9.57%</td>
<td>0.39</td>
</tr>
<tr>
<td>Urinary</td>
<td>1,815 0.82%</td>
<td>29 1.84%</td>
<td>0.04</td>
</tr>
<tr>
<td>Shock</td>
<td>3,956 1.80%</td>
<td>15 0.96%</td>
<td>0.28</td>
</tr>
<tr>
<td>Wound</td>
<td>5,551 2.52%</td>
<td>46 2.90%</td>
<td>0.67</td>
</tr>
<tr>
<td>VTE</td>
<td>2,875 1.31%</td>
<td>15 0.96%</td>
<td>0.59</td>
</tr>
<tr>
<td>Bowel</td>
<td>22,643 10.28%</td>
<td>59 3.74%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Total # Complications</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>157,299 71.43%</td>
<td>1,232 78.68%</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>47,231 21.45%</td>
<td>259 16.53%</td>
<td>&lt;0.02</td>
</tr>
<tr>
<td>2</td>
<td>12,300 5.59%</td>
<td>50 3.21%</td>
<td></td>
</tr>
<tr>
<td>3 or more</td>
<td>3,393 1.54%</td>
<td>25 1.59%</td>
<td></td>
</tr>
<tr>
<td><strong>Total Charges, $</strong></td>
<td>56,062 +/- 864</td>
<td>53,992 +/- 3,114</td>
<td>0.48</td>
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</table>

Funding: N/A
Poster #NM34
CRITICAL ANALYSIS OF PELVIC ORGAN PROLAPSE CONTENT ON PINTEREST
Lauren Pace, Medical Student, Amber Herbert, Medical Student, Alia Munir, Rena Malik, MD
University of Maryland, Baltimore
Presented By: Lauren Pace

Introduction: As social media has become increasingly pervasive, its applications have continued to broaden. Pinterest is a social media platform designed as a “visual discovery engine” with the aim of helping users to discover new websites and information on topics of interest1. There are 250 million monthly users on Pinterest, including 77.4 million in the United States2. Given that content is user-driven and any website can be pinned and shared, we sought to examine the quality of information available on pelvic organ prolapse. Our goal was to assess the understandability and actionability of content linked in top pelvic organ prolapse pins.

Methods: Pinterest results were analyzed by searching the term “pelvic organ prolapse.” We examined the first 100 results, analyzing the publisher/poster of the pin and the content linked therein. Using validated tools including the DISCERN criteria for quality of consumer health information and the Patient Education Materials Assessment Tool (PEMAT), we compared understandability and actionability of content. We also looked for commercial bias present in linked content and subjectively analyzed the overall quality.

Results: We evaluated 50 pins, reaching 4,052,435 followers. We determined that of these pins, 17 (34%) provided poor quality information and only 18 (36%) encouraged shared decision making with a medical professional (Table 3). With regard to adequate discussion of prolapse treatment options, 13 (26%) of pinned pages discussed observation, 28 (56%) discussed the option of surgery, 21 (42%) mentioned pessary, and 43 (86%) discussed pelvic floor muscle training (PFMT) (Table 2). 3 pins (6%) linked content with some level of misinformation (Table 3).

Conclusion: While social media platforms such as Pinterest increase accessibility of medical information, the lack of content moderation allows for posts that include commercial bias or misinformation. PFMT is a very common focus of pinned content, but not always discussed in the context of other options. Furthermore, only 36% of pinned pages encouraged shared decision making with a medical professional. These statistics are important for medical practitioners to recognize, as patients who research their condition on social media may have preconceptions regarding treatment for pelvic organ prolapse.
**Sources**

**Funding:** N/A
Poster #NM35
PATIENT PERSPECTIVES ON MID URETHRAL SLING SURGERY COMPLICATIONS
Pansy Uberoi¹, Wai Lee¹, Donna Berry², Kathleen Kobashi¹, Alvaro Lucioni¹, Una Lee¹
¹Virginia Mason, ²University of Washington
Presented By: Pansy Uberoi, MD, MPH

Introduction: Stress urinary incontinence (SUI) affects more than half of women aged 40 to 60. Mid urethral sling (MUS) surgery is the most common surgical treatment for SUI. Women’s experiences with mesh sling complications have not been well-documented in the medical literature. We sought to understand participants’ experiences including knowledge, attitudes, and beliefs regarding their MUS surgery and outcomes.

Methods: Patients who had undergone surgery for mesh sling complications over the past 10 years at a single institution were invited to participate in semi-structured focus groups or individual interviews. Discussions were recorded and transcribed. The transcribed data was analyzed for themes using Nvivo software. 4 individual investigators came to consensus on the common experiences.

Results: Our initial cohort included 7 women who participated in 3 focus groups. Recruitment of participants is ongoing. In the interim analysis, almost all participants recounted that potential mesh-specific complications and alternatives to mesh sling were not adequately discussed by their surgeons. Sling complications and related pain impacted women’s physical activity levels, lifestyle, family life, work productivity, and sexual lives. Women experienced lack of empathy from their surgeons, resulting in loss of trust in their surgeon. Women described various coping mechanisms, in light of diminished social support over time. Participants recommended more thorough preoperative counseling specific to mesh including potential complications, as well as treatment alternatives.

Conclusion: Women were not prepared for the mesh sling complications they experienced. Once the complications occurred, they found little support and empathy from their surgeons. The findings suggest room for improvement in our informed consent process for mesh sling surgery and improvements in postoperative care.

Funding: N/A
Poster #NM36

CLINICAL PHARMACIST-LED OVERACTIVE BLADDER SUPPLEMENTAL MANAGEMENT SUPPORT: PROSPECTIVE PILOT STUDY

Hamza Beano¹, Catherine Helms², Lydia Wang², Michael Kennelly¹
¹Dept of Urology, Carolinas Medical Center, ²Dept of Pharmacy, Carolinas Medical Center
Presented By: Hamza Mustafa Beano, MD

Introduction: Inadequate education and follow-up might be a contributing factor to limited compliance with 2nd line Overactive bladder (OAB) therapy. Clinical-pharmacists are at a unique position to support early OAB management due to their accessibility and their expertise in polypharmacy. We aim to evaluate the impact of clinical-pharmacist supplemental management support in OAB management.

Methodology: This is a single institution, IRB-approved, prospective, randomized, controlled trial. We included adult females with >3 months of OAB symptoms requiring/currently on pharmacotherapy. Patients were randomized to control (n=14) and intervention (n=14) groups (Figure 1). Both groups were seen 4 times in clinic (pre-visit, initial visit: 2 weeks, 2nd visit: 5-7 weeks, final visit: 9-11 weeks). Daily 50mg Mirabegron was started at initial visit and 5mg of Solifanacine was added at 4 weeks if needed. Additional counseling, medication optimization and telephone follow-up were provided in the intervention group. Primary end-points were mean missed medication doses/month and transition to 3rd-line therapy. Secondary outcomes were OAB-q scores, mean incontinence events/24hrs, mean daytime voids, mean nocturia/nights, Mini-Cog scores and in the intervention arm medication-related problems.

Results: 14 patients were randomized to each arm. Patient characteristics are summarized in table 1. Average missed doses/month and transition to 3rd-line therapy were similar in the control and intervention groups (1.1 vs 0.96, p=0.848 and 4 vs 2, p= 0.6483). Other endpoints are summarized in table 2. Improvement in nocturia/night between pre-visit and final visit was significant in the intervention arm (p=0.016) and not the control arm (p=0.709) but significance was lost comparing the intervention arm to the control arm. The mini-cog questionnaire scores at pre-visit and final visit were unchanged in the control (4.4 vs 4.3) and intervention arms (4.1 vs 4.5). The clinical pharmacist detected 48 MRP in 13 patients (figure 2) which were resolved in 81.2% of the cases by the pharmacist.

Conclusion: Clinical-pharmacists detected and addressed MRPs but not improve short term medication compliance, transition to 3rd-line therapy or the remaining outcomes compared to the control group. Our results suggest that clinical-pharmacists are most helpful in managing polypharmacy. Longer follow-up period with a larger sample size is needed to improve the validity of our conclusion.
**Funding:** N/A

**Poster #NM37**

WITHDRAWN
**Poster #NM38**  
**PREOPERATIVE PRACTICES AMONG UROLOGY, OBSTETRICS AND GYNECOLOGY, AND PRIMARY CARE PHYSICIANS CAN IDENTIFY PRACTICE GAPS IN PROVIDING HIGH VALUE CARE**  
Shirly Solouki, MD¹, Hauchie Pang, MD², Sharon Rikin, MD², Nitya Abraham, MD³  
¹Department of OB/GYN, Montefiore Medical Center, ²Department of Internal Medicine, Montefiore Medical Center, ³Department of Urology, Montefiore Medical Center  
Presented By: Shirly Solouki, MD

**Introduction:** Preoperative medical assessment (POMA) is generally a multi-disciplinary effort that is performed in order to identify and address medical issues that can increase perioperative morbidity and mortality. Guidelines for POMA include indications for testing; however, there may be gaps in how providers utilize these best practices which may result in low value care. The objective of this study was to evaluate the pre-operative practices and preferences of health care providers involved in POMA.

**Methods:** This is an ongoing cross-sectional study anonymously surveyed urology, obstetric and gynecology (ob/gyn), and primary care providers at an urban, academic medical center in 2019. The survey consisted of 23 multiple choice questions on their preoperative testing practices. Demographics and specialty-specific information were obtained. Descriptive statistics were used for data analysis.

**Results:** Out of 456 eligible providers, 89 participated from ob/gyn (48.3%), urology (14.6%) and primary care (35.9%). While 15% of providers reported that POMA is required for all patients, others reported that they consider comorbidities (59%), surgery type (17%), and/or age (59%) when deciding whether or not POMA is needed. Many providers reported always or almost ordering the following studies: CBC (70%), BMP (57%), type and screen (45%), EKG (24.7%), chest x-ray (35%). Only 23% of participants reported feeling very to extremely confident with the ASA Classification System. The majority of respondents prefer that anesthesia (45%) or internal medicine (31%) providers determine need for POMA.

**Conclusion:** We found that providers in our system often order testing without consideration of specific indications. Prior studies demonstrate that routine preoperative testing does not alter surgical management nor postoperative outcome in women undergoing low risk Urogynecological surgery. As we aspire to improve value-based care, one area of low value care is unnecessary preoperative testing. One reason for unnecessary testing which may be due to lack of confidence with the ASA classification. The majority of providers preferred that the necessity for POMA be determined by anesthesia or internal medicine providers. Efforts to reduce low value care should focus on implementing POMA best practices which may be improved by standardizing the responsibility of deciding who requires POMA to anesthesiologists or internists.

**Funding:** N/A
Poster #NM39
REAL WORLD OUTCOMES OF INTRAVESICAL ONABOTULINUM TOXIN A IN PATIENTS WITH SYMPTOMATIC OVERACTIVE BLADDER (OAB)
Gemma Scrimgeour, Kristina Aleksejeva, Richard Axell, Habiba Yasmin, Mehwash Nadeem, Stephen Unterberg, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
University College London Hospital
Presented By: Gemma Scrimgeour

Introduction: Whilst there is prospective randomised trial data showing the benefit of Onabotulinum Toxin A (Botox A) in index patients with symptomatic OAB, this data may not reflect real world outcomes in all-comers.

Methods: The notes of 418 consecutive patients (median age 61 years, range 22-90 years) with symptomatic OAB refractory to behavioural and medical treatment and urodynamically proven idiopathic urodynamic detrusor overactivity, having their first intravesical Botox A treatment between 1st January 2006 and 31st December 2018, were reviewed. Any patient not seen within the past six months was contacted by telephone. Five had inadequate notes and were excluded from assessment. Data was collected on patient demographics, patient global assessment of improvement following first treatment, dose of Botox A, the need for intermittent self-catherization (ISC), and number of repeat treatments. Statistical analysis was by chi-square and significance was determined at P < 0.05.

Results: 413 patients (285 female, 69%) fulfilled the above criteria and their outcomes are listed in the table below.

Conclusion: In real world patients (48.9% with previous pelvic surgery), Botox A makes 68.5% better, much better or very much better at the expense of new-onset ISC in 35%. A good response is significantly more likely in women but does not appear to be dose-dependent.

<table>
<thead>
<tr>
<th></th>
<th>Good Response (PGII 1 and 2)</th>
<th>Partial Response (PGII 3)</th>
<th>No Response (PGII&gt;4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>235(56.9%)</td>
<td>48(11.6%)</td>
<td>130(31.4%)</td>
</tr>
<tr>
<td>Female</td>
<td>174(74%)</td>
<td>32(66.7%)</td>
<td>80(61.5%)*</td>
</tr>
<tr>
<td>Male</td>
<td>61(26%)</td>
<td>16(33.3%)</td>
<td>50(38.5%)</td>
</tr>
<tr>
<td>Median age years</td>
<td>61(22-98)</td>
<td>63(26-91)</td>
<td>59(20-89)</td>
</tr>
<tr>
<td>Previous pelvic surgery</td>
<td>117(49.8%)</td>
<td>25(52%)</td>
<td>60(46.1%)</td>
</tr>
<tr>
<td>300U</td>
<td>14(5.9%)</td>
<td>2(4.1%)</td>
<td>13(10%)</td>
</tr>
<tr>
<td>200U</td>
<td>121(51.5%)</td>
<td>25(51.1%)</td>
<td>71(54.6%)</td>
</tr>
<tr>
<td>100U</td>
<td>97(41.3%)</td>
<td>21(43.8%)</td>
<td>46(35.4%)</td>
</tr>
<tr>
<td>Other</td>
<td>3(1.3%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>New CISC (includes SPC)</td>
<td>75(31.9%)</td>
<td>19(39.6%)</td>
<td>52(40%)</td>
</tr>
<tr>
<td>Repeat Botox A</td>
<td>3(1.3%)</td>
<td>2(2.26%)</td>
<td>2(2.36%)</td>
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<tr>
<td>Median [mean] number repeats (range)</td>
<td>3(1.3) (1-19)</td>
<td>2(2.26) (1-7)</td>
<td>2(2.36) (1-4)</td>
</tr>
</tbody>
</table>

* P < 0.05

Funding: N/A
Poster #NM40
OVERACTIVE BLADDER FOLLOW MIDURETHRAL SLING PLACEMENT: DE NOVO OR PERSISTENT?
John M. Masterson, MD1, Paige Kuhlmann, MD1, Kai B. Dallas1, Amit Reddy2, Kyle Tsai3, Peris Castaneda4, Karyn L. Eilber, MD1, Jennifer T. Anger, MD, MPH1, A. Lenore Ackerman, MD, PhD1
1Cedars-Sinai Medical Center, 2Tulane University School of Medicine, 3Northwestern University Feinberg School of Medicine, 4University of Michigan Medical School
Presented By: John Michael Masterson, MD

Introduction: Overactive bladder (OAB), characterized by urge urinary incontinence (UUI), following midurethral sling (MUS) surgery is often referred to as a complication, yet most cases are persistent UUI that pre-dated the sling. The goal of our study was to assess risk factors associated with UUI following MUS and to identify factors associated with de novo and persistent UUI after MUS. We also measured rates of third-line therapies for UUI after sling surgery.

Methods: Women who had a MUS placed at a single institution between 2013 to 2017 with at least two years follow-up were included. Patient demographics, perioperative factors (such as sling type, bladder perforation, bleeding), stress versus mixed incontinence history, and were analyzed for association with UUI and after MUS. Univariate analysis was performed using t or Chi-Square/Fisher’s tests and multivariate analysis was performed with logistic regression modeling.

Results: During the study period, 425 patients having MUS placement were identified. Preoperatively, 27 (6.4%) had history of OAB medication use, and 58 (13.6%) had history of UUI. Postoperatively, 73 (17%) had symptoms of UUI. Patients who experienced post-operative UUI were older (64.1 vs. 59.2 years, p=0.018) and more likely to have used OAB medications prior to MUS (11.2% vs 34.1% p=0.00004). A total of 21 (4.9%) patients required third-line OAB treatment following MUS (13 botox; 3 interstim, 5 combination botox and interstim). These patients were more likely to have had retropubic sling (54% vs. 46%, p=0.009), be Caucasian (72% vs 28%, p=0.029), have used pre-operative OAB medications (91.5% vs. 8.5%, p=0.03), and have higher body mass index (29.35 vs. 25.96, p=0.043). On multivariate analysis pre-operative OAB medication use was associated with (p=0.01645) UUI after MUS while placement of a transobturator sling was found to be protective against (p=0.00242) UUI after MUS (Table 1).

Conclusion: In this study, we found an association of pre-operative OAB medication use, age, race, BMI, type of sling and lack of prior third-line OAB treatment with development of UUI following MUS. As such, de novo OAB after MUS may not be as prevalent as previously thought. This information, in concert with careful pre-operative assessment of OAB-type symptoms, may be helpful when counseling patients undergoing MUS surgery.

<table>
<thead>
<tr>
<th>Variable</th>
<th>UUI after MUS or (95% CI)</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.0 (0.995-1.0)</td>
<td>0.110</td>
</tr>
<tr>
<td>BMI</td>
<td>1.0 (0.947-1.1)</td>
<td>0.877</td>
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<tr>
<td>Pre-operative OAB medication use</td>
<td>2.7 (1.200-4.1)</td>
<td>0.016*</td>
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<tr>
<td>Indication for MUS</td>
<td>0.2 (0.015-1.6)</td>
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<tr>
<td>Prophylaxis</td>
<td>0.5 (0.226-1.2)</td>
<td>0.145</td>
</tr>
<tr>
<td>Stress incontinence</td>
<td>0.5 (0.226-1.2)</td>
<td>0.145</td>
</tr>
<tr>
<td>Mixed UI</td>
<td>1.2 (0.271-5.5)</td>
<td>0.793</td>
</tr>
<tr>
<td>Trans obturator sling</td>
<td>0.4 (0.137-0.7)</td>
<td>0.002*</td>
</tr>
</tbody>
</table>

Table 1: Multivariate associations of risk of urge urinary incontinence after midurethral sling

*statistical significance at 0.05 threshold

Funding: N/A
Poster #NM41
RECREATIONAL PHYSICAL ACTIVITY IS ASSOCIATED WITH DECREASED URGE URINARY INCONTINENCE: RESULTS FROM THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY
Vishnu Ganesan, MD, Ramy Goueli, MD, Dayron Rodriguez, MD, Gary Lemack, MD
UT Southwestern Department of Urology
Presented By: Vishnu Ganesan, MD

Introduction: We sought to investigate associations between physical activity and both stress and urge urinary incontinence in a nationally representative adult population.

Methods: We performed a cross-sectional analysis of women age 20 and older in the 2007-2016 National Health and Nutrition Examination Survey. Urge incontinence (UUI) was determined by self-report of leaking urine before reaching the toilet and stress incontinence was determined by leaking urine with activity such as coughing or lifting. Measures of physical activity were obtained by self-report. Vigorous-intensity activities required hard physical effort and cause large increases in breathing or heart rate while moderate-intensity activities required small increases in breathing or heart rate. Survey weighted logistic regression models were used to analyze the relationship between activity type, intensity, and UUI and SUI while adjusting for potential confounders.

Results: We identified 15,040 women ages 20 years and older. The median age was 48 years (95% CI: 47-49). 66% (95% CI: 63%-70%) of the women were Caucasian with an average BMI of 29 kg/m² (95% CI 28.9 – 29.3). Overall 42% (95% CI: 41%-43%) of women reported SUI, 27% (95% CI: 26%-28%) reported UUI. After adjusting for age, parity, race, smoking history, BMI, we found women who participated in moderate recreational activity had significantly decreased odds of reporting UUI (OR 0.82; 95% CI: 0.81-0.95). However, women who reported vigorous work-related physical activity had significantly increased odds of reporting UUI (OR 1.3; 95% CI: 1.1-1.6). There was no significant association noted between both recreational and work-related physical activity and SUI (Table 1).

Conclusion: Our study suggests a significant association between physical activity and urge urinary incontinence that depends on the type and setting of the physical activity. Recreational exercise was associated with modest decrease in risk of reporting UUI which may be due to strengthening of the pelvic floor muscles. This was not seen with vigorous recreational activity. However, women who reported vigorous physical activity as part of work had increased risk reporting UUI which may be related to time constraints and bathroom access. These findings may have important implications for patient counseling with regards to encouragement of recreational physical activity.

Funding: N/A
Poster #NM42
TRENDS IN INNOVATION IN THE SURGICAL MANAGEMENT OF STRESS INCONTINENCE AND PELVIC ORGAN PROLAPSE: A “DEEP DIVE” INTO THE FDA 510(K) AND PREMARKET APPROVAL DATABASES
Cristina Fox, MD, Debra Fromer, MD
Hackensack University Medical Center, Hackensack, NJ
Presented By: Cristina M. Fox, MD

Introduction: In 2008, the FDA issued a landmark Public Health Notification (PHN) regarding adverse events of transvaginal mesh (TVM) for pelvic organ prolapse (POP) and stress urinary incontinence (SUI). In 2011, the FDA update stated that serious adverse events of TVM for POP repair are not rare. This same year, an FDA Executive Advisory Panel considered reclassification of TVM for POP repair from Class II (low to moderate risk) to Class III (high risk), which mandated a more extensive and costly Premarket Approval (PMA). The FDA followed with 109 orders for device manufacturers to initiate post-market 522 studies of existing TVM for POP repair and single-incision slings by 2013. In early 2016, up-classification of TVM for POP repair to Class III was announced along with a deadline of mid-2018 for PMAs and 522s. In April 2019 all TVM for POP repair were withdrawn from the market as the FDA revoked their clearance based on 1-year data. This series of events brings to question: how are the FDA regulatory clearance processes affecting trends in surgical innovation in the management of SUI and POP?

Methods: Utilizing the FDA 510(k) and PMA databases on the FDA website, we analyzed the trends of devices granted clearance for POP and SUI between 1999 and 2018. This included both modifications to existing devices and novel devices. Quantification of the number of novel device submissions during this study period was correlated to the FDA issued communications to estimate trends in device innovation.

Results: From 1999 to 2018, there were 127 total Cleared 510(k) Premarket Notifications, 48 for POP and 79 for SUI. Of the total submissions, there were 29 novel devices for POP and 40 for SUI. Figure 1 demonstrates a temporal analysis of submissions, correlating to a peak from 2004 to 2008, and accounting for 56% of all submissions. Conversely, post-2008, there is a precipitous drop in novel submissions, resulting in a literal flatline.

Conclusion: The declining trend in device manufacturer innovation correlates with increasing demands from the FDA involving intensive premarket approval processes. Such a trend limits surgical options for women with POP and SUI and threatens the quality, evidence-based care that our patients deserve.

Funding: N/A
THE ROLE OF SUPPORT GROUPS IN THE MANAGEMENT OF URINARY INCONTINENCE IN WOMEN
Gina Toma, Research Coordinator1,2, Alexandra Carolan, Study Personal3, Skye Buckner-Petty, Data Analyst4, Christopher Wolter, Study Personal3, Laura Vargas, Study Personal4, Aqsa Khan, Principal Investigator3
1Mayo Clinic Arizona, 2Arizona State University, 3Mayo Clinic Arizona, Department of Urology, Phoenix, AZ, 4Mayo Clinic Arizona, Department of Research Administration
Presented By: Gina Toma

Introduction: Qualitative studies on women with urinary incontinence have identified several issues, some examples including delays in seeking care, poor understanding of the condition, implementation of complex management strategies, and significant psychosocial impact1-3. There are few studies that have assessed how support group enrollment will impact their experience with incontinence management. The aim of this study was to evaluate if women seeking care for urinary incontinence had improved treatment outcomes and satisfaction when enrolled in a support group.

Methods: Adult women seeking treatment for urinary incontinence were randomized to support group enrollment or standard of care. Upon study enrollment, all participants were de-identified and completed validated questionnaires (MESA, UDI-6, OAB-SAT-q, PGI-S, PGI-I, SQoL-F, PHQ-9, IPAQ) repeated 12 weeks later. Three recorded support groups were offered two weeks apart from one another and later transcribed. A written survey was administered after each support group asking about how it impacted their condition. Two weeks following the last support group, the validated questionnaires were readministered. We used repeated measures ANOVA models to assess improvement in the outcomes form pre- to post-treatment in the intervention group as compared to the control group in an intent-to-treat manner. Grounded theory methodology was used to assess innate themes within the transcripts and surveys.

Results: After randomization, 9 control and 8 intervention participants were eligible for analysis. Seven women attended all three support group sessions as intent to treat analysis. Results of the transcripts indicated that the quality of life for women with urinary incontinence is substantially affected. Several themes emerged, including perception of gender differences, mistrust, poor education, coping strategies, bleak outlook, and desire for personalized care. Post session surveys revealed significant comfort in support group participation and desire for ongoing group meetings. There were no statistical differences found in survey results between control and intervention groups on statistical analysis.

Conclusion: There were no statistical differences in validated survey measurements, possibly due to the small sample size and short study duration. Despite this, qualitative analysis did demonstrate that there was a very favorable response to support group enrollment and a desire for ongoing sessions. Future directions will be to assess longer term impact of support group enrollment.
<table>
<thead>
<tr>
<th>Theme</th>
<th>Representative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appreciation of Support Group</td>
<td>“Well yeah, I would say I probably said more here than I have ever said before.”</td>
</tr>
<tr>
<td></td>
<td>“It was enlightening to see that I'm not the only one who struggles with urinary issues”.</td>
</tr>
<tr>
<td></td>
<td>“I had not discussed my situation managing urinary incontinence so thoroughly before this study”.</td>
</tr>
<tr>
<td></td>
<td>“Emotionally, this journey has been very difficult. It helped me deal with that”.</td>
</tr>
<tr>
<td></td>
<td>“These 3 sessions have opened my eyes to the condition of incontinence. My stress level about incontinence has been greatly reduced”.</td>
</tr>
<tr>
<td>Urinary incontinence as a gendered issue</td>
<td>“... I worked with a lot of men who had the bladder the size of a watermelon, that's all I could figure out and the last thing you wanted to do is be the person that asked to take a break. So there are all kinds of subtle pressure, for me it wasn't a legal issue, as much as it was a wanting to be at the table issue and not demonstrating weakness and being female.”</td>
</tr>
<tr>
<td>Desire for comprehensive and personalized care</td>
<td>“I mean even now I'm beginning to wonder if I should give up on the gastroenterologist and find a doctor that treats bowel and bladder- um, because they are probably more interrelated than I realize.”</td>
</tr>
<tr>
<td>Urinary incontinence causing shame, secrecy and humiliation</td>
<td>“It would seem to me that we can talk about almost anything else other than the incontinence. Incontinence tends to be an embarrassing baby thing, you know oh, you're not grown up, and, but, women go into detail about the breast cancer, and with men around! Talk about breast cancer and ovarian cancer and all these other, you know hysterectomies, and endometriosis, and all these other things that to me sound you know much more- at least feminine-wise, more intimate, personal, but it's the urinary, and I'll say bowel too incontinence that is like taboo subject.”</td>
</tr>
<tr>
<td>Lack of public awareness of diagnosis and treatment</td>
<td>“Then I told my doctor and she said, ‘Well maybe you need to see an urologist’, and I had no idea I was going to get the diagnosis of being incontinent...”</td>
</tr>
<tr>
<td>History of negative provider interactions</td>
<td>“...I was with him for several years and was terrible! And, um, and was demeaning, disrespectful, condescending, called me deary, it was terrible.”</td>
</tr>
<tr>
<td>Preference for physician-led education</td>
<td>“I think the internet has a place but it's not your doctor and I'm really grateful to have that kind of open dialogue and bring it in and ask questions if I have.”</td>
</tr>
</tbody>
</table>

**Funding:** N/A
Poster #NM44
INFLUENCE OF EXERCISE INTENSITY ON LUTS IN WOMEN
Su Jin Kim¹, Sung Tae Cho², Dong Wan Sohn³, Joon Chul Kim⁴, Hyun Woo Kim⁵, Sae Woong Kim⁶
¹Department of Urology, Yonsei University Wonju College of Medicine, Wonju, Korea, ²Department of Urology, Hallym University Kangnam Sacred Heart Hospital, Hallym University College of Medicine, Seoul, Korea, ³Department of Urology, Yeouido St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, ⁴Department of Urology, Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Bucheon, Korea, ⁵Department of Urology, The Catholic University of Korea College of Medicine, Seoul, Korea, ⁶Department of Urology, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea
Presented By: Su Jin Kim

Introduction: Lower urinary tract symptom (LUTS) is a common health-related problem in women of all ages. Modification of lifestyle can influence on the LUTS in women. Therefore, we studied the influence of daily exercise on LUTS in women who took regular health checkups.

Methods: A medical record of 1768 women who visited the health promotion center was reviewed. They completed the questions about the degree of exercise and LUTS from the health questionnaire. The questions about storage symptoms were composed of 5 inquiries about frequency, urgency, urge incontinence (UI), nocturia and stress urinary incontinence (SUI).

Results: The mean age of 1768 women was 43.1 (18 - 87) years old. Mean body mass index (BMI) and waist circumference (WC) were 21.6 (15.2 – 47.3) cm²/kg and 79.1 (51.7 – 137.8) cm. The most common LUTS was frequency (59.1%, 1045/1768) and the next was nocturia (41.9%, 741/1768) and SUI (39.9%, 706/1768). Of the 1768 women, 55 (978/1768) % performed regular exercise and 44.7 (790/1768) % did not perform any exercise. From the women doing regular exercise, 33.6 (329/978) % performed at least 150 minutes of moderate aerobic activity. The prevalence of frequency, UI, and SUI was significantly higher in women who did not regular exercise compared to the women doing regular exercise. However, a significant difference in the prevalence of LUTS was not noted according to the amount of daily exercise.

Conclusion: Regular exercise regardless of the intensity reduces risk factors of MetS and has a preventive effect on the development of OAB and SUI in women.

Funding: N/A
Poster #NM45
URETHROVAGINAL FISTULA: CHARACTERISTICS AND OUTCOMES
Sarah Ferrara, MD, BScH, FRCSC, Jennifer Locke, MD, PhD, FRCSC, Sender Herschorn, MDCM, FRCSC
University of Toronto, Sunnybrook Health Sciences Centre, Dept Urology, Toronto, ON, Canada
Presented By: Sarah R. Ferrara, MD, BScH, FRCSC

Introduction: Urethrovaginal fistula (UVF), a rare diagnosis in the developed world, is most often due to iatrogenic causes. We reviewed our 29-year experience on management of UVF and UVF outcomes following surgical repair.

Methods: All patients diagnosed with UVF at our centre between 1988 – 2017 were identified and included in this study. Patient charts were retrospectively reviewed for presentation, management, and surgical outcomes.

Results: We identified 41 cases of UVF, 40 of whom underwent surgical repair. Mean age at diagnosis was 47.8 (range 21-81). All patients had undergone prior surgery, with 20 patients (48.8%) having had some form of stress urinary incontinence (SUI) surgery. The etiology of UVF was secondary to SUI surgery in 15 patients (36.6%), mesh erosion in 8 patients (19.5%), and urethral diverticulum repair in 7 patients (17.1%). Mean duration of time from fistula to presentation at our centre was 36.8 months. Two patients had concomitant vesicovaginal fistulae (VVF), and one patient had concomitant VVF and uretero-vaginal fistula. The most common presenting symptom was continuous incontinence in 19 patients (46.3%). 38 patients underwent transvaginal surgical repair (95%). 19 patients had fascial sling placement at the time of surgery (46.3%). One patient required an intra-operative blood transfusion. Eight patients had Clavien-Dindo Grade I complications (20%), and four patients had Clavien-Dindo Grade III complications (10%). Two patients had UVF recurrence (5%). One patient, whose UVF occurred after cystectomy with neobladder creation for urothelial cancer, was treated surgically for severe incontinence with creation of a continent stoma. The second patient with UVF recurrence was treated conservatively. Mean follow-up after surgery was 3.44 years (0.11-17.04).

Conclusion: Although UVF is rare, it should be suspected in patients with continuous incontinence following a surgical procedure. Most UVF transvaginal surgical repairs are successful.

Funding: N/A
Poster #NM46
DOES THE ORIGIN OF REFERRAL TO PHYSICAL THERAPY MATTER? COMPARISON OF REFERRAL PATTERNS AND COMPLIANCE RATES ACROSS FPMRS, GYNECOLOGY, UROLOGY, AND PRIMARY CARE
Morgan Fullerton, FPMRS, Patricia Mwesigwa, FPMRS, Tamara Grisales, FPMRS, Christopher Tarnay, FPMRS
David Geffen School of Medicine at UCLA
Presented By: Morgan Elizabeth Fullerton, MD

Introduction: Pelvic floor exercises are first-line therapy for many pelvic floor disorders and can be performed under guidance of physical therapists. Pelvic floor physical therapy (PFPT) improves symptoms with minimal risk. Limited data suggests moderate rates of compliance; there is paucity of data on factors affecting utilization. This study examines PFPT referral patterns and compares rates of attendance and completion by referring provider specialty.

Methods: IRB-approved retrospective study reviewing patients referred to affiliated PFPT clinics at an academic medical center from the Departments of OB/GYN, Urology, and Primary Care over a 6-month period from January 1, 2018 through June 30, 2018. Statistical analysis was performed in STATA15 using t-test, ANOVA, and chi-square tests as appropriate.

Results: Total of 250 patients were referred to PFPT from the following specialties: FPMRS gynecologists (FPMRS-GYN) (n=87, 34.8%) and urologists (FPMRS-URO) (n=52, 20.8%), general OB/GYN (OBGYN) (n=101, 40.4%), general Urology (URO) (n=2, 0.8%), and Primary Care (PC) (n=8, 3.2%). Patients referred to PFPT differed in age (p<0.001) and parity (p<0.01) when compared by referring provider. The most common diagnoses were urinary incontinence (41.08%, n=129) and pelvic pain (35.03%, n=110); differences were noted in distribution of referring provider (p<0.001) for both diagnoses. OBGYN referrals had the youngest age (38.91 ± 14.15 years), lowest parity (0.9 deliveries), and highest proportion of referrals for pelvic pain (67.23%, n=80).

There were no differences in the rates of women contacting PFPT, attendance of first visit, attendance of >1 visit, number of visits attended, and PFPT duration based on referring provider. Overall, 49.6% (n=124) patients contacted PFPT. PFPT attendance was 47.2% (n=118), with 88.98% (n=105) of those attending >1 visit. Completion rate was 19.49% (n=23) for those who attended PFPT. Median duration of therapy was 39 days (range 1-383).

Direct comparison of FPMRS-GYN and FPMRS-URO referrals demonstrated no differences in patient characteristics, referral diagnoses, and attendance or completion rates of PFPT.

Conclusion: Less than half of patients referred to PFPT attend, with only 19.49% of those completing therapy. PFPT referrals and patient utilization are similar for FPMRS-GYN and FPMRS-URO. There are differences seen when comparing the populations referred by the different specialties, but ultimately patient utilization of PFPT is similar.

Funding: N/A
Poster #NM47
MAJOR ADVERSE CARDIOVASCULAR AND CEREBROVASCULAR EVENTS ASSOCIATED WITH FEMALE PELVIC RECONSTRUCTIVE SURGERY
Kasey Roberts, MD1, David Sheyn, MD2, Graham Chapman, MD3, Emily Slopnick, MD3, Jeffrey Mangel, MD2
1University Hospitals, Cleveland, OH, 2MetroHealth Hospitals, Cleveland OH, 3University Hospitals, Cleveland OH
Presented By: Kasey Roberts, MD

Introduction: National trends in major adverse cardiovascular and cerebrovascular events (MACCE) in women undergoing pelvic reconstructive surgery (PRS) is unknown.

Methods: Data from the Healthcare Cost and Utilization Project National Inpatient Sample was used to identify women undergoing PRS between 2012 to 2016. Patient- and hospital-level demographic, procedural, and comorbidity data were collected. Patients were stratified into those with and those without MACCE. MACCE was defined as all-cause mortality (ACM), cardiac arrest (CA), acute myocardial infarction (AMI) and acute ischemic stroke (AIS). Descriptive statistics are expressed as medians and interquartile ranges (IQR). Pairwise analysis was performed between groups using Wilcoxon rank-sum or Fisher's exact test as appropriate. Multivariable logistic regression was used to identify independent risk factors for MACCE.

