Welcome to San Diego!

Welcome to San Diego for the Fourth Winter Meeting of the Society for Urodynamics and Female Urology. Again this year, the meeting is being held in conjunction with the International Society of Pelvic Neuromodulation (ISPiN) Geriatric Urology Society (GUS) and the Society for Genitourinary Reconstructive Surgery (GURS). This year, for the first time, the meeting will start with a Basic Science Research Meeting organized and chaired by Phillipe Zimmern and Firouz Daneshagari.

My program co-chairs and I have attempted to construct an educational program focusing on using the resources of our own membership. We have an inspired program featuring some of the giants of our specialty. My co-chairs, Drs. Raz, Griebling, Kreder, Zimmern and Daneshagari, have all added significant contributions from their societies and I believe we have created a world-class program.

Our scientific program remains very topic-oriented toward female urology, BPH and voiding dysfunction. This year, in keeping with part of our society’s mission, we are also devoting one session to urodynamics.

In an effort to “shorten” the meeting days, industry sponsored symposia are scheduled at lunch time. We hope everybody will take advantage of these symposia, remembering that without the sponsorship of industry the cost of this meeting would be prohibitive.

We’re very excited about this meeting. In addition to state-of-the-art lectures, podium presentations and breakout sessions we have allotted more time for discussion and are anticipating that this year’s meeting will allow for increased audience participation.

San Diego is lovely this time of year with its temperate climate, exciting leisure activities and beautiful scenery. We hope that you and your guests will be able to enjoy this wonderful West coast location. Please plan on joining us at our welcome reception on Wednesday night and the banquet Friday night.

My co-chairs and I welcome you to San Diego and our exciting scientific program.

E. Ann Gormley, MD
SUFU Program Chair
Dear Members and Contributors,

Due to the large number of abstracts submitted this year, the selection process was done anonymously. We gratefully acknowledge the participation of

Rodney A. Appell, M.D.
Charles Butrick, M.D.
R. Duane Cespedes, M.D.
J. Quentin Clemens, M.D.
Deborah R. Erickson, M.D.
Gamal M. Ghoniem, M.D.
Angelo E. Gousse, M.D.
Magdy M. Hassouna, M.D.
Michael J. Kennelly, M.D.
Stephen R. Kraus, M.D.
Raul C. Ordoñica, M.D.
Steven P. Petrou, M.D.
Paul Pettit, M.D.
Shlomo Raz, M.D.
Harriette M. Scarpero, M.D.
Steven W. Siegel, M.D.
Suzette E. Sutherland, M.D.
E. James Wright, M.D.

And we thank each reviewer for the timely review of the abstracts and for conforming with the scoring grid.

2007 SUFU Meeting Program Chairs:
E. Ann Gormley, MD
Tomas Griebling, MD
Karl Kreder, MD
Shlomo Raz, MD

We would also like to thank the 2007 SUFU Essay Competition Reviewers:

Gary E. Lemack, M.D. (Chair)
Toby C. Chai, M.D.
Kathleen C. Kobashi, M.D.
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2006-2008

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Thank you the following companies for their unrestricted educational grants in support of our 2007 Winter Meeting

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Society for Urodynamics and Female Urology
2007 Winter Meeting
February 21 – 24, 2007
Manchester Grand Hyatt
San Diego, California

Needs & Objectives

NEEDS
Attendees of the SUFU program need to be aware of the latest updates and controversies in topics related to female urology, pelvic floor prolapse, geriatrics, BPH, genitourinary reconstructive surgery and pelvic neuromodulation. This meeting will provide active interactions between clinicians, investigators and basic scientists regarding diagnostic, therapeutics, and research topics related to urinary incontinence, pelvic organ prolapse, voiding dysfunctions, and pelvic neuromodulation. Attendees will benefit from the ongoing review of these topics, which will assist them in assessing patients and determining future research needs.

OBJECTIVES
At the conclusion of this program, participants should be able to:

1. Recognize the diagnostic and therapeutic challenges in urinary incontinence, pelvic organ prolapse, voiding dysfunction, and neuromodulatory therapies.
2. To categorize surgical treatment options for BPH, urinary incontinence and pelvic organ prolapse, including complications of their management.
3. To review the physiology of urinary continence, incontinence, and pelvic floor disorders.
4. To explain the role of new minimally invasive therapy, for benign prostatic hyperplasia, and integrate this knowledge into their practices.
5. To assess the translational role of basic science research related to topics of pelvic floor dysfunction. To recognize the importance of the role of geriatric urology and its application in the clinical practice of the members.
6. To assess and manage complicated female and male incontinence.
7. To describe new concepts of pelvic floor neuromodulation and new types on interventions, which use these modalities.

CME Accreditation
Please check the website at www.sufuorg.com for accreditation information.

Special Assistance
We encourage participation by all individuals. If you have a disability, advance notification of any special needs will help us better serve you. Call 847-517-7225 if you require special assistance to fully participate in the meeting.

General Disclaimer of the Society for Urodynamics and Female Urology
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**Meeting Registration Hours**  
*Location: Manchester Foyer, Level 2*  
Wednesday, February 21, 2007  7:00 a.m. – 7:00 p.m.  
Thursday, February 22, 2007  7:00 a.m. – 5:30 p.m.  
Friday, February 23, 2007  6:30 a.m. – 5:00 p.m.  
Saturday, February 24, 2007  7:00 a.m. – 4:00 p.m.

**Exhibition Hall Hours**  
*Location: Manchester Ballroom A-C, Level 2*  
Thursday, February 22nd  7:00 a.m. – 3:30 p.m.  
Friday, February 23rd  6:30 a.m. – 4:00 p.m.

**Speaker Ready Room**  
*Location: Show Managers Office 4, Level 2*  
Wednesday, February 21, 2007  3:00 p.m. - 7:30 p.m.  
Thursday, February 22, 2007  6:30 a.m. - 4:30 p.m.  
Friday, February 23, 2007  6:30 a.m. - 5:00 p.m.  
Saturday, February 24, 2007  7:00 a.m. - 1:00 p.m.
EXECUTIVE COMMITTEE MEETING

Location: Emma BC, Level 3

REGISTRATION

Location: Manchester Foyer, Level 2

INTRODUCTION

Location: Cunningham ABC, Level 4

Co-Chairs: Firouz Daneshgari, MD
Phillippe E. Zimmern, MD

Neuromodulation – Translational Research on BOTOX

Panel Discussion

Moderator: Christopher P. Smith, MD
Panelists: David Rapp, MD
Lori A. Birder, PhD
Christopher P. Smith, MD

Poster Session 1

Moderators: Gary E. Lemack, MD
Joseph Boggs, PhD

Poster #B1

BOTULINUM TOXIN A PREFERENTIALLY TARGETS SENSORY PATHWAYS IN A RAT NEUROGENIC BLADDER MODEL

Nilson Salas, MD, George Somogyi, MD, PhD, K. Roger Aoki, PhD, Joe Francis, PhD, David Gangitano, PhD, Timothy B. Boone, MD, PhD and Christopher P. Smith, MD, MBA
(Presented By: Nilson Salas, MD)
Poster #B2  EFFECTS OF AN ANTIEPILEPTIC -LEVETIRACETAM (KEPPRA®), ON NEUROGENIC OVERACTIVE BLADDER IN CHRONIC PARAPLEGIC RATS
Ehab Elzayat, MD, Lysanne Campeau, MD, Gilles Karsenty, MD, Bertil Blok, MD, Ante L. Padjen, MD, MSc and Jacques Corcos, MD (Presented By: Ehab Elzayat, MD)