Results: During the study period 53,540 patients underwent PRS. The rate of MACCE was 4.8 per 1,000 surgeries. The most common form of MACCE was AMI (3.7 per 1,000), followed by AIS (0.6 per 1,000), CA (0.4 per 1,000), and ACM (0.3 per 1,000). Patients experiencing MACCE were older (median 69 years, IQR: 58-76 vs 58, 46-68, p<0.001), more likely to have a household income in the 1st quartile (28.5% vs 22.9%, p=0.03), and more likely to have Medicare as their primary insurer (60.9% vs 33.6%, p<0.001).

Patients experiencing MACCE were more likely to have major pre-existing cardiovascular comorbidities, coagulopathy, neurologic disease (ND), and diabetes (Table 1). Additionally, patients experiencing MACCE were more likely to undergo robotic colpopexy (20.7% vs 9.6%, p<0.001), vaginal colpopexy (32.0% vs 28.5%, p=0.04), bilateral salpingo-oophorectomy (25.8% vs 19.6%, p=0.03) and to receive a blood transfusion (8.2% vs 2.5%, p<0.001); and less likely to undergo hysterectomy (39.5% vs 48.8%, p=0.01) and bilateral salpingectomy (3.5% vs 6.8%, p=0.03).

On logistic regression, pre-existing coagulopathy was the strongest predictor of MACCE, (aOR=5.53, 95%CI: 2.39-12.78), followed by blood transfusion (aOR=4.84, 95%CI: 1.89-12.45), congestive heart failure (CHF) (aOR=3.61, 95%CI: 1.56-8.37), ND (aOR=3.14, 95%CI: 1.23-8.06), and electrolyte abnormalities (aOR=1.99, 95%CI: 1.05-3.99).

Conclusion: MACCE after PRS is a rare event with AMI being the most common manifestation. Pre-existing ND, CHF, coagulopathy, electrolyte disturbances, and perioperative transfusions are strongly associated with MACCE.
| Funding: N/A |

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<td>Hematologic Disorders</td>
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<tr>
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<td>1,065 (2.0)</td>
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<td>29 (11.5)</td>
<td>5,795 (10.9)</td>
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<td>Hypothyroidism</td>
<td>53 (20.7)</td>
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<td>6 (2.3)</td>
<td>826 (1.6)</td>
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<td>Neoplasia</td>
<td>9 (3.5)</td>
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<td>Electrolyte Abnormalities</td>
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<tr>
<td>Paralysis</td>
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<td>Chronic Liver Disease</td>
<td>0 (0.3)</td>
<td>402 (0.8)</td>
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Poster #NM48

LANGUAGE DIFFERENCES BASED ON APPLICANT GENDER FOR FEMALE PELVIC MEDICINE AND RECONSTRUCTIVE SURGERY FELLOWSHIP RECOMMENDATION LETTERS

S. Freeman¹, E. McKay², A. Leegant², N. Abraham¹

¹Department of Urology, Albert Einstein College of Medicine and Montefiore Medical Center, Bronx, NY,
²Department of OB/GYN, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, NY

Presented By: Samantha Freeman

Introduction: Letters of recommendation (LOR) are a significant portion of an individual’s application to residencies and fellowships and can influence whether an applicant is extended an interview. Applicant gender differences may play a role in the language found in LOR. Previous studies have shown that the different language used in females’ LOR result in negative outcomes that hinder women’s progress in academic fields. While differences in language based on applicant gender have been identified in other fields, no prior studies have evaluated LOR for Female Pelvic Medicine and Reconstructive Surgery (FPMRS) fellowships.

Methods: This study collected LOR written for applicants to the Montefiore FPMRS Fellowship for three consecutive application cycles, from 2017 to 2019. Using the Linguistic Inquiry and Word Count (LIWC) program, we analyzed these letters of recommendation based on 16 categories and used statistical analysis to investigate whether the language found in these letters varied based on the gender of the applicant.

Results: 97 fellowship applications were analyzed, yielding a total of 354 letters of recommendation. 32 of the applicants were male while 65 were female. There were no significant differences between the male and female applicants, aside from their gender. Letters written for male applicants contained significantly more power words and significantly less affiliation words when compared to letters written for female applicants. The LIWC dictionary considers words emphasizing teamwork, helpfulness, communication, compassion, and empathy as affiliation words, while the power category includes words relevant to status, dominance, and social-hierarchies. These differences were maintained after adjusting for age, race, and step 1-3 scores.

Conclusion: Significant linguistic differences based on applicant gender were found to exist in LOR written for FPMRS fellowships. These differences are consistent with previous works examining LOR written for men and women within science and medical fields. These findings suggest that gender bias may be exacerbating stereotypes and could influence an applicant’s ability to match into their desired fellowship.

Funding: N/A
Poster #NM49
RATE OF DISCONTINUATION AND REASONS FOR DISCONTINUATION OF INTRAVESICAL ONABOTULINUM TOXIN A IN PATIENTS WITH SYMPTOMATIC OVERACTIVE BLADDER (OAB)
Gemma Scrimgeour, Kristina Aleksejeva, Richard Axell, Habiba Yasmin, Mehwash Nadeem, Stephen Unterberg, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
University College London Hospital
Presented By: Gemma Scrimgeour

Introduction: Prospective randomised trial data shows significant benefit from Onabotulinum Toxin A (Botox A) in index patients with symptomatic OAB in 60% and discontinuation in up to 50%. We have assessed benefit, discontinuation and reasons for discontinuation in real world patients.

Methods: The notes of 418 consecutive patients (median age 61 years, range 22-90 years) with symptomatic OAB refractory to behavioural and medical treatment, having their first intravesical Botox A treatment between 1st January 2006 and 31st December 2018, were reviewed. Any patient not seen within the past 6 months was contacted by telephone. Five had inadequate notes and were excluded. Data was collected on patient demographics, patient global assessment of improvement following first treatment, continuance of Botox A treatment, number of repeat treatments and reasons for discontinuation if discontinued. Statistical analysis was by chi-square and significance was determined at P < 0.05.

Results: 413 patients (285 female, 69%) fulfilled the above criteria and their outcomes are listed in the table below.

<table>
<thead>
<tr>
<th>Total</th>
<th>Good Response (PGII 1 and 2)</th>
<th>Partial Response (PGII 3)</th>
<th>No Response (PGII 4)</th>
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<tr>
<td>Total patients</td>
<td>NA</td>
<td>230 (55.7%)</td>
<td>130 (31.4%)</td>
</tr>
<tr>
<td>Died</td>
<td>14 (3.4%)</td>
<td>13 (5.5%)</td>
<td>2 (1.2%)</td>
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<tr>
<td>No benefit</td>
<td>130 (31.5%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Insufficient benefit</td>
<td>29 (7%)</td>
<td>1 (0.4%)</td>
<td>28 (58.3%)</td>
</tr>
<tr>
<td>No wish to ISC</td>
<td>16 (3.9%)</td>
<td>16 (3.9%)</td>
<td>0</td>
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<tr>
<td>Symptomatic resolved</td>
<td>9 (2.2%)</td>
<td>9 (2.2%)</td>
<td>0</td>
</tr>
<tr>
<td>Other medical issues</td>
<td>8 (2%)</td>
<td>8 (3.4%)</td>
<td>0</td>
</tr>
<tr>
<td>Concomitant recurrent issues</td>
<td>2 (0.5%)</td>
<td>2 (0.9%)</td>
<td>0</td>
</tr>
<tr>
<td>Preferred other treatments</td>
<td>4 (1%)</td>
<td>2 (0.9%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>1 (0.2%)</td>
<td>1 (0.4%)</td>
<td>0</td>
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<td>Misinformation</td>
<td>1 (0.2%)</td>
<td>1 (0.4%)</td>
<td>0</td>
</tr>
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<td>Unable to contact</td>
<td>7 (1.6%)</td>
<td>5 (2.1%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>Total discontinued</td>
<td>230 (55.7%)</td>
<td>66 (28.1%)</td>
<td>34 (70.8%)</td>
</tr>
</tbody>
</table>

*P < 0.05

Conclusion: In real world patients, Botox A makes 68.5% better, much better or very much better. However, 55.7% cease Botox A treatment; 32% after only one injection and 20% after further injections. The commonest reasons for discontinuations are poor/lack of response (38.5%) followed by dislike of ISC (3.9%), recurrent UTIs (2.2%) and resolution of symptoms (2.2%).

Funding: N/A
Poster #NM50  
TRANSVAGINAL MESH LONG TERM FOLLOW-UP  
Alexandra Carolan, MD, Karan Arora, MD, Christopher Wolter, MD  
Mayo Clinic Arizona  
Presented By: Alexandra Maria Ciota Carolan, MD  

Introduction: Patient and public interest in the safety and outcomes associated with transvaginal mesh for pelvic organ prolapse has continued to increase since the United States Food and Drug Administration (FDA) ordered manufacturers to pull transvaginal mesh products from the market in April 2019. The FDA concluded there is not currently enough evidence available to demonstrate the risks of transvaginal mesh outweigh the benefits. There is scarce data available describing the associated long term outcomes and safety. We aimed to review cases at our institution in order to have more information available to counsel patients whom have had transvaginal mesh placed.

Methods: We completed a retrospective chart review of transvaginal mesh placed for pelvic organ prolapse at our institution from 2008-2013. Mesh kits were not used; grafts were hand cut and sutured in place. Baseline characteristics included comorbidity, history of repair for prolapse or incontinence, and continence. Intraoperative complications and Clavien-Dindo post-operative complications were reviewed. Post-surgical outcomes reviewed included objective and subjective success of prolapse repair, continence, need for further procedures, mesh exposure, mesh infection, and dyspareunia.

Results: Thirty-seven women underwent transvaginal mesh placement for pelvic organ prolapse from 2008-2013 at our institution. Mean follow up was 29.15 months (range 0.25-102). Demographic characteristics included mean age of 71.6 years, median BMI 26.2 kg/m2, and median ASA class of 2. Thirty-two patients (86%) had previous hysterectomy, 11 (30%) had a history of an incontinence procedure, and 13 (35%) had a history of prolapse repair. Four patients (11%) had a 90 day complication, including one Clavien-Dindo grade 3a and one grade 3b; there were no grade 4 or 5 complications. Success of prolapse repair was 92% subjectively, by patient report, and 95% objectively, based on physical exam. Five patients (14%) had mesh exposure and underwent excision or explanation. There were no incidences of mesh infection. Three patients (8%) reported dyspareunia. Six patients (16%) underwent further procedures for incontinence.

Conclusion: In our cohort of women undergoing transvaginal mesh placement, the rate of complications was relatively low. Objective and subjective success was high. Women who have transvaginal mesh should be reassured that most patients do well after this operation.

Funding: N/A
Poster #NM51
LOWER URINARY TRACT SYMPTOMS (LUTS) REFRACTORY TO SACRAL NEUROMODULATION AFTER MID-URETHRAL SLING MAY BE HARBINGER OF UNDERLYING SLING COMPLICATION
Ramy Goueli, MD, MHS, Deborah Hess, MD, MS, Dayron Rodriguez, MD, MPH, Gary Lemack, MD, Philippe Zimmern, MD
Department of Urology, University of Texas Southwestern Medical Center
Presented By: Ramy Goueli, MD, MHS

Introduction: Management of lower urinary tract symptoms (LUTS) following mid-urethral sling (MUS) placement can be difficult given the resultant change of anatomy. We report on a series of women with a single MUS, who were subsequently treated with sacral neuromodulation but were found to have MUS-related issues requiring its removal.

Methods: A prospectively maintained IRB-approved database (2006 – present) of patients who underwent suburethral sling removal (SSR) was reviewed to include those treated with SNS for any indication following their MUS placement. The data was reviewed by an independent investigator not involved in these patients’ care. Presenting symptoms, demographic data, validated questionnaires, voiding and urodynamic studies (UDS), findings on lateral voiding cystourethrogram (VCUG) and office cystoscopy were reviewed before and after SSR. Bladder outlet obstruction (BOO) was diagnosed using a combination of symptoms and voiding test findings (UDS, VCUG) (Figure 1). All follow-up data was obtained at the most recent visit.

Results: Of 490 patients who underwent SSR, 10 had SNS placed prior to referral. Prior to SNS placement, 6 had trialed anticholinergic medications and 3 Botox SNS implant occurred at an average 28 months (IQR 7.6-44.75) after MUS. Of the ten patients who underwent SSR, seven had either urodynamic or radiographic evidence of obstruction, two had recurrent urinary tract infections, one had dyspareunia/pain and one had a mesh erosion. Average time from MUS placement to removal was 69 months (IQR 31.5-95.2). Median duration of follow up after SSR was 27months (IQR 6-39). For obstructed patients, Qmax improved post-SSR from 11.6±4.6 cc/sec to 21.7±11.2 cc/sec, (p=0.06). Six patients underwent subsequent Interstim removal, and four have the device deactivated. Following sling removal, 4 patients had worsened stress urinary incontinence, 2 had urge incontinence, and 4 reported both; average reported pads used per day (ppd) were 2.4±2.4 post SSR, compared to 3.8±3.5 ppd pre-operatively (p=0.35). UDI-6 total improved from 11±4.5 to 7.4±2.3 (p=0.15) post SSR, while the QOL improved from 7.8±2.4 to 5.2± 3.4 (p=0.21); seven patients reported improvement in their pre-operative symptoms.

Conclusion: LUTS following placement of MUS may be a harbinger of underlying MUS complications, and rather than Interstim, treatment may hinge on sub-urethral release of the MUS.
**Funding:** N/A
Poster #NMS2
IMPACT OF THE COLPOPEXY AND URINARY REDUCTION EFFORTS (CARE) TRIAL ON PRACTICE PATTERNS IN NEW YORK STATE
Annie Chen, Justina Tam, Alexandra Siegal, Michael Gross, Jason Kim, Steven Weissbart
Stony Brook Hospital
Presented By: Annie Chen, MD

Introduction: In 2006, the Colpopexy and Urinary Reduction Efforts (CARE) trial demonstrated that in women without stress urinary incontinence (SUI), abdominal sacrocolpopexy (SCP) with Burch colposuspension significantly reduced postoperative stress urinary incontinence. We sought to investigate the impact of these findings on the use of abdominal SCP in combination with an anti-incontinence procedure using a statewide database.

Methods: The NY Statewide Planning and Research Cooperative System (SPARCS) database was queried for inpatient procedures that describe SCP (ICD-9-CM 70.77 and 70.78), retropubic urethral suspension (ICD-9 CM 59.5), suprapubic sling procedures (ICD-9 CM 59.4), and other repair of stress urinary incontinence (ICD-9 CM 59.79). Data extracted from 5 years before the CARE trial (2001-2006) and 5 years after (2006-2011) was analyzed. Statistical analysis was performed using SPSS v26. Linear regression was performed to assess trends. Statistical significance was defined as p-value <0.05.

Results: Over the 10-year study period, a total of 248,876 procedures for pelvic organ prolapse and stress urinary incontinence were identified: 71,340 SCP and 140,888 anti-incontinence procedures including retropubic urethral suspension, suprapubic sling, and other repair of stress urinary incontinence. There was a significant correlation of SCP with concomitant SUI procedures (r²=0.848, p <0.001) and SCP alone (r²=0.575, p=0.007) after publication of the CARE trial.

Conclusion: In New York State, there was a significant positive correlation in the number of SCP performed with or without anti-incontinence procedures after the publication of the CARE trial. The CARE trial is an example of how evidence-based medicine translates into changes in practice patterns. Future studies are needed to investigate the impact of the CARE trial on surgical outcomes.
Funding: N/A
THE EFFECT OF THE FDA PROLAPSE MESH BAN ON ADVERSE EVENT REPORTING FOR STRESS URINARY INCONTINENCE MESH
Alyssa Yee, MD, Allison Polland, MD
Maimonides Medical Center
Presented By: Alyssa Yee, MD

Introduction: Transvaginal mesh (TVM) has been the subject of controversy, with the Food and Drug Administration (FDA) public health report in July 2011 stating serious complications associated with surgical mesh for transvaginal repair of pelvic organ prolapse (POP) are not rare. No conclusions were made for stress urinary incontinence (SUI) mesh. Despite this, studies show a decrease in both POP and SUI mesh usage after the FDA 2011 public health update. In April 2019, the FDA ordered manufacturers to stop distributing mesh for repair of anterior compartment prolapse. Given the effect of FDA notification on usage of slings, we hypothesized there would be an increase in adverse event reporting for slings after the FDA order. We sought to determine if there were differences in adverse event reporting of stress urinary incontinence mesh surrounding the FDA ban.

Methods: We queried the Manufacturer and User Facility Device Experience (MAUDE) database from Jan 1st, 2019 to present using “Boston Scientific,” “Coloplast,” and “Mesh.” Male slings, prolapse mesh, and incomplete entries were excluded. All voluntary de-identified reports by patients, facilities, device distributors and manufacturers adverse event (AE) reports were recorded biweekly during this time. An independent-samples t-test was run to determine if there were differences in reporting rates of adverse events involving SUI products 3.5 months prior to the ban compared to after.

Results: A total of 203 reports were identified with 177 classified as “Injury” while 26 were classified as “Malfunction.” A total of 79 reports occurred in the 3.5 months prior to the FDA order and 101 reports occurred over the 3.5 months afterwards. There was no significant difference in the biweekly rates of AE reporting before the FDA mesh ban compared to after (11.29 ± 6.05 vs 14.43 ± 5.59, p = 0.3327).

Conclusion: The 2011 FDA Public Health Notification reported serious and not rare complications of transvaginal prolapse mesh, which have incorrectly been ascribed to SUI mesh slings in the media. Our results show that despite this misunderstanding, there was not a significant difference in AE reporting for SUI mesh slings immediately after the FDA ban, suggesting the FDA ban did not influence SUI mesh reporting.

Funding: N/A
Poster #NM54
RISK FACTORS FOR INTRAOPERATIVE BLADDER PERFORATION AT THE TIME OF MIDURETHRAL SLING PLACEMENT
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1Cedars Sinai Medical Center, 2University of Michigan Medical School, 3Tulane University School of Medicine, 4Northwestern University Feinberg School of Medicine
Presented By: Paige Kuhlmann, MD

Introduction: Bladder perforation is a well known complication of midurethral sling placement; however, rates vary between surgeons. It is possible there are patient-specific factors associated with risk of perforation. We previously reported that patients with increased BMI who underwent sling placement at our institution had a lower risk of bladder perforation. In this study, we sought to confirm BMI as a protective factor, as well as elucidate any other potential risk factors.

Methods: Retrospective chart review of women who had a midurethral sling procedure performed by one of three FPMRS surgeons (JA, LA, KE) at our institution between 2013-2017 was completed. All cases with bladder perforation, as noted in the operative report during cystoscopy after trocar passage, were included. Patient demographics, perioperative factors, and intraoperative details were explored for associations with bladder perforation. Baseline values between those with and without bladder perforation were compared using Welch Two Sample t-test for continuous variables and chi squared method for categorical variables. Multivariate analysis was performed with logistic regression modeling.

Results: Of 390 patients, 35 (9%) had evidence of bladder perforation on cystoscopy. Average BMI of those with a perforation was 24.1 kg/m2, compared to 26.4 kg/m2 in those without (p=0.009). Those with a perforation were older than those without (60 vs 54 years, p=0.005). Transobturator sling compared to retropubic sling resulted in perforation rates of 2% versus 14%, respectively (p=3.4e-06). Pre-existing pelvic organ prolapse was protective against perforation (4% vs 11%, p=0.013). Those undergoing anterior colporrhaphy (AC) had a 5% perforation rate, compared to 11% in those without AC (p=0.03). In contrast, perforation rate increased to 27% in patients undergoing concomitant urethrolysis, compared to 8% in those without (p=0.021). In multivariate analysis, age and BMI remained significant, and perforation was found to be significantly associated with development of post-operative UTI (Table 1).

Conclusion: Intraoperative bladder perforation is associated with lower BMI and younger age. Distortion of anatomy from pre-existing prolapse, concurrent AC, and urethrolysis may explain their impact on perforation rate during sling placement, although these did not remain significant in multivariate analysis. Additionally, bladder perforation is a risk factor for post-operative UTI. Patients should be counseled on these associations accordingly.
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Funding: N/A

Table 1. Multivariate associations of bladder perforation during midurethral sling placement (statistical significance denoted in bold)
Poster #NM55
ASSOCIATION BETWEEN STRESS URINARY INCONTINENCE AND METABOLIC SYNDROME IN WOMEN 20-59 YEARS
Stephanie Gleicher, Natasha Ginzburg
SUNY Upstate Medical University
Presented By: Stephanie Gleicher

Introduction: Obesity has been shown to be associated with stress urinary incontinence (SUI) and weight loss is commonly recommended for symptom control. Currently, AUA/SUFU guidelines do not include weight loss or the treatment of metabolic disorders in the management of SUI. Literature remains inconclusive regarding the association between SUI and metabolic syndrome, which includes obesity, hyperlipidemia, and disturbed glucose levels. The objective of this study is to assess the association between SUI and metabolic syndrome in women 20-59 years.

Methods: We queried the NHANES database between 2013-2016 for women aged 20-59 years who responded to the question “Do you have leakage with physical activity?” as a surrogate for SUI. We correlated SUI with age, race, BMI, past pregnancy, hysterectomy, and smoking exposure. We defined metabolic syndrome per the NCEP ATP III criteria of > 2 risk factors of blood pressure >130/85, HDL < 50mg/dl, triglycerides > 150mg/dl, fasting blood glucose > 100mg/dl, and waistline > 35 inches. Sampling weights were applied to adjust for sampling bias and non-response bias.

Results: Of the 3,430 women in our study, 36% have SUI. SUI was significantly associated with older age, white race, higher BMI, prior pregnancy, prior hysterectomy, smoking at least 100 cigarettes, and metabolic syndrome. Among risk factors for metabolic syndrome, SUI was associated with larger waistlines, elevated fasting blood glucose, and elevated triglycerides. In our multivariate analysis, older age (OR 2.9 for 50-59 years, OR 2.5 for 40-49 years, OR 1.5 30-39, p <0.001), white race (OR 0.44 for black, p <0.001) prior pregnancy (OR 2.8, p <0.001) and metabolic syndrome (OR 1.6, p 0.01) remained significantly associated with SUI. BMI, smoking status, hysterectomy status, and individual risk factors for metabolic syndrome were not significantly associated with SUI.

Conclusion: Metabolic syndrome was found to be associated with SUI. However, the individual risk factors that define metabolic syndrome were not. This suggests that an undefined component of metabolic syndrome may be contributing to SUI.

Funding: NA
Poster #NM56
EFFECTS OF RADICAL HYSTERECTOMY ON URODYNAMICS AND RISK FACTORS OF INTERMITTENT CATHETERIZATION
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¹Department of Urology, Asan Medical Center, University of Ulsan College of Medicine, ²Department of Obstetrics and Gynecology, Asan Medical Center, University of Ulsan College of Medicine, ³Department of Urology, College of Medicine, The Catholic University of Korea
Presented By: Jung Hyun Shin, MD, PhD

Introduction: To evaluate the effect of radical hysterectomy (RH) with or without radiation therapy (RT) on urodynamics and find the predictive factors for intermittent catheterization (IC).

Methods: Patients who underwent urodynamic study between 2009 and 2018 with history of radical hysterectomy (cervical cancer) or simple hysterectomy (SH, benign condition) were reviewed. Only patients with available oncological data were included, and those who had 1) previous sling operation or pelvic organ prolapse repair, 2) concomitant colorectal surgery with RH, 3) neurological conditions such as strokes, Parkinson disease, spinal cord injury, etc. were excluded. Clinical demographics, symptoms, and urodynamic parameters were compared between RH and RH+RT group and findings from SH group were set as control. Predictive factors for IC after RH was analyzed with multivariate Cox regression.

Results: A total of 204 patients were included (RH; n=57, RH+RT; n=71, SH; n=76). RH+RT group had advanced pathologic stage than RH group. RH+RT patients had higher prevalence of urge incontinence (35.1% vs. 53.5%, p=0.037), leading to higher continuous rate of antimuscarinics or beta 3 agonist (7.0% vs. 46.5%, p=0.002). RH group had higher prescription rate of cholinergics (43.2% vs. 11.7%, p=0.002) but there was no significant differences in IC rate. Both RH and RH+RT group had lower Qmax, larger PVR and impaired detrusor contractility than SH group. RH+RT group presented increased bladder sensation (first sense to void, 300.3±167.4ml vs.198.3±167.9ml, p=0.017), decreased compliance, higher incidence of DLPP and lower maximal capacity than RH group. Operation method; laparoscopy (HR 2.455 (1.164-5.180), p=0.018), robotics (HR 6.372 (2.638-20.211), p<0.001), size (HR 1.235 (1.022-1491), p=0.029) and parametrium invasion (HR 2.397 (1.079-5.532), p=0.032) was the predictive factor for IC on multivariate analysis.

Conclusion: Radical hysterectomy resulted in inefficient emptying of bladder including lower Qmax, larger PVR and impaired contractility. Adjuvant radiation therapy exacerbated bladder compliance leading to increased bladder sensation and decreased maximal capacity. Operation method (laparoscopy and robotics), tumor size, and parametrium invasion increased the risk of IC.

Funding: N/A
Poster #NM57

METABOLIC RISK FACTORS FOR UROLITHIASIS IN WOMEN WITH INCONTINENCE

Varun Talanki¹, Anjali Kapur¹, Samanvaya Sharma², Varsha Talanki², Colin Dabrowski², Edward Forsyth¹, Jason Kim¹, David Schulsinger¹, Steven Weissbart¹

¹Stony Brook Urology, ²Stony Brook University

Presented By: Varun Talanki, MD

Introduction: Incontinence and urolithiasis are frequent problems encountered by general urologists and FPMRS specialists. Women may self-limit their oral fluid intake to try to alleviate symptoms of incontinence, and some providers recommend this practice. Conversely, it is well described that increasing fluid intake decreases the risk of urolithiasis. We sought to quantify these competing risk factors to help inform providers on how to manage these common, sometimes concomitant, urologic ailments.

Methods: We conducted a cross sectional study of women with urolithiasis who underwent initial metabolic evaluation at our urology practice. Women were categorized into two groups based on a standardized questionnaire: 1) women with incontinence and 2) women without incontinence. 24 hour urine collection, before and after counseling, was analyzed for metabolic risk factors for stone disease i.e. low fluid intake, hypocitraturia and hyperuricosuria.

Results: The 24 hour urine collections of 218 patients (106 with incontinence, 112 without incontinence) collected between June 2017 and September 2019 were analyzed. There was no significant difference in initial 24 hour urine volume between patients with and without incontinence (1.91 vs. 1.86 L respectively, p=0.67). Likewise, there was no difference in urine citrate (577 vs. 553, p=0.58), urine uric acid (0.56 vs. 0.57, p=0.68), or stone type between the groups. Patients with incontinence had lower urine pH (6.0 vs. 6.2, p=0.01), and higher urine supersaturation of uric acid (0.97 vs. 0.68, p=0.01) compared to patients without incontinence. Both groups increased their 24 hour urine volumes after counseling, however women with incontinence did not improve their fluid intake as markedly as those without incontinence (63 vs. 184 ml, p=0.046) on follow-up 24 hour urine collection.

Conclusion: Women with and without incontinence experience similar risk factors for urolithiasis. Fluid intake should be encouraged to reduce this risk. However, women with incontinence fail to effectively increase their urine volume despite counseling. Women with incontinence and urolithiasis appear to benefit from metabolic evaluation and further research is needed to assess if treatment of their incontinence may minimize their risk factors for stone disease.

Funding: N/A
Poster #NM58
POST- RADICAL CYSTECTOMY ENTEROCELE: A CASE SERIES AND REVIEW OF THE LITERATURE
Alan Paniagua Cruz, BS¹, Raju Chelluri, MD², Parvati Ramchandani, MD², Thomas Guzzo, MD,MPH², Ariana Smith, MD²
¹University of Michigan, ²University of Pennsylvania
Presented By: Raju Chelluri, MD, MS

Introduction: Radical cystectomy (RC) with anterior exenteration (hysterectomy, salpingoophorectomy, and anterior vaginectomy) is the standard of care for women with muscle invasive bladder cancer. This procedure leads to significant disruption of the pelvic floor and can predispose women to pelvic organ prolapse (POP) after surgery. We present on four women with POP after undergoing RC for bladder cancer and conduct a review of the literature to identify current understanding and knowledge gaps for this complication.

Methods: Baseline demographic and health information was collected through retrospective chart review. To conduct a review of the literature, a Boolean search with the term, “("radical cystectomy") AND ("enterocele" OR "pelvic organ prolapse" OR "rectocele" OR "vaginal vault prolapse")” was performed in PubMed through August 2019.

Results: Four women presented with a symptomatic bulge from the vagina and were found to have POP. Three had grade 4 enteroceles with associated rectoceles and one had a grade 2 enterocele with grade 3 rectocele. Radiographic findings consistent with high-grade enterocele at rest were present in three women (Figure 1), but none had mention of this in the report. Three patients had a prolonged rise in intra-abdominal pressure following RC (small bowel obstruction, prolonged ileus), one had a history of pelvic floor weakness with prior POP surgery. Vaginal sparing RC was performed in one patient but it did not prevent this complication. Nine studies on 22 patients with POP after RC were identified in the literature. Four focused on treatment with colpocleisis or vaginal repair and three focused on prevention in the setting of orthotopic neobladder with sacrocolpopexy. Two studies looked at POP symptoms after cystectomy.

Conclusion: Asking about bulge symptoms would have identified all four cases of postoperative enterocele in our series and is sensitive for most women with this complication. Attention to the pelvic floor on cross-sectional imaging with identification of features that indicate pelvic floor weakness such as herniation of intestinal contents below the pubo-coccygeal line will identify and/or confirm high-grade enterocele. Familiarity with risk factors for POP and intraoperative identification of weakened vaginal support can aide in prevention of this complication through concomitant vaginal vault suspension, pelvic floor reconstruction, or gynecologic organ sparing surgery.

Funding: N/A
Poster #NM59
HABIT VERSUS URGENCY-DRIVEN VOIDING FREQUENCY IN REFRACTORY FEMALE OAB PATIENTS 18 MONTHS FOLLOWING SELECTIVE BLADDER DENERVATION: A CASE FOR THE NEUROGENIC ETIOLOGY OF OAB
Eric Rovner, Professor of Urology1, Eboo Versi, Clinical Associate Professor2, Le-Mai Tu, Professor of Urology2, Roger Dmochowski, Professor of Urology4, Stefan deWachter, Professor of Urology5
1Medical University of South Carolina, 2Rutgers RWJ Medical School of New Jersey, 3University of Sherbrooke Canada, 4Vanderbilt University Medical Center, 5University of Antwerp Belgium
Presented By: Eric Scott Rovner, MD

Introduction: Selective bladder denervation (SBD) of the trigone is designed to ablate nerves thought to be responsible for the symptom of urgency, while preserving the urothelium normal voiding function. SBD serves as an interesting model to examine the relationship between urgency and non-urgency voids and its implications for the etiology of OAB.

Methods: 35 women with refractory OAB underwent SBD to ablate sub-trigonal tissue sparing the bladder urothelium and vaginal epithelium using a 60-second radiofrequency temperature-controlled algorithm. Pre- and post- procedure assessments to 18 months consisted of 3-day diaries, Kings Health Questionnaire (KHQ), OAB-q SF and Treatment Benefit Scale (TBS) and adverse events at follow up.

Results: The mean age was 66 years, OAB duration 10 years and 24/35 subjects have completed follow-up through 18 months. At baseline the severity of OAB symptoms was similar to that reported in other studies of intervention for refractory OAB. Baseline OABq Symptom Bother was positive correlated with urgency related voids but negatively correlated with non-urgency voids. Following treatment, most diary variables were improved and these were mirrored by improvements in QoL measures (Table 1). While urgency-related voids decreased, non-urgency-related voids increased resulting in only a modest decrease in total voiding frequency with no change in volume voided per micturition. There was no impairment of voiding function (PVR unchanged). Adverse events included 6 patients with UTIs, and one with a ureteric obstruction which resolved with insertion of a stent. At follow up, this patient was free of OAB symptoms.

Conclusion: SBD of the trigone resulted in improvements in most OAB parameters to 18 months which was reflected in an improvement of quality of life measures. The fact that total voiding frequency was only marginally reduced despite marked reduction in urgency suggests that voiding is driven more by habit. Improvement in QoL measures appears to be related more to improvements in urgency related outcomes than urinary frequency per se. These data suggest that the trigone is the pathological location and possibly source of refractory OAB symptoms and its ablation lends support the neurogenic etiology of refractory OAB.

Funding: Amphora Medical Inc.
Poster #NM60
LONG-TERM TRENDS OF SURGICAL MANAGEMENTS FOR MALE STRESS URINARY INCONTINENCE: ARTIFICIAL URETHRAL SPHINCTER VS MALE URETHRAL SLING - A 12 YEAR ALL-PAYER DATABASE ANALYSIS
Zhenyue Huang1, Kelly Leong2, Michael Gross2, Xiaohui Liang2, Steven Weissbart1, Jason Kim1
1Stony Brook University Hospital, 2Stony Brook University School of Medicine
Presented By: Zhenyue Huang, MD

Introduction: Artificial urethral sphincter (AUS) is traditionally the gold standard surgical treatment for stress urinary incontinence (SUI) among men who fail conservative managements. Male urethral sling offers a less invasive management for mild to moderate SUI. There is paucity of long-term data on temporal trends of surgical managements for male SUI. We sought to investigate trends of AUS vs male sling procedures from 2003 to 2015 utilizing an all-payer database.

Methods: AUS and male sling procedures performed between 2003 and 2015 in both inpatient and outpatient ambulatory setting in New York State were extracted from the Statewide Planning and Research Cooperative System (SPARCS) database utilizing CPT and ICD-9/10 procedure codes. Spearman correlation analysis was performed to assess trends.

Results: A total of 1830 male sling placements and 1481 AUS insertions were identified. AUS placement increased steadily from 45 cases in 2003 to 221 cases in 2015 (P <0.001) (figure 1A). Male sling placement trended upwards from 51 cases in 2003 to 134 in 2015 (p=0.049). It surpassed AUS placement from 2008-2013 but slowly decreased by 40% from 228 cases in 2009 to 134 cases in 2015. AUS removal/revision trended upwards during the study period (p<0.001) (figure 1B). Interestingly, despite an overall increase in sling placement, sling revision/removal remained relatively stable.

Conclusion: In New York State, the utilization of both AUS and male urethral sling has increased over the past decade. AUS removal/revision trended upwards during this time period, whereas incidence of male sling revision/removal remained relatively low and stable. Future studies are warranted to investigate physician and patient factors influencing the trends of surgical management of male SUI.

Funding: N/A
Poster #NM61
DOES RADIATION THERAPY IMPACT OUTCOMES ON INDIVIDUALS UNDERGOING REVISION ARTIFICIAL URINARY SPHINCTER SURGERY?
Ross Avant, Madeleine Manka, Brian Linder, Daniel Elliott
Mayo Clinic
Presented By: Ross A. Avant, MD

Introduction: Previous reports on the effect of radiation therapy on primary artificial urinary sphincter (AUS) device survival have met with conflicting results, and data evaluating this after revision surgery is sparse. Thus, we evaluated artificial urinary sphincter device outcomes after revision surgery, and compared them among individuals who did versus did not undergo prior radiation therapy.

Methods: A database of patients who underwent AUS revision surgery at our institution was used to perform a retrospective review. Device survival endpoints, including overall survival, infection/erosion, urethral atrophy, and device malfunction were evaluated. Overall device survival (i.e. any repeat surgery) was compared between groups, stratified by external beam radiation status, via Kaplan-Meier method. Proportional hazard regression and competing risk analysis were used to evaluate association between prior radiation therapy and device outcomes.

Results: From 1983 to 2016, a total of 527 patients underwent AUS revision surgery. Of these, 173 (33%) patients had undergone prior radiation therapy. Patients with prior radiation therapy were more likely to have diabetes mellitus (22% vs 14%; p = 0.05), hypertension (70% vs 56%; p < 0.01), previous vesicourethral anastomotic stenosis (41% vs 19%; p < 0.0001), as well as prior androgen deprivation therapy (26% vs 6%; p < 0.0001). Overall, there was not enough evidence to support the existence of a significant difference in device survival among patients with or without a history of radiotherapy, with 1 and 5 year-overall survival of 84% vs 85% and 50% vs 64%, respectively (p = 0.08). On competing risk analysis, a history of pelvic radiation therapy was not enough evidence to support a significant association with the risk of device infection/erosion, mechanical failure, or urethral atrophy.

Conclusion: There was not enough evidence of a difference in the rate of device erosion or infection, cuff atrophy, malfunction, or overall device survival following AUS revision surgery between patients with and without a history of pelvic radiation. These findings may be helpful when counseling patients regarding outcomes after AUS revision.
Funding: N/A
Comparing Perception of Urinary Incontinence Severity and Degree of Bother Between Spouses

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1Department of Urology, Mayo Clinic, Rochester, MN, USA, 2Department of Health Sciences Research, Mayo Clinic, Rochester, MN, USA

Presented By: Elizabeth Bearrick, MD

Introduction: Male stress urinary incontinence is most commonly encountered following management of prostate cancer or benign prostatic hyperplasia. While there are several studies evaluating the impact that stress urinary incontinence can have on quality of life, there are few studies evaluating the perceived impact of incontinence between partners. By comparison, there are a few studies comparing patient and partner satisfaction following inflatable penile prosthesis placement. Thus, we compared validated questionnaire responses regarding the severity and bother of male urinary incontinence between partners.

Methods: We prospectively evaluated patients who underwent primary AUS placement from 2017 to 2019. Patients and partners were surveyed using the Michigan Incontinence Symptom Index. Characteristics regarding the patients were reviewed and data recorded, including age, prior prostatectomy, prior radiation, medical comorbidities. Hazard regression analysis and Spearman’s rank correlation coefficient were used to determine the association between spouse and patient perceived bother.

Results: A total of 136 patients (with paired partner questionnaire responses) were included in the study. The median age of the cohort was 68.9 years (IQR 64.1, 73.7). 92% had prior prostatectomy and 57% had prior radiation. In terms of total severity, there was a positive correlation between patient and spouse responses (Rspearman 0.33, p= 0.01). Likewise, there was a positive correlation related to the total bother score (Rspearman = 0.43, p< 0.0001). While there was correlation in the grading of how severe a problem the incontinence is (p=0.0001), there was not with regard to the perceived need to change daily activities because of the leakage (p=0.07).

Conclusion: Partners of patients who undergo AUS and the patient themselves largely rate the bother and severity of leakage similarly. As such, this may serve as another means of assessing urinary incontinence symptoms.

Funding: N/A
Poster #NM63
REDUCED RADIATION TECHNIQUE FOR IMPLANTATION OF SACRAL NEUROMODULATION
Jason Groegler, Mohammad Hajjha, Forrest Jellison, Akin S. Amasyali, Ashley Feldkamp, Reihaneh Moghisi, Ruth Belay, Jonathan Maldonado, Mark Dickinson, Junchan Joshua Yune, D. Duane Baldwin, Andrea Staack
Loma Linda University
Presented By: Ruth Belay, MD

Introduction: Sacral neuromodulation (SNM) is a treatment option for urinary or fecal incontinence. It involves placement of a lead in the S3 foramen and an internal pulse generator. Fluoroscopic imaging is used at various steps of the SNM placement. This exposes the surgeon, patient, and operating room staff to harmful effects of ionizing radiation. The aim of this study is a proof of concept for applying a novel reduced radiation fluoroscopy technique during SNM insertion.

Methods: A retrospective cohort of 51 consecutive patients that underwent SNM lead placement at a single academic institution were investigated. Reduced fluoroscopy (RF) was performed on 11 patients while conventional fluoroscopy (CF) settings were employed for the remaining 40 patients. During RF, the C-arm is set to 1 pulse/s fluoroscopy, the “low dose” setting is activated, which reduces the current by 50%, collimation is optionally used, and the automatic brightness control (ABC) to optimize image quality is activated. During CF, the C-arm is set to 30 pulses/s fluoroscopy, ABC is activated and collimation is used optionally. RF techniques with lead placement were reproduced by three different surgeons and different radiology technicians. Comparisons of fluoroscopy image quality, settings, and radiation exposure during RF and CF were performed.

Results: Surgeons indicated all images obtained with RF provided adequate visualization of landmarks to guide SNM implantation (Figure 1). RF settings resulted in significant reduction in radiation compared to CF settings including the fluoroscopy time (8.61 vs. 48.16 sec, p<0.001), dosage (2.66 vs. 26.25 mGy, p=0.001), and current (1.67 vs. 4.18 mAs, p<0.001). There was no significant difference in total operative time (59.18 vs. 61.33 min, p=0.77) and the rate of progression from stage 1 to stage 2 during follow-up (75% vs. 84%, p=0.55).

RF has also been utilized in obese patients with BMIs > 30 kg/m2.

Conclusion: SNM insertion can be achieved using RF settings without compromising patient’s outcomes or operative times. Applying the RF technique during SNM treatment reduces overall radiation exposure to the patient and the operating room personnel. Further validation of RF in a larger cohort as an alternative approach to the CF technique in the setting of a prospective study is needed.
Funding: N/A
Poster #NM64
LONGITUDINAL ANALYSIS OF URINARY ATP LEVELS BEFORE AND AFTER WEEKLY POSTERIOR TIBIAL NERVE STIMULATION TREATMENTS FOR OVERACTIVE BLADDER
S. Freeman¹, L. Tellechea², M. Laudano¹, N. Abraham¹, S. Suadicani¹
¹Department of Urology, Albert Einstein College of Medicine and Montefiore Medical Center, Bronx, NY,
²Department of OB/GYN, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, NY
Presented By: Samantha Freeman

Introduction: Overactive bladder (OAB) is diagnosed clinically based on symptoms. The prevalence of OAB among US women has been estimated at 25%. ATP is released from the urothelium and levels tend to be higher in animal models and patients with OAB, yet little is known about the effect of third line treatments, such as Posterior Tibial Nerve Stimulation (PTNS) on these ATP levels. The objective of this pilot study was to quantify changes in voided urine ATP levels and correlate with OAB-V8 symptom scores in patients throughout their PTNS treatments.

Methods: Urine samples were collected from women prior to and after weekly PTNS treatments, aliquoted into 1 ml tubes, immediately frozen on dry ice, and stored in a -80ºC freezer. Urine ATP levels were quantified using the luciferin-luciferase luminescent assay (Invitrogen Molecular Probes ATP Determination Kit). OAB-V8 questionnaires were administered before each PTNS treatment. Urinalysis was checked to rule out infection at time of sample collection. ATP levels before and after treatments were compared and correlated with OAB-V8 Scores.

Results: 7 patients were included. Median age was 70 (IQR: 59.75-78.25). All patients had idiopathic OAB. 2 patients had chronic pain disorders, including fibromyalgia, peripheral neuropathy, or migraines. 1 patient had type 2 diabetes. 4 patients had prior pelvic surgery. Urine ATP levels varied along the course of treatment. OAB-V8 scores decreased in 6/7 patients.

Conclusion: Urine ATP levels did not follow an identifiable pattern during PTNS treatments that would correlate with OAB-V8 score improvement. This suggests that the improvement in symptoms may not involve mechanisms related to urothelial ATP release and signaling.

Funding: N/A
**Poster #NM65**  
**OUTCOMES IN SACRAL NEUROMODULATION OF PATIENTS WITH NON-OBSTUCTIVE URINARY RETENTION: EFFECT OF AGE AND COMORBIDITIES**  
Kim Thai, MD¹, Rachel High, DO², Zoe Blumenthal³, Katherine Dowd, MD¹, Erin Bird, MD¹, Jill Danford, MD²  
¹Department of Urology, Baylor Scott and White Health, Temple TX, ²Department of Obstetrics and Gynecology, Baylor Scott and White Health, Temple, TX, ³Texas AM College of Health Sciences, Temple, TX  
Presented By: Kim H. Thai, MD  

**Introduction:** Sacral neuromodulation (SNM) is efficacious to improve bladder control in patients with non-obstructive urinary retention (UR) and overactive bladder (OAB). Most evidence supporting SNM use for UR includes female patients1,2,3. In the female population, increasing age has a negative effect on outcomes for SNM. There are very few studies on the predictive factors of success of SNM on non-obstructive UR in both men and women. The objective of this study was to evaluate the effect of age and comorbidities on the outcome of SNM for nonobstructive UR.  

**Methods:** After IRB approval, a retrospective chart review was performed from January 2000-December 2017. Male and female patients age 18 or older with a diagnosis of non-obstructive UR who had a test phase for SNM were included. Characteristics associated with implantation were evaluated with bivariate analysis. Subanalysis of cure (cessation of catheter use) was performed in subjects who documented catheter use during testing.  

**Results:** Of 116 patients included, 66.4% (77/116) progressed to implantation. Patients receiving implants were significantly younger (median 58 years vs 71 years old, p=0.0003). Other characteristics were not significantly associated with implantation. Patients who had an acontractile bladder and underactive detrusor were less likely to undergo 2nd stage implant but this was not statistically significant. Whether the patient had complete urinary retention (unable to voluntary void) or incomplete urinary retention made no difference in progression to implantation. Cure (cessation of catheterization) occurred in 22/42(52%) patients who received implants. Age, gender, BMI, and complete vs incomplete retention did not predict cure.  

**Conclusion:** In both males and females who have nonobstructive urinary retention, age was the only predictive factor in success of progression from SNM test phase to 2nd stage SNM implant. There were no specific patient characteristics that predicted cure or cessation of catheterization.
| Funding: N/A |

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| SUFU 2020 Winter Meeting |

| CLINICAL SCIENCE ABSTRACTS |

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<thead>
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Poster #NM66
EVALUATION OF COHORT PROGRESSING FROM FIRST TO SECOND STAGE SACRAL NEUROMODULATION AND INDICATIONS FOR UNPLANNED DEVICE REMOVAL
Ashley Feldkamp, Akin S. Amasyali, Jason Groegler, Jonathan Maldonado, Ruth Belay, Forrest Jellison, Andrea Staack
Loma Linda University
Presented By: Jonathan Maldonado, MD

Introduction: Sacral neuromodulation (SNM) is indicated for the treatment of overactive bladder, urinary retention, and bowel disorders, which is typically implanted in two separate procedures. Patient selection in the progression from first to second Stage implantation is not well defined. The purpose of this study is to determine whether symptoms, comorbidities, and demographics influence progression to second Stage implantation or future unplanned SNM removal or revision. The goal of this study is to provide additional clinical guidance when deciding whether to perform staged or direct full Stage procedures.

Methods: A retrospective review was conducted in patients who underwent staged SNM treatment at a single hospital by five different providers between 2012 and 2019. Outcome was measured as 1.) Progression from Stage 1 to 2, and 2.) Indications for unplanned SNM removal or revision. Chi Square analysis, Mann-Whitney U, and Fisher’s exact tests were used for data comparison and evaluation.

Results: A total of 153 patients underwent SNM therapy for symptoms of overactive bladder (n=129), urinary retention (n=42), neurogenic bladder dysfunction (n=18), fecal incontinence (n=18), and constipation (n=5). 92.2% (n=118/128) of patients progressed to Stage 2. Diagnoses of urinary retention and neurogenic bladder dysfunction were associated with lower progression to Stage 2 (p=0.034, p=0.017, respectively). Non-obese patients (BMI < 30 mg/kg2) were more likely to have SNM removal or surgical revision within 4 years (17.5%) than obese (BMI ≥ 30) patients (9.5%) (p=0.041). Other demographic characteristics and medical parameters were not found to be associated with SNM outcome.

Conclusion: The high progression rate from Stage 1 to 2 in patients with overactive bladder symptoms in this study supports the concept of performing direct full SNM in order to save time, costs, and potentially reduce patient morbidity related to an additional procedure. A staged procedure should be discussed to patients with urinary retention or neurogenic bladder dysfunction. Patient selection based on BMI seems also important since a lower BMI can be associated to higher SNM removal or revision rate. Future prospective investigations are needed to further explore direct full Stage SNM implantation and the parameters that predict outcome of SNM in order to improve patient selection.

Funding: N/A
Poster #NM67
THE RELATIONSHIP BETWEEN MOTOR AND SENSORY RESPONSES IN SACRAL NEUROMODULATION
Anastasia Couvaras, Kristen Gurtner, Colin Goudelocke
Presented By: Anastasia Couvaras

Introduction: Many sacral neuromodulation (SNM) lead implants rely primarily or solely on motor response with data demonstrating that leads placed without sensory testing do not have adverse outcomes. However, postoperative programming is typically conducted using sensory response. Therefore, the relationship between intraoperative motor response and postoperative sensory response is important. While prior studies have classified lead placement by number of electrodes producing a bellows or toe response, we tracked the opening motor threshold for each response on each electrode. This allows an examination of how the lowest motor threshold on each electrode impacts the location of sensation, amplitude of sensory threshold and rate of successful implantation.

Methods: This is an analysis of a prospective database of SNM leads placed by a single surgeon from September 2017-September 2019. All lead placements including those for staged testing, lead revision and full implantation were included if motor and sensory threshold data were available. Intraoperative motor thresholds for each electrode were recorded for both bellow and toe and postoperative sensory data were recorded for each of the first four standard programs in a seated position as vaginal/scrotal, peri-anal, and perineal.

Results: A total of 125 leads were evaluated with 95 (76%) placed for staged testing and 30 (24%) as revisions or full implants. Indications for SNM were urgency (82/125; 66%) and non-obstructive retention (43/125; 34%). Leads with exclusive bellows response generally resulted in peri-anal sensation for each of the four programs (73%, 64%, 55%, 55%) and those with toe response corresponding most often with vaginal/scrotal sensation (67%, 75%, 75%, 67%). These findings were significant for all but program 4. Mixed motor leads demonstrated no significant differences among the sensory locations. The mean difference between motor and sensory thresholds for each program was 0.30 [95% CI 0.21-0.39], 0.23 [0.13-.33], 0.19 [0.11-0.27], and 0.33 [0.22-0.44]. There were no differences in rates of implantation on any program among the sensation locations.

Conclusion: Location of SNM sensation can generally be predicted based on the type of motor response, though there is considerable overlap. Amplitude of motor threshold is relatively close to post-operative sensory threshold. However, sensory location does not appear to predict successful lead implantation.

Funding: N/A
Poster #NM68
A PROSPECTIVE, MULTICENTER, INTERNATIONAL STUDY TO EXPLORE THE EFFECT OF THREE DIFFERENT AMPLITUDE SETTINGS IN SUBJECTS WITH URINARY URGE INCONTINENCE RECEIVING INTERSTIM THERAPY

Dean Elterman¹, Colin Goudelocke², Michael Ehlert³, Dirk de Ridder⁴, Rebecca McCrery⁵, Mahreen Pakzad⁶, Melissa Kaufman⁷, Sagar Shah⁸, Eric Margolis⁹, Raviender Bukkapatnam¹⁰, Gayle Johnson¹¹, Thaddeus Brink¹¹, Mylene Champs¹¹

¹University Urology Associates, Toronto, Canada, ²Ochsner Medical Center, New Orleans, LA, USA, ³Minnesota Urology, Fridley, MN, USA, ⁴UZ Leuven, Leuven, Belgium, ⁵Adult Pediatric Urology and Urogynecology, Omaha, NE, USA, ⁶University College London, London, UK, ⁷Vanderbilt University Medical Center, Nashville, TN, USA, ⁸East Coast Institute for Research, Jacksonville, FL, USA, ⁹Urologic Research and Consulting LLC, Englewood, NJ, USA, ¹⁰Florida Urology Partners, Tampa, FL, USA, ¹¹Medtronic, Minneapolis, MN, USA

Presented By: Dean S. Elterman, MD, MSc, FRCSC

Introduction: InterStim therapy is commercially approved for the treatment of patients with overactive bladder. There is a lack of clinical evidence regarding sub-sensory amplitude effects of sacral neuromodulation on overactive bladder symptoms. This prospective, randomized, multicenter, single-blinded study evaluated the effect of three different amplitude settings (50% of sensory threshold, 80% of sensory threshold and sensory threshold) as measured by urinary voiding diaries through 12 weeks of InterStim therapy in subjects with urinary urge incontinence.

Methods: Subjects who qualified for a neurostimulator device implant were randomized to one of the three amplitude settings. Subjects completed urinary voiding diaries (3-day) to assess change in voiding symptoms from baseline through 12 weeks. Safety was evaluated by the collection of reportable adverse events.

Results: Forty-six (46) subjects were implanted with a neurostimulator device in the study. All of the implanted subjects were female. The mean age of implanted subjects was 59.8 ± 16.0, mean BMI 32.7 ± 8.2, years since OAB diagnoses was 7.7 ± 9.6. Baseline urge urinary incontinence episodes per day was 4.7 ± 3.5 collected through a three day voiding diary. Motor response at the time of lead placement was obtained in 98% (45/46) of subjects. Final study results will be complete in December 2019 and will be available at the time of presentation.

Conclusion: The results of this study will be provided at the time of presentation and will add to the clinical evidence on evaluation of efficacy and safety of sensory and sub-sensory amplitude stimulations.

Funding: Medtronic
Poster #NM69
USE OF TRANSCUTANEOUS POSTERIOR TIBIAL NEUROSTIMULATION (T-PTNS) IN CHILEAN PATIENTS: COULD A HOME-BASED SUPERVISED TREATMENT OPTION BE MORE EFFECTIVE THAN AN OFFICE-BASED MODEL?
Marcelo Mass-Lindenbaum1, Yael Dimonte-Bendov2, Miriam Cohen-Vaizer3, María Ignacia Opitz4, Javier Pizarro-Berdichevsky5,6
1Universidad de los Andes, Santiago, Chile, 2Universidad del Desarrollo, Santiago, Chile, 3Universidad de Chile, Santiago, Chile, 4Urogynecology Unit Sótero del Río Hospital, Santiago, Chile, 5Urogynecology Unit Sótero del Río Hospital, Santiago, Chile, 6División de Obstetricia y Ginecología, Pontificia Universidad Católica de Chile
Presented By: Javier Pizarro-Berdichevsky, MD

Introduction: Describe the use of t-PTNS in our population and evaluate the efficacy as a treatment for Overactive bladder (OAB). In addition, compare the efficacy of t-PTNS according to whether it was used previously, concomitantly and/or after anticholinergics.

Methods: A retrospective study from a prospectively collected database was conducted. The patients are offered to acquire a transcutaneous electrical nerve stimulation (TENS) device to complete treatment at home or to complete the 36 sessions at the hospital. The efficacy of the treatment was evaluated according to a subjective evaluation of the patients using PGII. Treatment failure was defined as a null response to the therapy, after 36 sessions. A univariate and multivariable analysis was performed for success factors. The patients were divided into 3 groups. One group was anticholinergic naïve (Group 1), another group used t-PTNS after failing treatment with anticholinergics (Group 2), and the other group used t-PTNS concomitantly with anticholinergics (Group 3).

Results: 120 female patients were included. Of all patients, 89 (74.2 %) completed 36 sessions, of those 89 patients, 31 (36%) acquired the TENS device and completed the 36 sessions at home. Of the patients who acquired the TENS device, 22 (71%) were successful, and the group who did not acquire the TENS device, having an office based treatment, only 27 (47%) were successful. Another possible division is that, of the 89 patients, 26 (29%) belong to Group 1, 26 (29%) to Group 2 and 37 (41.6%) to Group 3. Of the Group 1 16 (62%) were successful, of the Group 2 14 (54%) were successful and of the Group 3 19 (42%) were successful. After a logistic regression analysis, the fact of acquiring the TENS device was the only variable that persisted statistically significant as a protective factor for treatment failure, with an OR of 0.132 (CI 95% 0.038-0.455).

Conclusion: The overall success was 55%. Anticholinergic naïve group had a higher success rate. Another finding was that performing the t-PTNS at home was a predictive factor for success (72 vs 28%).

Funding: N/A
**Poster #NM70**

**IS THERE A LEARNING CURVE IN SACRAL NEUROMODULATION?**

Hossein Saadat, MD, Mitchell Goldenberg, MBBS PhD, Valentin Shabataev, MD, Dean Elterman, MD, FRCSC
Division of Urology, University of Toronto

Presented By: Mitchell G. Goldenberg, MBBS, PhD

**Introduction:** Sacral Neuromodulation (SNM) has shown to be an effective treatment option in the context of refractory overactive bladder symptoms, non-mechanical urinary retention, and pelvic/bladder pain. Although SNM has been available for decades, there has been minimal investigation into the impact of surgeon experience on long-term outcomes of SNM.

**Methods:** Patients undergoing SNM implantation by a single surgeon from January 2014 to December 2015 were included. Patients undergoing SNM implantation during the surgeon’s first 12 months experience (2014, Group A) were compared to those in the second year (2015, Group B). Cox proportional hazard modelling was done to compare implant survival between these two groups.

**Results:** A total of 83 patients were included (23 in Group A and 60 in Group B). Patient characteristics did not vary significantly between cohorts. Surgical times decreased with surgeon experience (57 vs. 38 minutes respectively). Initial failure rates were higher in Group A than in Group B (13.04% vs 6.67%), however this was not statistically significant (p=0.38). No statistically significant difference in implant survival between the two cohorts at 36 months (p=0.58, Figure-1), although the curves appear to diverge our study period.

**Conclusion:** SNM can provide long-term improvement in LUTS. Surgeon experience does not appear to influence outcomes of SNM in the first 36 months postoperatively. Complete follow-up data beyond 36 months may be required to better understand the impact of surgeon experience.

**Figure-1:**

![Comparison of survival rates between 2014 and 2015](image)

**Funding:** N/A
**Poster #NM71**

**SACRAL NEUROMODULATION FOR NEUROGENIC LOWER URINARY TRACT SYMPTOMS IN SPINA BIFIDA AND SPINAL CORD INJURY PATIENTS**

Yurong Mai, Yasmeen Jaber, Kyle Blum, Hajar Ayoub, Corresponding Author
University of Texas Houston, Department of Surgery, Urology, Houston, TX
Presented By: Yurong Mai

**Introduction:** Sacral Neuromodulation (SN) utilizes an implantable pulse generator (IPG) to alter neuronal transmission within the pelvic nerves, modulating pathologic derangements in voiding and storage reflexes. SN is approved for urgency frequency syndrome, urge incontinence, fecal incontinence, and non-obstructive retention (NOR). However, there remains a paucity of data on the utility of SN for abnormal sacral anatomy and neurogenic lower urinary tract symptoms (NLUTS). Herein, we report SN outcomes in a series of patients with spina bifida (SB) and incomplete spinal cord injury (ISCI).

**Methods:** Our series includes SB and ISCI patients with NLUTS refractory to medical management. Symptoms consisted of urinary urgency, NOR, and fecal incontinence. All patients underwent preoperative urodynamics study, confirming neurogenic etiology. IPG implantation was predicated on successful test stimulation and symptom improvement of greater than 50%. Post-operative post-void residuals (PVR) were collected on each patient. Patient-reported symptoms following SN placement were scored using a numeric gradation system (0- no improvement 0%, 1- mild improvement 25%, 2-moderate improvement 50%, 3- significant improvement 75%).

**Results:** Out of a total 4 patients, 2 patients had ISCI and 2 had SB. Three (75%) of the patients reported improvement of fecal incontinence or NLUTS with SN (Figure 1). ISCI patients exhibited significant improvement (score 3) in bladder sensation and NOR at follow up (mean of 6.25 months). PVRs improved in ISCI patients from initial 370 ml and 480 ml, to 0 ml and 90 ml after SN placement, respectively. In the SB group, PVRs were unable to be obtained due to continued dependence on intermittent catheterization. One SB patient experienced slight improvement (score 1) in bladder sensation and significant improvement (score 3) in fecal incontinence. The other SB patient did not respond and underwent colostomy for neurogenic bowel management.

**Conclusion:** SN demonstrated an improvement in bladder sensation and NOR in patients with ICSI. A mixed response was observed in SB patients, suggesting a subset of these patients will experience significant bladder and bowel benefit with SN. Currently, this patient population requires morbid and major reconstructive surgeries to treat their neurogenic bowel and bladder. Further investigation of the role of SN in SB patients and those with sacral anomalies is warranted.
Patient Reported Improvement in Incomplete Spinal Cord Injury and Spina Bifida Patients after Sacral Neuromodulation

**Figure 1.** Patient reported outcomes for correction of fecal or urinary incontinence after sacral neuromodulation using a scoring system of 0-3, with 0=none improvement, 1=mild improvement, 2=moderate improvement, 3=significant improvement. ISCI=Incomplete Spinal Cord Injury, SB=Spina Bifida, SN=Sacral Neuromodulation

**Funding:** N/A
Poster #NM72
POST-PTNS TRENDS - WHO COMMITS? A PROSPECTIVE COHORT STUDY EVALUATING POST-PTNS TREATMENT IN OVERACTIVE BLADDER
Caroline Brandon, MD1, Benjamin Brucker, MD1, Scott Smilen, MD2, Nirit Rosenblum, MD1, Kimberly Ferrante, MD3, Victor Nitti, MD4, Dominique Malacarne-Pape, MD1
1NYU Langone Health, 2Jersey Shore University Medical Center, 3Kaiser Permanente, 4University of California at Los Angeles
Presented By: Caroline Brandon, MD, MSc

Introduction: Percutaneous tibial nerve stimulation (PTNS) is an efficacious treatment option for overactive bladder syndrome (OAB). There is a paucity of data surrounding long-term efficacy of PTNS and limited studies are aimed at characterizing those patients who seek post-PTNS follow up maintenance. The aim of this study was to evaluate those who completed PTNS treatment and continued with post-treatment PTNS maintenance versus alternative therapeutic options.

Methods: This is a prospective cohort study at a single academic institution. Ninety patients started PTNS according to our clinical protocol. The Patient Global Impression of Severity (PGIS) and Patient Global Impression of Improvement (PGII), and OAB Short Form (OABq-SF) questionnaires were used to assess OAB symptom severity and improvement, respectively. Following 12 sessions, patients were given the choice to continue maintenance PTNS or to pursue other options.

Results: Our completion rate was 70/90 (77.8%). Of all patients who continued some type of therapy for OAB, significantly more patients went on to monthly PTNS maintenance compared with all other options (54.3% vs 37.1%, p=0.02). There were no differing demographic features between those who pursued Post-PTNS maintenance and those who chose an alternative therapy. Overall OABq-SF scores improved significantly by the end of treatment but did not differ between those who chose PTNS maintenance and those who pursued another treatment. Medications did not improve the perception of improvement when added to PTNS (p=0.45). Individuals who chose PTNS maintenance showed significant improvement in urgency (3.4 (0.89) to 2.6 (0.89); p=0.049) and incontinence (3.2 (1.72) to 2.7 (1.37); p=0.038) over the initial 12 weeks, while those who chose otherwise did not. Individuals who went on to monthly maintenance showed lower PGII scores compared with those who sought alternatives (2.70 (1.6) vs 3.81 (1.07); p=0.01), despite no difference in starting severity of OAB symptoms (PGIS score 3.33 (0.72) vs 3.33 (0.70); p=1).

Conclusion: Patients were more likely to continue maintenance PTNS than any other form of treatment. Despite no predictive characteristics found, favorable improvement subscores in urgency and incontinence were associated with those pursuing maintenance therapy. Overall, those who perceived greater improvement were more likely to pursue long-term PTNS therapy as their OAB treatment of choice.

Funding: N/A
Poster #NM73
PATIENT PERCEPTIONS OF TREATMENT OPTIONS FOR OVERACTIVE BLADDER AND THEIR LIKELIHOOD TO TRY A TRANSCUTANEOUS TIBIAL NERVE STIMULATION SYSTEM
Nel Gerig, MD¹, Samir Arora, MD², Jessica Spear², Mingming Zhang, PhD³, Laura LeScoezec³
¹The Pelvic Solutions Center, ²Aventiv Research, ³Avation Medical, Inc.
Presented By: Nel Elisabeth Gerig, MD

Introduction: Overactive bladder (OAB) is a quality of life condition impacting 16% of the population 1. Although several treatment options are available, there are significant drawbacks to each. There is a need for a non-invasive, patient-centric option for the treatment of OAB.

Methods: 40 subjects with OAB were asked about their current and past experiences with OAB treatments including the benefit(s), drawback(s) and, reason(s) for discontinuation. After the completion of the interview, subjects were stimulated transcutaneously at the tibial nerve. Stimulation was increased to the highest level tolerable. After stimulation, all subjects were asked their likelihood of trying a transcutaneous tibial nerve stimulation (TTNS) system on a 5-point Likert scale and the benefit(s) and drawback(s) of it as a treatment option for OAB.

Results: 40 subjects completed the study (10 males; 30 females). Their mean age was 58.5 years (range 25-73). The mean duration of symptoms was 8.6 years (range 1-30). 32.5% of the subjects were treating their symptoms by behavioral therapy (25.0%), Kegel exercises (7.5%), and medication (10.0%). Additionally, 40.0% of the subjects were using incontinence protection. Mean satisfaction was rated a 3 or lower on a 5-point Likert scale for all current therapies, (2.6 - incontinence protection, 2.4 - behavioral therapy, 3.0 – Kegel exercises, 2.8 – medication). The discontinued treatments reported by subjects were behavioral therapy (5.0%), Kegel exercises (7.5%), medication (30.0%), PTNS (2.5%), Botox (5%), and SNS (5.0%). 60.0% of the subjects reported no previous treatment. The reasons for discontinuing the treatments can be found in Figure 1. 57.5% of subjects had never tried a treatment past first-line therapy. After receiving stimulation, 62.5% of the subjects were “extremely likely”, 32.5% of the subjects were “very likely”, and 5.0% of the subjects were “moderately likely” to try a TTNS system as a treatment. The subjects’ initial perception of the benefit(s) and drawback(s) of a TTNS system for OAB can be found in Figures 2 and 3.

Conclusion: OAB subjects are not satisfied with the current treatments and would be willing to try a TTNS system for their OAB. A long-term study is needed to determine the usability, satisfaction, and efficacy of a TTNS system.
Funding: Financial support for this study provided by Avation Medical.
Poster #NM74
LONG TERM FOLLOW-UP OF IMPLANTED SACRAL NERVE STIMULATION DEVICES: AN INSTITUTIONAL REVIEW
Eileen Brandes, MD, E. Ann Gormley, MD
Dartmouth Hitchcock Medical Center, Lebanon, NH
Presented By: Eileen Brandes, MD

Introduction: Sacral nerve stimulation (SNS) is approved for the treatment of overactive bladder (OAB), urinary retention and fecal incontinence. Implanted devices may be removed due to device failure, infections, pain or need for MRI. Ideally, patients are followed yearly to monitor symptoms and assess battery life. It is unclear how many patients continue to have sustained responses and/or appropriate follow-up. We sought to determine the number of patients who had their device removed, those with functional and non-functional devices, those without follow-up within a year and those with a device greater than five years old that is likely non-functional.

Methods: This is a retrospective study chart review looking at five FPRMS surgeons at one institution with the first and second stages performed in an operating room. We searched the records from 2001-2019 using three CPT codes (64561, 64590, 64595). Cases were verified through chart review by two reviewers.

Results: Records revealed that 150 unique patients underwent first stage SNS for one or more reasons: OAB (136), urinary retention (9) and fecal incontinence (15). Thirteen patients did not proceed to a second stage. Ten patients were deceased and excluded. Of the 127 who proceeded to a second stage, 38 had their device removed for the following: lack of response (21), infection (4), pain (14) and need for MRI (6). Twenty-eight patients complied with their post-operative visits. These patients have functioning implants and are at a mean of 39 months (4 months-9.5 years) from their initial or subsequent generator. Of the remaining 61 patients, 41 have devices over 5 years old. 54/61 patients had functional devices when last seen at a mean of 5.7 years ago. 34/61 patients have not been seen within our system for any care within the last year.

Conclusion: SNS can be a very effective treatment for refractory OAB and urinary retention. However, many patients require removal or revision and some patients fail to follow-up. The biggest limitation to this study is the possibility that patients have re-located and/or are getting follow-up elsewhere. This does not negate the large number of devices that remain in patients without adequate follow-up who remain active in our medical records.

Funding: DHMC
Poster #NM75
OUTCOMES OF PATIENTS WITH REFRACTORY OAB UNDERGOING PERCUTANEOUS TIBIAL NERVE STIMULATION IN REAL LIFE PRACTICE.
Wesley Smith, BS, Dayron Rodriguez, MD, MPH, Lauren Sudheimer, PA, Alana Christie, BS, MS, Maude Carmel, MD, Gary Lemack, MD, Philippe Zimmern, MD
Department of Urology, UT Southwestern Medical Center
Presented By: Wesley James Smith, BS

Introduction: Percutaneous tibial nerve stimulation (PTNS) has variable success, ranging from 35%-86%. There is a paucity of data in the literature regarding long-term outcomes after PTNS and prognostic factors for success. We report on a single institution’s experience with PTNS treatments for refractory overactive bladder (OAB).

Methods: Following IRB approval, a retrospective chart review of patients who underwent PTNS treatments for refractory OAB was performed as part of a quality improvement project. Data collected included patient demographics, medical history, surgical history, obstetric history, urinary tract symptoms, OAB treatment history, pad usage, number of PTNS treatments, and follow-up evolution. Patients were stratified by their completion of 12 PTNS sessions. PTNS was performed by FPMRS-trained specialists. PTNS success was defined as continuation of maintenance PTNS with no other medical/surgical treatments required for symptom relief.

Results: From 2012 to 2019, 80/100 patients completed at least 12 sessions, with 58 females (median age: 73 (range 64-79)) and 22 males (median age: 67 (range 58-77)). Females had a median of 5 years on OAB drugs (range 3-10) and failed a median of 2 drugs (range 2-3), while males had median of 4 years on OAB drugs (range 3-7) and failed a median of 3 drugs (range 2-4). PTNS success was 67% in females and 55% among men. Twenty-one did not want to continue to 12 sessions due to lack of benefits. Six of 26 were satisfied after 12 sessions (see Table). Of those on maintenance PTNS, 40% decided for another therapy ultimately. On univariate analysis, diabetes was found to be a predictor of PTNS failure among female patients (p=0.023). No other prognostic factors were found to be significant. Regardless of PTNS ‘success’, there was overall decreased daytime frequency (15 to 8, p<0.001), decreased nocturia (3 to 2, p<0.001), and decreased pad usage (3 to 0, p<0.001).

Conclusion: PTNS has a role in the armamentarium of OAB therapy in both men and women. However, the long-term success rate in real life practice requires maintenance therapy in the subgroup of satisfied patients who have done well with the first 12 PTNS sessions. Despite symptomatic improvement in the majority, alternative therapies are often sought out beyond PTNS.
### Table 1. Treatment satisfaction stratified by number of PTNS treatments received

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;12 PTNS Treatments (n=20)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not continue due to lack of benefits</td>
<td>16</td>
<td>20</td>
<td>80%</td>
</tr>
<tr>
<td>Patient moved to another city</td>
<td>1</td>
<td>20</td>
<td>5%</td>
</tr>
<tr>
<td>Time commitment overbearing</td>
<td>3</td>
<td>20</td>
<td>15%</td>
</tr>
<tr>
<td><strong>12 PTNS Treatments (n=26)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pursued another medical/surgical treatment</td>
<td>15</td>
<td>26</td>
<td>58%</td>
</tr>
<tr>
<td>Satisfied without continuation of PTNS</td>
<td>6</td>
<td>26</td>
<td>23%</td>
</tr>
<tr>
<td>Insurance issue/time commitment overbearing</td>
<td>5</td>
<td>26</td>
<td>19%</td>
</tr>
<tr>
<td><strong>&gt;12 PTNS Treatments (n=54)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pursued another medical/surgical treatment</td>
<td>21</td>
<td>54</td>
<td>39%</td>
</tr>
<tr>
<td>Satisfied with PTNS and continued maintenance treatments</td>
<td>33</td>
<td>54</td>
<td>61%</td>
</tr>
</tbody>
</table>

**Funding:** N/A
Poster #NM76
WHICH URODYNAMIC PARAMETERS CAN PREDICT OUTCOME OF INTRAVESICAL INJECTIONS OF ONABOTULINUM TOXIN A FOR OVERACTIVE BLADDER
Kristina Aleksejeva, Gemma Scrimgeour, Richard Axell, Habiba Yasmin, Daniyal Motan, Stephen Unterberg, Mehwash Nadeem, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
FFR Urology, University College London Hospital
Presented By: Kristina Aleksejeva

Introduction: Intravesical Onabotulinum Toxin A (Botox A) injections are widely used for treatment of refractory overactive bladder (OAB) symptoms. We have assessed whether pre-operative UDS findings can predict patient’s outcomes.