Poster #B3  MODULATION OF NON-ADRENERGIC NON-CHOLINERGIC (NANC) CONTRACTIONS OF NORMAL AND SPINAL CORD INJURED (SCI) BLADDERS BY CHOLINERGIC RECEPTOR AGONIST
H Henry Lai, MD, Nelson Salas, MD, Christopher P Smith, MD, Timothy B Boone, MD, PhD and George T Somogyi, MD PhD (Presented By: H Henry Lai, MD)

Poster #B4  ROLE OF INDUCIBLE NITRIC OXIDE SYNTHASE IN DIABETIC BLADDER DYSFUNCTION
Guiming Liu, MD, PhD, Yi-Hao Lin, MD, Timothy Kern, PhD and Firouz Daneshgari, MD (Presented By: Guiming Liu, MD, PhD)

Poster #B5  DIFFERENTIAL VULNERABILITIES OF URETHRAL AFFERENTS IN DIABETES AND FINDING OF A NOVEL URETHRA-TO-URETHRA REFLEX
Zhongguang Yang, MD, PhD, Paul Dolber, PhD and Matthew Fraser, PhD (Presented By: Zhongguang Yang, MD, PhD)

Poster #B6  EXTERNAL URETHRAL SPHINCTER DYSFUNCTION IN DIABETIC RATS
Guiming Liu, MD, PhD and Firouz Daneshgari, MD (Presented By: Guiming Liu, MD, PhD)

Poster #B7  TOLTERODINE DOES NOT AFFECT MEMORY ASSESSED BY PASSIVE-AVOIDANCE TEST IN MICE
Gregg Cappon, PhD, Richard Alper, PhD, Brian Bush, PhD, Donald Newgreen, BSc, PhD, Edmund Kadyszewski, MS and Greg Finch, PhD (Presented By: Gregg Cappon, PhD)

Poster #B8  USING CAVEOLIN-1 KNOCKOUT MOUSE TO STUDY IMPAIRED DETRUSOR CONTRACTILITY AND DISRUPTED MUSCARINIC ACTIVITY IN THE AGING BLADDER
H Henry Lai, MD, Timothy B Boone, MD, PhD, Christopher P Smith, MD, Timothy C. Thompson, PhD and George T. Somogyi, MD, PhD (Presented By: H. Henry Lai, MD)

10:00 a.m. – 10:30 am  Break
10:30 a.m. – 11:00 am  
**Translational Research Priorities in Stress Urinary Incontinence**  
*Panel Discussion*  
**Moderator:** Maryrose P. Sullivan, PhD  
**Panelists:** Tom F. Lue, MD  
Margot S. Damaser, PhD  
Chris Constantinou, PhD

11:00 a.m. – 12:00 p.m.  
**Poster Session II**  
**Moderators:** Matthew O. Fraser, PhD  
Tom F. Lue, MD

**Poster #B9**  
**ESTROGEN-SENSITIVE PROJECTIONS FROM THE MEDIAL PREOPTIC AREA TO THE DORSAL PONTINE TEGMENTUM, INCLUDING BARRINGTON’S NUCLEUS, IN THE RAT**  
Leslie Rickey, MD, MPH, Sara Sarkey, PhD and Lydia DonCarlos, PhD (Presented By: Leslie Rickey, MD, MPH)

**Poster #B10**  
**ACUTE ANATOMICAL EFFECTS OF VAGINAL DISTENSION IN THE RAT**  
Hardeep Phull, BS, Lindsay Eggers, BS, Donna Hansel, MD, PhD, the Cleveland Clinic and Margot Damaser, PhD (Presented By: Hardeep Phull, BS)

**Poster #B11**  
**STEM CELL HOMING AND FUNCTIONAL RECOVERY AFTER VAGINAL DISTENSION IN FEMALE RATS**  
Lynn Woo, MD, Adonis Hijaz, MD, Niladri Mal, BS, Marc Penn, MD, PhD, Raymond Rackley, MD, and Margot Damaser, PhD (Presented By: Lynn Woo, MD)

**Poster #B12**  
**ROLE OF PUBO-URETHRAL LIGAMENT INTEGRITY IN LEAK POINT PRESSURE ALTERATIONS IN THE RAT MODEL OF STRESS URINARY INCONTINENCE**  
John Kefer, MD, PhD and Firouz Daneshgari, MD (Presented By: John Kefer, MD, PhD)

**Poster #B13**  
**URINARY INCONTINENCE, BLADDER DYSFUNCTION AND PELVIC ORGAN PROLAPSE IN LYSYL OXIDASE LIKE-1 (LOXL1) MUTANT MICE: A COMPLETE ANIMAL MODEL FOR FEMALE PELVIC FLOOR DISORDERS?**  
Una Lee, MD, Firouz Daneshgari, MD, Guiming Liu, MD, Cleveland Clinic, Mei Li, MD, PhD, DanLi Lin, MD, Paul Zaszczyrzynski, Hui Q. Pan, MD PhD, Tiansen Li, MD PhD, and Margot Damaser, PhD (Presented By: Una Lee, MD)
Poster #B14  VOLUME CHANGES AND HISTOLOGICAL RESPONSE TO INJECTED DEXTRANOMER/HYALURONIC ACID COPOLYMER (ZUIDEX™) AND COLLAGEN (CONTIGEN®) IN RAT MODEL
Ehab Elzayat, MD, Gilles Karsenty, MD, Tarek Bismar, PhD, and Jacques Corcos, MD (Presented By: Ehab Elzayat, MD)

Poster #B15  ADVANCED GLYCATION END PRODUCTS AND URODYNAMIC FUNCTION AFTER PUDENDAL NERVE CRUSH IN DIABETIC FEMALE RATS
Hui Q Pan, MD, PhD, Danli Lin, MD, Lindsay Eggers, BS, David Sypert, Vincent Monnier, MD, Firouz Daneshgari, MD and Margot Damaser, PhD (Presented By: Hui Q Pan, MD, PhD)

Poster #B16  INCIDENCE, VARIATION, AND SEVERITY OF PELVIC ORGAN PROLAPSE IN PAROUS LOXL1-DEFICIENT FEMALE MICE COMPARED TO A LARGE ACADEMIC MICE COLONY
Una Lee, MD, A Marcus Gustilo-Ashby, MD, Nanette Kleinman, DVM, Firouz Daneshgari, MD, Tiansen Li, PhD and Margot Damaser, PhD (Presented By: Una Lee, MD)

12:00 p.m. – 1:30 p.m.  Lunch
Location: Windsor BC, Level 3

1:30 p.m. – 3:00 p.m.  “Ask the Expert” Roundtable Discussions
Location: Maggie, Level 3
1. LUT Biomechanics
Matthew O. Fraser, PhD
2. Prostatic Growth and Pathology
Wade Bushman, MD
3. Essentials of a Basic Science Laboratory for Translational Research of LUT
Samuel Chacko, PhD
4. Animal Models of LUT Dysfunction
Margot S. Damaser, PhD

3:00 p.m. – 3:15 p.m.  Break

3:15 p.m. – 4:00 p.m.  Translational Research Priorities in OAB Panel Discussion
Location: Cunningham ABC, Level 4
Moderator: Firouz Daneshgari, MD
Panelists: Michael R. Ruggieri Sr., PhD
          Anthony J. Kanai, PhD
          Karl B. Thor, PhD

4:00 p.m. – 5:00 p.m.  Poster Session III
Moderators: Samuel Chacko, PhD
            Lori A. Birder, PhD
Poster #B17  THE URETHRA AS SENSOR: CHARACTERIZATION OF VOIDING-ASSOCIATED ABDOMINAL WALL ACTIVITY IN THE RAT AND ITS ROLE IN NORMAL VOIDING
Phillip Smith, MD, Christopher Smith, MD, Timothy Boone, MD, PhD and George Somogyi, MD, PhD (Presented By: Phillip Smith, MD)