Methods: A retrospective review of 418 patients (median age 61 years, range 22-90, 128 men) having intravesical Botox A injections for refractory OAB symptoms between 2006 and 2018 was conducted. The outcome of Botox A was categorized by 5 point PGII when last seen or when contacted by telephone if last review was greater than 6 months previously. Outcome was correlated with the urodynamic parameters.

Results: Urodynamic results were available for review on 309 (74%) patients; 214 women median age 59 years (range 22-90) and 95 men median age 69 years (range 27-94) having Botox A during this time period under the care of 4 consultant surgeons. Urodynamically proven IDO was demonstrated in 215 cases (69%). Statistical analysis was by Students T-Test and Chi Square Test. The outcomes are listed in Table 1:

<table>
<thead>
<tr>
<th></th>
<th>Failure (PGII ≥3)</th>
<th>Partial Success (PGII 2)</th>
<th>Success (PGII 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men IDO</td>
<td>27</td>
<td>8</td>
<td>35</td>
</tr>
<tr>
<td>Men no DO</td>
<td>11</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Women IDO</td>
<td>36</td>
<td>13</td>
<td>96*</td>
</tr>
<tr>
<td>Women no DO</td>
<td>26</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>OAB Wet Women</td>
<td>20</td>
<td>7</td>
<td>54</td>
</tr>
<tr>
<td>OAB Wet Men</td>
<td>17</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Median Peak DO pressure Women (cmH2O)</td>
<td>33</td>
<td>62</td>
<td>34</td>
</tr>
<tr>
<td>Median Peak DO Pressure Men (cmH2O)</td>
<td>50.5</td>
<td>61.5</td>
<td>60</td>
</tr>
<tr>
<td>Volume at 1st DO Women (ml)</td>
<td>255</td>
<td>125</td>
<td>240</td>
</tr>
<tr>
<td>Volume at 1st DO Men (ml)</td>
<td>215</td>
<td>190</td>
<td>210</td>
</tr>
<tr>
<td>BOO Women</td>
<td>3</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>BOO Men</td>
<td>7</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Duration Detrusor Contraction Woman (s)</td>
<td>63**</td>
<td>107</td>
<td>85.5</td>
</tr>
<tr>
<td>Duration Detrusor Contraction Man (s)</td>
<td>73.5</td>
<td>97</td>
<td>93</td>
</tr>
</tbody>
</table>

Conclusion: Intravesical Botox A was significantly more successful in women with urodynamically proven IDO (75%) comparing with men (60%) and women with no DO (62%). Successful outcomes were significantly associated with increased duration of voiding detrusor contractions but not with any other urodynamic parameters.

Funding: N/A
Poster #NM77
DOES EMOTIONAL CONDITION IMPACT ON UROFLOWMETRY?
Emanuele Rubilotta, Dept. of Urology, Marilena Gubbiotti, Dept. of Urology, Antonella Giannantoni, Dept. of Urology, Alessandro Antonelli, Dept. of Urology, Matteo Balzarro, Dept. of Urology
1AOUI Verona, Verona, Italy, 2Univ. of Perugia, Perugia, Italy, 3Univ. of Siena, Siena, Italy
Presented By: Matteo Balzarro, MD

Introduction: To assess the emotional condition of the patients at uroflowmetry (UF) and whether anxiety may affect patient's micturition.

Methods: This is a prospective multicenter ongoing study started on July 2018. Patients were enrolled during an office UF. Data recorded were: demographics, urological history, UF, post void residual (PVR) urine, International Prostate Symptoms Score (IPSS) in males, ICIQ-FLUTS in females. General anxiety level was evaluated by the General Anxiety Disorder - 7 (GAD - 7) questionnaire considering the levels of severity of anxiety as following scores: <5 lacking; 5-9 mild; 10-14 moderate; 15-21 severe. Anxiety levels UF-related were evaluated using questions #4-6 of the Amsterdam Preoperative Anxiety and Information Scale (APAIS). Levels of severity were considered as following scores: 3-6 lacking, 7-10 moderate, 11-15 severe. Specific linker-type scales assessed the subjective micturition satisfaction/reproducibility and the discomfort (threshold score: 60). Statistical tests used were: one-way ANOVA, and Mann-Whitney.

Results: Patients enrolled were 125 (mean age 65+ 13 yrs): 85 men (68%), 40 women (32%). Voided volumes, Qmax, PVR, and discomforts did not correlate with higher level of anxiety. Greater anxiety negatively influenced the subjective satisfaction and the UF reproducibility. Patients with higher anxiety levels showed greater symptomatology questionnaires. Table 1 shows results according to GAD and APAIS modified scores. A general high level of anxiety was assessed in 41.6% (52/125). A high level of UF-related anxiety was recorded in 42.4% (53/125). Women reported GAD score >5 in the 87.5% (35/40), and APAIS score >6 in the 70% (28/40). GAD score > 5 and APAIS modified score >6 were documented in males in 44.7% (38/85) and 29% (25/85) respectively. A low satisfaction/reproducibility of the exam was reported by 31.2% (39/125): 38.5% males, 45% females. High discomforts were recorded in 51.2% (74/125): 56.5% men, 65% women.

Conclusion: Uroflowmetry has an important impact on the emotional condition of the patients, mostly in women. High levels of general and UF-related anxiety were found in 4/10 patients. Anxiety influenced the subjective reproducibility of the micturition at UF, and thus the reliability of these UFs may be questionable. A proper counseling may lower anxiety levels obtaining more physiological results at UF.
### Table 1.
Results according to the General Anxiety Disorder (GAD) scores.

<table>
<thead>
<tr>
<th></th>
<th>GAD &lt;5</th>
<th>GAD 5-9</th>
<th>GAD 10-14</th>
<th>GAD 15-21</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>52</td>
<td>33</td>
<td>34</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>VV, mean</td>
<td>272.3 ±</td>
<td>279.8 ±</td>
<td>274.2 ±</td>
<td>169.2 ±</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>137.2</td>
<td>124.5</td>
<td>124.7</td>
<td>88.1</td>
<td></td>
</tr>
<tr>
<td>Qmax, mean</td>
<td>15.2 ± 9.0</td>
<td>16.6 ± 7.5</td>
<td>14.7 ± 5.6</td>
<td>12.9 ± 3.7</td>
<td>0.09</td>
</tr>
<tr>
<td>PVR, mean</td>
<td>53.8 ± 47.1</td>
<td>41.8 ± 46.6</td>
<td>45.0 ± 56.2</td>
<td>27.5 ± 30.1</td>
<td>0.44</td>
</tr>
<tr>
<td>Sympt. Quest., mean</td>
<td>11.6 ± 6.7</td>
<td>13.3 ± 6.2</td>
<td>20.7 ± 9.3</td>
<td>21.0 ± 8.7</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Satisfaction, mean [0-100]</td>
<td>69.2 ± 18.5</td>
<td>62.4 ± 19.0</td>
<td>47.1 ± 30.0</td>
<td>60.0 ± 24.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Discomforts, mean [1-5]</td>
<td>2.8 ± 1.3</td>
<td>3.1 ± 1.3</td>
<td>3.4 ± 1.4</td>
<td>3.2 ± 1.2</td>
<td>0.15</td>
</tr>
</tbody>
</table>

### Results according to the Amsterdam Preoperative Anxiety and Information Scale (APAIS) modified scores.

<table>
<thead>
<tr>
<th>APAIS modified</th>
<th>3-6</th>
<th>7-10</th>
<th>11-15</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>72</td>
<td>38</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>VV, mean</td>
<td>236.3 ± 116.1</td>
<td>283.7 ± 140.0</td>
<td>266.1 ± 164.8</td>
<td>0.7*</td>
</tr>
<tr>
<td>Qmax, mean</td>
<td>14.7 ± 7.1</td>
<td>16.0 ± 8.8</td>
<td>16.7 ± 7.2</td>
<td>0.6*</td>
</tr>
<tr>
<td>PVR, mean</td>
<td>49.3 ± 48.4</td>
<td>38.6 ± 36.9</td>
<td>57.3 ± 73.6</td>
<td>0.3*</td>
</tr>
<tr>
<td>Sympt. Quest., mean</td>
<td>12.4 ± 7.2</td>
<td>16.4 ± 7.4</td>
<td>19.1 ± 11.3</td>
<td>0.02*</td>
</tr>
<tr>
<td>Satisfaction, mean [0-100]</td>
<td>61.1 ± 24.1</td>
<td>62.6 ± 23.7</td>
<td>56.0 ± 25.9</td>
<td>0.6*</td>
</tr>
<tr>
<td>Discomforts, mean [1-5]</td>
<td>3.1 ± 1.4</td>
<td>2.9 ± 1.4</td>
<td>3.1 ± 1.1</td>
<td>0.7*</td>
</tr>
</tbody>
</table>

**Funding:** N/A
Poster #NM78
THE ROLE OF THE PREOPERATIVE POST VOID RESIDUAL URINE VOLUME IN MALES UNDERWENT TRANSURETHRAL RESECTION OF THE PROSTATE FOR LOWER URINARY TRACT SYMPTOMS
Emanuele Rubilotta, Dept. of Urology, Antonio Soldano, Dept. of Urology, Clara Cerrato, Dept. of Urology, Alessandro Antonelli, Dept. of Urology, Matteo Balzarro, Dept. of Urology
AOUI Verona, Verona, Italy
Presented By: Matteo Balzarro, MD

Introduction: To assess the role of the preoperative post-void residual (PVR) urine in males underwent transurethral resection of the prostate (TURP) for lower urinary tract symptoms (LUTS) and the related outcomes after the procedure.

Methods: This is a prospective ongoing study started in January 2017 involving males with LUTS candidates for TURP. The medical and urological history was recorded. Both preoperative evaluation and the 1-year follow-up consisted in: uroflowmetry, PVR, PVR-ratio (ratio of PVR to bladder volume), the International Prostate Symptoms Score Questionnaire (IPSS). Patients were also distributed in groups according to preoperative PVR thresholds: i) 0-50ml; ii) 51-100ml; iii) 101-150ml; iiii) 151-200ml; iiiii) PVR>200ml. Statistical tests used were: T-test, Wilcoxon, one-way ANOVA, Kruskal-Wallis.

Results: Data were complete in 52 patients, mean age was 68.9+8.5 yrs (Table 1). A significant improvement in voided volume, Qmax, PVR, IPSS score was documented. Mean voided volume was 214.8 ml (sd 102.1 ml) and 301.0 ml (sd 335.9 ml) respectively preoperative and postoperative. Mean Qmax was 9.7 ml/s (sd 4.2 ml/s) and 19.5 ml/s (sd 10.2 ml/s) respectively preoperative and postoperative. Mean PVR was 120.5 ml (ds 125.9 ml) and 25.8 ml (ds 25.4 ml) respectively preoperative and postoperative. Mean preoperative PVR ratio was 31.1% (ds 22.3%) and 9% (ds 8.8%) postoperative. Mean preoperative IPSS scores was 22.6 (ds 7) and 8.7 (ds 6) postoperative. A PVR < 100ml was found in 59.6% of the males, while the remaining 21/52 patients (40.4%) had a PVR >100ml. No significant difference was found in Qmax and IPSS score among the groups, in both preoperative and postoperative assessment. After TURP, we found in each group a significant improvement in Qmax and IPSS score; PVR significantly decreased in all groups except in the Group i with very low preoperative PVR.

Conclusion: Only a minor part of the males showed a high preoperative PVR (>100ml), therefore PVR did not have a crucial role in the decision-making. Quite the reverse, Qmax and symptoms score had the main influence. PVR was not correlated to preoperative and postoperative Qmax and IPSS. This finding suggests that PVR was a poor predictive factor for the decision-making and outcomes in males candidates for TURP.
**Funding:** N/A
**Poster #NM79**

**EFFECTIVENESS OF COGNITIVE DISTRACTORS IN DELAYING BLADDER FULLNESS SENSATION**

Priscilla Koirala¹, Natalie Swavely, MD², Urmilia Sivagananalingam¹, Kaitlyn Maddra¹, Rui Li, PhD³, Kyla Egenberger³, Sydney Roberts³, Samuel Weprin, MD², John Speich, PhD³, Adam Klausner, MD²

¹Virginia Commonwealth University School of Medicine, ²Virginia Commonwealth University, Department of Surgery, Division of Urology, Richmond, VA, ³Virginia Commonwealth University College of Engineering, Department of Mechanical Nuclear Engineering Richmond, VA

Presented By: Natalie Swavely, MD

**Introduction:** Cognitive distractors have been used in behavioral therapy for patients with overactive bladder (OAB). However, there is limited data on quantifying the effect of cognitive distractors and their potential use in characterizing various OAB phenotypes. The objective of this study was to determine if the addition of a distractor during an oral hydration study would influence the time to reach the sensation of complete bladder fullness in participants with or without OAB.

**Methods:** Individuals with no urgency or high urgency based on ICIq-OAB surveys (question 5a ≤1 or ≥2) were enrolled in an oral hydration study. Participants drank 2L Gatorade G2® and completed three consecutive fill-void cycles. During third fill-void cycle, when each participant reached 75% perceived bladder fullness, they completed a word search puzzle intended to serve as a distractor for 90 seconds. The time from completion of the distractor until the subject reached perceived 100% bladder fullness was calculated for the normal and OAB groups. A Mann-Whitney test was then performed in SPSS.

**Results:** Data from 17 subjects (10 healthy, 7 OAB) were analyzed. During Fill 3, the time from the completion of the distractor until 100% bladder fullness sensation for the OAB group (2.6 ± 1.6 minutes) was significantly less than the time for the healthy group (7.6 ± 6.2 minutes, p<0.01, U-test).

**Conclusion:** These results suggest that the participants with OAB may be less affected by cognitive distractors than healthy patients. Further research is needed to determine whether an oral hydration study with a cognitive distractor would be an effective way to differentiate an OAB phenotype that might better respond to behavioral therapy.

**Funding:** NIH grant R01DK101719 and the Virginia Commonwealth University School of Medicine Summer Research Fellowship Program
Poster #NM80
IS THERE AN ASSOCIATION BETWEEN URODYNAMIC AND MRI FINDINGS AMONG MULTIPLE SCLEROSIS PATIENTS WITH LOWER URINARY TRACT SYMPTOMS?

Nadia Sion, Medical Student¹, Yang Mao-Draayer², Giulia Lane², J. Quentin Clemens², Priyanka Gupta², Paholo Barboqilio-Romo², Brittany Kirch, Medical Student³, Anne Cameron², John Stoffel²
¹Central Michigan University, Mt Plesant MI, ²University of Michigan, Ann Arbor MI, ³University of Michigan, Ann Arbor, MI

Presented By: Nadia Sion, BS, MS

Introduction: Multiple sclerosis (MS) patients can be significantly impacted by both urinary retention and lower urinary tract symptoms (LUTS). MRI is commonly used to diagnose and follow patients with MS through identification of T1 and T2-weighted demyelinating lesions. We investigated whether number and location of MRI lesions were associated with specific urodynamic findings.

Methods: We retrospectively reviewed records of MS patients with LUTS who had both an MRI and a urodynamic (UDS) evaluation between 2010-2017. MRI studies were reviewed by a multiple sclerosis specialized neurologist and were categorized by lesion localization, the presence of T1, T2 and post-contrast lesions. Urodynamic studies were evaluated by a FPMRS trained urologist and categorized by presence of detrusor overactivity (DO), detrusor sphincter dysynergia (DSD), atonic bladder, and low bladder compliance (< 12 cc/cm H2O). These findings were also assessed for associations with demographics, symptom severity and quality of life (QOL) based on the Michigan Incontinence Symptom Index (M-ISI) and American Urological Association Symptom Score (AUASS).

Results: We identified 31 MS patients (18 male, 13 female) with LUTS who had both urodynamic and MRI data for review. The cohort had a mean age of 58 and mean time from initial MS diagnosis of 20 years. 26% of patients had lesions in the supratentorial cerebrum, 16% in the cortical cerebrum, 32% in the brainstem, 45% in the cervical spine and 26% in the thoracic spine. UDS showed DO (73%), DSD (43%), atonic bladder (3%) and low compliance (10%). Average AUASS/QOL score was 14/3, average ISI severity/QOL score was 13/3. Although urodynamic findings were not associated with any specific CNS lesion location (p > 0.05), there was a significant association with T2 lesion number and DO (p=0.03). Low QOL on AUASS or M-ISI was associated with DO (p=0.02), but there was not a specific lesion location or grouping associated with low urinary QOL.

Conclusion: In this group of patients with longstanding MS, the number of T2 lesions was associated with detrusor overactivity on urodynamics. We did not demonstrate associations between specific lesion locations and other UDS findings.

Funding: N/A
Poster #NM81
DETAILED ANALYSIS OF HEAD TO HEAD COMPARISON OF FULL URODYNAMICS WITH AIR FILLED VERSUS FLUID FILLED CATHETER SYSTEMS
Peter F.W.M. Rosier, MD PhD
Department of Urology. University Medical Center Utrecht
Presented By: Peter Rosier, MD, PhD

Introduction: Standard cystometry is performed with fluid filled tubing (FL) with external pressure sensors. Air filled catheter pressure system (AF) was developed to circumvent (erroneous) external pressure reference and avoid artefacts from tubes movements. We have compared how both systems perform when used head to head during otherwise standard cystometry.

Methods: Thirty-eight patients with LUT dysfunction were included, after IRB approval of the protocol and individual written informed consent. Our full-traces (all 20Hz data-samples) urodynamic measurement head to head comparing study reports detailed in vivo cough- responses of AF versus FL system in pves and pabd. Pressures of all four channels were equalized from the first sample after flushing of the FL system to allow better understanding of the specific responses of both systems to pressure variations during the measurements.

Results: Curve fitting analysis was done with matlab®. The average time shift (measured over the full urodynamic studies) in pves 0s [-0.05-0s] and in pabd -0.05s [-0.05-0s] was almost zero. The cross-correlation of the pressure channels (per location pabd or pves) of both systems (FL and AF) was extremely high: 0.995 [0.981-0.998] for pves and 0.993 [0.982-0.998] for pabd. Analysis of 68 coughs, in detail showed an amplitude median difference of 6.8 [3.8-8.9] cmH2O for pves, 6.0 [1.7-8.0] cmH2O for pabd and 4.9 [1.2-9.7] cmH2O for pdet. The cross-correlation for the coughs was 0.996 [0.990-0.997] in the FL and 0.998 [0.994-0.999] in AF. The time delay was 0 [0-0] s in both systems. The amplitude difference is 3.8 [1-7] cmH2O in FL and 2.9 [0.6-6.1] cmH2O in AF. There was no difference between both systems with regard to area under the cough curve (pves 25.2 cmh2O*s FL versus 24.7 cmh2O*s AF and pabd 25.0 cmh2O*s versus 26.1cmh2O*s).

Conclusion: The high cross-correlation of data-samples of both systems per location indicates that the pves and pabd signals are around 99% similar after equalizing the two systems at the first relevant sample. The cross-correlation in the calculated detrusor pressure is less, with median of 72%.

Both systems measure very similar however the conclusion may be that the FL system responds erroneously underdamped, or that the AF system reacts dampened however not leading to clinically relevant differences.

Funding: Unrestricted sponsor for conduct of study: Tdoc-Andromeda-Laborie
Poster #NM82

POST-VOID RESIDUAL URINE IN HEALTHY YOUNG VOLUNTEERS
Emanuele Rubilotta, Dept of Urology, Alessandro Antonelli, Dept of Urology, Matteo Balzarro, Dept of Urology
AOUI Verona, Verona, Italy
Presented By: Matteo Balzarro, MD

Introduction: To measure post void residual (PVR) urine in young and healthy volunteers.

Methods: This is an observational prospective multicenter ongoing study started on January 2018, involving volunteers of both sexes (age 18-35 y.o.) asked to perform a uroflowmetry (UF). Exclusion criteria were: lower urinary tract symptoms (LUTS), urological and neurological diseases, surgery of LUT/pelvis/genitalia, pharmacological therapies, previous urethral catheterization, radiation therapy of the pelvis. Data recorded was: medical history, physical examination, UF analyzed also by in Liverpool nomograms (LN), PVR and PVR-ratio (ratio of PVR to bladder volume), a VAS scale indicating the subjective micturition evaluation at UF (normal > 6), International Prostate Symptoms Score (IPPS) in males, W-IPSS and ICIQ-FLUTS in women. Population was also divided according to IPSS/WIPSS severity scores: (i) 0-7; (ii) 8-19; (iii) 20-39. Statistical tests used were: T test, Mann-Whitney.

Results: Volunteers enrolled were 114, 45.6% (52/114) males, 54.4% (n 62/114) females. Mean age was 26 y.o. (18-35 y.o.). Data on Qmax, PVR, PVR-ratio, IPSS/WIPSS are listed in Table 1. Mean ICIQ-FLUTS score was 2.8 ± 3.9, median 2 (1-3). IPSS-WIPSS scores <8 was reported by 98.2% (n 110/112). Low reproducibility of micturition at UF was found in 5.3% (n 6/114). Table 1 reports outcomes according to LN. A PVR of 0mL was found in 60.5% of the population (69/114): 63% males (34/54), 56.4% females (35/62). A PVR> 50 ml was found in 12.3% of the cohort (14/114): 7.7% males (4/52%), 16.1% females (10/62). A PVR-ratio >10% was found in 21% of the volunteers (24/114): 17.3% males (9/52), 24.2% females (15/62).

Conclusion: In a non-negligible part of young and healthy population PVR was documented (40%). PVR was relevant in more than 1/5 subjects and in women was more frequent with volumes two times higher. LN evaluation recognized a significant part of the volunteers UF as pathological (17.5%). This group had a significant lower Qmax, but no significant higher PVR. This data may confirm the controversial role of PVR also in this population. PVR may be a sign of an asymptomatic underlying pathological bladder emptying or, in reverse, a parameter not always pathological.
Funding: N/A
Poster #NM83
THE VALUE OF URODYNAMIC TESTING PRIOR TO SACRAL NEUROMODULATION IN PATIENTS WITH REFRACTORY OVERACTIVE BLADDER
Xibei Jia, MD1, Tess Crouss, MD2, Neha Rana, MD3, Kristene Whitmore, MD4, Babak Vakili, MD5
1UMass Memorial Medical Center, 2Cooper University Health Care, 3Hospital of the University of Pennsylvania, 4Drexel University College of Medicine, 5Christiana Care Health System
Presented By: Xibei Jia, MD

Introduction: Sacral neuromodulation (SNM) is a treatment option for patients with refractory overactive bladder (OAB). Urodynamic testing (UDT) should be considered in patients with refractory OAB prior to invasive therapy such as SNM. Detrusor overactivity (DO) may or may not be demonstrated on UDT in patients with refractory OAB, as well as other diagnoses such as stress urinary incontinence (SUI) or intrinsic sphincter deficiency (ISD). The objective of our study is to assess whether or not these urodynamic diagnoses can predict the rate of success from stage I to stage II interstim implantation.

Methods: We conducted a retrospective cohort study of all women who had UDT performed prior to SNM implantation in a single community hospital between January 2009 and January 2019. Patients were identified using CPT code associated with “Interstim Stage I and II”. We included all patients who underwent Stage I interstim for refractory OAB and excluded patients who underwent Stage I interstim for urinary retention or fecal incontinence. Patient demographics, UDT diagnoses and operative reports were obtained from electronic medical records (EMR).

Results: Seventy-nine patients met criteria. Of the 79 patients, 32 patients (40.5%) demonstrated DO on UDT (DO+) and 47 (59.5%) patients did not (DO-). There was no difference in patients’ characteristics such as age, body mass index, number of failed OAB medications and prior incontinence procedures between the two groups. Twenty-seven patients (84.3%) in the DO+ group underwent full implantation compared to 45 patients (95.7%) in the DO- group (p=0.08). Eleven patients (34.3%) in the DO+ group and 19 patients (40.4%) in the DO- group had concomitant SUI. In the DO+ group, there was no difference in the rate of full implantation in patients with or without concomitant SUI (p=0.685). In the DO- group, all 19 patients with concomitant SUI had full implantation.

Conclusion: Urodynamic testing is recommended prior to invasive therapy for refractory OAB. The most common urodynamic diagnoses in our patients with refractory OAB are DO followed by SUI. However, urodynamic diagnoses such as DO or SUI cannot predict the rate of success from stage I to stage II interstim implantation. The value of UDT prior to SNM is yet to be determined.

Funding: N/A
Poster #NM84
CLINICIAN FACTORS AFFECTING DOSE OF RADIATION DURING VIDEO URODYNAMICS.
Habiba Yasmin, Bogdan Toia, Richard Axell, Kristina Aleksejeva, Mahreen Pakzad, Rizwan Hamid, Jeremy Ockrim, Tamsin Greenwell
Female Functional and Restorative Urology Unit, UCLH NHS Foundation Trust, UK
Presented By: Habiba Yasmin

Introduction: Videourodynamic (VUDS) allow for correlation of anatomy with physiology during filling and voiding – and enable more precise delineation of site or cause of obstruction and/or incontinence as well as additional findings such as vesico-ureteric reflux at the expense of radiation exposure. We have assessed the total radiation screening time (RST) (which would be a proxy for total dose if all machines were the same), the actual radiation dose (RD) of VUDS and factors affecting total RST and hence RD during VUDS.

Methods: The RST of all 986 consecutive patients having VUDS to investigate refractory lower urinary tract symptoms (LUTS) between 13/01/2018 and 31/1/2019 was prospectively recorded on our Soliton database. 208 (31.2%) patients were excluded due to: additional simultaneous tests such as retrograde leak point pressure, missing information fields, failure to complete VUDS due to patient or equipment factors and missing or incorrect dose area product data. The rate of non diagnostic VUDS (reported as normal or with diagnosis at variance with patient symptoms) was similar in all groups and was 20% overall. Clinical scientists and training urologists performed VUDS using a standardised Female, Functional and Restorative (FFR) Urology protocol whilst the other groups did not. Total RST and total RD (machine dependent) were determined and correlated with speciality and grade of clinician performing the test. Statistical analysis was by Kruskal-Wallis and Dunn's post-hoc analysis. Statistical significance was determined at P < 0.001.

Results: 678 patients (413 female, 60.6%) fulfilled the above criteria and their results are listed in the table below. There was no significant difference in patients’ age, presenting LUTS and sex amongst the groups (with the exception of the gynaecologists).

<table>
<thead>
<tr>
<th>Clinician Group</th>
<th>Nst (Nrd)</th>
<th>Median RST (s)</th>
<th>Median RD (μGy.m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiologists</td>
<td>323(320)</td>
<td>57.0*</td>
<td>170*</td>
</tr>
<tr>
<td>Gynaecologists</td>
<td>25</td>
<td>53.0*</td>
<td>236</td>
</tr>
<tr>
<td>Urologists</td>
<td>53(52)</td>
<td>25.0*</td>
<td>155</td>
</tr>
<tr>
<td>Clinical Scientists</td>
<td>281(275)</td>
<td>26.0*</td>
<td>116*</td>
</tr>
<tr>
<td>Radiographers</td>
<td>6</td>
<td>54</td>
<td>204</td>
</tr>
<tr>
<td>Consultants</td>
<td>101(99)</td>
<td>66.0*</td>
<td>258*</td>
</tr>
<tr>
<td>Training Doctors</td>
<td>300(298)</td>
<td>49.0*</td>
<td>160</td>
</tr>
<tr>
<td>Training Urologists</td>
<td>53(52)</td>
<td>25.0*</td>
<td>155</td>
</tr>
<tr>
<td>Training Radiologists</td>
<td>247(246)</td>
<td>54.0*</td>
<td>160</td>
</tr>
<tr>
<td>Clinical Scientists (non-FFR patients)</td>
<td>68(95)</td>
<td>35.0*</td>
<td>84.6*</td>
</tr>
</tbody>
</table>

*P < 0.001

Conclusion: There is a wide variation in total screening time (median=38s, range=247s) and hence radiation dose (median=149μGy.m², range=1150μGy.m²) during VUDS. Clinical scientists and urologists in training have significantly lower screening times and doses whilst Consultants in particular Radiology Consultants have significantly longer screening times for the same diagnostic yields. Patient may benefit from adoption of the FFR urology VUDS protocol to reduce screening time and hence radiation dose.

Funding: N/A
Poster #NM85
UROLOGIC CHARACTERISTICS OF ADULT SPINA BIFIDA PATIENTS WHO DO NOT HAVE A CLINICAL INDICATION FOR URODYNAMICS
Shenelle Wilson, MD1, Betsy Hopson2, David Joseph, MD2, L. Keith Lloyd, MD1, Tracey Wilson, MD1
1University of Alabama at Birmingham, 2Children's of Alabama
Presented By: Shenelle Wilson, BSN, MD

Introduction: There is minimal literature regarding the utilization of urodynamic testing (UDS) in adult spina bifida (SB) patients. In our previous study, we sought to describe patients in our SB clinic who required UDS and found that 32% underwent UDS over an 8-year period. In this complementary study, we seek to characterize those patients who did not have a clinical indication for UDS. We hypothesize that they have different characteristics and long-term outcomes compared to patients undergoing UDS.

Methods: A retrospective chart review of patients seen in the UAB Adult Multidisciplinary SB Clinic and registered with the National Spina Bifida Patient Registry from 2011-2018 was performed. Urologic management, surgeries, and clinical outcomes were identified and differences between groups were characterized using statistical analysis.

Results: Of active patients in the SB clinic, 64% (n=93) did not have a clinical indication for urodynamic testing. As noted in the table below, there were no significant differences between no UDS patients and those undergoing UDS with regard to gender, diagnosis, or spinal defect level. Those without UDS were more likely to perform CIC (p= 0.035) and less likely to be incontinent into a diaper (p= <0.001) than those undergoing UDS. They were also more likely to have had prior urological surgeries. With regard to clinical outcomes, those who did not undergo UDS were less likely to have an active/ongoing GU problem and less likely to have required GU surgery while under current care.
Conclusion: Although SB is not considered a progressive neurologic disorder, bladder function may change over time. This change may require UDS to aid in patient evaluation and management. After comparing patients in our SB clinic who developed a change in their urinary tract and underwent UDS to those who had stable urinary tract function and imaging, it was found that characteristics associated with undergoing UDS included not utilizing CIC, incontinence into a diaper, and having had no previous GU surgeries. Those who had prior urologic surgeries, including augmentation cystoplasty, were less likely to require UDS. This information may help clinicians identify those SB patients who may need UDS in the future, versus those may do well with routine non-invasive monitoring alone.

Funding: N/A
Poster #NM86

DO URODYNAMICS PREDICT URINARY RETENTION AFTER SLING PLACEMENT IN THE COMPLEX PATIENT: THE VALUE OF REPRODUCING SYMPTOMS ON URODYNAMICS

Nicholas Major1, Alyssa Greiman2, Yu Zheng1, Caitlin Lim1, Lauren Rittenberg3, Lindsey Cox1, Ross Rames1, Eric Rovner1

1Medical University of South Carolina, Dept. of Urology, Charleston, SC, 2University of Michigan, Dept. of Urology, Ann Arbor, MI, 3Tuscon, AZ

Presented By: Nicholas Major, MD

Introduction: To examine urinary retention (UR) after sling in female patients with or without detrusor underactivity (DU) or Valsalva voiding whose urodynamics (UDS) accurately reproduced voiding symptoms to determine if the reproduction of voiding symptoms on UDS in those with DU is predictive of UR after sling.

Methods: Following IRB approval, we performed a review of all female patients undergoing midurethral (MUS) or autologous pubovaginal sling (aPVS) looking specifically at the occurrence of short and long term urinary retention. Preoperative UDS data was obtained from a prospectively acquired UDS database in which patients are directly queried at the time of the UDS study whether the filling/storage and emptying phases of the study reproduced their usual symptoms.

Results: Of the 141 women who had a sling procedure, 124 (87.9%) had preoperative UDS. Of those who had UDS, 41 (33%) had de novo UR at some point post-operatively. As compared to those without DU and/or Valsalva voiding, patients with DU and/or Valsalva voiding were more likely to have UR (75.6% vs 56.6%, p=0.04). There was no difference in risk of UR in patients with DU/Valsalva voiding whose UDS reproduced voiding symptoms compared to those with DU/Valsalva voiding whose UDS did not reproduce symptoms (OR 0.01, CI 0.32-3.19, P 0.98).

Conclusion: This study found that patients with DU/Valsalva voiding did have an increased risk of UR, though we did not find that reproduction of symptoms on UDS correlates with the risk of UR in either those with DU/Valsalva voiding nor with normal bladder contractility.

Funding: N/A
Poster #NM87
A NEW METHOD OF THE URODYNAMIC CATHETER INSERTION IN PATIENTS WITH DIFFICULT CATHETERIZATION
Olga Staroseltseva, MD, Gleb Kovalev, MD, Nikita Kubin, PhD, Anastasya Zaytseva, MD
Saint-Petersburg State University Clinic of advanced medical technologies n.a. Nikolay I. Pirogov, Saint-Petersburg, Russia
Presented By: Olga Staroseltseva, MD

Introduction: The most important part of successful cystometry during the urodynamic study is the correct placement of the vesical transducer (Pves). The most accurate results are obtained by using the thinnest (8 Fr) catheter, which passing is not always possible by standard methods. The greatest difficulties arise when the study is performed in male patients with prostatic hyperplasia, patients after prostate surgery, patients with false passages of the urethra, as well as patients with a history of spinal cord injury (SCI). Our aim was to develop and test the method of vesical catheter insertion using the Nelaton catheter in complicated patients.

Methods: From 2015 to 2018 the insertion of urodynamic catheter following this method was performed in 16 male patients. The average age was 62 ± 3.4 years. The indication was the inability to introduce a 6 Fr catheter in a standard way. In 43.75% of cases the cause was prostatic hyperplasia, in 31.25% - previous for prostate gland surgical procedures, in 18.75% - spasm of the external urethral sphincter due to SCI and in 6.25% - other reasons. The presented method consisted of the following:
• The patient is in the low lithotomy position;
• A rigid cystoscope 21 Ch is passed into the bladder under the visual control, then the optical lens and the bridge are removed;
• The preliminary cut along up to the middle (see figure) the Nelaton catheter 16Ch is into the sheath of cystoscope. The catheter connector is cut off;
• The sheath is removed. A 2-lumen urodynamic catheter 8 Fr. Is inserted into the Nelaton catheter;
• After the urine is dripped from the urodynamic catheter, the Nelaton catheter is carefully removed while holding the urodynamic catheter.
• The urodynamic catheter is fixed to the penis.

Results: Using the presented method the vesical transducer was successfully inserted in all 16 patients without any complications.

Conclusion: The advantage of the described method of urodynamic catheter insertion is the use of a cystoscope, which ensures the passage of anatomical obstacles under the control of vision. The method can be used at Urology Departments for male patients with difficulties in urodynamic catheter insertion.

Funding: N/A
Poster #NM88
IMMUNE CELL PROFILES AND CYTOKINE LEVELS WITHIN HUNNER’S LESION OF INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME PATIENTS
Joel Stern¹, Robert Moldwin¹, Vishaan Nursey², Ed Miller³, Horacio Rilo¹, Inna Tabansky⁴
¹Zucker School of Medicine at Hofstra/Northwell, ²Feinstein Institute of Medicine, ³RDS2 Solutions, ⁴Rockefeller University
Presented By: Joel Stern, PhD

Introduction: Interstitial Cystitis/Bladder Pain Syndrome (IC/BPS) is an inflammatory condition primarily affecting the bladder urothelium. It shares many comorbidities with other urological diseases, resulting in a high rate of misdiagnosis. Accurate and comprehensive diagnostic tests would be clinically beneficial in regard to early-stage disease diagnosis and treatment determining immune cell and cytokine profiles in patients is a potential first step to designing such diagnostic tests.

Methods: To analyze the immune profiles of IC patients, we compared bladder tissue biopsy samples from IC patients with Hunner’s Lesions (HL) against biopsy samples from unaffected individuals. To perform this comparison, we used immunohistochemistry (IHC) analysis of immune cell markers, measurement of Immunoglobulin levels and quantifications of urinary levels of 9 different cytokines using a MSD cytokine assay and ELISA. Immunoglobulin levels were measured in a cohort consisting of patients with HL and IC patients without HL.

Results: Urinary cytokines were evaluated in a cohort consisting of 18 HL, 18 NHL, and 4 healthy control subjects. The IHC analysis showed an increase in the number of immune cells found in the bladder tissue of the Hunner’s lesions. Levels of CD138- and CD20-positive cells were particularly elevated. As both molecules are markers of B-cells, these results indicate that B-cell bladder infiltration and adaptive immune activation may be clinical indicators of IC with Hunner’s lesions. Consistent with the B cell activation, cytokine assays demonstrated a significant increase in both urinary IL-6, TNF-alpha, IL-6, macrophage inhibitory factor and Immunoglobulin urine concentration among patients with Hunner’s lesions, as opposed to IC patients and healthy control subjects without the lesions. IL-6 has been shown to induce differentiation of activated B-cells into antibody producing plasma cells, which produce IgG, among other proteins.

Conclusion: Our results indicate that HL are associated with an increase in B-cell activation. While it remains to be determined whether the observed activation of B cells is a result or a cause of the disease process, this association could be used to design tests to determine treatment efficacy and confirm diagnosis of IC/BPS.

Funding: N/A
Poster #NM89

UROPATHOGEN ISOLATES FROM SPORADIC URINARY TRACT INFECTIONS COMPARED TO RECURRENT INFECTION: CONSIDERATIONS FOR A UROGYNECOLOGIC POPULATION

Megan Bradley¹, Jessica Sassani¹, Camila Cabrera², Kristen Venuti², Mary Ackenbom¹
¹Magee Womens Hospital - University of Pittsburgh Medical Center, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Urogynecology, ²Magee Womens Hospital - University of Pittsburgh Medical Center, Department of Obstetrics, Gynecology and Reproductive Sciences

Presented By: Megan Sara Bradley, MD

Introduction: There is much to learn about the care of urogynecologic patients suffering from urinary tract infections (UTI). The aims of the study were to describe the prevalence of common uropathogens in women with sporadic UTI versus those with recurrent UTI (rUTI) and to investigate the characteristics of women with non-E. coli UTI in a urogynecologic population.

Methods: This was a cross-sectional analysis of all women treated for at least one UTI by a Urogynecologic provider in a one-year time frame. Subjects were divided into two groups based on their rUTI history and frequency of UTI: 1) sporadic UTI - no history of rUTI and a singular, sporadic infection in the study timeframe and 2) rUTI - history of rUTI and ≥2 UTIs in the study time frame. Diagnostic criteria for acute UTI included lower-urinary tract symptoms and a UCx with >10³-5 colony-forming units (CFUs/mL) of bacteria. Our primary outcome was the difference in uropathogen profiles between groups. A sub-analysis was performed to investigate host characteristics associated with recurrent E. coli infections.

Results: There were a total of 471 positive UCx among 265 women during the study period. A total of 163 (61.5%) women were in the sporadic UTI group and 102 (38.5%) were in the rUTI group. Women in the rUTI group were more likely to have neurogenic bladder (p=0.01), be performing self-catheterization (p<0.01), be on antibiotic suppression (p<0.01), and using vaginal estrogen therapy (p<0.01) (Table). It was uncommon for women in the rUTI group to have all E. coli infections (n=27, 26.5%) as compared to the 61.3% of women in the sporadic UTI group with an E. coli UTI (p<0.01) (Table). Among those with rUTIs, there were no risk factors that were significantly associated with recurrent E. coli UTIs, when controlling for confounders such as post-operative state and current antibiotic suppression.

Conclusion: In a urogynecologic patient population, most women with rUTI demonstrated variable uropathogens over the course of the year. Additionally, we did not identify any variables associated with repetitive E. coli infections. Pre-treatment urine cultures are essential to verify causative uropathogens in this population to target specific organisms, avoid incorrect antibiotic selection, and hopefully reduce antibiotic resistance.
### Demographic Variables and Uropathogens by UTI Group

<table>
<thead>
<tr>
<th></th>
<th>Sporadic UTI (n=163)</th>
<th>Recurrent UTI (n=162)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>66.0 (±12.3)</td>
<td>68.5 (±12.2)</td>
<td>0.03</td>
</tr>
<tr>
<td>BMI</td>
<td>28.8 (±9.6)</td>
<td>28.9 (±6.7)</td>
<td>0.39</td>
</tr>
<tr>
<td>Caucasian Race</td>
<td>157 (96.3%)</td>
<td>159 (95.3%)</td>
<td>0.58</td>
</tr>
<tr>
<td>Diabetes</td>
<td>25 (15.3%)</td>
<td>15 (14.7%)</td>
<td>0.89</td>
</tr>
<tr>
<td>Current smoker</td>
<td>15 (9.2%)</td>
<td>6 (7.8%)</td>
<td>0.70</td>
</tr>
<tr>
<td>Sexually active</td>
<td>61 (37.4%)</td>
<td>31 (30.4%)</td>
<td>0.24</td>
</tr>
<tr>
<td>History of recurrent UTI</td>
<td>0 (0.0%)</td>
<td>100 (100.0%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Antibiotic suppression</td>
<td>0 (0.0%)</td>
<td>20 (19.6%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>138 (84.9%)</td>
<td>99 (94.2%)</td>
<td>0.12</td>
</tr>
<tr>
<td>Hormone therapy</td>
<td>41 (25.3%)</td>
<td>54 (52.8%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Vaginal Estrogen</td>
<td>34 (20.9%)</td>
<td>43 (42.4%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Prostate</td>
<td>61 (37.4%)</td>
<td>24 (23.5%)</td>
<td>0.02</td>
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<tr>
<td>Pessary Use</td>
<td>22 (13.5%)</td>
<td>16 (15.7%)</td>
<td>0.41</td>
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<tr>
<td>Neurogenic Bladder</td>
<td>2 (1.2%)</td>
<td>7 (6.9%)</td>
<td>0.01</td>
</tr>
<tr>
<td>CSF</td>
<td>12 (7.4%)</td>
<td>21 (20.6%)</td>
<td>&lt;0.01</td>
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<tr>
<td>Postoperative UTI</td>
<td>22 (13.5%)</td>
<td>3 (2.9%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Post BTKA UTI</td>
<td>8 (4.9%)</td>
<td>2 (2.0%)</td>
<td>0.22</td>
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<td>Bacterial isolate</td>
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<tr>
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<td>77 (53.9%)</td>
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<td>75 (73.2%)</td>
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<td>13 (7.4%)</td>
<td>7 (9.4%)</td>
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<td>7 (8.9%)</td>
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<tr>
<td>All Enterococcus</td>
<td>29 (17.8%)</td>
<td>0 (0.0%)</td>
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<tr>
<td>Any Enterococcus</td>
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**Funding:** N/A
Poster #NM90
PARALYZING PAIN: INTRADETRUSOR BOTULINUM TOXIN A INJECTION VIA FLEXIBLE CYSTOSCOPY FOR TREATMENT OF INTERSTITIAL CYSTITIS
Lauren Gleich1, David Sussman2
1Rowan SOM, Stratford, NJ, 2New Jersey Urology, Voorhees, NJ
Presented By: Lauren D. Gleich, DO, BS

Introduction: Intradetrusor Botulinum toxin A (BTX-A) is a fourth-line treatment for management of interstitial cystitis (IC). Previous research describes intradetrusor BTX-A administration under general anesthesia using rigid cystoscopy. To our knowledge, there is no literature describing intradetrusor BTX-A administration using flexible cystoscopy in patients with IC. Our objective was to determine if intradetrusor BTX-A can be administered to patients with IC using flexible cystoscopy in an outpatient clinical setting with subjective improvement of patient symptoms.

Methods: A retrospective chart review was completed using patients from a private practice urology group diagnosed with IC, who had undergone intradetrusor BTX-A injection. All patients had previously reported incomplete response to first, second, and third-line treatments for IC. Patients underwent intradetrusor BTX-A injection with flexible cystoscopy using local anesthesia or monitored anesthesia care (MAC) in an outpatient urology office. Primary endpoint was successful intradetrusor BTX-A administration using flexible cystoscopy with subjective patient-reported improvement of IC symptoms. Secondary endpoints included type of anesthesia, time interval between injections, and amount of BTX-A injected.

Results: 18 patients diagnosed with interstitial cystitis underwent intradetrusor BTX-A via in-office flexible cystoscopy. All patients were able to tolerate the procedure. MAC was used in 13 (72.2%) patients, while 5 (27.8%) were completed with local anesthesia. Reported symptom improvement following first injection was 66.7% (P=0.0010). Of the 18 patients, 15 underwent second injection with 78.6% improvement. Improvement was based on patient-reported symptoms documented by the urologist. All patients received 100U at time of first injection. Dose of second injection was determined by patient's previous response. 11/15 (73.3%) continued to receive 100U, 3/15 (20.0%) received 150U, and 1/15 (6.7%) received 200U. Improvement in symptoms was 80%, 66.7%, and 100%, respectively. Injection intervals were determined by patient's return of subjective symptoms and request for repeat treatment. Average time between first and second injection was 8.36 months.

Conclusion: This study is the first to confirm intradetrusor BTX-A can be successfully administered in the outpatient setting using flexible cystoscopy in patients with IC and provide symptom improvement. Patient comfort may be increased with MAC in those who cannot tolerate local anesthesia. Limitations of this study include small sample size, lack of validated questionnaires, and retrospective nature.

Funding: N/A

Poster #NM91
WITHDRAWN
Poster #NM92
OUTCOMES OF SECONDARY ELECTROFULGURATION IN THE MANAGEMENT OF WOMEN WITH ANTIBIOTIC-REFRACTORY RECURRENT URINARY TRACT INFECTIONS
Jacqueline A. Chavez, BS1, Alana L. Christie, MS2, Feras Alhalabi, MD1, Philippe E. Zimmern, MD1
1U.T. Southwestern Medical Center, Urology, 2U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center
Presented By: Jacqueline Chavez, BS

Introduction: To evaluate the efficacy of a secondary electrofulguration (EF2) in women with a history of antibiotic-refractory, recurrent urinary tract infections (RUTIs) who have already undergone one EF and have recurrent UTI symptoms.

Methods: An institutional review board-approved, prospectively maintained database of non-neurogenic women with a history of RUTIs and recurrent UTI symptoms after one EF with > 6 months follow-up was reviewed. Office cystoscopy was carried out preoperatively and again 6 months following EF2. Cystoscopic evidence of inflammation was noted at the urethra, bladder neck, trigone, and/or beyond the trigone. Endoscopic success at 6 months post-EF2 was defined as complete resolution of previous lesions with no new lesions seen. Clinical success was defined as no RUTIs within the last year of follow-up; improvement as < 3 treated UTIs/year; and failure as > 3 treated UTIs/year, daily antibiotic suppression, or a third EF.

Results: From 2006-2018, 58/69 (84%) women with median age 70 years met study criteria. 53/58 had endoscopic data 6-month post-procedure. Clinical success or improvement was noted in 24 (41%) with a median follow-up of 54 months (Table 1), and endoscopic success in 26 (49%). Of 30 women with UTI culture results after EF2, we observed multiple organisms (20%), and highly resistant (43%) and ESBL (50%) strains. Furthermore, of the 24 women who underwent a third EF, 16 (67%) were clinically successful or improved at most recent follow-up. Among those with clinical failure, 16/26 (47%) remained on suppressive antibiotics and 9/26 (26%) required IV antibiotic courses.

Conclusion: Women with persistent UTIs following EF may benefit from a secondary EF procedure, as 41% demonstrated complete resolution or improvement of symptoms with durable follow-up. In selected patients after EF2, a third EF can provide additional benefit.

Funding: N/A
Poster #NM93

UROPATHOGENIC BACTERIA ISOLATED FROM HUMAN CATHETER BIOFILMS EXHIBIT DECREASED GROWTH IN HYPERTONIC SALINE RELATIVE TO NORMAL SALINE CONTROLS

Glenn Werneburg1,2, Nadine Henderson3, David Thanassi3, Raymond Rackley1
1Department of Urology, Glickman Urological and Kidney Institute, Cleveland Clinic Foundation, Cleveland, OH, 2Department of Microbiology and Immunology, Stony Brook University, Stony Brook, NY, 3Center For Infectious Diseases, Department of Microbiology and Immunology, Stony Brook University, Stony Brook, NY

Presented By: Glenn T. Werneburg, MD, PhD

Introduction: Patients managed with indwelling urethral or suprapubic catheters are commonly subject to recurrent catheter-associated urinary tract infections (CAUTI). In our clinic we have implemented a bladder care pathway for CAUTI prevention consisting of an oral probiotic regimen, a neurogenic bowel supplement program, and catheter antiseptic program consisting of irrigation with a 3% NaCl solution. Clinical observations from our CAUTI prevention program support a decreased rate of CAUTIs in this population. We hypothesize that biofilm-forming uropathogenic bacteria may be subject to growth inhibition in the context of 3% (0.51 M) NaCl solution compared to standard of care use of normal saline as a control.

Methods: Biofilms were isolated from patient urinary catheters through luminal swabbing. Bacterial composition of the biofilms was determined using next-generation sequencing via the Microgen DX platform. Isolates were grown overnight in LB cultures inoculated from frozen glycerol stocks. Bacterial concentrations were normalized via dilution and cultures were then diluted 1:100 in the presence of 3% saline in LB, as well as a corresponding solution of normal saline in LB as a control, and incubated for 24 h. Growth was analyzed using spectrophotometry.

Results: Isolates from biofilms chosen for analysis contained a combination of *Escherichia coli*, *Klebsiella pneumoniae*, *Staphylococcus aureus*, *Enterococcus faecalis*, and *Citrobacter freundii* (Figure 1a), which frequently contained antibiotic resistance genes. Isolates from all 5 analyzed catheter samples exhibited less growth in hypertonic saline relative to the normal saline solution controls (Figure 1b).

Conclusion: Consistent with our clinical results, 3% hypertonic saline lead to lower growth of bacteria isolated from urinary catheters. Additional studies, including analyses of disruption of established biofilms and antibiotic resistance changes, are needed to determine whether routine irrigation of urinary catheters with 3% hypertonic saline leads to biofilm disruption and thus a lower incidence of catheter-associated UTIs.

**Figure 1a. Bacterial biofilm composition and antibiotic resistance profiles of analyzed isolates**

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Indwelling time (days)</th>
<th>Organism(s) detected by next-generation sequencing</th>
<th>Proportion of sample</th>
<th>Resistance genes detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>Staphylococcus aureus</td>
<td>98%</td>
<td>none</td>
</tr>
<tr>
<td>2</td>
<td>43</td>
<td><em>Klebsiella pneumoniae</em></td>
<td>81%</td>
<td>Beta-lactam</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td><em>Escherichia coli</em></td>
<td>79%</td>
<td>Beta-lactam</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td><em>Escherichia coli</em></td>
<td>100%</td>
<td>Beta-lactam</td>
</tr>
<tr>
<td>5</td>
<td>13</td>
<td><em>Escherichia coli</em></td>
<td>100%</td>
<td>Beta-lactam Quinolone</td>
</tr>
</tbody>
</table>

**Figure 1b. Catheter biofilm isolates exhibit growth inhibition in hypertonic saline**

- 3% NaCl in LB
- 0.9% NaCl in LB

Funding: N/A
Poster #NM94
HUNNER LESION PHENOTYPE IN IC/BPS (INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME): A SYSTEMATIC REVIEW AND META-ANALYSIS
Nicholas Pickersgill, Joel Vetter, H Henry Lai
Division of Urologic Surgery, Washington University School of Medicine
Presented By: Nicholas Pickersgill

Introduction: Interstitial cystitis/bladder pain syndrome (IC/BPS) is a heterogeneous syndrome with a variety of potential clinical phenotypes and diverse etiology. It has been suggested that patients with Hunner lesion (HL) might represent a distinct clinical phenotype different from those without Hunner lesion (HL). However, to our knowledge, there has been no systemic review that formally compared IC/BPS patients with and without HL. The objective of this study was to compare the demographics, clinical presentation, comorbidities, urinary markers profiles, and treatment responses between IC/BPS patients with and without Hunner lesions (HL).

Methods: We performed a systematic review of literature in PubMed® in February 2019. Publications were included if they compared relevant data between IC/BPS patients with and without HL. Meta-analysis was performed on a subset of clinical characteristics. Literature search yielded 237 articles. 66 articles were included in this systematic review. Findings from 23 articles were used for meta-analysis.

Results: Meta-analysis showed that IC/BPS patients with HL were significantly older (mean difference, MD=6.7 years, 95%CI 2.0-11.3, p=0.005), reported higher urinary frequency (MD=3.2/day, 95%CI 1.1-5.4, p=0.003), nocturia (MD=1.0/night, 95%CI 0.1-2.0, p=0.034), IC Symptom Index (MD=2.2, 95%CI 1.4-3.0, p<0.001), and IC Problem Index (MD=1.3, 95%CI 0.7-1.9, p<0.001), but lower cystometric bladder capacity (MD= -113mL, 95%CI -164 to -61 mL, p<0.001) compared to IC/BPS patients without HL. There were no differences in pain scores (p=0.105) or sex difference (p=0.83) between the two groups. While some studies reported higher rates of comorbid pain syndromes (e.g., fibromyalgia) among patients without HL, overall results were conflicting. Patients with HL had higher urinary levels of pro-inflammatory cytokines/chemokines (CXCL10, NGF, IL-6, IL-8, MIF), and luminal nitric oxide (NO). Although placebo effects cannot be ruled out in uncontrolled studies, IC/BPS patients with HL responded remarkably well to targeted endoscopic treatments, such as triamcinolone injection or fulguration of HL. In comparative studies, IC/BPS patients with HL responded better to oral cyclosporine A than those without HL.

Conclusion: Systematic review and meta-analysis demonstrated significant differences in demographics, clinical presentation, urinary markers profiles, and treatment responses between patients with and without HL. Data from the literature provided strong evidence that HL is a distinct clinical phenotype different from non-HL.

Funding: N/A
 Poster #NM95
LONGITUDINAL CHANGES IN THE “PELVIC PAIN ONLY” AND “WIDESPREAD PAIN” PHENOTYPES IN THE MAPP UROLOGIC CHRONIC PELVIC PAIN SYNDROME (UCPPS) COHORT
H. Henry Lai1, Emine Bayman2, J Richard Landis3, Steve Harte4, J Quentin Clemens5, Lasrissa Rodriguez6, Siobhan Sutcliffe7, Bayley Taple8, Bruce Naliboff9
1Departments of Surgery (Urology) and Anesthesiology, Washington University School of Medicine, 2Departments of Biostatistics and Anesthesiology, University of Iowa, 3Department of Biostatistics, Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine, 4Department of Anesthesiology, University of Michigan, 5Department of Urology, University of Michigan, 6Departments of Urology, and Obstetrics and Gynecology, University of Southern California, 7Departments of Surgery (Public Health Sciences), Washington University School of Medicine, 8Department of Medical Social Sciences, Northwestern University Feinberg School of Medicine, 9Department of Medicine, David Geffen School of Medicine at UCLA
Presented By: H. Henry Lai, MD

Introduction: Urologic chronic pelvic pain syndrome (UCPPS) is a heterogeneous syndrome with a variety of potential clinical phenotypes and diverse etiologies. Previous work from the MAPP Research Network identified several pain phenotypes within UCPPS based on the distribution of pain across the body: 1) “Pelvic Pain Only”, 2) “Widespread Pain”, and 3) an “Intermediate” group.1 Here we examined longitudinal changes in body pain phenotypes, focusing on how often patients progressed from “Pelvic Pain Only” at baseline to “Widespread Pain” at follow ups; and conversely, how often “Widespread Pain” changed to “Pelvic Pain Only” over time.

Methods: Men and women with UCPPS (IC/BPS or CP/CPPS) who enrolled in the MAPP-I Epidemiology and Phenotyping Study completed a self-report whole body map to indicate the locations of pain every 2 months for 12 months (at baseline, and during 2, 4, 6, 8, 10, 12-month follow ups). Patients were categorized at each assessment into one of three pain phenotypes: 1) “Pelvic Pain Only” if pain was restricted to the pelvic region only, 2) “Widespread Pain” if 3 or more body regions had pain, and 3) an “Intermediate” group if 1-2 body regions had pain.1 Only patients who completed 3 or more follow-ups were included in this longitudinal analysis. The primary outcome measure was the group classification for the majority of follow up assessments. To be included in a group, patients had to qualify for the same group at ≥60% of the follow-up visits.

Results: Among the 93 UCPPS patients with “Pelvic Pain Only” at baseline, only 2 patients (2%) showed a “Widespread Pain” phenotype at the majority of assessments over 12 months of follow up. Among the 121 patients who had “Widespread Pain” at baseline, 7 patients (6%) demonstrated “Pelvic Pain Only” at the majority of assessments over 12 months of follow up. Figure 1 shows the frequency of majority phenotypes during 12 months of follow up for each phenotype at baseline.

Conclusion: It was uncommon for UCPPS patients to change phenotypes from “Pelvic Pain Only” to “Widespread Pain” or vice versa over 12 months. Although patients endorsed fluctuations in number of pain regions, their phenotypic membership remained relatively stable over time.
Funding: NIH/NIDDK
Poster #NM96
PATIENT PERSPECTIVES ON CANNABINOIDS FOR INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME
Kate Anderson, Resident1, Danielle Jenkins, Resident2, Mary Lynch, Psychiatrist3, Ashley Cox, Urologist1
1Dept. of Urology, Dalhousie University, 2Dept. of Urology, Queen's University, 3Dept. of Anesthesia, Pain Management and Preoperative Medicine, Dalhousie University
Presented By: Kate Anderson, MD

Introduction: Interstitial cystitis/bladder pain syndrome (IC/BPS) is a chronic condition often causing a significant impact on quality of life (QOL). The goals of management remain symptom control and maximizing QOL. We sought to: determine if patients with IC/BPS use cannabis products for symptoms of IC/BPS, elicit perceptions of patients with IC/BPS regarding use of cannabis products, and determine if higher Pain and Urgency/Frequency Symptom Scale (PUF) scores correlate to use of cannabinoid products.

Methods: We conducted a cross-sectional survey study of IC/BPS patients at our centre. Patients were asked to complete two anonymous surveys: 1) A demographics and perceptions of cannabis survey modified from a previous study, and 2) PUF Symptom Scale.

Results: Ninety-seven patients participated in the study and 78 completed both surveys (80%). Ninety-five percent of respondents were female, mean age 49 ± 16.5 years. Median patient-reported duration of IC/BPS symptoms was 9 years. The majority (60%) of participants reported taking medications for IC/BPS. Reported cannabis use was 58% (56/97) and 82% (37/45) found it to be at least slightly effective for symptom management. Seventeen percent reported that cannabis use resulted in a decrease or discontinuation of their other IC/BPS medications. The majority of patients reported no negative side effects from cannabis use (60%). Moderate-severe side effects were reported by 12.5% of patients. The three most common modalities used were: inhaled (57%), oils (51%), edibles (43%). The mean total PUF score was 20.4 ±7.4. There was no correlation found between cannabis use and total PUF score (r= 0.041, p=0.724). We found no statistically significant difference in severity of PUF total score for patients who had used cannabis within the last 6 months and those who had not (20.7 +/- 7.5 vs. 20.1 +/- 7.3, p=0.72).

Conclusion: Use of cannabis products by patients with IC/BPS is common. Respondents who used cannabis products largely perceived them to be beneficial for their symptoms with minimal side effects. Further research should be directed towards determining if there is clinical utility for cannabis as a potential therapy for patients with IC/BPS.

Funding: N/A
Poster #NM97
PRELIMINARY REPORT OF A NOVEL THERAPY FOR CHRONIC PELVIC PAIN: SOLA THERAPY
Charles Butrick, cwbutrick@gmail.com, Charles Butrick, Author and presenter
The Urogynecology Center
Presented By: Charles W. Butrick, MD, FPMRS

Introduction: Photobiomodulation (PBM) has been used for over 30 years in the management of various myofascial pain disorders and has been shown to improve tissue healing, to reduce inflammatory conditions and to reduce C fiber activity thus providing analgesic benefits. The delivery of therapeutic laser energy (non-ablative, near infrared) using a small transvaginal or trans-anal probe allows the delivery of therapeutic energy to pelvic muscles and organs, tissues not previously reached with existing PBM instruments. SoLá therapy is indicated for the temporary relief of muscle pain, muscle spasm, and the temporary increase in blood flow.

Methods: SoLá therapy™ involves a small probe approximately the size of a tampon that delivers therapeutic doses of near infrared energy at 2 coherent wavelengths (810/980nm). The SoLá device delivers effective energy density to the tissues of the pelvis based on proprietary protocols. These protocols were developed through analysis of decades of historical data on PBM devices used in other areas of the body. Depth of near infrared energy penetration and temperature end points were validated in the live ovine model.

Patients were selected from an established pelvic pain center. These patients had failed to respond to aggressive multimodal therapy for their various pain disorders. Visual analog scales were collected by this SoLá device and delivered autonomously to a central database in HIPPA compliant fashion. Patients were consented for nine 2-3 minute treatment sessions delivered over 3 weeks.

Results: 8 consecutive patients who had completed 9 treatment sessions and their outcomes are summarized in table. Significant improvement in VAS was seen in 6 of the 8 patients. Pain reduction of between 60--100% was identified. There were no complications associated with therapy.

Conclusion: While preliminary, this therapy shows significant improvement in various pain disorders that involve a component of pelvic floor myofascial pain (MFP). These patients had failed various combinations of multimodal therapy including pharmacologic therapy, manual physical therapy, trigger point injections, sacral nerve stimulation, and intravesical therapy for her IC. Duration of pain relief will be the subject of future reports as that data becomes available. Data concerning PBM when used for other pain disorders suggests that 6-12 months of relief can be expected.

Funding: UroShape Inc
Poster #NM98
URINARY TRACT INFECTION PRESENTATION OF ELDERLY PATIENTS AND THE DECISION TO EMPIRICALLY TREAT
1Beaumont Hospital, Royal Oak, MI, 2Pathnostics, Irvine, CA, 3Comprehensive Urology, Royal Oak, MI, 4Kelly Statistical Consulting, 5Regional Urology, Shreveport, LA, 6MidLantic Urology, Philadelphia, PA, 7Minnesota Urology, 8Premier Urology, NJ, 9Urology San Antonio, TX, 10Urology of South Florida, Delray Beach, FL, 11Atlantic Urology Clinics, Myrtle Beach, SC
Presented By: Annah Vollstedt, MD

Introduction: Early recognition of UTI in the elderly is crucial, the presentation often non-specific, making the decision to empirically treat without urine culture (UC) difficult. We sought to characterize presenting UTI symptoms and patient data driving the decision to empirically treat.

Methods: Following IRB approval, we prospectively collected data from patients > 60 years presenting with UTI symptoms to a multi-provider urology clinic from 7-2018 to 2-2019. Clinico-demographics and urinalysis (UA) results were tested for associations with empiric treatment decision. Classification and regression tree (CART) analysis was performed to predict empiric treatment.

Results: A total of 2,511 patients, median age 73 years, 54% female, were included. In comparing presenting symptoms, females more often presented with dysuria, urinary incontinence, cloudy/malodorous urine, abdominal/flank/pelvic pain, low grade fever, increased frequency and urgency (p all <0.0001). Males more often presented with nocturia and were found to have blood on urinalysis. Females more often presented with acute change in mentation and decline in activities of daily living (p <0.0001) and were more commonly treated with a recent antibiotic course (p<0.0001). Thirty-three percent (833/2511) of patients were empirically treated. Urologists were more likely to empirically treat females than males (70% vs 30%, OR 2.6).

Acute change in mentation, female or male, increased the odds of empiric treatment at least 3-fold. CART analysis showed the most important symptom in deciding on empiric treatment was dysuria (importance factor (IF) 42), whether an antibiotic was used in the last 3 weeks (IF 32), gender and a positive nitrites, leukocytes or blood on UA (IF 27 each). 58% of patients with dysuria were treated empirically vs. 28% without dysuria treated empirically. For women, antibiotic use in the last 3 weeks was of next importance, and for men positive leukocytes, nitrites or blood on UA was of next importance, Figure 1.

Conclusion: Males and females with UTI symptoms present differently. One-third of all patients were treated empirically, but females were more likely to be empirically treated. Dysuria, recent antibiotic use and positive UA were most strongly associated with the decision for empiric treatment. More studies are needed regarding the clinical consequences of treating empirically or not.
**Funding:** Pathnostics
Poster #NM99
THE EFFECT OF DIET ON URINARY PH FLUCTUATIONS AMONG OLDER WOMEN WITH RECURRENT URINARY TRACT INFECTIONS
Jacqueline A. Chavez, BS¹, Juliann M. Chavez, PhD², Alana L. Christie, MS³, Feras Alhalabi, MD¹, Philippe E. Zimmern, MD¹
¹U.T. Southwestern Medical Center, Urology, ²Private Practice, ³U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center
Presented By: Jacqueline Chavez, BS

Introduction/BACKGROUND: Acidic urine pH may be protective against recurrent urinary tract infections (RUTIs), a common problem in older women. We compared diet to urine pH fluctuations throughout the day in older women with RUTIs.

Methods/MATERIALS: Following IRB approval, women > 55 years with documented RUTIs (> 3/year) were enrolled. Participants were given pre-formatted charts to record urinalysis reagent strips (Medimpex) findings 4 times per day (before each meal and at bedtime) as well as concomitant information on their food/beverage intake (food diary) at each meal. No patients were on a controlled diabetic or renal diet, and all participants were encouraged to maintain their usual dietary habits. Urine cultures were obtained at baseline to ensure no infection during the measurement period. Nutrient content reported in food diaries was analyzed by an experienced registered dietitian (JMC) and compared to parallel fluctuations in urine pH.

Results: Of 26 women with a median age of 72 (55-86) years who participated, the first 3 days of recordings with pH and diet were used for this analysis. 16 exhibited consistent urine pH values (change ≤ 1 unit) over measurements, with an overall median of 6 (5-9). Among 10 women with variable (change > 1 unit) urine pH values, 9 were associated with large decreases in urine pH. Of those, the six women with drops to pH of 5 occurred pre-lunch (2 women dropped twice, see Figure 1) or at bedtime (2). Comparing dietary analysis and pH urine changes, beta-carotene (P = 0.017) and total dietary sugar intake (P = 0.036) were found associated with lower urine pH or a decrease in urine pH, whereas monounsaturated fatty acids (MFA 22:1, P = 0.023) and protein (P = 0.028) were associated with an increase in urine pH.

Conclusion: In this real-life, observational study, nearly 40% of older women with RUTI exhibited significant changes in urine pH, with decreased urine pH associated with nutrients found specifically in orange and yellow vegetables as well as in several major food groups. A longitudinal study is needed to determine if changing an individual’s diet and/or adding supplements could decrease the urine pH, thus affecting the rate of RUTIs.

Funding: N/A
Poster #NM100
APPLYING TIME-DRIVE ACTIVITY-BASED COSTING (TDABC) TO WOMEN WHO UNDERWENT FULGURATION FOR THE MANAGEMENT OF RECURRENT URINARY TRACT INFECTIONS
Amy Kuprasertkul, BS, Shivani Gaitonde, BS, Joseph J. Crivelli, MD, Philippe Zimmern, MD
U.T. Southwestern Medical Center, Urology
Presented By: Amy Kuprasertkul, BS

Introduction: Defining the costs of treating recurrent urinary tract infections (RUTI) is challenging due to the multitude of treatment options and unpredictable disease course. A previous study proposed Time-Driven Activity-Based Costing (TDABC), which examines costs of each resource utilized in patient care from initial urologic visit through 5 years follow-up [1]. This method suggested theoretical index pathways for common treatment courses. In this study, we applied these pathways to a cohort [2] who underwent cystoscopic electrofulguration (CEF) for antibiotic-refractory RUTI to evaluate cost-efficacy of CEF in treating RUTIs.

Methods: Following IRB approval, a well-characterized cohort of women [2] who underwent CEF was analyzed. Prior to CEF, all patients had RUTI (³3 UTIs/year) and inflammatory lesions on preoperative cystoscopy. Each patient's pre-CEF RUTI treatment course was assigned to a TDABC index pathway according to the antibiotic regimen and sequence (self-start, post-coital, continuous/suppression). Costs were summed using the Medicare Physician Fee Schedule, GoodRx pricing, and institutional expenses [1]. Post-CEF categories were: cure (no further UTIs), improved (<3 UTIs/year), failed (³3 UTIs/year) (Table).

Results: Of the 95 women with a median follow-up of 4.9 years after CEF, 14 (15%) were cured, 69 (73%) were improved, and 12 (13%) failed. The predominant pathway pre-CEF was “continuous” (n=55/95, 58%). Main pathways and associated costs are described in the Table. For the cure group, post-CEF cost was $330 (cystoscopy cost), since they had no further UTIs. In the improved group, post-CEF cost (<3 UTIs/year) was $1870-$2050 assuming annual follow-up and standard treatment of each UTI episode. For the 12 failures, pre-CEF cost ranged from $1534-$5388 and post-CEF cost were much higher and quite variable, including repeat fulguration (n=8).

Conclusion: Applying TDABC to a well-characterized cohort of women with RUTI treated with CEF, treatment costs pre- and post- CEF were determined in the context of index pathways. The majority of pre-CEF index pathways in this cohort were more costly than their post-CEF pathways.

Table 1. Pre-Fulguration Index Pathway 5-year Cost Estimates for RUTI Management

<table>
<thead>
<tr>
<th>Cure</th>
<th>Improved</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=14</td>
<td>n=69</td>
<td>n=12</td>
</tr>
<tr>
<td>2</td>
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<td>3</td>
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<td>1</td>
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</tr>
<tr>
<td>2</td>
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</tbody>
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5-year Estimated Cost ($)

- Self-start: 1,533
- Self-start → Continuous: 6,801
- Self-start → Continuous → Self-start: 2,038
- Self-start → Continuous → IV Therapy: 5,308
- Post-coital → Continuous: 1,725
- Post-coital → Continuous → IV Therapy: 2,161
- Post-coital → Continuous → Vertical: 2,970
- Post-coital → Continuous → Vertical → Pyelonephritis: 6,000

References:

Funding: N/A
Poster #NM101
CYSTOSCOPIC ANTIBIOTIC IRRIGANT TO REDUCE POSTOPERATIVE URINARY TRACT INFECTIONS AFTER PELVIC RECONSTRUCTION AND MINIMALLY INVASIVE GYNECOLOGIC SURGERY: A RANDOMIZED CONTROLLED TRIAL
Emily Slopnick, MD1,2, Graham Chapman, MD1,2, Welles Henderson, MD1,2, David Sheyn, MD1,2, Andre Petrikovets, MD1,2, Adonis Hijaz, MD2, Robert Pollard, MD1, Jeffrey Mangel, MD1
1MetroHealth Medical Center, Dept. of Obstetrics and Gynecology, Cleveland, OH, 2University Hospitals Cleveland Medical Center, Dept. of Urology, Cleveland, OH
Presented By: Emily Slopnick, MD

Introduction: After pelvic reconstructive surgery, the rate of postoperative urinary tract infection (UTI) is reported as high as 20.3%, even with prophylactic antibiotics. Our objective was to evaluate the effectiveness of an antibiotic irrigation during cystoscopy to prevent postoperative UTI in women undergoing elective pelvic surgery.

Methods: For this prospective randomized controlled trial, women who were undergoing elective surgery for pelvic organ prolapse, stress urinary incontinence or minimally invasive gynecologic surgery were enrolled. Participants were randomized to receive either normal saline for intraoperative cystoscopy (control group) or neomycin in normal saline (antibiotic group). Patients and providers who diagnosed and treated UTIs were blinded to the type of fluid. Postoperative urine testing within six weeks was recorded, and patients were contacted at three time points post-operatively to assess for urinary complaints and adverse events. A UTI was defined as a positive urine culture or patient report of antibiotic treatment for a UTI. Chi-square and multivariable logistic regression analyses were performed to identify factors associated with postoperative UTI.

Results: We enrolled 216 women with a negative preoperative urine culture: 111 controls (51.4%) and 105 antibiotic (48.6%) subjects. There were no differences in medical comorbidities or surgery type between groups. 147 women (68.1%) had any vaginal procedure with their surgery, including 59 (27.3%) vaginal prolapse repairs and 108 (50.0%) midurethral sling placements (MUS). 86 (39.8%) women had any laparoscopic procedure, and three patients (1.4%) underwent open surgery.