Poster #B18  A MECHANISM FOR THE PRODUCTION OF ANTI PROLIFERATIVE FACTOR FROM FRIZZLED-8
Jay Reeder, PhD, Ronald Wood, PhD, Alan Friedman, PhD, Edward Schwartz, PhD, Edward Messing, PhD, and Robert Mayer, MD, (Presented By: Robert Mayer, MD)

Poster #B19  ROLE OF NICOTINIC AND ESTROGEN SIGNALING DURING EXPERIMENTAL ACUTE AND CHRONIC BLADDER INFLAMMATION IN MICE
Magaly Martinez-Ferrer, PhD, Juan Iturregui, MD, Ali-Reza Sharif-Afsar, BS, Robert Matusik, PhD, Roger Dmochowski, MD and Neil Bhowmick, PhD (Presented By: Magaly Martinez-Ferrer, PhD)

Poster #B20  LINK BETWEEN CYTOKINE EXPRESSION AND PURINERGIC SIGNALING IN BLADDER UROTHELIAL CELLS (BUC)
Yan Sun, PhD, Susan Keay, MD, PhD, Todd Lehrfeld, MD and Toby Chai, MD (Presented By: Toby Chai, MD)

Poster #B21  BLADDER FUNCTION OF EXPERIMENTAL AUTOIMMUNE CYSTITIS IN MOUSE. A POTENTIAL MICE MODEL OF INTERSTITIAL CYSTITIS.
Yi-Hao Lin, MD, Guiming Liu, MD, PhD, Vince Tuohy, MD, PhD and Firouz Daneshgari, MD (Presented By: Yi-Hao Lin, MD)

Poster #B22  CANNABINOID RECEPTORS IN BLADDER: NOVEL THERAPEUTIC TARGETS FOR INTERSTITIAL CYSTITIS/PAINFUL BLADDER SYNDROME
Shelby Morrisroe, MD, Brian Philips, PhD, Christian Coyle, PhD, Erin Gibbons, MD, Immaculada Ballesteros, PhD, Fernando de Miguel, PhD, Pradeep Tyagi, PhD, William de Groat, PhD, Naoki Yoshimura, MD, PhD and Michael Chancellor, MD (Presented By: Shelby Morrisroe, MD)

Poster #B23  FUNCTIONAL SIGNIFICANCE OF MUSCARINIC RECEPTOR EXPRESSION IN THE PROXIMAL AND DISTAL RAT VAGINAL MUSCULARIS
Maureen Basha, PhD, Ed Labelle, PhD, Tanchun Wang, MB, Robert Moreland, PhD, Drexel University College of Medicine, Alan Wein, MD PhD (Hon), and Samuel Chacko, DVM, PhD, (Presented By: Maureen Basha, PhD)
IDENTIFICATION OF THE OBESE MICE, WITH OR WITHOUT DIABETES, FOR INVESTIGATION OF BLADDER DYSFUNCTION AND URINARY INCONTINENCE IN OBESITY RELATED RESEARCH
Una Lee, MD, Guiming Liu, MD, Sarah McAchran, MD, and Firouz Daneshgari, MD (Presented By: Una Lee, MD)

PHOTOSELECTIVE VAPORIZATION OF THE PROSTATE (PVP) USING THE GREENLIGHT HIGH PERFORMANCE SYSTEM (HPS) IN THE CANINE MODEL
Richard Lee, MD, Rajiv Saini, MD and Alexis Te, MD (Presented By: Richard Lee, MD)

Fellows Forum (for participating Fellows only)
Location: Windsor BC, Level 3
Moderators: Eric Rovner, MD
Gary E. Lemack, MD
Harriette M. Scarpero, MD

Welcome Reception
Location: Manchester Foyer/Terrace, Level 2

THURSDAY, FEBRUARY 22, 2007

Registration
Location: Manchester Foyer, Level 2

Breakfast for “New and Prospective Members”
Location: Connaught, Level 3

Breakfast for all attendees in exhibit hall

Exhibit Hall Open
Location: Manchester Ballroom A-C, Level 2

Introduction - E. Ann Gormley, MD
Location: Manchester Ballroom G-I, Level 2

BPH

New Therapeutic Targets for Male Voiding Symptoms (including anticholinergics and PDE – 5 inhibitors)
Claus Roehrborn, MD

BPH Male Incontinence Podium Session
Moderators: Claus Roehrborn, MD
Michael Darson, MD
8:30 a.m. #1 UP-REGULATION OF CONNEXIN GENE EXPRESSION IN URINARY BLADDER SMOOTH MUSCLE INDUCED BY MEDIATORS OF HYPERTROPHY
Ziv Radisavljevic, MD, Tomasz Golabek, MD, Vivian Cristofaro, PhD, Subbarao Yalla, MD, and Maryrose Sullivan, PhD,
(Presented By: Vivian Cristofaro, PhD)

8:40 a.m. #2 CAVEOLIN GENE EXPRESSION IN URINARY BLADDER SMOOTH MUSCLE IS REGULATED BY ANGIOTENSIN-II
Ziv Radisavljevic, MD, Vivian Cristofaro, PhD, Tomasz Golabek, MD, Subbarao Yalla, MD, and Maryrose Sullivan, PhD,
(Presented By: Vivian Cristofaro, PhD)

8:50 a.m. #3 THE EFFECT OF SILDENAFIL CITRATE ON BLADDER OUTLET OBSTRUCTION IN A MOUSE MODEL
Charles Beamon, MD, and Craig Comiter, MD (Presented By: Charles Beamon, MD)

9:00 a.m. #4 THE EFFECT OF ANTI-MUSCARINIC AGENTS ON POST-VOID RESIDUAL URINE VOLUME (PVR) IN HIGH RISK MALE PATIENTS WITH LOWER URINARY TRACT SYMPTOMS (LUTS)
Alexandra Rogers, BA, Dominick Carbone, MD and Scott MacDiarmid, MD, (Presented By: Alexandra Rogers, BA)

9:10 a.m. #5 LOWER URINARY TRACT SYMPTOMS ASSOCIATED WITH OBSTRUCTIVE SLEEP APNEA IMPROVE AFTER TREATMENT WITH CONTINUOUS POSITIVE AIRWAY PRESSURE
Mara Monoski, MD, Alexis Te, MD, and Steven Kaplan, MD
(Presented By: Mara Monoski, MD)

9:20 a.m. #6 COMPLICATIONS OF ETHYLENE VINYL ALCOHOL COPOLYMER AS AN OFF-LABEL INTRA-URETHRAL BULKING AGENT IN MEN WITH STRESS URINARY INCONTINENCE
Eric Hurtado, MD, Rebecca McCrery, MD, and Rodney Appell, MD, (Presented By: Eric Hurtado, MD)

9:30 a.m. – 10:00 a.m. Break – Visit the Exhibits

GERIATRIC UROLOGY
Moderator: Tomas L. Griebling, MD

10:00 a.m. – 10:30 a.m. State of the Art Lecture:
Utility of Urodynamics in Elderly Patients with Voiding Dysfunction
Gary E. Lemack, MD
10:30 a.m. – 11:15 a.m. Geriatric Podium Session
Moderator: Tomas L. Griebling, MD

10:30 a.m. #7 AGING EFFECTS ON THE PROLIFERATION AND DIFFERENTIATION CAPACITY OF ADIPOSE STEM CELLS
Valerie A. Arboleda, BA, Suny Kun, BA, Vanda Lopez, MD, Rong Zhang, PhD and Larissa V. Rodriguez, MD, (Presented By: Valerie A. Arboleda, BA)

10:40 a.m. #8 THE EFFECTS OF AGING IN AN ANIMAL MODEL OF STRESS URINARY INCONTINENCE
Vanda Lopez Gunther, MD, Dhiren Dave, MD, Xiaoyen Zeng, MD and PhD, University of California and Larissa V. Rodriguez, MD, (Presented By: Vanda Lopez Gunther, MD)