Overall, 10.7% of patients developed a UTI within six weeks postoperatively. On Chi-square analysis, there was no difference in the rate of UTI between study groups (9.9% control vs. 11.4% antibiotic, p=0.718). On backward, stepwise multivariable logistic regression, while use of antibiotic irrigant had no impact on UTI rate, patients who had a concurrent MUS were twice as likely to develop a UTI (aOR 2.6, CI 1.0-6.8, p=0.044). Obesity was associated with a lower rate of UTI (aOR 0.38, CI 0.16-0.93, p=0.033). In a subgroup analysis of vaginal surgeries, the rate of UTI was 13.6% with no difference between study groups (p=0.835).

Conclusion: When cystoscopy is performed during elective pelvic surgery, use of antibiotic irrigation does not impact the risk of postoperative UTI.

Funding: N/A
Poster #NM102
PELVIC FLOOR TENDERNESS REPRODUCES PELVIC PAIN IN UROLOGIC CHRONIC PELVIC PAIN SYNDROME: FINDINGS FROM MULTIDISCIPLINARY APPROACH TO THE STUDY OF CHRONIC PELVIC PAIN (MAPP) STUDY

Priyanka Gupta, Department of Urology1, J. Quentin Clemens, Department of Urology1, H. Henry Lai, Division of Urologic Surgery2, J. Richard Landis, Department of Biostatistics3, Siobhan Sutcliffe, Department of Obstetrics and G2, Larissa V. Rodriguez, Department of Urology4

1University of Michigan, Ann Arbor, MI, USA, 2Washington University School of Medicine, St. Louis, MO, USA, 3Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine, Philadelphia, PA, USA, 4University of Southern California, Los Angeles, CA, USA

Presented By: Priyanka Gupta, MD

Introduction: Patients with urologic chronic pelvic pain syndromes (UCPPS) often have significant pelvic floor dysfunction. The prevalence of this finding on physical exam and correlation with symptoms has not been studied in a systematic and reproducible manner.

Methods: Patients completed intake questionnaires and a standardized pelvic examination that palpated 6 locations in the pelvic floor examining the anterior and posterior levators and the obturator internus in women, vaginally, and in men, transrectally. At each point, the examiner asked the participant whether they experienced pain with palpation. To determine a pelvic exam tenderness score, the 6 points were coded (0:no,1:yes) and the results were summed. Patients were asked if they had suprapubic or perineal pain to palpation. Finally, they were asked if the exam reproduced their UCPPS pain symptoms. A multiple regression model, adjusting for baseline urologic pain severity, was used to investigate the association between multiple factors and this pelvic exam tenderness score.

Results: Screening visit data from the Symptom Patterns Study (SPS) within the MAPP-II Research Network were utilized to classify 347 women with interstitial cystitis (IC)/bladder pain syndrome (BPS), 121 men with chronic prostatitis (CP)/chronic pelvic pain syndrome (CPPS) only, and 52 men with IC/BPS or both (IC/BPS,CP/CPPS). In the women, 208 (59.9%) had ≥4 points positive on pelvic examination. In the men, 53 (43.8%) with CP/CPPS only, and 22 (42.3%) with IC/BPS or both (IC/BPS,CP/CPPS) had a pelvic exam score ≥4. The final question at the end of the pelvic exam - “did the pelvic examination reproduce your pain or discomfort” was the most predictive (p<0.001) of the total score, regardless of sex and diagnosis subgroup. Women were more likely to have some positive pelvic exam points present on examination even if the exam did not correlate with their symptoms (Figure 1)

Conclusion: The response to whether or not the pelvic examination reproduces UCPPS pain symptoms was significantly associated with the total score for pelvic floor tenderness across all subgroups. This further illustrates the importance of recognizing and treating pelvic floor dysfunction in patients with urologic pain conditions.

Figure 1: Mean Pelvic Exam Tenderness Score by Reproducible Pain within Sex and Diagnosis Subgroups
**PEX: Exam reproduce pain or discomfort**

Funding: NIDDK - MAPP Network
Poster #NM103
DISCREPANCIES IN PATIENT AND PHYSICIAN PERSPECTIVES OF QUALITY OF CARE DELIVERED TO PATIENTS WITH RECURRENT URINARY TRACT INFECTIONS
Taylor Sadun¹, Victoria Scott², Lauren Thum³, Melissa Markowitz¹, Sally Maliski⁴, Ja Hong Kim¹, Jennifer Anger²
¹Department of Urology, David Geffen School of Medicine at UCLA, Los Angeles, CA, ²Division of Urology, Cedars-Sinai Medical Center, Beverly Hills, CA, ³Urology Specialists, Sioux Falls, SD, ⁴School of Nursing, University of Kansas Medical Center, Kansas City, KS
Presented By: Taylor Sadun, MD

**Introduction:** Insight into patient perspective and impact of recurrent UTIs (rUTIs) on quality of life (QoL) is sparse. The study objective is to identify discrepancies in patient and physician perspectives of care provided to patients with rUTIs with the hope of improving the quality of care.

**Methods:** Patient perspectives were obtained by recruiting women with rUTIs (n=29) to focus group discussions regarding knowledge, prevention strategies, treatment with antibiotics and alternatives, and impact on QoL. Physician perspectives were obtained, blinded to focus group discussion results, through interviews with experts specializing in UTI management. Qualitative analysis was performed using grounded theory methods as described by Charmaz. Themes developed by independent coders were compared and contrasted.

**Results:** Analysis of transcripts produced three predominant themes. First, patients were fearful of undertreated acute infections due to miscommunication with primary care providers, adverse effects from antibiotic usage, and rUTIs as a harbinger of larger underlying disease. Physicians also noted patient fear associated with rUTI and augmented management through extensive counseling. Second, while patients with rUTIs were more focused on improving care for acute UTIs, physicians were conversely more focused on prophylaxis and efficacious management of a chronic condition. Third, while patients reported resentment and frustration with their disease management, physicians paradoxically believed that their patients were overall satisfied with their care. We also analyzed expert practice pattern in antibiotic usage (Figure 1).

**Conclusion:** This study demonstrated the importance of addressing patient fear of rUTIs through counseling by experts. Referral to UTI specialist allowed for more detailed evaluation of a patient’s history of bladder, bowel, and pelvic floor dysfunction; attention to antibiotic stewardship; and shared decision making. Analysis revealed that patients focus more on acute infections, while expert physicians focus on the chronic condition. This may explain the discrepancy in perceived satisfaction between the patient and treating physicians and highlight the need to improve current UTI management through patient education and expected treatment outcomes. Finally, while expert practice patterns in prophylactic and treatment antibiotic usage vary, we expect more uniformity after the publication of AUA rUTI treatment guidelines in 2019.
Funding: N/A
**Poster #NM104**

**COMPARISON OF DEEP PHENOTYPING FEATURES OF UCPPS PATIENTS WITH AND WITHOUT HUNNER LESION - A MAPP RESEARCH NETWORK STUDY**

H Henry Lai¹, Craig Newcomb², Dina Appleby², J Quentin Clemens³, Priyanka Gupta³, Larissa Rodriguez⁴, J Richard Landis²

¹Departments of Surgery (Urology) and Anesthesiology, Washington University School of Medicine, 
²Department of Biostatistics, Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine, 
³Department of Urology, University of Michigan, 
⁴Departments of Urology, and Obstetrics and Gynecology, University of Southern California

Presented By: H. Henry Lai, MD

**Introduction:** It has been suggested that IC/BPS patients with Hunner lesion (also called “classic IC”, “ulcerative IC”, or ESSIC type 3C) might represent a distinct clinical phenotype different from those without Hunner lesion; however their findings were inconsistent (Doiron, Peters, Moh et al). In addition, these studies had major methodological weaknesses (e.g., exclusion of male patients, self-reported medical history, inclusion of patients with unknown Hunner status, and single center studies). The MAPP-II Symptom Pattern Study (SPS) represents the most comprehensive deep phenotyping study of UCPPS (urologic chronic pelvic pain syndrome) patients across six clinical centers in the US. Here we compared male and female UCPPS patients with versus without documented Hunner lesion.

**Methods:** We performed medical chart review on 193 male and 385 female UCPPS patients who enrolled in the MAPP-II SPS. 223 patients had cystoscopy and documentation of their Hunner status. 28 of 223 (12.5%, 8 males, 20 females) had Hunner lesion, while 195 of 223 (87.5%) did not have Hunner lesion.

**Results:** UCPPS patients with Hunner lesion were significantly older (58.0 vs. 43.6, p<0.0001), had more severe nocturia (3.5 vs. 2.0, p<0.0001), and higher ICSI and ICPI scores (12.7 vs. 9.8, p=0.0035; 10.4 vs. 9.8, p=0.018) than those without Hunner lesion. Patients with Hunner lesion also reported less severe non-urologic pain (1.8 vs. 3.6, p=0.0006), less widespread body pain (no. of body regions with pain: 1.0 vs. 2.5, p=0.0029), less chronic overlapping pain conditions (0.8 vs. 1.3, p=0.039), and lower fibromyalgianess scores (5.5 vs. 8.7, p=0.0036) than those without Hunner lesion. Hunner patients also had less anxiety (4.1 vs. 7.2, p=0.0013), lower perceived stress (12.5 vs. 15.9, p=0.040), and less catastrophizing (8.3 vs. 11.9, p=0.033) than non-Hunner patients. There were no differences in sex distribution, severity of urologic pain, bladder hypersensitivity features, and pelvic floor tenderness between the two groups.

**Conclusion:** UCPPS patients with Hunner lesion had more severe urinary symptoms, less systemic/non-urologic pain, and less psychosocial symptoms than those without Hunner lesion. The deep phenotyping studies from MAPP provided strong evidence that Hunner lesion is a distinct clinical phenotype different from non-Hunner lesion.

**Funding:** NIH/NIDDK
**Poster #NM105**

**PREVALENCE AND CHARACTERIZATION OF DYSPAREUNIA IN A GENERAL UROLOGY CLINIC POPULATION**

Jacqueline Zillioux, MD¹, Clinton Yeaman, MD¹, Kimberly Boatman², Sarah Krzastek, MD³, David Rapp, MD¹

¹University of Virginia, Dept. Urology, Charlottesville, VA, ²University of Virginia School of Medicine, Charlottesville, VA, ³Virginia Commonwealth University, Dept. Urology, Richmond, VA

Presented By: Jacqueline Zillioux, MD

**Introduction:** Dyspareunia affects an estimated 8-22% of US women. However, a paucity of investigation exists to better understand the specific location and quality of sexual pain. We aimed to assess the specific character of dyspareunia in a general urology population presenting for evaluation of unrelated non-painful complaints.

**Methods:** This is an IRB-approved prospective, survey-based study of female patients presenting to a general urology clinic over a 10-month period (7/2018-5/2019). Participants were recruited and screened by a study coordinator in clinic registration, excluding those presenting specifically for a painful complaint or condition (flank pain, interstitial cystitis). Patients were given a 32-item survey with questions pertaining to sexual activity and dyspareunia, with focus on pain location, quality, frequency, and severity. Detailed anatomic figures were included to aid patients with pain localization. Analysis was performed with R programming language (3.6.1).

**Results:** A total of 181 women completed the survey, with a mean age of 56 years. Overall, fifty-three (29%) women reported dyspareunia. However, among currently sexually active women the prevalence of dyspareunia was 46% (38/83). A majority (53%) of patients indicated moderate to severe dissatisfaction with their sexual activity. Despite this finding, a significant proportion (33%) of patients with dyspareunia reported having at least weekly sexual activity. Further, the majority (60%) reported onset of pain prior to age 50. Patients reported a significant variety of pain locations and qualities (Tables 1A and 1B). Whereas women more commonly reported multiple pain locations (median 2 (IQR 1,4)), the majority (70%) endorsed only one pain quality. A significant proportion (34%) reported high or very high pain severity, with 45% having pain most or all times of sexual activity.

**Conclusion:** A significant percentage of women presenting to a general urology clinic experience dyspareunia. Notably, patient-reported pain characteristics, including location and quality, varied significantly across women assessed. Further study is needed to understand how these characteristics may relate to different and specific etiologies of sexual pain and directed treatment options.

**Funding:** N/A

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### TABLE 1A.

<table>
<thead>
<tr>
<th>Location of Pain</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside Labia</td>
<td>6 (11.3)</td>
</tr>
<tr>
<td>Outside Clitoris</td>
<td>4 (7.5)</td>
</tr>
<tr>
<td>Introitus</td>
<td>31 (58.5)</td>
</tr>
<tr>
<td>Inside Vagina</td>
<td>53 (100%)</td>
</tr>
<tr>
<td>Upper third</td>
<td>21 (39.6)</td>
</tr>
<tr>
<td>Middle third</td>
<td>17 (32.0)</td>
</tr>
<tr>
<td>Lower third</td>
<td>15 (28.3)</td>
</tr>
<tr>
<td>Anterior wall</td>
<td>13 (24.5)</td>
</tr>
<tr>
<td>Posterior wall</td>
<td>17 (32.0)</td>
</tr>
<tr>
<td>Right side</td>
<td>14 (26.4)</td>
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<tr>
<td>Left side</td>
<td>14 (26.4)</td>
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</table>

### TABLE 1B.

<table>
<thead>
<tr>
<th>Pain Severity (over last 4 months)</th>
<th>N (%)</th>
</tr>
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<tbody>
<tr>
<td>Very high</td>
<td>7 (13.2)</td>
</tr>
<tr>
<td>High</td>
<td>11 (20.7)</td>
</tr>
<tr>
<td>Moderate</td>
<td>18 (33.9)</td>
</tr>
<tr>
<td>Low</td>
<td>10 (18.3)</td>
</tr>
<tr>
<td>None</td>
<td>3 (5.6)</td>
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</table>

<table>
<thead>
<tr>
<th>Pain Quality</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharp or stabbing</td>
<td>33 (62.3)</td>
</tr>
<tr>
<td>Dull</td>
<td>18 (33.9)</td>
</tr>
<tr>
<td>Numbness/Tingling</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Occurs with touch</td>
<td>15 (28.3)</td>
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</table>
**Poster #NM106**

**INTERSTITIAL CYSTITIS EXAMINATION OF THE CENTRAL AUTONOMIC NETWORK (ICECAN): DESIGN AND METHODS**

Katherine Sheridan¹, Jody Barbeau², Camila Bomtempo, MD³, Gisela Chelimsky, MD⁴, Quentin Clemens, MD⁵, Lisa Conant, PhD⁶, Mingen Feng², Adonis Hijaz, MD⁷, Jeffrey Janata, PhD⁸, Richard Jennings, PhD⁹, Thomas Kamarck, PhD¹⁰, Sumana Koduri, MD³, Henry Lai, MD¹¹, Richard Landis, PhD¹², Sangeeta Mahajan, MD¹³, Marcellus Merritt, PhD¹⁴, Lutfi Tugan Muftuler, PhD¹⁵, Crystal O’hara¹, Pippa Simpson, PhD², Julian Thayer, PhD¹⁶, Frank Tu, MD, MPH¹⁷, Candida Ustine¹⁸, Dewayne Williams, PhD¹⁹, Ke Yan, PhD², Thomas Chelimsky, MD²⁰

¹Medical College of Wisconsin, Neurology, WI, ²Medical College of Wisconsin, Quantitative Health Sciences, WI, ³Medical College of Wisconsin, Obstetrics and Gynecology, WI, ⁴Medical College of Wisconsin, Gastroenterology, Pediatrics, WI, ⁵University of Michigan, Urology, MI, ⁶Medical College of Wisconsin, Neuropsychology, Neurology, WI, ⁷University Hospitals, Urology, OB/GYN, OH, ⁸University Hospitals Cleveland, Psychiatry, Adult Psychiatry, OH, ⁹University of Pittsburgh, Psychiatry, Psychology, PA, ¹⁰University of Pittsburgh, Psychology, PA, ¹¹Washington University, Urology, WA, ¹²University of Pennsylvania, Biostatistics, PA, ¹³University Hospitals, Urological Institute, OB/GYN, OH, ¹⁴University of Wisconsin Milwaukee, Psychology, WI, ¹⁵Medical College of Wisconsin, Research, Neurosurgery, WI, ¹⁶University of California, Irvine, Psychological Sciences, CA, ¹⁷NorthShore University Health System, IL, ¹⁸Medical College of WI, Neurology, WI, ¹⁹University of California, Irvine, Psychological science, CA, ²⁰Medical College of Wisconsin, Neurology, NeuroMuscular, WI

Presented By: Katherine Sheridan

**Introduction:** The treatment of the pelvic pain diagnoses Interstitial Cystitis/ Bladder Pain Syndrome (BPS) and Myofascial Pelvic Pain Syndrome (MPP) remains elusive. ICECAN posits that in BPS, but not in the comparison disorder MPP, pain generation involves activation of central autonomic sympathetic networks in response to a stressor. ICECAN will investigate this hypothesis in 2 ways: (1) by examining the temporal relationship between changes in autonomic cardiovagal modulatory indices and the pain experience and (2) by determining if reducing sympathetic autonomic influence through a beta-blocker (metoprolol compared to placebo) diminishes pain.

**Methods:** 150 women (50 BPS, 50 MPP, 50 HC) across three sites (Milwaukee, Chicago, Cleveland) will participate in this randomized double-blind crossover 24-week study of metoprolol vs placebo (8 weeks each). Detailed screening confirms subject diagnoses of MPP and/or BPS, and absence of co-morbid diagnoses (migraine, IBS, etc.) in HC. Participant heart rate is monitored by a Faros device for 24 hours weekly while they record emotional, pain, voiding states and events using an ecological momentary assessment (EMA) on a custom smart phone App. Study site visits at weeks 0, 4, 12, 16 and 24 include neurological, pelvic, hypermobility and fibromyalgia exams, assessment of 28 co-morbidities, autonomic cardiovascular evaluation, uroflow, and surveys assessing pain, anxiety, depression, catastrophizing, etc.

**Results:** As of October 2019, the following number of subjects have started/withdrawn/completed the trial: HC 20/2/18, MPP 14/1/10, BPS 20/8/7. Recruitment challenges have included: time of site visits, hesitation to take a beta-blocker, 24-week trial duration, and home monitoring time (EKG monitoring/ questionnaires every 85 minutes during the same 24-hour period). Several changes in the study and creative strategies have been implemented. Including community outreach via an online QR code survey, flyers, television/ radio advertisements, social media postings, eliminating the lengthiest portion of clinic visits: DNIC, adding an optional 12-week observational study, and developing concise, engaging, personal recruitment scripts which are practiced weekly until retained.

**Conclusion:** The novel tools applied in this trial may open new understanding of the relationships between autonomic changes and pelvic pain. If targeting autonomic abnormalities influences pain, a major new avenue of treatment options could emerge.

**Funding:** NIH: NIDDK
Poster #NM107
REASONS FOR MISDIAGNOSIS OF INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME (IC/BPS) IN A NATIONAL COHORT OF VA PATIENTS
Kai Dallas¹, Catherine Bresee², Amanda De Hoedt³, Justin Senechal³, Kamil Barbour⁴, Jayoung Kim¹, Stephen Freedland¹, Jennifer Anger¹
¹Cedars-Sinai, Division of Urology, Los Angeles, CA, ²Cedars-Sinai, Department of Biostatistics and Bioinformatics Research, Los Angeles, CA, ³Veterans Affairs Medical Centers, Urology Section, Durham, NC, ⁴National Center for Chronic Disease Prevention and Health Promotion, CDC, Atlanta, GA
Presented By: Kai B. Dallas, MD

Introduction: According to the Society of Urodynamics, Female Pelvic Medicine, and Urogenital Reconstruction (SUFU), IC/BPS is defined as “an unpleasant sensation (pain, pressure, and discomfort) perceived to be related to the urinary bladder, associated with lower urinary tract symptoms of more than 6 weeks duration, in the absence of infection or other identifiable causes”. The prevalence of IC/BPS is estimated to range from 0.045%-6.5% (women) and 0.008%-4.2% (men). This lack of accuracy is a major limitation to research in the field and is due to a lack of diagnostic standards and the fact that there is symptomatic overlap with several other conditions. In this study we aimed to explore the rates and reasons for misdiagnosis of IC/BPS in a large national cohort.

Methods: After obtaining IRB approval, the Veterans Affairs Informatics and Computing Infrastructure (VINCI) was used to identify all patients in the VA system between 1999 and 2016 with an ICD-9/10 code for IC/BPS (595.1/ N30.10). Of the 164,845 patients identified, a sample of 1,650 was randomly selected for detailed chart review to assess if the diagnostic criteria for IC/BPS existed (see Figure 1). If patients records were not sufficient to make a determination, they were considered equivocal. Patients were excluded if they had concomitant conditions which would make it difficult to assess for the presence of IC/BPS (see Figure 1).

Results: Of the 1,650 patients selected for in-depth chart review, 379 (23.0%) were excluded by our criteria. The majority of exclusions were due to a history of cancer. Of the remaining 1,271 patients, 561 (44.1%) met diagnostic criteria for IC/BPS, 459 (36.1%) did not and 251 (19.8%) did not have sufficient records to accurately determine if they had IC/BPS or not (Figure 1). The most common reason for not-meeting the criteria for IC/BPS was the lack of pain as a symptom, and a history of recurrent UTIs (Figure 1).

Conclusion: We found a high rate of misdiagnosis of IC/BPS, with only 44.1% of patients with an ICD diagnosis of IC/BPS actually meeting diagnostic criteria after in depth chart review. These data can be used to improve prevalence estimates of IC/BPS as well as diagnostic practices.
Figure 1: Cohort Consort Diagram of Accuracy of IC/BPS Diagnosis

N=1,650 IC Cases Reviewed

N=379 Meets Exclusion Criteria

Exclusion Reasons
- Cancer History (n=270)
- Dementia (n=78)
- HIV+ (n=13)
- Cystectomy (n=11)
- Deceased (n=5)
- Transgender (n=2)

N=1,271 Meets Inclusion Criteria

N=561 Confirmed ICDx POSITIVE Abstracked Data on IC Dx

N=251 ICDx Equivocal Abstracked Data on IC Dx

N=459 Confirmed ICDx NEGATIVE Abstracked Data on IC Dx

Criteria for diagnosis of IC/BPS:

1. Two visits (in the VA system) complaining of unpleasant bladder centric sensation in the absence of positive urine culture at least 6 weeks apart
2. One visit complaining of bladder centric pain/unpleasant bladder centric sensation and a second visit complaining of “likely” IC/BPS-related pain in the absence of positive urine culture at least 6 weeks apart (both at the VA). We defined “likely” IC/BPS-related pain as pain that could be due to IC/BPS but without a specific complaint of bladder centric pain or bladder tenderness on exam. Symptoms of “likely” IC/BPS include dysuria, pelvic pain, chronic lower abdominal pain, dyspareunia
3. A history of bladder pain and/or a history of IC/BPS (in the VA or other system) with an additional visit complaining of bladder centric pain in the absence of a positive urine culture
4. If there was insufficient information in a patient’s record to confirm IC/BPS diagnosis, they were classified as equivocal.

Funding: Centers for Diseases Control 1U01DP006079 (Freedland/Anger/Kim) 9/30/15-9/29/20
The Epidemiology of Interstitial Cystitis in a Nationwide Multiethnic VA Cohort
Poster #NM108
INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME WITH CO-OCCURRING ENDOMETRIOSIS: A COMMON CLINICAL PHENOTYPE IN CHRONIC PELVIC PAIN SYNDROME
Tyler Overholt, MD¹, Robert Evans, MD¹,², Catherine Matthews, MD¹,², Gopal Badlani, MD¹,², Heather Heath, BS³, Stephen Walker, PhD¹,²,³
¹Wake Forest Baptist Health Department of Urology, ²Wake Forest Baptist Health Female Pelvic Medicine and Reconstructive Surgery, ³Wake Forest Institute for Regenerative Medicine
Presented By: Tyler Lynne Overholt, MD

Introduction: Interstitial cystitis/bladder pain syndrome (IC/BPS) is a chronic pelvic pain disorder with unclear etiology. It has been reported that as many as 48-65% of women with chronic pelvic pain (CPP) have co-occurring IC/BPS and endometriosis. If this co-occurrence is indicative of an overlapping etiology and/or pathophysiology, it would make clinical sense to screen for both conditions in patients who present with CPP. To investigate this concept further we performed a retrospective review of our prospective database of female IC/BPS patients with, and without, a concomitant diagnosis of endometriosis.

Methods: Patients between ages 18-80 y/o were prospectively enrolled in our IRB-approved IC/BPS patient registry at the time of their therapeutic hydrodistention procedure. Demographic and clinical information, including information regarding co-occurring symptoms and syndromes, was documented for each patient. For statistical comparisons performed in this study, IC/BPS patients were identified as either: with co-occurring endometriosis (Group A) or without endometriosis (Group B).

Results: Of the 437 females (96% of the total registry participants) included in these analyses, 81 (18.5%) had both IC/BPS and endometriosis (Group A). A large number of these patients (30-39 y/o) were in the 30-39 y/o (19.3%) age-ranges. Group A had a significantly higher number of patients with non-low anesthetic bladder capacity (defined here as BC>400cc) than Group B (97.5% vs 85.6%; p=0.003). Group A also had a significantly lower number of patients with Hunners lesion than Group B (2.5% vs 10.9%, p=0.019). The prevalence of two additional and frequently co-occurring conditions, irritable bowel syndrome (IBS; 52.4% vs 37.5%, p=0.013) and fibromyalgia (FM; 45.1% vs 24.2%, p=0.0001), was significantly higher in Group A.

Conclusion: In this retrospective chart review of 437 female IC/BPS patients we found a co-occurring diagnosis of endometriosis was common. A significant number of those with co-occurring IC/BPS and endometriosis were between the ages of 20-39 y/o, had a non-low BC (without Hunners lesion), and were also more likely to have co-occurring IBS and FM, compared to those with IC/BPS alone. These data suggest that a common mechanism(s) may underlie the significant overlap in these co-occurring conditions in a large number of IC/BPS patients and should therefore be the target of additional investigations.

<table>
<thead>
<tr>
<th>Clinical Parameter</th>
<th>Endometriosis + IC/BPS</th>
<th>IC/BPS only</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Low Anesthetic Bladder Capacity</td>
<td>80 (97.5%)</td>
<td>304 (85.6%)</td>
<td>0.003</td>
</tr>
<tr>
<td>Hunners Lesion</td>
<td>2 (2.5%)</td>
<td>39 (10.9%)</td>
<td>0.019</td>
</tr>
<tr>
<td>Irritable Bowel Syndrome</td>
<td>43 (52.4%)</td>
<td>133 (37.5%)</td>
<td>0.013</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>37 (45.1%)</td>
<td>86 (24.2%)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Table 1. Clinical parameters associated with patients who have co-diagnoses of IC/BPS and endometriosis vs patients with IC/BPS only.

Funding: NIH R21 DK106554-01 (SJW)
Poster #NM109
TRAUMA-INFORMED CARE PRACTICES IN THE TREATMENT OF INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME
Lindsey McKernan, Emily Newbury, Rochell Burton
Vanderbilt University Medical Center
Presented By: Lindsey Colman McKernan, PhD

Introduction: Psychosocial distress is highly prevalent in populations with lower urinary tract symptoms such as pelvic pain, urgency, frequency, nocturia, and incomplete emptying. In particular, research indicates that individuals with interstitial cystitis have higher rates of exposure to psychological trauma across the lifespan. Further, emerging research suggests that women meeting diagnostic criteria for IC/BPS are more likely than other chronic pain patients to screen positive for post-traumatic stress disorder; however, this has yet to be studied in a clinic setting. The purpose of this investigation is to describe the prevalence of posttraumatic stress symptoms in an outpatient integrative specialty clinic dedicated IC/BPS. We then explore the potential utility of applying trauma-informed care practices to facilitate clinic visits with these patients.

Methods: We retrospectively reviewed a convenience sample of N=18 patients diagnosed with IC/BPS at a large academic medical center, gathering data from validated assessment measures given at intake between 08/2019-10/2019 detailing disease severity (ICSI/ICPI), degree of widespread pain (MBM-II), trauma exposure and posttraumatic stress symptoms (PC-PTSD-5).

Results: The sample consisted of 94.11% women, with an average age of 44.4 years. On initial assessments, 61.1% (11/18) of patients self-reported exposure to trauma, and 38.9% (7/18) screened positive for posttraumatic stress disorder (PC-PTSD-5 3). Participants experienced, on average moderate to severe IC/BPS symptoms and impact (ICSI/ICPI average total score = 22.7) and widespread pain (MBM-II average = 7.1 pain sites).*

Conclusion: Given the increased rates of trauma exposure and positive screening for posttraumatic stress in this population, we encourage the integration of trauma-informed care practices that emphasize collaboration, establishing rapport, and building trust and perceived safety during initial visits and psychoeducation on the pain-trauma relationship. We review these practices in detail, along with anecdotal information from patients regarding their perceived benefit during visits.

*Data collection will conclude 3/2020 at which point updated figures will be provided
Funding provided by the National Institute of Diabetes and Digestive and Kidney Diseases (1 K23 DK118118-R01A1); British Psychological Society
Poster #NM110
ASYMPTOMATIC BACTERIURIA IS NOT ASSOCIATED WITH FREQUENCY OF SYMPTOMATIC URINARY TRACT INFECTIONS IN PATIENTS WHO ARE CATHETER DEPENDENT
Alyssa Greiman, MD, Giulia Lane, MD, Rachel Bergman, BS, Paholo Barboglio Romo, MD, J. Quentin Clemens, MD, Priyanka Gupta, MD, Diana O'Dell, John Stoffel, Anne P. Cameron
Department of Urology, University of Michigan, Ann Arbor, MI, USA.
Presented By: Alyssa Kay Greiman, MD

Introduction: Asymptomatic bacteriuria (ASB) is common in patients who are catheter dependent and is suspected to predispose patients to symptomatic urinary tract infections (UTI). We aim to determine risk factors associated with the presence of ASB and assess if ASB is associated with the frequency of symptomatic UTIs.

Methods: As part of an ongoing prospective study, we obtained urine cultures and urologic history from 72 asymptomatic patients with a diagnosis of neurogenic bladder who managed their bladder with intermittent catheterization, suprapubic catheter, or indwelling urethral catheter. All positive urine cultures regardless of colony count were included.

Results: Of the 72 patients enrolled, the majority were female (53%), the mean age was 55 years (19-81 years) and most had neurogenic bladder due to spinal cord injury (47 %) or multiple sclerosis (14 %). Most patients performed intermittent catheterization (89 %), while the remaining 11 % had suprapubic or urethral catheters.

Urine cultures among these asymptomatic patients were positive in 74% (n=53). The most common bacteria were escherichia coli (24.7%), enterococcus species (13.7%), and klebsiella pneumonia (13.7%). ASB was associated with younger age (p = 0.04), and diagnosis of spinal cord injury (p = 0.03). There was no association between ASB and catheterization type (70.3% intermittent versus 100% indwelling p = 0.24).

The presence of ASB was not associated with the incidence or frequency of symptomatic UTIs, with 37.7% of patients with ASB having 1-2 symptomatic UTIs in the preceding year compared to 31.5% of those with a negative culture, and 30.1% of patients with ASB having 3 or more symptomatic UTIs compared to 26.4% of those with a negative culture (p = 0.38).

Gender, menopausal status, BMI, smoking status, diabetes, fecal incontinence, immunosuppression, bladder augmentation, history of urolithiasis, bladder compliance, vesicoureteral reflux, and hydronephrosis were not associated with the presence of ASB.

Conclusion: Asymptomatic bacteriuria was found in all patients who managed their bladder with an indwelling catheter and in 70% of patients who performed intermittent catheterization. It was more common in younger patients with spinal cord injury. The presence of asymptomatic bacteria was not associated with either the incidence or frequency of symptomatic self-reported urinary tract infections.
### Table 1: Baseline demographics and clinical data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Negative Culture</th>
<th>Asymptomatic Bacteriuria</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>19 (26.4%)</td>
<td>53 (73.6%)</td>
<td>0.29</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>12 (63.2%)</td>
<td>26 (49.1%)</td>
<td>0.29</td>
</tr>
<tr>
<td>Male</td>
<td>7 (36.8%)</td>
<td>27 (50.9%)</td>
<td></td>
</tr>
<tr>
<td>Menopause status (N, %)</td>
<td>9 (75%)</td>
<td>14 (53.8%)</td>
<td>0.21</td>
</tr>
<tr>
<td>Age (average)</td>
<td>59.2</td>
<td>51.6</td>
<td>0.04</td>
</tr>
<tr>
<td>BMI (average)</td>
<td>26.4</td>
<td>28.1</td>
<td>0.34</td>
</tr>
<tr>
<td>Intermittent catheterization (N, %)</td>
<td>19 (100%)</td>
<td>45 (84.9%)</td>
<td>0.24</td>
</tr>
<tr>
<td>Indwelling catheter (N, %)</td>
<td>0 (0%)</td>
<td>8 (15.1%)</td>
<td>0.24</td>
</tr>
<tr>
<td>Current Smoker (N, %)</td>
<td>2 (10.5%)</td>
<td>5 (9.4%)</td>
<td>0.89</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1 (5.3%)</td>
<td>9 (17.0%)</td>
<td>0.21</td>
</tr>
<tr>
<td>Fecal incontinence</td>
<td>5 (26.3%)</td>
<td>8 (15.1%)</td>
<td>0.28</td>
</tr>
<tr>
<td>Bladder Augment</td>
<td>3 (15.8%)</td>
<td>3 (5.7%)</td>
<td>0.17</td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>2 (10.5%)</td>
<td>3 (5.7%)</td>
<td>0.47</td>
</tr>
<tr>
<td>History of kidney stones</td>
<td>4 (21.1%)</td>
<td>16 (30.2%)</td>
<td>0.45</td>
</tr>
<tr>
<td>History of bladder stones</td>
<td>1 (5.3%)</td>
<td>7 (13.2%)</td>
<td>0.34</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
<td>0.03</td>
</tr>
<tr>
<td>Myelomeningocele</td>
<td>2 (10.5%)</td>
<td>2 (3.8%)</td>
<td></td>
</tr>
<tr>
<td>Multiple sclerosis</td>
<td>6 (31.6%)</td>
<td>4 (7.5%)</td>
<td></td>
</tr>
<tr>
<td>Spinal cord injury</td>
<td>4 (21.1%)</td>
<td>30 (56.6%)</td>
<td></td>
</tr>
<tr>
<td>Transverse myelitis</td>
<td>0 (0%)</td>
<td>1 (1.9%)</td>
<td></td>
</tr>
<tr>
<td>CVA</td>
<td>0 (0%)</td>
<td>1 (1.9%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>6 (31.6%)</td>
<td>15 (28.3%)</td>
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</tr>
<tr>
<td>Urinary incontinence (N, %)</td>
<td>12 (63.1%)</td>
<td>34 (64.2%)</td>
<td>0.94</td>
</tr>
<tr>
<td>Urinary capacity performed (N, %)</td>
<td>14 (73.7%)</td>
<td>45 (84.9%)</td>
<td>0.27</td>
</tr>
<tr>
<td>Bladder capacity (average)</td>
<td>415.8 mL</td>
<td>355 mL</td>
<td>0.40</td>
</tr>
<tr>
<td>Abnormal compliance (N, %)</td>
<td>2 (14.2%)</td>
<td>8 (17.8%)</td>
<td>0.62</td>
</tr>
<tr>
<td>Vesicoureteral reflux (N, %)</td>
<td>1 (7.1%)</td>
<td>5 (11.1%)</td>
<td>0.57</td>
</tr>
<tr>
<td>Upper tract imaging performed (N, %)</td>
<td>16 (84.2%)</td>
<td>51 (96.2%)</td>
<td>0.72</td>
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<tr>
<td>Normal</td>
<td>12 (75%)</td>
<td>35 (68.6%)</td>
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</tr>
<tr>
<td>Hydronephrosis</td>
<td>1 (6.2%)</td>
<td>1 (2.0%)</td>
<td></td>
</tr>
<tr>
<td>Cortical thinning or scarring</td>
<td>1 (6.2%)</td>
<td>5 (9.8%)</td>
<td></td>
</tr>
<tr>
<td>Kidney stones</td>
<td>2 (12.6%)</td>
<td>30 (19.6%)</td>
<td></td>
</tr>
<tr>
<td>History of symptomatic UTI treated in past year</td>
<td></td>
<td></td>
<td>0.38</td>
</tr>
<tr>
<td>0 UTIs</td>
<td>11 (57.9%)</td>
<td>36 (67.9%)</td>
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<tr>
<td>1 UTI</td>
<td>8 (42.1%)</td>
<td>17 (32.1%)</td>
<td></td>
</tr>
<tr>
<td>2 UTIs</td>
<td>2 (10.5%)</td>
<td>15 (28.3%)</td>
<td></td>
</tr>
<tr>
<td>3 UTIs</td>
<td>4 (21.0%)</td>
<td>5 (9.4%)</td>
<td></td>
</tr>
<tr>
<td>4 UTIs</td>
<td>3 (15.8%)</td>
<td>7 (13.2%)</td>
<td></td>
</tr>
<tr>
<td>5 or more UTIs</td>
<td>1 (5.3%)</td>
<td>4 (7.5%)</td>
<td></td>
</tr>
<tr>
<td>Table 1: Baseline demographics and clinical data</td>
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**Funding:** Microbiome Explorers Program
Poster #NM111
FACTORS CONTRIBUTING TO THE CONVERSION OF HOLMIUM ENUCLEATION OF THE PROSTATE TO AN OPEN OR HYBRID PROCEDURE
Timothy Han, Lydia Glick, Thomas Hardacker, Patrick Shenot, Akhil Das
Department of Urology, Thomas Jefferson University, Philadelphia PA
Presented By: Timothy Moonhwan Han

**Introduction:** Holmium laser enucleation of the prostate (HoLEP) is a commonly performed surgical procedure for management of benign prostatic hyperplasia (BPH). In men with prostates >100 grams, HoLEP can be an excellent replacement for open prostatectomy, however certain technical challenges can occur requiring conversion to an open or hybrid procedure. Hybrid procedure combines endoscopic laser enucleation with a cystotomy and may also be performed when there is a high expected time for morcellation. As data and literature is limited regarding these conversions, we sought to determine the incidence of and factors contributing to the conversion of HoLEP to an open or hybrid procedure at our institution.

**Methods:** A retrospective review, from an IRB approved database, of all patients that underwent HoLEP at our institution between January 2013 and September 2019 was performed. 685 consecutive HoLEP cases in 670 patients were identified, with all cases performed by one surgeon (AD). Data collected included demographics, prostate size on pre-operative assessment, post-operative pathologic prostate specimen weight, and reason for conversion.

**Results:** Of the 685 HoLEP cases, 14 (2.0%) required conversion. Pre-operative prostate size ranged from 150-405 grams (mean=227.3 g, median=200 g) with post-operative pathologic prostate specimen weight ranging from 72-295 grams (mean=171.3 g, median=143 g). Amongst the 14 patients, reasons for conversion included inability of the endoscope sheath to reach the end of the bladder neck (10 patients), bleeding preventing adequate visibility (3 patient), and technical laser difficulties (1 patient). For 57% (8/14) of these patients, two separate informed consents were obtained, with 50% (4/8) of those cases requiring the surgeon to obtain consent from family member(s) while the patient was still under anesthesia. However, for the other 6 patients, the plan for possible conversion was discussed at initial consent.

**Conclusion:** In prioritizing technical success and patient safety, HoLEP cases may require conversion to open or hybrid procedures. At our institution, we have adopted obtaining consents for possible cystotomies for patients with prostate sizes >200 grams. Anticipatory discussion with patients undergoing HoLEP for BPH may be necessary to prepare them for possible conversion, improve the informed consent process, and provide the highest quality of patient care and transparency.

**Funding:** N/A

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**Poster #NM112**
WITHDRAWN
Poster #NM113
COMPARISON OF BIPOLAR PLASMA VAPORIZATION VERSUS STANDARD HOLMIUM LASER ENUCLEATION OF THE PROSTATE: SURGICAL PROCEDURES AND CLINICAL OUTCOMES FOR SMALL PROSTATE VOLUMES
Kang Sup Kim¹, Yong Sun Choi²
¹Department of Urology, Incheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea,
²The Department of Urology, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea
Presented By: Kang Sup Kim

Introduction: Bipolar plasma vaporization of the prostate (BPVP) is an attractive alternative to resection. There are numerous studies comparing transurethral resection of prostate or photoselective vaporization of the prostate with BPVP; however, there is a lack of data comparing holmium laser enucleation of the prostate (HoLEP) with BPVP. We aimed to compare HoLEP and BPVP with a focus on functional outcomes, safety, and complications.

Methods: From January 2017 to June 2018, patients who underwent HoLEP or BPVP for benign prostatic hypertrophy were enrolled in this study. Inclusion criteria were prostate volume <40 mL measured by transrectal ultrasound, international prostate symptom score (IPSS) >7, maximum urinary flow rate (Qmax) <15 mL/s, and postvoiding residual volume (PVR) >100 ml. Perioperative and postoperative parameters including IPSS, Qmax, quality of life, PVR, and complications were compared between groups.

Results: Sixty-three patients were enrolled in this study. There were small differences in perioperative parameters. Hospital stays and catheterization periods were significantly shorter in the BPVP group. The postoperative complications were comparable between groups. PVR was comparable in both groups except for 1 month postoperatively. The incontinence rate was higher in the HoLEP group, but without statistical significance.

Conclusion: In terms of surgical safety and efficacy as well as patient comfort, BPVP is comparable with HoLEP for small prostate volumes. BPVP can be a viable alternative technique in small BPH surgical treatment.

Funding: N/A
Poster #NM114
CONTINUATION OF ANTIPLATELET AND/OR ANTICOAGULATION IN PATIENTS UNDERGOING TRANSURETHRAL CONVECTIVE WATER VAPOR THERAPY FOR BPH
Ajay Gopalakrishna, David Yang, Raevti Bole, Ruby Kuang, Matthew Houlihan, Masaya Jimbo, Sevann Helo, Matthew Ziegelmann, Tobias Kohler
Mayo Clinic, Department of Urology
Presented By: David Y. Yang, MD

Introduction: Rezūm is a minimally invasive technique to treat benign prostatic hyperplasia (BPH). Major advantages include no de novo erectile dysfunction and low rate of retrograde ejaculation. Discontinuation of peri-operative antiplatelet and/or anticoagulation (APAC) is often preferred in practice to avoid bleeding complications.

Methods: We retrospectively reviewed patients who underwent Rezūm therapy at our institution since 7/2017. When deemed medically necessary, APAC was continued in the perioperative setting. Post-procedure catheterization regimen included a minimum of 3 days and a maximum of 4 weeks in men with preoperative catheter dependence. Outcomes included pre- and post-operative AUA symptoms score, peak flow, and postvoid residual. Bleeding-related complications and urinary tract infection rate were recorded.

Results: Sixty-eight patients were treated on APAC (Table). The average prostate gland size was 73 grams. Significant improvements were seen in AUA symptom score, peak flow, and post void residual. Bleeding complications requiring intervention occurred in 6 (9.3%) patients, with all 6 undergoing catheter irrigation, 2 undergoing blood transfusion, and 1 undergoing cystoscopic clot evacuation. Interestingly, 9/146 (6.3%) patients who were not on APAC had hematuria requiring intervention. There was no statistically significant difference in bleeding complications. There was no de novo erectile dysfunction reported.

Conclusion: In our experience, bleeding complications in patients undergoing Rezūm on APAC is uncommon. There were no apparent differences in complication rates between patients on APAC and those not on APAC. Rezūm appears to be a safe and efficacious treatment option in men continuing APAC who wish to preserve sexual function.

Funding: N/A
Poster #NM115

IMPACT OF BODY MASS INDEX ON OUTCOMES FOLLOWING LASER PHOTOSELECTIVE VAPORIZATION OF THE PROSTATE

Hudson Pierce¹, Ramy Goueli¹, Bashir Al Hussein Al Awamih¹, Dominique Thomas¹, Shokhi Goel¹, Malek Meskawi², Kevin Zorn², Alexis Te¹, Bilal Chughtai¹

¹Weill Cornell Medicine-New York Presbyterian, Department of Urology, New York, NY, ²University of Montreal Hospital Center, Montreal, Canada

Presented By: Hudson Pierce

Introduction: Obesity is a major public health concern associated with a significant number of co-morbidities, including increased risk of perioperative complications in surgical patients. Obese patients have been shown to have inferior functional outcomes following TURP and open prostatectomy for treatment of BPH, but there remains a lack of evidence regarding the impact of obesity on bladder outlet obstruction surgery outcomes. We sought to assess the safety and efficacy of PVP in obese patients by comparing functional outcomes and complications in a group of men stratified according to BMI.

Methods: A retrospective analysis was undertaken of 424 men who underwent 180W Greenlight PVP between 2012 and 2016 at two tertiary medical centers. Patients were stratified based on the WHO classification of obesity as determined by the Body mass index (BMI). Normal weight men had BMI<25 kg/m², overweight men had BMI between 25 and 30 kg/m² and obese men had BMI greater than 30 kg/m². Primary endpoints examined were differences in intraoperative outcomes and incidence of intraoperative and postoperative complications between BMI groups. Secondary endpoints were improvements in symptom index scores (IPSS), quality of life (QOL) score, and uroflowmetric variables Qmax and PVR.

Results: Compared to normal weight men, overweight men required increased mean operative time (67.1 min vs 57.9 min; p = 0.019), increased mean lasing time (32.9 min vs 28.7 min; p = 0.032), and higher mean energy use (278.7 kJ vs 239.3 kJ; p = 0.032). No significant differences between groups were observed for intraoperative complications, postoperative complications, or readmission rates. IPSS, QOL, Qmax, and PVR were all significantly improved at 24 months for each group, and there were no differences in improvement between groups. On multivariable analysis, increasing prostate volume was a significant predictor for increased operative time, lasing time, and energy use. BMI was not a significant predictor for outcomes following PVP.

Conclusion: Increased BMI is associated with longer operative and lasing times and increased energy use following PVP, but does not result in increased intraoperative or postoperative complications. Postoperative functional outcomes are not affected by BMI. GreenLight PVP is a safe and effective procedure in overweight men.

Funding: N/A
Poster #NM116
PERSISTENT LOWER URINARY TRACT SYMPTOMS FOLLOWING UROLIFT: DOES REMOVAL HELP?
Samantha Nealon, MD, Sarah Azari, MS4, Ross Simon, MD, Daniel Hoffman, MD
University of South Florida
Presented By: Samantha C. Nealon, MD

Introduction: BPH can cause lower urinary tract symptoms (LUTS), affecting quality of life and sexual function. Transurethral resection of the prostate (TURP) is considered the gold standard for management of BPH. Common complications of TURP include urinary retention, bladder neck contracture, urethral stricture, stress incontinence, and ejaculatory dysfunction. UroLift is a minimally invasive treatment which lifts and holds enlarged prostate tissue out of the urethra and has been demonstrated to have significantly reduced sexual side effects. While there are notable cure rates at 5 years, surgical retreatment for failure to cure with UroLift is 13.6%, and little is known about patient outcomes following removal of UroLift. This study examines voiding function and patient satisfaction following UroLift removal and subsequent treatment with either greenlight laser photovaporization of the prostate (GLL) or TURP.

Methods: We examined six patients who had undergone UroLift and were still having bothersome urinary symptoms. These patients had UroLift removed with subsequent GLL, TURP, or both. They were treated by a single surgeon at a single institution. Maximum flow rates, post-void residual volumes (PVR), AUA Symptom Scores (AUASS), and bother scores were examined before and after removal of UroLift. We hypothesized that removal of UroLift would result in improvement in urinary symptoms and patient satisfaction.

Results: All surgeries were technically successful without complications. Two patients had maximum flow rates measured before and after UroLift removal; both had increased flow rates with an average increase of 10.5 mL/sec. Of the three patients that had PVRs measured, two out of the three had decreased PVRs following UroLift removal with an average decrease of 215.5 mL. Five patients had AUASS before and after removal, three of which had decreased scores after removal, with an average decrease of 15 points. Bother scores were reduced in 4 out of 4 patients with scores measured before and after removal, with an average decrease of 2.3 points.

Conclusion: In this case series, removal of UroLift and treatment with either GLL or TURP resulted in improved urinary symptoms and patient satisfaction in patients who had persistent LUTS following UroLift. Prospective studies are warranted with larger sample sizes to confirm these findings.

Funding: N/A
Introduction: Transurethral resection of the prostate using monopolar current (mTURP) is the most common treatment of BPH. Newer technologies have been advocated to reduce complications and length of hospitalization. Traditionally, mTURP is performed as an inpatient procedure (post-op hospitalisation (POH)). At our center, many patients have undergone mTURP as a day care outpatient surgery (DCS), being discharged home within hours after the surgery with the catheter in place. To our knowledge, only two contemporary studies (from UK and India) have reported on the feasibility and safety of this method. We herein review our experience with regards to safety and efficacy in a cohort of patients treated by mTURP in DCS.

Methods: The records of patients treated at our institution between January 2016 and March 2018 who had undergone mTURP for BPH were reviewed. Patients demographics, complications and functional outcomes were recorded.

Results: Of the 362 mTURP procedures, 187 (52%) were DCS and 175 were POH. Patients in the POH group were slightly older than the DCS group (73 vs 70 yo, p=0.002). There were not any significant differences between the two groups for ASA score, BMI, surgery performed under aspirin (13% in each group), mean volume of prostate resected (17.4 vs 18.9 gm) and type of anesthesia (71% under regional anesthesia in each group). Mean resection time of 48.1 min in DCS group and 52.2 min in POH group were comparable (p=0.06). 22% of patients in each group consulted in the ER within the first 30 PO days, with similar rates of hematuria (11.3%), acute retention (9.6%) or UTI (9.4%). Readmission rate was 4.4% overall (8 patients in each group). Blood transfusion was required for 6 patients in DCS group and 1 patient in POH group (p=0.06). Reoperation (clot evacuation and fulguration) within 30 days PO occurred in 8 cases in POH group, half in the initial hospitalisation, and the other half upon readmission from the ER for hematuria. No death occurred. Long-term complication rate (stricture, incontinence, OAB) was similar between DCS and POH.

Conclusion: In our study, comparable 30-day complication rates were observed between both groups, suggesting that mTURP is suitable for an outpatient setting in carefully selected patients.

Funding: None
Poster #NM118  
NEGATIVE PSA VELOCITY AS A PREDICTOR OF NEGATIVE BIOPSY IN PATIENTS WITH ELEVATED PSA  
Jeffrey Arace, Viktor Flores, Dennis Robins, Thomas Monaghan, Nicholas Suss, Miriam Andrusier, William Sterling, Nicholas Karanikolas, Andrew Winer, Jeffrey Weiss  
State University of New York Downstate Medical Center, Brooklyn, NY and Department of Veterans Affairs, New York Harbor Healthcare System, Brooklyn, NY  
Presented By: Jeffrey Arace  

Introduction: PSA as a screening tool for prostate cancer remains controversial, and the interpretation of a declining though elevated PSA (>4.0ng/ml) is often unclear. We examined the value of negative PSA velocity (PSAV) and finasteride-induced PSA decline in predicting negative biopsy result.  

Methods: A retrospective review was conducted using data from an Institutional Review Board-approved database. Demographics, prostate specific antigen (PSA), PSA velocity (PSAV) and pathologic data were collected on men who underwent transrectal ultrasound (TRUS)-guided prostate biopsies between 1990 and 2018. PSAV was calculated using linear regression, and the criterion for inclusion was men with at least 2 PSA measurements recorded prior to the PSA that lead to biopsy. Negative PSAV was defined as PSAV <0 (a declining PSA, even if >4.0ng/ml); positive PSAV was ≥0 (stable or increasing PSA). Prostate volume, race and finasteride use were also considered. Multiple logistic regression was used to assess prediction of negative biopsy result.  

Results: 341 men were found to have negative PSAV at time of biopsy, and 1379 were found to have positive PSAV. Negative PSAV was a significant predictor of negative biopsy result in men with PSA>4.0ng/ml (OR 2.039, 95CI 1.463-2.841, p<0.0001), but finasteride use does not increase likelihood of negative biopsy result (OR 1.131, 95CI 0.753-1.698, p=0.553). When PSA<4.0ng/ml, finasteride use (OR 2.471, 95 CI 1.240-4.924, p=0.010) predicted negative result, though negative PSAV was no longer predictive (OR 1.157, 95 CI 0.684-1.959, p=0.587). TRUS volume>50ml predicts negative biopsy result in men with PSA>4.0ng/ml (OR 3.394, 95CI 2.698-4.269, p<0.0001) and in men with PSA<4.0ng/ml (OR 1.727, 95CI 1.026-2.907, p=0.040).  

Conclusion: Negative PSAV and elevated TRUS volume can predict negative biopsy result in men with PSA>4.0ng/ml, and elevated TRUS volume is also a useful predictor when PSA<4.0ng/ml. Finasteride use is predictive of negative biopsy result when PSA<4.0ng/ml, but not when PSA>4.0ng/ml. These findings suggest useful criteria by which to avoid unnecessary prostate biopsy (particularly in patients with concurrent BPH) but underline the complexity of interpreting changes in PSA.  

Funding: N/A
Poster #NM119
PELVIC ORGAN PROLAPSE ON YOUTUBE: EVALUATION OF CONSUMER INFORMATION
Amber Herbert¹, Amy Nemirovsky, MS¹, Deborah Hess, MD², Dawn Walter³, Nitya Abraham, MD⁴, Stacy Loeb, MD, MSc³, Rena Malik, MD¹
¹University of Maryland, Baltimore, ²Brigham and Women's Hospital, ³NYU School of Medical Center and the Manhattan Veterans Affairs, ⁴Montefiore Medical Center
Presented By: Amber Herbert

Introduction: The social media platform YouTube is a significant source of healthcare information for users with over 4,000 videos on pelvic organ prolapse (POP). Comprising 1.5 billion users, YouTube is currently being used in medicine to promote content dissemination and patient/physician education. The aim of this study was to evaluate the quality, understandability, and actionability or the ability for consumers to act after viewing, of POP videos on YouTube.

Methods: Videos were evaluated on YouTube using the search term, “Pelvic Organ Prolapse.” The first 135 YouTube videos were analyzed by five trained reviewers. Videos were excluded if they lacked narration in English, exceeded 10.00 minutes in length, demonstrated a surgical operation, or contained both no text and no audio. Videos were assessed using two validated grading system: DISCERN quality criteria and the Patient Education Materials Assessment Tool (PEMAT).

Results: In total, 100 videos met the inclusion criteria with a total of 6,307,202 views. Surgical repair was the most common treatment option discussed (57%); however few videos that covered surgical repair also reported surgical complications (Table 1). More than 50% of the videos were given low PEMAT scores (a score below 75%) for understandability and actionability (Table 2). Thirty-one percent of videos have the potential to spread misinformative or biased information to unknowing users (Table 2).

Conclusion: With millions of views on YouTube, many POP videos lack high quality information which is essential for decision-making. Thirty-one percent of POP YouTube videos can possibly spread biased or misinformative content to users. There is little oversight of the quality of information that is uploaded on YouTube, which can hinder users who are increasingly dependent upon websites like, YouTube, to make appropriate medical judgements. In addition, the validated PEMAT criteria found more than half of POP videos were given a PEMAT score of less than 75% for both understandability and actionability. YouTube videos can leave many patients unable to understand the topic, thus affecting their ability to seek proper medical care. Efforts should be made to ensure the dissemination of both comprehensive and accurate healthcare options to the millions of users on YouTube and other social media websites.
Table 1. Surgical options mentioned in YouTube videos on pelvic organ prolapse.

<table>
<thead>
<tr>
<th>Surgical Approach Videos</th>
<th>Number of videos (%), N=100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>57 (57)</td>
</tr>
<tr>
<td>Approaches to Surgery</td>
<td>Number of videos (%), N=57</td>
</tr>
<tr>
<td>Abdominal Approach</td>
<td>7 (12)</td>
</tr>
<tr>
<td>Vaginal Approach</td>
<td>9 (16)</td>
</tr>
<tr>
<td>Both</td>
<td>13 (23)</td>
</tr>
<tr>
<td>Neither</td>
<td>20 (49)</td>
</tr>
<tr>
<td>Surgical Complications</td>
<td>Number of videos (%), N=57</td>
</tr>
<tr>
<td>Urinary Incontinence after surgery</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Need for Repeat Surgery</td>
<td>5 (9)</td>
</tr>
<tr>
<td>Mesh Complications</td>
<td>Number of videos (%), N=15</td>
</tr>
<tr>
<td>Yes</td>
<td>5 (40)</td>
</tr>
</tbody>
</table>

Table 2. Pelvic organ prolapse videos with content that includes misinformation, biased data, or insufficient scientific validation.

<table>
<thead>
<tr>
<th>Poor quality (DISCERN score &lt;3)</th>
<th>Percent of Videos</th>
<th>Mean number of views</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Misinformation* (score &gt;=3)</td>
<td>18%</td>
<td>3,506</td>
</tr>
<tr>
<td>Commercial Bias</td>
<td>21%</td>
<td>18,740</td>
</tr>
<tr>
<td>Low PEMAT Understandability</td>
<td>54%</td>
<td>88,316</td>
</tr>
<tr>
<td>Low PEMAT Accountability</td>
<td>84%</td>
<td>75,231</td>
</tr>
<tr>
<td>Total Unique Views and Videos</td>
<td>94%</td>
<td>67,502</td>
</tr>
</tbody>
</table>

*Score of some misinformation to high misinformation on a likert scale.

**Funding:** Stacy Loeb, MD, MSc is supported by the Edward Blank and Sharon Cosloy-Blank Family Foundation.
Poster #NM120
THE TRANSVAGINAL PELVIC ORGAN PROLAPSE MESH BAN - UNFAIRLY INCLUDING BIOLOGIC PRODUCTS?
Christopher Elliott1,2, Eric Sokol3, Lisa Rogo-Gupta3
1Santa Clara Valley Medical Center Division of Urology, 2Stanford University Medical Center Department of Urology, 3Stanford University Medical Center Department of Obstetrics and Gynecology
Presented By: Christopher Stephen Elliott, MD, PhD

Introduction: On April 16th 2019, the Food and Drug Administration (FDA) made the controversial decision to halt all transvaginal prolapse mesh sales in the United States. This followed a series of events initiated by reports of high numbers of transvaginal mesh complication in the FDA’s Manufacturer and User Facility Device Experience (MAUDE). Interestingly, despite differing risk profiles, both synthetic and biologic mesh products have been included under the broader heading of transvaginal mesh by the FDA. We sought to examine MAUDE reported complications of biologic transvaginal mesh products since the reclassification of transvaginal mesh to a high-risk device in 2016, specifically for Xenform (Boston Scientific), a biologic mesh seeking post-market approval in both the pelvic organ prolapse and stress urinary incontinence fields.

Methods: We accessed the MAUDE database (https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfmaude/search.cfm) for the time period 1/1/2016 to 4/16/2019 using the search terms mesh, surgical, urogynecologic, non-synthetic and Xenform. Individual records were reviewed and classified.

Results: During the time period studied, 386 reports on Xenform were made to the dataset. On review, only 2 (0.5%) gave information that was highly likely to be a mesh related complication. The vast majority (90.4%) were placed by law firms with either no further information given or with generic complaints lacking detail (Table 1). There were no reports of complications due to Xenform when used for stress urinary incontinence.

Conclusion: There are few adverse event reports in the MAUDE database that appear directly attributable to Xenform biologic mesh. Since the FDA reclassification of transvaginal mesh in 2016, the majority of reporting for Xenform biologic transvaginal mesh in MAUDE is incomplete and done by law firms rather than medical professionals calling into question the impartiality of reported data.

Table 1: Description of MAUDE Reported Complication

<table>
<thead>
<tr>
<th>Description of MAUDE Reported Complication</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess requiring device explant</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Pelvic pain after explant requiring further surgery</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Postoperative pain - unclear if due to mesh</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Long term pelvic pain - unclear if due to mesh</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Bladder empting issues long after prolapse repair - unclear if due to mesh</td>
<td>2 (0.5%)</td>
</tr>
<tr>
<td>Known surgical complication unrelated to mesh</td>
<td>26 (6.7%)</td>
</tr>
<tr>
<td>Unrelated urinary tract infection &gt; 1 year out from device implant</td>
<td>3 (7.5%)</td>
</tr>
<tr>
<td>Damaged packaging</td>
<td>2 (0.5%)</td>
</tr>
<tr>
<td>Attorney report of severe pain after prolapse repair with mesh exposure and/or contraction</td>
<td>9 (2.3%)</td>
</tr>
<tr>
<td>Attorney report - no details other than multiple corrective surgeries</td>
<td>11 (2.8%)</td>
</tr>
<tr>
<td>Attorney report - no details</td>
<td>329 (85.2%)</td>
</tr>
</tbody>
</table>

Funding: N/A
Poster #NM121
RECURRENT OF APICAL PROLAPSE: COMPARISON BETWEEN ABSORBABLE AND NON-ABSORBABLE SUTURES
Fabiola Schlageter¹, Marcelo Mass-Lindenbaum², Bernardita Blümel³, Javier Pizarro-Berdichevsky¹
¹Urogynecology Unit Sótero del Río Hospital. División de Obstetricia y Ginecología, Pontificia Universidad Católica de Chile, ²Universidad de los Andes, Santiago, Chile, ³Urogynecology Unit Sótero del Río Hospital. Clínica Santa María
Presented By: Javier Pizarro-Berdichevsky, MD

Introduction: The aim of this study was to compare recurrence of apical prolapse after apical prolapse surgery (uterosacral ligament suspension- USLS, and sacrospinous ligament fixation - SSLF) between delay absorbable (polydioxanone) and non-absorbable (Prolene) sutures.

Methods: We performed a retrospective analysis of our prospectively collected database of patients who underwent vaginal uterosacral ligament suspension (USLS) and sacrospinous fixation (SSLF), from 2006 to 2019. Demographics, surgery details, apical correction failure according composite outcome (subjective complaint of prolapse and/or descent of more than 50% total vaginal length and/or reoperation for apical prolapse) and follow-up time were analyzed between 2 groups: Absorbable and non-absorbable suspension suture. The inclusion criteria were patients who underwent a USLS and SSLF, and had at least 3 months of follow-up. Data is presented as numbers (%), means ± SD and medians (IQR). Multivariable logistic regression analysis was performed to control for confounders factors. P < 0.05 was considered significant.

Results: 73 patients met the inclusion criteria. In 26 (36%) only absorbable sutures were used, and in 47 (64%) non-absorbable sutures were used. The mean age was 62.9±8.4 years, median parity was 3 (IQR 2-4), 50 (85%) patients were postmenopausal and the mean BMI was 29.9±4.65. 42 (58%) patients had a SSLF and 31 (43%) patients had a USLS. Of the SSLF group, 14 (33%) patients used absorbable sutures and 28 (67%) used non-absorbable sutures. Of the USLS group, 12 (39%) used absorbable sutures and 19 (61%) used non-absorbable sutures. The primary outcome was not statistically different between absorbable and non-absorbable sutures groups (12% v/s 21% respectively). Symptomatic recurrence for absorbable and non-absorbable sutures cohorts was 12% and 17%, respectively. Reoperation for prolapse was 0% vs 2% respectively. In multivariable logistic regression analyses, there were no predictive factors for the composite outcome between both types of sutures.

Conclusion: Vaginal apical prolapse surgery using only absorbable sutures has similar outcomes in the medium term as compared with non-absorbable sutures. Is probable that our study is underpowered to demonstrate differences between groups. Similarly to the OPTIMAL trial, our reoperation rate was low (less < 2%), which could be explained by the fact that most of the “anatomical failures” are not clinically relevant for the patients.

Funding: N/A
Poster #NM122
PREOPERATIVE PATIENT EDUCATION FOR PELVIC ORGAN PROLAPSE MOST OFTEN DONE BY PERSONAL INTERVIEW AND PRINT MATERIALS
Amy Nemirovsky, MS, Rena D. Malik, MD
University of Maryland School of Medicine
Presented By: Amy Nemirovsky, MS

Introduction: Patients undergoing surgery for pelvic organ prolapse (POP) surgery are often not adequately informed about their procedure. Preoperative patient education has been shown to improve post-operative outcomes. The aim of this study is to characterize the methods, resources, and content that female urology/urogynecology providers use for preoperative counseling.

Methods: A 73 item survey containing provider demographics, patient education methods, resources, content, and provider communication techniques was created using REDCap. An electronic link to the survey was distributed via email, Twitter, and Facebook. Attending physicians, trainees, physician assistants, nurse practitioners and nurses who routinely counsel patients prior to POP were invited to participate in the survey. Routine counseling was predetermined as 6 or more patients per year.

Results: A total of 104 participants completed the survey. The majority were attending physicians (77%). Providers counseled a median of 60 patients (7-600) on POP surgery per year. Time spent counseling patients ranged from 10-120 minutes, with a median of 30 minutes. The most common way providers chose to counsel their patients was through personal interview (77%). (Table 1) Brochures and drawn/printed illustrations were also often employed (69% and 57%, respectively). IUGA was the most popular printed resource (49%), but many providers also used their own materials. While using videos to educate patients were not popular (5%), those who did use educational videos used YouTube for content. While most topics were well covered, the use of pelvic floor physical therapy as treatment and postoperative analgesia were not discussed by 15% and 18% of providers, respectively. Urinary incontinence (67%) and mesh complications (77%) were the complications most commonly discussed in detail, while many providers did not mention even constipation or dyspareunia as a potential complication. Providers reported using a variety of methods to enhance patient understanding, including speaking slowly (80%), using simple language (96%), and supplementing discussion with illustrations or print materials (86%). Only 20% of respondents asked patients to evaluate the counseling provided to them.

Conclusion: The most common method of patient education employed by providers is personal interview and print materials. Few use instructional videos or mobile applications. Future work should assess patient perceptions of these counseling methodologies to improve patient education.
### Table 1. Provider methods, topics, and communication techniques for pelvic organ prolapse counseling (N=88)

<table>
<thead>
<tr>
<th>Method</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Interview</td>
<td>68 (77.3)</td>
</tr>
<tr>
<td>Draw(Printed Illustrations)</td>
<td>10 (11.4)</td>
</tr>
<tr>
<td>Print Material (Brochures)</td>
<td>9 (10.2)</td>
</tr>
<tr>
<td>Model/Props</td>
<td>1 (1.1)</td>
</tr>
</tbody>
</table>

#### Topics Included (%)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Included (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause of POP</td>
<td>68 (100)</td>
</tr>
<tr>
<td>Anatomy of POP</td>
<td>68 (100)</td>
</tr>
<tr>
<td>Observation as a treatment</td>
<td>88 (100)</td>
</tr>
<tr>
<td>PEPT* as a treatment</td>
<td>75 (85)</td>
</tr>
<tr>
<td>Use of a pessary</td>
<td>84 (95)</td>
</tr>
<tr>
<td>Surgical approach (Vaginal, Open, Robotic)</td>
<td>87 (99)</td>
</tr>
<tr>
<td>Use of native tissues</td>
<td>84 (96)</td>
</tr>
<tr>
<td>Use of mesh</td>
<td>78 (88)</td>
</tr>
<tr>
<td>Use of biologics</td>
<td>41 (47)</td>
</tr>
<tr>
<td>Management of the uterus</td>
<td>84 (95)</td>
</tr>
<tr>
<td>Hospital Course</td>
<td>86 (99)</td>
</tr>
<tr>
<td>Use of Foley catheter postoperatively</td>
<td>84 (95)</td>
</tr>
<tr>
<td>Patients’ own role in recovery after surgery (mobility, oral intake)</td>
<td>84 (95)</td>
</tr>
<tr>
<td>Use of analgesia postoperatively</td>
<td>72 (82)</td>
</tr>
</tbody>
</table>

#### Do you discuss the following postoperative complications when counseling your patient?

<table>
<thead>
<tr>
<th>Complications</th>
<th>Yes, in detail (%)</th>
<th>Yes, mentioned (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary Incontinence</td>
<td>29 (33)</td>
<td>49 (56)</td>
<td>10 (11)</td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>29 (33)</td>
<td>49 (56)</td>
<td>10 (11)</td>
</tr>
<tr>
<td>Mesh complications*</td>
<td>29 (33)</td>
<td>49 (56)</td>
<td>10 (11)</td>
</tr>
<tr>
<td>Constipation</td>
<td>29 (33)</td>
<td>49 (56)</td>
<td>10 (11)</td>
</tr>
<tr>
<td>Urinary Retention</td>
<td>40 (45)</td>
<td>51 (57)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Storage lower urinary tract symptoms</td>
<td>32 (36)</td>
<td>53 (60)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Injury to surrounding structures</td>
<td>33 (38)</td>
<td>55 (62)</td>
<td>0</td>
</tr>
<tr>
<td>Need for repeat surgery</td>
<td>45 (51)</td>
<td>40 (45)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Infection</td>
<td>45 (51)</td>
<td>40 (45)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Bleeding</td>
<td>27 (31)</td>
<td>40 (46)</td>
<td>1 (1)</td>
</tr>
</tbody>
</table>

#### How often do you use the following communication techniques when counseling your patients for POP?

<table>
<thead>
<tr>
<th>Communication technique</th>
<th>Most of the time/Always</th>
<th>Occasionally</th>
<th>Rarely/Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask patient to repeat back information</td>
<td>26 (30)</td>
<td>22 (25)</td>
<td>40 (45)</td>
</tr>
<tr>
<td>Speak slowly</td>
<td>70 (80)</td>
<td>37 (43)</td>
<td>13 (15)</td>
</tr>
<tr>
<td>Limit number of concepts</td>
<td>46 (53)</td>
<td>30 (34)</td>
<td>12 (13)</td>
</tr>
<tr>
<td>Use simple language</td>
<td>84 (96)</td>
<td>3 (3)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Read instruction out loud</td>
<td>84 (96)</td>
<td>3 (3)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Hand out printed materials</td>
<td>76 (86)</td>
<td>6 (7)</td>
<td>6 (7)</td>
</tr>
<tr>
<td>Underline key points on print material*</td>
<td>80 (90)</td>
<td>24 (28)</td>
<td>22 (25)</td>
</tr>
<tr>
<td>Write or print instructions</td>
<td>64 (72)</td>
<td>36 (41)</td>
<td>9 (10)</td>
</tr>
<tr>
<td>Draw pictures or use printed illustrations</td>
<td>76 (86)</td>
<td>31 (36)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Follow-up with patients by telephone</td>
<td>28 (33)</td>
<td>51 (57)</td>
<td>9 (10)</td>
</tr>
<tr>
<td>Ask patient whether they would like a family member or friend accompany them</td>
<td>10 (11)</td>
<td>11 (13)</td>
<td>68 (76)</td>
</tr>
<tr>
<td>Ask patients how they learn best</td>
<td>65 (75)</td>
<td>37 (43)</td>
<td>8 (9)</td>
</tr>
</tbody>
</table>

Funding: N/A
Poster #NM123
COMPARING TRANSVAGINAL MESH UTILIZATION IN UROGYNECOLOGIC SURGERIES BETWEEN ACADEMIC AND NON-ACADEMIC INSTITUTIONS IN NEW YORK STATE
Sina Mehraban-Far, Michael Gross, Zhenyue Huang, Alexandra Siegal, Michael Hung, Anh Nguyen, Steven Weissbart, Jason Kim
Department of Urology, Stony Brook University, Stony Brook, NY
Presented By: Alexandra Siegal

Introduction: The Food and Drug Administration (FDA) issued a warning in 2011 regarding the risk of serious complications associated with the use of surgical mesh in transvaginal repair of pelvic organ prolapse (POP) and urethral sling in treating stress urinary incontinence (SUI). Our objective was to compare the impact of this warning on the trends in utilization of mesh in SUI and POP repair surgeries between academic and non-academic institutions.

Methods: The Statewide Planning and Research Cooperative System (SPARCS) database was used to obtain all cases of transvaginal POP repair and urethral sling for SUI from 2009-2015 in New York State. Cases were identified by Current Procedural Terminology code. Surgical facilities were stratified as academic (AC) or non-academic (NA). An institution was identified as AC if it was affiliated with a university or hosted graduate medical education programs, otherwise, it was classified as NA. Statistical analysis was performed using chi-square and t-test.