10:50 a.m. #9 EVALUATION OF INCONTINENCE AND DISABILITY IN COMMUNITY-DWELLING OLDER
Eric Gwynn, MD, Scott Macdiarmid, MD, Matteo Cesari, PhD, and Jeff Williamson, MD, (Presented By: Eric Gwynn, MD)

11:00 a.m. #10 A MULTICENTRIC, PROSPECTIVE, RANDOMIZED CLINICAL TRIAL COMPARING TENSION-FREE VAGINAL TAPE SURGERY AND NO TREATMENT FOR THE MANAGEMENT OF STRESS URINARY INCONTINENCE IN ELDERLY WOMEN
Lysanne Campeau, MDCM, Le Mai Tu, MD, Marie-Claude Lemieux, MD, Alain Naud, MD, Gilles Karsenty, MD, and Jacques Corcos, MD, (Presented By: Lysanne Campeau, MDCM)

11:15 a.m. – 1:00 p.m. Lunch
Location: Manchester D-F, Level 2

URODYNAMICS
Location: Manchester Ballroom, G-I, Level 2
Moderators: Christopher K. Payne, MD
Stephen R. Kraus, MD

1:00 p.m. – 1:30 p.m. Urodynamics and Prolapse – Urodynamic Results of the Care Trial
Linda Brubaker, MD

1:30 p.m. – 2:00 p.m. Urodynamics and SUI – Lessons Learned from UITN (Standardization of Urodynamics and Correlation of UDS with Symptoms/Outcome)
Michael E. Albo, MD

2:00 p.m. – 2:30 p.m. Urodynamics and Obstruction
Wendy W. Leng, MD

2:30 p.m. – 3:00 p.m. Predictors of Success for Neuromodulation
Michele Spinelli, MD
3:00 p.m. – 3:30 p.m.  Break – Visit the Exhibits

3:30 p.m. – 4:30 p.m.  Urodynamic Podium Session
Moderators:  Christopher K. Payne, MD
Stephen R. Kraus, MD

3:30 p.m. #11  COMPARISON OF CYSTOMETRIC METHODS IN FEMALE RATS
Phillip Smith, MD, Christopher Smith, MD, Timothy Boone, MD PhD and George Somogyi, MD PhD, (Presented By: Phillip Smith, MD)

3:40 p.m. #12  DIFFERENCES BETWEEN THE DATA OF FREE FLOW AND INTUBATED FLOW IN WOMEN WITH URINARY INCONTINENCE. WHAT DO THEY MEAN?
Françoise Valentini, MD, PhD, Brigitte Marti, Physiotherapist, Gilberte Robain, MD, PhD, and Pierre Nelson, PhD, (Presented By: Françoise Valentini, MD, PhD)

3:50 p.m. #13  DOES URETHRAL FUNCTION AFFECT URODYNAMIC VOIDING PARAMETERS IN WOMEN WITH PROLAPSE?
Linda Brubaker, MD (Presented By: Linda Brubaker, MD)

4:00 p.m. #14  PRIMARY BLADDER NECK DYSFUNCTION: CAN WE DO BETTER SCREENING FOR IT AND MONITORING ITS RESPONSE TO THERAPY?
Andrew Combs, RPA-C, CUPA Wellman Cheung, MD, and Richard Macchia, MD, (Presented By: Andrew Combs, RPA-C, CUPA)

4:10 p.m. #15  URODYNAMIC STRESS INCONTINENCE AT LOW BLADDER VOLUME IS NOT ASSOCIATED WITH DECREASED QUALITY OF LIFE OR SURGICAL FAILURE
Lior Lowenstein, MD, Yashika Dooley, MD, Kimberly Kenton, MD, MS, Leslie Rickey, MD, Mary Pat FitzGerald, MD, Elizabeth Mueller, MD and Linda Brubaker, MD, MS (Presented By: Lior Lowenstein, MD)

4:20 p.m. #16  URODYNAMIC OUTCOMES OF REPEATED BOTULINUM TOXIN-A INJECTIONS IN THE TREATMENT OF NEUROGENIC DETRUSOR OVERACTIVITY
Jacob McClean, MS, H. James Norton, PhD, and Michael Kennelly, MD, (Presented By: Jacob McClean, MS)
BREAKOUT SESSIONS  4:30 p.m. – 5:30 p.m.

4:30 p.m. – 5:30 p.m. #1  
BPH – Male Luts and the Need for Urodynamics  
Location: Manchester Ballroom G-I, Level 2  
Moderator: Alexis E. Te, MD  
Panelists: Stephen R. Kraus, MD  
Alexis E. Te, MD

#2  Geriatric Urology: Geriatric Education in Female  
Urology and Urodynamics  
Location: Cunningham A-C, Level 4  
Moderator: George W. Drach, MD  
Panelists: Tomas L. Griebling, MD  
Larissa V. Rodriguez, MD

5:30 p.m. – 7:00 p.m.  
POSTER SESSION I  
Location: Emma A-C, Level 3  
Moderated Poster Session – Urodynamics, Female  
Urology, Pelvic Organ Prolapse, IC and Pelvic Pain  
Moderators: Harris E. Foster, MD  
Firouz Daneshgari, MD

(Unmoderated poster session to run concurrently)

Poster #1  
ANALYSIS OF VIDEOURODYNAMIC RESULTS AND  
THE UTILITY OF LEAK POINT PRESSURE AS A  
MEASURE FOR INTRINSIC SPHINCTER DEFICIENCY  
IN WOMEN WITH STRESS URINARY  
INCONTINENCE  
Sender Herschorn, MD, FRCSC, Stephanie Tam, BSc, and Lesley Carr, MD, FRCSC, (Presented By: Sender Herschorn, MD, FRCSC)

Poster #2  
HEALTH CARE SEEKING FOR PELVIC FLOOR  
DISORDERS: A POPULATION BASED STUDY  
Michelle Morrill, MD, San Diego, Emily Lukacz, MD, San Diego, CA, Jean Lawrence, ScD, MPH, Charles Nager, MD, Richard Contreras, and Karl Luber, MD, (Presented By: Michelle Morrill, MD)

Poster #3  
THE EVOLUTION OF OBSTRUCTION-INDUCED  
OVERACTIVE BLADDER (OAB) SYMPTOMS  
FOLLOWING URETHROLYSIS FOR FEMALE  
BLADDER OUTLET OBSTRUCTION  
Jonathan Starkman, MD, John Duffy, MD, Chris Wolter, MD, Melissa Kaufman, MD, Harriette Scarpero, MD and Roger Dmochowski, MD (Presented By: Jonathan Starkman, MD)
Poster #4  NEARLY HALF OF WOMEN HAVING RECONSTRUCTIVE PELVIC SURGERY REPORT NEW PELVIC SYMPTOMS POSTOPERATIVELY
Thythy Pham, MD, Kimberly Kenton, MD, MS, and Linda Brubaker, MD, MS (Presented By: Thythy Pham, MD)

Poster #5  A NEW OVERACTIVE BLADDER QUESTIONNAIRE & SEVERITY SCORE
Jerry G. Blaivas, MD, Jeffrey P. Weiss, MD, Georgia Panagopoulos, PhD, David C. Chaikin, MD, and Chandra Samaroo (Presented By: Jerry G. Blaivas, MD)

Poster #6  THE PITFALLS OF URODYNAMIC EVALUATION IN PATIENTS WITH GRADE 4 CYSTOCELE AND SYMPTOMS OF OBSTRUCTION
Veronica Traca, MD, Christian Twiss, MD, Larissa Rodriguez, MD, and Shlomo Raz, MD (Presented By: Veronica Traca, MD)