Results: Transvaginal mesh was utilized for 3,971 cases for POP and 46,237 cases of urethral sling, of which 56% and 60% were performed at NA institutions respectively. Within a year after 2011, there was a 33% decline in the use of transvaginal mesh in POP repairs at NA, yet a 12% increase at AC institutions (p<0.001) (Fig.1A). After 2012, the average annual growth rate for transvaginal mesh utilization was -22% and -13% in AC and NA institutions respectively (p=0.19). The usage of urethral slings at NA institutions declined by 25% one year after 2011, whereas AC institutions showed only an 11% decline (p<0.001) (Fig.1B). After 2012, the average annual growth rate was -5% and -12% in AC and NA institutions respectively (p=0.28).

Conclusion: One year after the 2011 FDA warning regarding surgical mesh, the utilization of mesh in transvaginal POP repair and urethral slings for SUI declined in NA institutions, while the numbers in AC institutions were largely unchanged. The long-term response to the FDA warning was a reduction in transvaginal mesh and sling procedures for both AC and NA institutions. Despite overall decreased mesh utilization after 2011, AC institutions now account for an increasing proportion of total mesh implantation cases.
Funding: N/A
Poster #NM124
PREFERRED SURGICAL APPROACH FOR APICAL PELVIC ORGAN PROLAPSE RECONSTRUCTION SURGERY IN ELDERLY PATIENTS: STATE-WIDE ANALYSIS
Sina Mehraban-Far¹, Michael Gross¹, Michael Hung¹, Alexandra Siegal¹, Wai Lee², Steven Weissbart¹, Jason Kim¹
¹Department of Urology, Stony Brook University, Stony Brook, NY, ²Urology and Renal Transplantation, Virginia Mason, Seattle, WA
Presented By: Alexandra Siegal

Introduction: As the global population continues to age, comorbidities become an important consideration in selecting the surgical approach in reconstructive repair of pelvic organ prolapse (POP). Our objective was to evaluate the preferred surgical approach in apical POP reconstructive surgery in elderly patients.

Methods: The Statewide Planning and Research Cooperative System (SPARCS) database was queried for all open and laparoscopic abdominal sacrocolpopexies (ASC), as well as transvaginal surgeries (TVS) including sacrospinous ligament fixation and uterosacral ligament suspension from 2006 to 2015 in New York state. Cases were identified by Current Procedural Terminology code. Patients were stratified by age as young (aged<65), early-elderly (aged 65-74) and late-elderly (aged >74).

Results: Our search yielded 6273 cases of reconstructive POP surgery, including 2022 (35%) cases of ASC and 4071 (65%) cases of TVS during the study period. The patient population composed of 4173 (65%) young, 1430 (22%) early-elderly and 670 (11%) late-elderly individuals (Figure 1). TVS accounted for 84%, 71% and 60% of cases in late-elderly, early-elderly and young patients respectively (p<0.001). In patients aged over 65, the odds of having undergone a TVS versus ASC increased by 5.5% with every one-year increase in patient's age (OR=1.055, 95% CI=1.037-1.074). ACS was performed laparoscopically in 94% (490 out of 521 cases) of patients aged 65 and over, versus 78% (1312 out of 1681 cases) of patients aged under 65 (p<0.001).

Conclusion: An analysis of the reconstructive POP repair cases in NYS revealed a significant association between a patient's advanced age and increased preference for TVS over ASC. Additionally, of all ASC procedures performed, a laparoscopic approach was utilized almost exclusively in the older population. This preference for less invasive surgery may highlight the desire to balance the morbidity of surgery with lasting POP repair outcomes in elderly patients with multiple comorbidities.
Figure 1. Trends in the preferred surgical approach for apical pelvic organ prolapse (POP) reconstruction surgery in New York State from 2006-2015

**Funding:** N/A
Poster #NM125
AUTOLOGOUS FASCIA LATA GRAFTS FOR THE REPAIR OF ANTERIOR COMPARTMENT PELVIC ORGAN PROLAPSE
Margeaux Dennis, DO, Colton Prudnick, DO, Leonard Zuckerman, MD
Sparrow Hospital, Lansing MI
Presented By: Margeaux Dennis, DO

Introduction: Pelvic organ prolapse (POP) is common in the aging female population. Surgical repair of prolapse was the most commonly performed inpatient procedure on women over the age of 70 from 1976-2006. The FDA recently mandated that manufacturers and suppliers of surgical mesh utilized for the repair of anterior compartment prolapse stop selling and distributing their products. Anterior colporrhaphy with an autologous fascia lata graft is a known technique that’s sparsely described. The purpose of this project is to highlight the technique as well as retrospectively review the outcomes of a single surgeon.

Methods: A literature review was conducted for articles related to the use of tensor fascia lata (TFL) in reconstructive surgeries. A retrospective chart review was performed for a single surgeon who performed these operations from 2014 - 2019.

Results: Following review, the surgeon performed a total of thirty-one anterior colporrhaphies with TFL grafts with twenty-six patients having adequate data upon chart review. Overall, 96% of patients experienced resolution of their POP symptoms. The most common post-operative complaint was pain at the TFL harvest site, occurring in a total of 6/26 patients (23%). Following this, 2/26 patients (8%) experienced seroma of the TFL site, while 1 patient (4%) experienced a hematoma. No patients required return to the operating room due to complications.

Conclusion: Considering the recent FDA mandate on synthetic slings, surgeons who once heavily relied upon these products will be forced to explore alternative techniques for an extremely commonly performed procedure. This technique has been successful and reliable for this surgeon. Further research should include prospective studies comparing the long-term efficacy, complication rates, and patient satisfaction of this technique to other alternatives currently on the market

Funding: N/A
Poster #NM126
VALIDATED SURGICAL STEPS OF THE ROBOTIC ASSISTED SACROCOLPOPEXY OPERATION
Kai Dallas¹, A. Lenore Ackerman¹, Karyn Eilber¹, Lisa Rogo-Gupta², Victoria Scott¹, Mireille Troung³, Tara Cohen⁴, Jennifer Anger¹
¹Cedars-Sinai, Division of Urology, Los Angeles, CA, ²Stanford University, Department of Obstetrics Gynecology, Stanford, CA, ³Cedars-Sinai, Department of Obstetrics Gynecology, Los Angeles, CA, ⁴Cedars-Sinai Medical Center, Department of Surgery, Los Angeles, CA
Presented By: Kai B. Dallas, MD

Introduction: Robotic surgery presents new challenges in surgical training. Not only is there a learning curve associated with new technology, but console time during procedures is split between surgeon and trainee. These challenges are compounded by limitations of time and resources. Modular training and assessment tools have been developed for other surgical procedures utilizing a form of human risk analysis known as Healthcare Failure Mode and Effect Analysis (HFMEA) that considers both learning curves (LCs) and technical competence attained by trainees to remedy these problems. The first step to developing these tools is to map the process steps in a structured fashion with expert consensus while also identifying high-risk steps that could result in an adverse event. In this study we extend this methodology to the robotic-assisted sacrocolpopexy (RASC) operation.

Methods: An expert panel, including six experts from two high-volume tertiary referral centers, identified the surgical procedure steps involved in the RASC procedure through consensus. These steps were then assigned a “hazard-score” which is a function of the difficulty of the step and the severity of potential errors made at this step.

Results: The expert panel developed the steps of the RASC procedure, assigned the level of difficulty (how challenging the step is to perform, range I-IV) and determined the risk associated with each step (ie level of potential patient harm with the presence of an error, range I-IV, Table 1) with little to no disagreement. However, significant variation was noted when determining how to combine the RASC with other reconstructive procedures. Additionally, there was a lack of data available to guide this decision.

Conclusion: We present a validated stepwise description of the RASC procedure with concomitant hazard-scores. Given the number of pelvic organ prolapse (POP) procedures performed (>200,000 in the United States annually) and that management for POP continues to evolve (i.e. the withdrawal of transvaginal mesh from the market) it is important that surgical training include all available options. This validated procedural map could be a valuable tool as national standardization of technique during training may help improve outcomes. Future work involves completing the HFMEA by evaluating the reliability, validity and educational impact of our work.
### Table 1: Robotic Assisted Sacrocolpopexy Surgical Steps

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Difficulty</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Initial consult and pre-operative planning</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>2.</td>
<td>Day of surgery (pre-operative)</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>3.</td>
<td>Peritoneal set-up</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>4.</td>
<td>Access</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>5.</td>
<td>Port Placement and Docking</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>6.</td>
<td>Identification of the sacral promontory and rectal space dissection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>7.</td>
<td>Identify location of the cervix and divide lateral attachments (bladder, ureter)</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>8.</td>
<td>Anterior peritoneal dissection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>9.</td>
<td>Amplication of cervix</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>10.</td>
<td>Posterior peritoneal dissection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>11.</td>
<td>Vaginal fixation*</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>12.</td>
<td>Sacral fixation</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>13.</td>
<td>Peritoneal re-approximation</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>14.</td>
<td>Closure</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>15.</td>
<td>Cystoscopy</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>16.</td>
<td>Conclusion</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>17.</td>
<td>Discharge/Return</td>
<td>I</td>
<td>I</td>
</tr>
</tbody>
</table>

*If cervix is already absent, steps 16-17 are skipped. If plan is for anterior suture, the mesh should be fixed to the posterior vaginal fascia to the sacral promontory.

**Funding:** N/A
Poster #NM127

AUTOMATIC SEGMENTATION AND 3D VISUALIZATION OF PELVIC MESH USING MATHEMATICAL MODELLING AND MACHINE LEARNING TECHNIQUES IN MRI

Gaik Ambartsoumian, MD1, Souvik Roy, MD1, Gaurav Khatri, MD2, Philippe E. Zimmern, MD3

1University of Texas at Arlington, 2U.T. Southwestern Medical Center, Department of Radiology, 3U.T. Southwestern Medical Center, Urology

Presented By: Gaik Ambartsoumian, PhD

Introduction: Pre-operative imaging to localize and measure previously placed synthetic pelvic implants, such as mid-urethral slings and/or trans-vaginal meshes, is an important task in modern pelvic floor reconstruction [1]. An accurate imaging and localization of these implants is an absolute necessity. Therefore, our aim is to develop new mathematical models and machine learning techniques for automatic detection of pelvic mesh in MRI, as well as a mechanism for 3D visualization of the mesh and important anatomic pelvic structures.

Methods: Some of the most efficient modern methods of automatic image segmentation use machine learning techniques requiring massive training data. A realistic yet efficient option of acquiring large training data sets is the generation of synthetic data using mathematical models optimized for the specific task at hand [2]. Utilizing the expertise of our diverse group comprised of applied mathematicians, radiologists and pelvic floor specialists, we de-identified human MR images from 10 patients (several hundred 2D images per patient) collected by the medical team and transferred to the mathematicians in DICOM format as part of inter-institutional Material Transfer Agreement. Images from 5 women were manually segmented and labeled by the mathematicians, verified by the radiologist, and are currently used as source of data augmentation (i.e. for generating additional synthetic training data). This augmented data set will be applied to train a Convolutional Neural Network (CNN) to analyze our MR images. The MR images from the remaining 5 patients will then be used as validation and test data sets.

Results: Based on 2D image segmentation and labeling, we have established a framework for enhanced 3D stereo-metric visualization of MR images (figure), which is often more desirable for physicians than slice-by-slice image sequences provided by conventional DICOM viewers. Using machine learning techniques, we are currently developing a new mathematical apparatus for automatic segmentation of MR images of pelvic floor structures, including pelvic implants.

Conclusion: This interdisciplinary project on mathematical approaches to automatic segmentation and 3D visualization of MRI of pelvic floor structures yielded very encouraging results. Comparison with intra-operative findings during mesh removal procedures will be needed to validate these results.
Figure. 3D rendering of some pelvic floor structures (pubic bone, bladder, vagina, synthetics mesh and bowel) using 3D Slicer [3] and manually segmented MR images.

References


Funding: N/A
Poster #NM128

URODYNAMIC CHANGES OF BLADDER FUNCTION ACCORDING TO THE DEGREES OF CYSTOCELE

Hyeon Woo Kim, Busan, South Korea, Jeong Zoo Lee, Busan, South Korea, Dong Gil Shin, Busan, South Korea
Pusan National University Hospital
Presented By: Hyeon Woo Kim

Introduction: The present study aims to evaluate and compare the alteration of bladder function according to varying degrees of cystocele by using the urodynamic study results.

Methods: This study included 86 women with cystocele who underwent urodynamic study. The patients were classified into four grades according to pelvic organ prolapse quantification of the International Continence Society. Variables such as bladder capacity, maximum detrusor pressure (Max-Pdet), maximum flow rate (Qmax), and postvoiding residual volume (PVR) were investigated and were compared between each cystocele grades.

Results: The only variable showing a significant difference between the cystocele grades was PVR (p <0.001, Table 1). Especially, a significant difference regarding PVR was presented between grade I and III, I and IV, and II and IV. Additionally, PVR was positively correlated to cystocele grade (r=0.50, p<0.001).

Conclusion: Postvoid residual tends to increase significantly with the increase of cystocele severity.

Table 1. Comparison of patient characteristics and urodynamic results between the grades of cystocele.

<table>
<thead>
<tr>
<th></th>
<th>Grade I (n=15)</th>
<th>Grade II (n=37)</th>
<th>Grade III (n=21)</th>
<th>Grade IV (n=13)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years)</td>
<td>55.33 ± 2.55</td>
<td>58.27 ± 8.90</td>
<td>56.19 ± 9.60</td>
<td>58.77 ± 7.01</td>
<td>0.142</td>
</tr>
<tr>
<td>Mean BMI (kg/m²)</td>
<td>23.54 ± 5.28</td>
<td>22.87 ± 8.12</td>
<td>23.29 ± 4.58</td>
<td>23.33 ± 6.25</td>
<td>0.851</td>
</tr>
<tr>
<td>Past history</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes (n)</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Hypertension (n)</td>
<td>3</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mean delivery number</td>
<td>2.78 ± 1.12</td>
<td>3.42 ± 0.29</td>
<td>2.85 ± 1.21</td>
<td>3.69 ± 1.02</td>
<td>0.216</td>
</tr>
<tr>
<td>Mean bladder capacity (mL)</td>
<td>449.20 ± 133.82</td>
<td>416.00 ± 146.88</td>
<td>420.00 ± 171.41</td>
<td>410.46 ± 59.16</td>
<td>0.872</td>
</tr>
<tr>
<td>Mean Max-Pdet (cmH₂O)</td>
<td>29.80 ± 17.09</td>
<td>37.95 ± 21.01</td>
<td>33.49 ± 15.85</td>
<td>44.08 ± 2.93</td>
<td>0.147</td>
</tr>
<tr>
<td>Mean Qmax (mL/s)</td>
<td>24.00 ± 24.29</td>
<td>22.44 ± 10.66</td>
<td>23.05 ± 11.28</td>
<td>20.96 ± 4.88</td>
<td>0.892</td>
</tr>
<tr>
<td>Mean PVR (mL)</td>
<td>19.00 ± 21.23</td>
<td>33.95 ± 25.22</td>
<td>59.33 ± 57.41</td>
<td>87.69 ± 51.06</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

BMI: body mass index, Max-Pdet: maximum detrusor pressure, Qmax: maximum flow rate, PVR: postvoid residual

Funding: None
Poster #NM129
EXTRAPERITONEAL SACROCOLOPEXY WITH PVDF VISIBLE MESH
Ralf Anding, MD
Dept. of Urology, University Hospital, Bonn, Germany
Presented By: Ralf G. Anding, MD

Introduction: Sacrocolpopexy is a standard procedure for the treatment of genital prolapse in women. It connects two extraperitoneally located structures, the sacrum and the vaginal cuff. In contrast to the usual transperitoneal route (open or laparoscopic) it appears reasonable to proceed extraperitoneally from the beginning and leave the peritoneal cavity unharmed. This method with the use of a conventional polypropylene (PP) mesh was introduced by Onol et al. in 2011. The utilization of PVDF (Polyvinylidenfluoride) mesh loaded with iron particles for hernia repair in humans and the visualization on MRI was first reported by Hansen et al. in 2013. This presentation introduces a novel technique with a combination of these innovative methods.

Methods: Of the initial 21 patients with PVDF visible mesh implant (DynaMesh® PR visible, FEG Textiltechnik, Aachen, Germany) 17 patients had a completely extraperitoneal sacrocolpopexy. A cosmetically favourable Pfannenstiel incision is used to access the retroperitoneum. Eight patients had a concomitant burch colposuspension for stress urinary incontinence. In selected patients pre- and postoperative dynamic MRI studies were conducted for the evaluation of the pelvic floor defect and its correction together with the demonstration of the visible mesh implant.

Results: All 21 patients had a complete anatomic and functional correction of their prolapse. No complications occurred. In the selected cases the mesh implant could be visualized with the experience of the MRI settings for hernia meshes. Dynamic sequences could well demonstrate the correction of the pelvic floor defect. In addition, 3D images and animations of the meshes were created from the MRI data sets with further useful information of the postoperative position and shape of the meshes and their relation to the pelvic organs.

Conclusion: The extraperitoneal sacrocolpopexy is an excellent procedure for the correction of genital prolapse in women and less harmful than the transperitoneal approach. The utilization of the PVDF visible mesh implants offers an alternative to PP meshes and enables the visualization of the surgical result and possible sequelae. Further enhanced 3D animations of the mesh and pelvic organs offer new perspectives for scientific purposes.

Funding: N/A
Poster #NM130
PATIENT OUTCOMES UTILIZING DISTAL LEVATOR Plication (DLP) FOR PROLAPSE REPAIR: A SINGLE-SURGEON EXPERIENCE
Michele Fascelli, Glenn Werneburg, Jessica Rueb, Samir Derasavifard, Neil Kocher, Howard Goldman
Glickman Urological and Kidney Institute, Cleveland Clinic, Cleveland, OH
Presented By: Michele Fascelli, MD

Introduction: There are several indications for an effective, safe, and minimally invasive option for vaginal reconstruction involving narrowing of the genital hiatus. Here we present our experience performing a distal levator plication – a reconstruction of the levator ani complex proximal to and at the vaginal introitus - at the time of prolapse repair and assess adverse events and outcomes. This is offered to women who no longer anticipate engaging in vaginal intercourse.

All narrowing anterior and posterior colporrhaphy with vault suspension in which the use of a distal levator plication (DLP) was performed were subsequently evaluated for post-operative complications and outcomes.

Methods: Cases from 2016 to 2019 of women undergoing transvaginal pelvic organ prolapse surgery, with or without a concomitant incontinence procedure, were evaluated. Instances of DLP performed by a single surgeon were retrospectively reviewed. Patient demographic data, sensation of a vaginal bulge, and patient global impression of change (PGIC) were evaluated.

Results: Twenty-three patients were included in the study. Patients undergoing narrowing prolapse repair were a median 77 years of age (range 59-81 years) with average BMI 29.8 kg/m2 (SD 5.2) (Table 1). At the time of preoperative in-office pelvic exam, 96% (n=22) demonstrated POP-Q stage 3 to 4. Among the 23 patients, only three (13%) had history of prior vaginal prolapse repair. Stress urinary incontinence was concomitantly treated in 65% of patients. The median follow-up was 15 months (range 1-39 months). One patient developed de novo urgency which improved with an anticholinergic medication. No major adverse events were noted; four women experienced a post-operative urinary tract infection. Resolution of POP after their procedure was reported by 95% (n=21) of women. PGIC scores (n=19) suggested 89% of women felt their prolapse was better (84% much, 5% a little better) compared to prior to their surgery. No patient reported worsening of their prolapse symptoms.

Conclusion: Distal levator plication is a reliable, safe, and effective adjunct to anterior and posterior colporrhaphy and apical suspension when considering repair of pelvic organ prolapse. A two-finger width introitus is anticipated.
<table>
<thead>
<tr>
<th>Age (yrs, median, range)</th>
<th>77 (59-81)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity (%, n)</td>
<td>96% (22)</td>
</tr>
<tr>
<td></td>
<td>0% (0)</td>
</tr>
<tr>
<td></td>
<td>4% (1)</td>
</tr>
<tr>
<td>BMI (kg/m², mean, SD)</td>
<td>25.8 (5.2)</td>
</tr>
<tr>
<td>Smoking History (%), n</td>
<td>0% (0)</td>
</tr>
<tr>
<td></td>
<td>35% (8)</td>
</tr>
<tr>
<td></td>
<td>65% (15)</td>
</tr>
<tr>
<td>SUJ treated concomitantly (%), n</td>
<td>65% (15)</td>
</tr>
<tr>
<td>POP-Q (median, range)</td>
<td>3.5 (0-6)</td>
</tr>
<tr>
<td></td>
<td>-1 (-3-1)</td>
</tr>
<tr>
<td></td>
<td>1 (-3-7)</td>
</tr>
<tr>
<td>Prior Surgery for Prolapse (%), n</td>
<td>13% (3)</td>
</tr>
<tr>
<td></td>
<td>87 (25)</td>
</tr>
<tr>
<td>ASA (%), n</td>
<td>61% (14)</td>
</tr>
<tr>
<td></td>
<td>22% (9)</td>
</tr>
<tr>
<td></td>
<td>0% (0)</td>
</tr>
<tr>
<td>Postoperative Pain Issues (%), n</td>
<td>39% (9)</td>
</tr>
<tr>
<td>Postoperative UTI (%), n</td>
<td>17% (4)</td>
</tr>
<tr>
<td>De novo urgency (%), n</td>
<td>4% (1)</td>
</tr>
<tr>
<td>No. of Voiding Trials (%), n</td>
<td>70% (16)</td>
</tr>
<tr>
<td></td>
<td>20% (6)</td>
</tr>
<tr>
<td></td>
<td>4% (1)</td>
</tr>
<tr>
<td>Other complications (ED visits, readmissions, bleeding, wound complications) (%), n</td>
<td>0% (0)</td>
</tr>
</tbody>
</table>

**Funding:** N/A
Poster #NM131
CORRELATION OF PRESENTING SYMPTOMS WITH EXPLANTED SYNTHETIC MID-URETHRAL SLING PATHOLOGY FINDINGS
Rahul S. Patel, BS¹, Alana L. Christie, MS², Philippe E. Zimmern, MD³
¹U.T. Southwestern Medical Center, Geriatrics, ²U.T. Southwestern Medical Center, Simmons Comprehensive Cancer Center, ³U.T. Southwestern Medical Center, Urology
Presented By: Rahul S. Patel, BS

Introduction: To compare explanted mid-urethral sling (MUS) pathology findings with presenting symptoms prior to synthetic sling removal (SSR), including potential correlation with systemic autoimmune inflammatory disorder (SAID)-related complaints.

Methods: An IRB-approved, prospectively maintained database of women who underwent SSR for a one MUS-related complication(s) was retrospectively reviewed for demographics, time interval between MUS placement and SSR, MUS material, history of SAID, and presenting symptoms prior to SSR. MUS-related symptoms included incontinence, voiding dysfunction, dyspareunia/pain, erosion, exposure, and/or urinary tract infections, as well as those suggestive of a reaction related to the mesh material itself (SAID or mesh reaction group). These were then compared with the official pathology report findings of these explanted sling specimens to test the hypothesis that there is no correlation between mesh explant findings and presenting symptoms. The SAID group was followed for symptom resolution after SSR.

Results: From 2005 to 2019, 353/474 women who underwent SSR met study criteria. Of these, 24 reported SAID-related symptoms. Compared to the non-SAID group, SAID women were younger (p= 0.0268), had more volume of mesh removed (p=0.0467), reported fibromyalgia-like symptoms (p< 0.0001), and had more pain/dyspareunia as the primary SSR indication (p= 0.0005) (Table). The SAID group were also significantly more likely to have an established pre-existing autoimmune disorder compared to the non-SAID group (25% v 8%; p = 0.0166). The type of MUS placed and the dwelling time were rather similar in both groups. There was no statistically significant difference in pathology findings between the two groups. Chronic inflammation and fibrosis were more likely noted in women who underwent SSR primarily for pain/dyspareunia or voiding dysfunction (p<0.001). Of note, of the 18/24 SAID women with continued follow up, 5 (28%) reported symptoms’ resolution.

Conclusion: This large series comparing pathological findings of explanted MUS with presenting symptoms of MUS-related complications identified unique characteristics of women with SAID complaints, with only a third reporting symptom resolution in follow-up. Unrelated to the type of MUS, we observed a higher rate of chronic inflammation and fibrosis in those primarily complaining of pain/dyspareunia or voiding dysfunction.
### Table 1. Mesh reaction by patient characteristics

<table>
<thead>
<tr>
<th>Allergy</th>
<th>Total (n = 183)</th>
<th>No mesh reaction (n = 229)</th>
<th>Mesh reaction (n = 24)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of mesh</td>
<td>Total (n = 183)</td>
<td>No mesh reaction (n = 229)</td>
<td>Mesh reaction (n = 24)</td>
<td>p</td>
</tr>
<tr>
<td>Missing</td>
<td>19 (10%)</td>
<td>18 (99%)</td>
<td>1 (54%)</td>
<td>0.0371</td>
</tr>
<tr>
<td>TOT</td>
<td>109 (59%)</td>
<td>96 (99%)</td>
<td>13 (54%)</td>
<td>0.0371</td>
</tr>
<tr>
<td>TVT</td>
<td>225 (54%)</td>
<td>214 (95%)</td>
<td>11 (46%)</td>
<td>0.45</td>
</tr>
<tr>
<td>Median months from placement to removal (IQR)</td>
<td>53 (23-86)</td>
<td>52 (24-87)</td>
<td>54 (48.8-82)</td>
<td>0.65</td>
</tr>
<tr>
<td>Median age at removal (IQR)</td>
<td>57 (49-67)</td>
<td>57 (49-67)</td>
<td>57 (43.5-55.5)</td>
<td>0.0268</td>
</tr>
<tr>
<td>Median BMI (IQR)</td>
<td>28 (24-32)</td>
<td>29 (24-32)</td>
<td>29 (24-32)</td>
<td>0.43</td>
</tr>
<tr>
<td>Median grade (IQR)</td>
<td>2 (2-3)</td>
<td>2 (2-3)</td>
<td>2 (2-3)</td>
<td>0.50</td>
</tr>
<tr>
<td>Median parity (IQR)</td>
<td>2 (2-3)</td>
<td>2 (2-3)</td>
<td>2 (2-3)</td>
<td>0.83</td>
</tr>
<tr>
<td>Pathological findings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibrosis/Fibrosis</td>
<td>307 (8%)</td>
<td>307 (8%)</td>
<td>1 (4%)</td>
<td>0.056</td>
</tr>
<tr>
<td>Chronic inflammation</td>
<td>169 (48%)</td>
<td>169 (48%)</td>
<td>1 (4%)</td>
<td>0.60</td>
</tr>
<tr>
<td>Foreign body/Giant cell reaction</td>
<td>203 (58%)</td>
<td>203 (58%)</td>
<td>1 (4%)</td>
<td>0.70</td>
</tr>
<tr>
<td>Adipose</td>
<td>14 (4%)</td>
<td>14 (4%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Muscle</td>
<td>17 (5%)</td>
<td>17 (5%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Squamous mucosa</td>
<td>14 (4%)</td>
<td>14 (4%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Acute inflammation</td>
<td>6 (2%)</td>
<td>6 (2%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Allergies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None reported</td>
<td>75 (21%)</td>
<td>75 (21%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Drug/antibiotics</td>
<td>255 (72%)</td>
<td>254 (72%)</td>
<td>1 (4%)</td>
<td>1</td>
</tr>
<tr>
<td>Latex</td>
<td>22 (6%)</td>
<td>22 (6%)</td>
<td>0 (0%)</td>
<td>0.38</td>
</tr>
<tr>
<td>Adhesive tape</td>
<td>32 (9%)</td>
<td>32 (9%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Vaccine/Tissud</td>
<td>9 (3%)</td>
<td>9 (3%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Rubber</td>
<td>2 (1%)</td>
<td>2 (1%)</td>
<td>0 (0%)</td>
<td>1</td>
</tr>
<tr>
<td>Indigo/contrast or shellfish</td>
<td>17 (5%)</td>
<td>17 (5%)</td>
<td>0 (0%)</td>
<td>1</td>
</tr>
<tr>
<td>Metals</td>
<td>3 (1%)</td>
<td>3 (1%)</td>
<td>0 (0%)</td>
<td>1</td>
</tr>
<tr>
<td>Poly, duster, dust, moist</td>
<td>3 (1%)</td>
<td>3 (1%)</td>
<td>0 (0%)</td>
<td>1</td>
</tr>
<tr>
<td>Silicone</td>
<td>1 (0%)</td>
<td>1 (0%)</td>
<td>0 (0%)</td>
<td>1</td>
</tr>
<tr>
<td>Food</td>
<td>26 (7%)</td>
<td>26 (7%)</td>
<td>0 (0%)</td>
<td>0.24</td>
</tr>
<tr>
<td>Immune-related disorders</td>
<td></td>
<td></td>
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<td>Incontinence</td>
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**Funding:** N/A
Poster #NM132  
KETAMINE CYSTITIS: SURGICAL OUTCOMES OF RECONSTRUCTIVE SURGERY  
Gabriel Vizgan, Muhammad Farooq, Jerry Blaivas  
Presented By: Gabriel Vizgan

Introduction: Ketamine abuse and ketamine cystitis (KC) have profound effects on the upper and lower urinary tracts (LUTS), yet there is a dearth of professional and public awareness concerning this devastating condition. The purpose of this literature review is to analyze the outcomes of reconstructive lower urinary tract (LUT) surgery (RLUTS) in patients with KC.

Methods: We conducted a literature review of surgical outcomes in KC patients who underwent reconstructive LUT surgery through 9/15/19. Seventeen search criteria were employed to search Pub Med and six other search engines. In vitro, animal studies, letters to the editor and those that did not evaluate surgical outcomes of RLUTS is were excluded.

We analyzed the scientific quality of the research, demographics, prior treatments, types of surgeries performed, patient reported success, complications (anastomotic leaks, bowel obstructions, renal failures), reoperations, pre- and post-op: LUT symptoms, maximum voided volume, post void residual, bladder compliance, bladder capacity, and intermittent self-catheterization.

Results: The initial search criteria presented 748 articles of which 293 were excluded by title and 440 excluded by abstract, leaving 15 articles available for review. The overall scientific quality of the studies was poor and follow up was short. 773 patients were found to have suffered from ketamine cystitis throughout the literature. However, data was often unspecific for many of these patients. Of the 773 patients, 640 were reported as having been treated conservatively: 81 males and 16 females, with an age range of 20-43, mean age of 25, and an average duration of ketamine abuse lasting 3.609. 133 were identified as having been treated surgically: 39 males and 51 females, with an age range of 18-37, mean age of 28, and an average duration of ketamine abuse lasting 3.609 years. RLUTS included: EC (118), neobladder (8) and urinary diversion (2), ureteroneocystotomy (3) and continent urinary stoma (2).

Conclusion: Refractory KC has devastating effects on the upper and LUT that requires major RLUTS. Several iterations of EC appear effective in treating LUTS and pain, at least in the short term. There was a high incidence of post-operative ureteral obstruction. The overall quality of the studies was poor and follow up was limited.
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<tr>
<td>Follow Up in Months (N=76)**</td>
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<td>26 ± 7</td>
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<td>Patients That Reported Success* (N=105)**</td>
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<td>82 (78%)</td>
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<td>Patients That Reported Pain (N=68)**</td>
<td>52 (76%)</td>
<td>16 (23%)</td>
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<tr>
<td>Voids Per Day (N=78)**</td>
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<td>Maximum Voided Volume ml (N=67)**</td>
<td>44 ± 7.9</td>
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<td>Bladder Capacity ml (N=75)**</td>
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<td>Bladder Compliance (N=68)**</td>
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<td>Post Void Residual Urine ml (N=68)**</td>
<td>8.2 ± 0.24</td>
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<td>Hydrourephrosis/Ureteral Obstruction (N=83)**</td>
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<td>Denovo Ureteral Obstruction (N=43)**</td>
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<td>Vesicoureteral Reflux (N=68)**</td>
<td>8.5 ± 3.0</td>
<td>1.4 ± 0.8</td>
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<td>Number of Major Complications (N=33)**</td>
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<td>17 (53%)</td>
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<td>Number of Reoperations (N=86)**</td>
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<td>Number of Patients that Required Clean Intermittent Self-Catheterisation (N=73)**</td>
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<td>21 (28%)</td>
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**N** represents the number of patients we were able to acquire that specific data on.
*Patient success rate was greatly not stated and had to be extrapolated from the articles.
Poster #NM133
AUTOLOGOUS FASCIA SACROCOLPOPEXY FOR PELVIC ORGAN PROLAPSE: SAFETY AND SHORT-TERM OUTCOMES
Janine Oliver
University of Colorado School of Medicine
Presented By: Janine L. Oliver, MD

**Introduction:** Many patients with pelvic organ prolapse elect for durable abdominal repair with sacrocolpopexy, but some may either prefer to avoid the risks of synthetic polypropylene mesh or have relative contraindications to mesh use. Sacrocolpopexy with autologous fascia graft is an alternative technique, but there is limited data on outcomes.

**Methods:** Data was prospectively collected and retrospectively reviewed on patients who underwent sacrocolpopexy utilizing autologous fascia for symptomatic stage ≥ 2 pelvic organ prolapse by a single surgeon. Either rectus fascia or fascia lata was harvested. Graft size was approximately 12 x 2 cm. Sacrocolpopexy was performed either via abdominal or robotic-assisted technique. Autologous fascia was sutured to the vaginal cuff and to the anterior longitudinal ligament in standard fashion. The electronic medical record was reviewed to collect data on perioperative and short-term outcomes.

**Results:** Six patients were identified. Indication for autologous fascia use was patient preference to avoid synthetic mesh in two patients, pelvic organ prolapse mesh complications in two patients, awaiting renal transplantation in one patient, and concern for endometrial cancer and desire for concomitant sacrocolpopexy with hysterectomy in one patient. Four patients underwent abdominal sacrocolpopexy with autologous rectus fascia and two patients underwent robotic-assisted laparoscopic sacrocolpopexy with autologous fascia lata. Median operative time was 361 minutes (range 274-521 minutes), with most patients undergoing concomitant procedures. There were no intraoperative complications. Median length of hospitalization was 2 days (range 1-12 days). 30-day complications included anemia requiring transfusion in one patient and appendicitis in one patient. After median follow up of 6.8 months (range 2.1-20 months), there were no apical recurrences of pelvic organ prolapse ≥ stage 2. There were no adverse events related to the fascia harvest site.

**Conclusion:** Sacrocolpopexy with autologous fascia demonstrated short-term durability with minimal morbidity in this small preliminary cohort. Further follow-up is needed to determine long-term outcomes.

**Funding:** N/A
Poster #NM134
SINGLE INSTITUTE EXPERIENCE WITH FEMALE BUCCAL MUCOSA GRAFT URETHROPLASTY
David Koslov, MD, Kirk Redger, MD, Alan Quach, MS, Brian Flynn, MD
University of Colorado
Presented By: David Koslov, MD

Introduction: Female urethral stricture disease remains a rare entity, with controversy in the literature regarding the definition of strictures and approach to management. Male urethroplasty results in long term urethral patency with minimal risk, however urethroplasty in women is often avoided out of concern for postoperative stress incontinence and fistulae. Repairs are described with vaginal and labial flaps as well as both dorsal and ventral buccal mucosa grafts. We report our institutional experience with 11 patients undergoing urethroplasty with primarily dorsal onlay buccal mucosa grafts between 3/2015 and 3/2019.

Methods: Retrospective review of 11 consecutive patients undergoing female urethroplasty with buccal mucosa grafting at the University of Colorado Health and Denver Health by a single surgeon between 3/2015 and 3/2019. Patient demographics, surgical variables and postoperative data points were collected. Success defined as no need for subsequent dilation, incision, or urethroplasty.

Results: 11 female patients with a median age of 46 underwent urethroplasty at our institute (10 dorsal onlay, 1 ventral onlay). Etiology was primarily iatrogenic. At a median follow up of 470 days, 1 required a secondary procedure for obstruction (urethral dilation), with an overall success rate of 91% for patency. 1 patient was incontinent postoperatively and subsequently responded well to an autologous fascia pubovaginal sling. Catheter duration was 14.3 days on average. No graft donor-site complications occurred.

Conclusion: Female urethroplasty with buccal mucosa graft is effective at treating female urethral stricture disease, with excellent outcomes at over a year of follow-up and minimal risk of stress incontinence postoperatively.

Funding: N/A
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