Poster #7  ROBOTIC ABDOMINAL SACROCOLPOPEXY REPAIR OF ADVANCED FEMALE PELVIC ORGAN PROLAPSE: UTILIZING POP-Q BASED STAGING AND OUTCOMES
John Kefer, MD, PhD, Jihad Kaouk, MD, and Firouz Daneshgari, MD (Presented By: John Kefer, MD, PhD)

Poster #8  SCHEDULED REPEATED BOTOX (TM) INJECTIONS FOR IDIOPATHIC OAB: EVALUATING THERAPEUTIC TIME
Angelo Gousse, MD, Paholo Barboglio, MD, Brian Cohen, MD and Dinorah Rodriguez, RN (Presented By: Angelo Gousse, MD)

Poster #9  URINARY FREQUENCY AND URGE URINARY INCONTINENCE IN BOTOX (TM) REPEATED INJECTIONS: OUTCOME DATA USING VOIDING DIARIES AND UDI-6 CORRELATION
Angelo Gousse, MD, Paholo Barboglio, MD, Brian Cohen, MD and Dinorah Rodriguez, RN (Presented By: Angelo Gousse, MD)

Poster #10  ARE THERE DIFFERENCES BETWEEN WOMEN WITH URGE PREDOMINANT AND STRESS PREDOMINANT MIXED URINARY INCONTINENCE?
Jack Lewis, MD, Alexander Ng, PhD, R. Corey O'Connor, MD and Michael Guralnick, MD, FRCSC (Presented By: Michael Guralnick, MD, FRCSC)

UNMODERATED POSTERS

Poster #11  CADAVERIC FASCIAL SLING: MINIMUM OF 24 MONTHS FOLLOW-UP
Tanya Nazemi, MD, Kathleen Kobashi, MD, Seattle, WA, Fred Govier, MD, and Brian Yamada, MD, (Presented By: Tanya Nazemi, MD)
COMPLICATIONS OF LAPAROSCOPIC SACROCOLPOPEXY FOR TREATMENT OF VAGINAL VAULT PROLAPSE
Mia Swartz, MD, MS, Paul Kozlowski, MD, Fred Govier, MD, and Kathleen Kobashi, MD (Presented By: Mia Swartz, MD, MS)

COMMERCIAL PROLAPSE REPAIR “KITS” VS. TRADITIONAL TRANSVAGINAL PROLAPSE REPAIRS: A COMPARISON OF EFFICACY AND COST
Colin Goudelocke, MD, Rashel Haverkorn, MDB, Jill Williams, PhD, Basir Tareen, MD, Raymond Bologna, MD, and Alex Gomelsky, MD (Presented By: Colin Goudelocke, MD)

IS AN ELEVATED POST-VOID RESIDUAL A RISK FACTOR FOR BACTERIURIA?
Michelle Morrill, MD, Matthew Thomas, MD, Emily Lukacz, MD, Charles Nager, MD, CA, Curt Powell, MD, Shawn Meneefee, MD, Amanda Simgsiman, MD, Michael Albo, MD, and Karl Luber, MD (Presented By: Michelle Morrill, MD)

LOWER URINARY TRACT SYMPTOMS AND INCONTINENCE IN COLLEGIATE ELITE FEMALE ATHLETES AND MATCHED CONTROLS
Chad Huckabay, MD, Megan Steiger, MS, Art Erdman, PhD, and Gerald Timm, PhD, (Presented By: Chad Huckabay, MD)

TWO TYPES OF URGENCY
Jerry G. Blaivas, MD, Georgia Panagopoulos, PhD, Jeffrey P. Weiss, MD, and Candra Samaroo (Presented By: Jerry G. Blaivas, MD)

PATIENT TOLERABILITY OF BOTULINUM TOXIN INJECTIONS UNDER LOCAL ANESTHESIA: A QUESTIONNAIRE-BASED STUDY
Katie Ballert, MD, Diah Douglas and Victor Nitti, MD (Presented By: Katie Ballert, MD)

ASSESSING THE EFFECTIVENESS OF BOTOX A INJECTIONS AS A TREATMENT OPTION FOR WOMEN WITH HIGH TONE PELVIC FLOOR MUSCLE DYSFUNCTION
Howard R. Goldstein, MD, Kristene Whitmore, MD, Amy Rejba, MSN, CRNP, and Howard Goldstein, MPH, MD (Presented By: Peter Finamore, MA, MD)

BOTOX (TM) REPEATED INJECTIONS: SIDE EFFECTS AND COMPLICATIONS
Angelo Gousse, MD, Paholo Barboglio, MD, Brian Cohen, MD, and Dinorah Rodriguez, RN, (Presented By: Angelo Gousse, MD)
INITIAL EVALUATION OF THE EFFECT OF INJECTION VOLUMES OF INTRAVESICAL BOTULINUM-A TOXIN INJECTIONS IN PATIENTS WITH OVERACTIVE BLADDER SYMPTOMS
Alvaro Lucioni, MD, David Rapp, MD, W. Stuart Reynolds, MD, Edward Gong, MD, Paula Fedunok, PAC and Gregory Bales, MD (Presented By: Alvaro Lucioni, MD)

PREDICTIVE FACTORS FOR POST-ROBOTIC PROSTATECTOMY (RP) URINARY INCONTINENCE (UI) IN MEN WITH PRE-OPERATIVE LOWER URINARY TRACT SYMPTOMS (LUTS) - A PILOT STUDY
Rajiv Saini, MD, Alexis Te, MD, Ashutosh Tewari, MD, Sandhya Rao, MD and Steven Kaplan, MD (Presented By: Rajiv Saini, MD)

FRIDAY, FEBRUARY 23, 2007

6:30 a.m. – 5:00 p.m.  Registration
Location: Manchester Foyer, Level 2

6:30 a.m. – 8:00 a.m.  Breakfast for all attendees in exhibit hall

6:30 a.m. – 4:00 p.m.  Exhibit Hall Open
Location: Manchester Ballroom A-C, Level 2

8:00 a.m. – 5:00 p.m.  Video Viewing in Speaker Ready Room
Location: Show Managers Office 4, Level 2

7:00 a.m. – 8:00 a.m.  SUFU Annual Business Meeting
Location: Manchester Ballroom G-I, Level 2

OVERACTIVE BLADDER
Moderator:  Roger R. Dmochowski, MD

8:00 a.m. – 8:30 a.m.  Inaugural Blaivas Lectureship: Perspective on OAB
Jerry G. Blaivas, MD

8:30 a.m. – 9:00 a.m.  Botox and the Relationship of Industry and Academics
Mitchell Brin, MD

GU RECONSTRUCTION

9:00 a.m. – 9:30 a.m.  Management of Rectourethral Fistulas
Kenneth W. Angermeier, MD

9:30 a.m. – 10:00 a.m.  Break – Visit the Exhibits

10:00 a.m. – 10:40 a.m.  Overactive Bladder Podium Session
Moderators:  Gamal M. Ghoniem, MD
Eric Scott Rovner, MD
10:00 a.m. #17 ELEVATED SENSORY THRESHOLDS IN THE URETHRA OF WOMEN WITH IDIOPATHIC OVERACTIVE BLADDER CONSISTENT WITH C FIBER NEUROPATHY
Kimberly Kenton, MD, MS, Lior Lowenstein, MD and Jennifer Simmons, MD (Presented By: Kimberly Kenton, MD, MS)

10:10 a.m. #18 IMPACT OF OVERACTIVE BLADDER AND INCONTINENCE ON MENTAL HEALTH AND HEALTH-RELATED QUALITY OF LIFE IN WOMEN
Debra Irwin, MSPH, PhD, Ian Milsom, MD, Con Kelleher, MD and Zoe Kopp, MPH (Presented By: Zoe Kopp, MPH)

10:20 a.m. #19 THE IMPACT OF OVERACTIVE BLADDER (OAB) AND URINARY INCONTINENCE ON FEMALE SEXUAL FUNCTION USING VALIDATED INSTRUMENTS
Paholo Barboglio, MD, Brian Cohen, MD, and Angelo Gousse, MD, (Presented By: Paholo Barboglio, MD)

10:30 a.m. #20 REPEAT BOTOX A INJECTIONS AND URODYNAMIC FINDINGS IN NEUROGENIC OAB: LONG-TERM RESULTS OF A SINGLE CENTER PROSPECTIVE TRIAL
Angelo Gousse, MD, Paholo Barboglio, MD, Rolando Rivera, MD, Hari Tunuguntla, MD and Lottie Cason, (Presented By: Angelo Gousse, MD)

10:40 a.m. – 11:00 a.m. Prize Essay Winner Presentations
Moderator: Gary E. Lemack, MD

10:40 a.m. #21 DO WOMEN HAVE REALISTIC EXPECTATIONS OF TREATMENT FOR STRESS URINARY INCONTINENCE?
Carolyn Langford, DO, Mostafa Elmissary, MD, and Ghoniem Gamal, MD, FACS, (Presented By: Carolyn Langford, DO)
Resident Essay Contest Winner: 1st Place Clinical

10:50 a.m. #22 INCREASED EFFICACY AND POTENCY OF CARBACHOL IN INDUCING INCREASES IN INTRACELLULAR CALCIUM ([CA2+]I) AND OUTWARD POTASSIUM CURRENTS (I0) IN OVERACTIVE BLADDER (OAB) AND INTERSTITIAL CYSTITIS (IC) HUMAN BLADDER UROTHELIAL CELLS (BUC)
Gopal Gupta, MD, Mingkai Li, MD/PhD, Yan Sun, PhD, Mingkui Chen, PhD, Michael Gold, PhD, Marc Simard, MD/PhD, and Toby Chai, MD (Presented By: Gopal Gupta, MD)
Resident Essay Contest Winner: 1st Place Basic Science
11:00 a.m. – 11:05 a.m.  **NAFC Continence Care Champion Award**  
Presenter: Melissa Ross

11:05 a.m. – 11:15 a.m. **Lapides Award**  
**Moderator:** Ananias C. Diokno, MD  
**Implanted Mouse Bone Marrow-Derived Cells Can Reconstruct Functional Smooth Muscle Layer-Like Structures in Cold-Injured Urinary Bladder Walls**  
Presented By: Tetsuya Imamura, PhD

11:15 a.m. – 1:00 p.m. **Industry Sponsored Lunch Symposium**  
The Desire for Dryness: Urologic Advances in the Management of Overactive Bladder  
Location: Manchester Ballroom, D-F, Level 2  
Speakers: Rodney A. Appell, MD  
Craig V. Comiter, MD

**FEMALE UROLOGY – STRESS INCONTINENCE/PROLAPSE**  
Location: Manchester Ballroom, G-I, Level 2  
Moderators: J. Christian Winters, MD  
Philippe E. Zimmern, MD

1:00 p.m. – 1:30 p.m. **Prolapse Debate: All Mesh, Some Mesh or No Mesh?**  
**Moderator:** David Staskin, MD  
**All Mesh:** Gopal H. Badlani, MD  
**Some Mesh:** Raymond R. Rackley, MD  
**No Mesh:** Mary Pat FitzGerald, MD

1:30 p.m. – 2:00 p.m. **Report of the Guidelines Committee**  
Rodney A. Appell, MD

2:00 p.m. – 2:30 p.m. **Outcomes from the UITN**  
Toby C. Chai, MD

2:30 p.m. – 3:30 p.m. **Female Urology/Prolapse Podium Session**  
**Moderators:** J. Christian Winters, MD  
Philippe E. Zimmern, MD

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2:30 p.m.  **#23 Increased Susceptibility to Genitovaginal Prolapse Associated with a Polymorphism in the Promoter of the Extracellular Matrix Protein LAMC1**  
Ganka Nikolova, PhD, Christian Twiss, MD, Hane Lee, BS, Suzanne Borkovitz, PhD, Stanley Nelson, PhD, Janet Sinsheimer, PhD, Eric Vilain, PhD, and Larissa Rodriguez, MD (Presented By: Ganka Nikolova, PhD)
2:40 p.m. #24 SEXUAL FUNCTION BEFORE AND AFTER VAGINAL PROLAPSE SURGERY WITH DERMAL ALLOGRAFT REINFORCEMENT
Sarit Aschkenazi, MD, Sylvia Botros, MD, Jay-James Miller, MD, Jennifer Beaumont, MD, Peter Sand, MD, and Roger Goldberg, MD (Presented By: Sarit Aschkenazi, MD)

2:50 p.m. #25 ISOLATED SACROCLOPOPEXY IMPROVES POSTERIOR COMPARTMENT DEFECTS
Maryam Guiahi, MD, Kimberly Kenton, MD, MS, and Linda Brubaker, MD, MS (Presented By: Kimberly Kenton, MD, MS)

3:00 p.m. #26 MECHANISM OF FEMALE URINARY INCONTINENCE IN DIABETES
Courtenay Moore, MD, Margot Damaser, PhD and Firouz Daneshgari, MD (Presented By: Courtenay Moore, MD)

3:10 p.m. #27 RATE OF DE NOVO STRESS URINARY INCONTINENCE AFTER URETHRAL DIVERTICULUM REPAIR
Una Lee, MD, Sandip Vasavada, MD, Howard Goldman, MD, Firouz Daneshgari, MD, and Raymond Rackley, MD (Presented By: Una Lee, MD)

3:20 p.m. #28 WHICH SLING FOR THE OBESE WOMAN? EFFICACY AND PERIOPERATIVE COMPLICATIONS OF 3 PUBOVAGINAL SLING PROCEDURES
Rashel Haverkorn, MD, William S. Kubricht III, MD, and Alex Gomelsky, MD, (Presented By: Rashel Haverkorn, MD)

3:30 p.m. – 4:00 p.m. Break – Visit the Exhibits

BREAKOUT SESSIONS 4:00 p.m. – 5:00 p.m.

4:00 p.m. – 5:00 p.m. #1 Complications of SUI Surgery
Location: Manchester Ballroom G-I, Level 2
Preventing and dealing with extrusion, infection, how to remove mesh, sling incision, etc.
Moderator: Victor W. Nitti, MD
Panelists: Rodney A. Appell, MD
Jerry G. Blaivas, MD
Edward J. McGuire, MD

#2 Neuromodulation
Location: Cunningham A-C, Level 4
New techniques, troubleshooting and revisions for clinical neuromodulation
Moderator: Steven Siegel, MD
Panelists: Paul Pettit MD
Raul C. Ordorica, MD
Sandip P. Vasavada, MD
5:00 p.m. – 6:30 p.m.  

**POSTER SESSION II**  
Location: Emma ABC, Level 3  
**Moderated Poster Session – Drugs and Devices**  
Moderators:  
*Alan J. Wein, MD, PhD (Hon.)*  
*Michael J. Kennelly, MD*  
(Unmoderated poster session to run concurrently)

**Poster #21**  
**TROSPIUM CHLORIDE EXTENDED-RELEASE FORMULATION PROVIDES EFFECTIVE RELIEF FOR THE SYMPTOMS OF OVERACTIVE BLADDER, IMPROVES PATIENT-REPORTED QUALITY OF LIFE, AND IS WELL TOLERATED: RESULTS FROM A MULTICENTER, PHASE III, PLACEBO-CONTROLLED STUDY**  
Roger Dmochowski, MD, Norman Zinner, MD, and Peter Sand, MD, (Presented By: Roger Dmochowski, MD)

**Poster #22**  
**ONCE-DAILY TROSPIUM CHLORIDE EXTENDED RELEASE IS EFFECTIVE AND WELL TOLERATED FOR THE TREATMENT OF OVERACTIVE BLADDER: RESULTS FROM A MULTICENTER, PHASE III TRIAL**  
David Staskin, MD, Peter Sand, MD and Norman Zinner, MD (Presented By: David Staskin, MD)

**Poster #23**  
**A COMPARISON OF THE PHARMACOKINETICS OF ONCE-DAILY TROSPIUM CHLORIDE EXTENDED RELEASE 60 MG IN FASTED, FASTED WITH ANTACID, AND HIGH-FAT MEAL CONDITIONS**  
Nova Silver, ASN, BS, RN, Bobby Sandage, PhD, LuAnn Sabounjian, RN, Ute Schwiderski, PhD, and Mark Harnett, PhD (Presented By: Nova Silver, ASN, BS, RN)

**Poster #24**  
**LONG-TERM SURGICAL OUTCOMES OF ILEOCYSTOPLASTY WITH CONTINENT ABDOMINAL STOMA**  
David Hajek, MD, Eric Saltel, MD, and Sender Herschorn, MD (Presented By: David Hajek, MD)

**Poster #25**  
**SATISFACTION AND IMPACT ON QUALITY OF LIFE FOLLOWING A MONTI CATHETERIZABLE STOMA**  
Andrew Shapiro, MD, Claudio Romero, MD, and Ouida Westney, MD, (Presented By: Andrew Shapiro, MD)

**Poster #26**  
**EVALUATION OF URINARY OUTCOME AFTER REPAIR OF RECTO-URETHRAL FISTULA IN PATIENTS PREVIOUSLY TREATED FOR PROSTATE CANCER**  
Mostafa Elmissiry, MD, Gamal Ghoniem, MD, FACS, Eric Weiss, MD, Carolyn Langford, DO, Hassan Abdelwahab, MD, Dan Ruiz, MD, and Steven Wexner, MD, (Presented By: Gamal Ghoniem, MD, FACS)
Poster #27  VESICOVAGINAL FISTULA REPAIR - 20-YEAR EXPERIENCE  
Doreen Chung, MD, and Sender Herschorn, MD (Presented By: Doreen Chung, MD)

Poster #28  EFFECT OF EXTERNAL BEAM RADIOTHERAPY VERSUS BRACHYTHERAPY ON ARTIFICIAL URINARY SPHINCTER (AMS 800) IN PROSTATE CANCER PATIENTS: IS OUTCOME AFFECTED?  
Paholo Barboglio, MD, Brian Cohen, MD and Angelo Gousse, MD (Presented By: Paholo Barboglio, MD)

Poster #29  DORSAL GENITAL NERVE STIMULATION FOR THE TREATMENT OF REFRACTORY OVERACTIVE BLADDER SYMPTOMS  
Howard Goldman, MD, Jeffrey Mangel, MD, and Cindy Amundsen, MD, (Presented By: Howard Goldman, MD)

Poster #30  DOES CURRENT PERCEPTION THRESHOLD TESTING SELECTIVELY MEASURE DIFFERENT POPULATIONS OFafferent?  
Lior Lowenstein, MD, Kathleen Jesse, RN, and Kimberly Kenton, MD MS, (Presented By: Lior Lowenstein, MD)

UNMODERATED POSTERS

Poster #31  A STUDY OF THE THERAPEUTIC USE OF GUIDED IMAGERY FOR WOMEN WITH INTERSTITIAL CYSTITIS  
Kenneth M. Peters, MD, Donna J. Carrico, NP, MS, Ibrahim A. Ibrahim, MD, MPH, PhD, and Ananias C. Diokno, MD  
(Presented By: Kenneth M. Peters, MD)

Poster #32  SACRAL NERVE STIMULATION IN NEUROGENIC VOIDING DYSFUNCTION  
Ronald Glinski, MD FACS, Suzette Sutherland, MD, Steven Mindrup, MD, Jyothi Kesha, MD, and Siegel Steven, MD  
(Presented By: Ronald Glinski, MD FACS)

Poster #33  SACRAL NEUROMODULATION (INTERSTIM®) AND ITS EFFECTS ON NON-OBSTRUCTIVE URINARY RETENTION IN MEN  
Benjamin Coons, MD, Cory Harris, BS, Jonathan Starkman, MD, Harriette Scarpero, MD, and Douglas Milam, MD, (Presented By: Chris Wolter, MD)

Poster #34  MALE SLING FOR MODERATE TO SEVERE STRESS URINARY INCONTINENCE: EFFICACY AND MECHANISM.  
Béchir Hage, MD, Samer Hanna, MD, Gerard Schmutz, MD, Michel Carmel, MD, Yves Ponsot, MD, and Le Mai TU, MD  
(Presented By: Béchir Hage, MD)
Poster #35  COMPLICATIONS OF THE MALE PERINEAL SLING AND THEIR MANAGEMENT
Katie Ballert, MD, Melissa Fischer, MD, Chad Huckabay, MD and Victor Nitti, MD (Presented By: Katie Ballert, MD)

Poster #36  BONE ANCHORED MALE SLING IN THE MANAGEMENT OF POST PROSTATECTOMY INCONTINENCE- FIVE YEARS EXPERIENCE FROM SINGLE INSTITUTION
Ajay Singla, MD, and Neelesh Aggarwal, MD (Presented By: Ajay Singla, MD)

Poster #37  A NOVEL NEUROMUSCULAR ELECTROSTIMULATION TREATMENT FOR INTERSTITIAL CYSTITIS PATIENTS
Peter De Jong, Piotr Radziszewski, Piotr Dobronski, Andrzej Borkowski, Marue Cervigni, Matthew Parsons, Linda Cardozo, Bruce Farnsworth, Jørgen Nordling, Jan Groen, Ruud Bosch, Christopher Chapple, Helen O’Connel, Anna Rosamilia and Israel Nissenkorn (Presented By: Peter De Jong)

Poster #38  EFFECTS OF PRIOR THERAPY ON HEALTH-RELATED QUALITY OF LIFE FOLLOWING TREATMENT WITH TRANSDERMAL OXYBUTYNIN
Roger Dmochowski, MD, Robert Parker, MD, and Rita Melkonian, MD, (Presented By: Roger Dmochowski, MD)

Poster #39  SACRAL NEUROMODULATION FOR MANAGEMENT OF VOIDING DYSFUNCTION REFRACTORY TO MEDICAL THERAPY FOLLOWING HYSTERECTOMY
Melissa Kaufman, MD, PhD, Cory Harris, BA, Jonathan Starkman, MD, Douglas Milam, MD, Harriette Scarpero, MD, and Roger Dmochowski, MD, (Presented By: Melissa Kaufman, MD, PhD)

Poster #40  SACRAL NERVE STIMULATION IN MEN
Steven Mindrup, MD, Suzette Sutherland, MD, Jyothish Kesha, MD, and Steven Siegel, MD, (Presented By: Steven Mindrup, MD)

7:30 p.m. – 10:00 p.m.  Annual Banquet
Location: Manchester Ballroom G-I, Level 2
SATURDAY, FEBRUARY 24, 2007

7:00 a.m. – 4:00 p.m.  Registration
Location: Manchester Foyer, Level 2

Residents And Fellows Breakfast
Location: Emma AB, Level 3
Moderators:  Eric Rovner, MD  
            Harriette M. Scarpero, MD

8:00 a.m. – 1:00 p.m.  Video Viewing in Speaker Ready Room
Location: Show Managers Office 4, Level 2

ISPIN – BASIC SCIENCE – BLADDER
Location: Manchester Ballroom G-I, Level 2
Moderator:  Adonis K. Hijaz, MD

8:00 a.m. – 8:30 a.m.  Assessment and Treatment of Bladder Storage
Edward J. McGuire, MD

8:30 a.m. – 9:00 a.m.  New Findings in Urothelial Research
Lori A Birder, PhD

9:00 a.m. – 9:30 a.m.  Highlights of the AUA Summer Research Meeting
Deborah R. Erickson, MD

9:30 a.m. – 9:40 a.m.  Lifetime Achievement / Zimskind Award Winners
Presenter:  Delbert C. Rudy, MD

9:40 a.m. – 10:00 a.m.  Break

ISPIN - NEUROMODULATION AND PAIN
Moderator: Deborah R. Erickson, MD

10:00 a.m. – 10:30 a.m.  Sex and Sleep: Important Predictors of Quality of Life
in Patients with Chronic Pelvic Pain
J. Curtis Nickel, MD

10:30 a.m. – 11:00 a.m.  Neuromodulation for Pelvic Pain
Shlomo Raz, MD

11:00 a.m. – 12:30 p.m.  Lunch
Location: Manchester D-F, Level 2

12:30 p.m. – 1:30 p.m.  Neuromodulation/Basic Science/Bladder Podium Session
Location: Emma AB, Level 3
Moderators:  Magdy M. Hassouna, MD, PhD  
            Toby C. Chai, MD
12:30 p.m. #29 SCIATIC NERVE INJURY INDUCES DE NOVO EXPRESSION OF THE CHEMOKINE MONOCYTE CHEMOATTRACTANT PROTEIN-1 (MCP-1/CCL2) AND ITS COGNATE RECEPTOR, CCR2, IN BLADDER-ASSOCIATED PRIMARY AFFERENT NEURONS
Mary P FitzGerald, MD, Kara Brogan, Matthew Ripsch, and Fletcher A. White, PhD (Presented By: Mary P FitzGerald, MD)

12:40 p.m. #30 CALCITONIN GENE-RELATED PEPTIDE RELEASE IS NOT INHIBITED BY ANTIChOLINERGICS IN ACUTE INJURY RAT BLADDER MODEL
W. Stuart Reynolds, MD, Alvaro Lucioni, MD, David E. Rapp, MD, Gregory T. Bales, MD, and Daniel S. McGehee, PhD (Presented By: W. Stuart Reynolds, MD)

12:50 p.m. #31 EVIDENCE FOR CENTRAL HYPEREXITABILITY IN PATIENTS WITH INTERSTITIAL CYSTITIS
Christian Twiss, MD, Lisa Kilpatrick, PhD, Veronica Triaca, MD, Valerie Arboleda, BA, Michelle Craske, PhD, Hana Ibrahimovic, BA, Shlomo Raz, MD, Emeran Mayer, MD, Edward Ornitz, MD, Bruce Naliboff, PhD and Larissa Rodriguez, MD (Presented By: Christian Twiss, MD)

1:00 p.m. #32 THE ROLE OF THE NF-KB SIGNALING PATHWAY AND APF IN THE PATHOGENESIS OF INTERSTITIAL CYSTITIS
Raymond Rackley, MD, Susan Keay, PhD, Mei Kuang, MS, Joseph Abdelmalak, MD, Ashwin Vaze, MD, Sandip Vasavada, MD, and Joseph DiDonato, PhD (Presented By: Raymond Rackley, MD)

1:10 p.m. #33 THE EFFECT OF INTRAVESICAL RESINIFERATOXIN, OXYBUTYNIN, AND LIDOCAINE ON THE AFFERENT AUTONOMIC BLADDER SENSORY THRESHOLD IN RAT
Yasuhiro Yamada, MD, Robert Abouassaly, MD, Osamu Ukimura, MD, Guiming Liu, MD, and Firouz Daneshgari, MD (Presented By: Yasuhiro Yamada, MD)

1:20 p.m. #34 URINARY HB-EGF, APF VARIATION WITH SYMPTOM SEVERITY AND MENSTRUAL CYCLE IN PATIENTS WITH PAINFUL BLADDER SYNDROME
Mary P. FitzGerald, MD, Matthew J. Hejna, Michael J. Tagge, Judith Senka, and Susan O. McGuire (Presented By: Mary P. FitzGerald, MD)

1:30 p.m. – 2:30 p.m. Clinical Neuromodulation and Pelvic Pain Podium Session
Location: Emma AB, Level 3
Moderators: Craig V. Comiter, MD
            Cindy L. Amundsen, MD
1:30 p.m. #35 MECHANISM OF ACTION OF SACRAL NEUROMODULATION: CENTRAL OR PERIPHERAL?
Nasim Zabihi, MD, Veronica Triaca, MD, Christian Twiss, MD, Cheri Geist, Shlomo Raz, MD, Daniel Silverman, MD, and Larissa Rodriguez, MD, (Presented By: Veronica Triaca, MD)

1:40 p.m. #36 SACRAL NEUROMODULATION FOR URINARY RETENTION: A RETROSPECTIVE COHORT COMPARISON BETWEEN UNILATERAL AND RANDOMIZED USE OF BILATERAL LEAD PLACEMENTS AT THE TIME OF A STAGE I TRIAL.
Ashwin Vaze, MD, Humphrey Atiemo, MD, Sarah McAchran, MD, Joseph Abdelmalak, MD, Courtenay Moore, MD, Sandip Vasavada, MD, Howard Goldman, MD, and Raymond Rackley, MD, (Presented By: Ashwin Vaze, MD)

1:50 p.m. #37 MANAGEMENT OF NON-OBSTRUCTIVE URINARY RETENTION IN FEMALE PATIENTS WITH SACRAL NEUROMODULATION
Cory Harris, BS, Benjamin Coons, MD, Jonathan Starkman, MD, Roger Dmochowski, MD, and Harriette Scarpero, MD (Presented By: Chris Wolter, MD)

2:00 p.m. #38 SACRAL NEUROMODULATION FOR THE TREATMENT OF FECAL INCONTINENCE AND VOIDING DYSFUNCTION IN WOMEN
Humphrey Atiemo, MD, Ashwin Vaze, MD, Courtney Moore, MD, Sarah McAchran, MD, Joseph Abdelmalak, MD, Howard Goldman, MD, Sandip Vasavada, MD, and Raymond Rackley, MD, (Presented By: Humphrey Atiemo, MD)

2:10 p.m. #39 MAGNETIC RESONANCE IMAGING FOLLOWING INTERSTIM™ THERAPY
Howard Woo, MD, Thomas Holley, MD and Jack Winters, MD, (Presented By: Howard Woo, MD)

2:20 p.m. #40 SEXUAL FUNCTION AND SEXUAL DISTRESS IN WOMEN WITH INTERSTITIAL CYSTITIS
Kenneth M. Peters, MD, Donna J. Carrico, NP, MS, Kim A. Killinger, NP, MSN, Ibrahim A. Ibrahim, MD, MPH, PhD, Ananias C. Diokno, MD, and Alessandra Graziottin, MD (Presented By: Kenneth M. Peters, MD)

2:30 p.m. – 3:00 p.m. Break
3:00 p.m. – 4:00 p.m. #1 Pelvic Pain – New Paradigms for the Management of the Chronic Pelvic Pain of Interstitial Cystitis and Vulvodynia
Location: Annie AB, Level 3
Moderator: J. Curtis Nickel, MD
Panelists: Kristene E. Whitmore, MD
          Charles W Butrick, MD
          Kenneth M. Peters, MD

#2 GU Reconstruction
Complications in Urethroplasty
Location: Emma AB, Level 3
Moderator: Anthonry R. Stone, MD
Panelists: Gregory T. Bales, MD – Staged Repairs
          Andrew C. Peterson, MD – Posterior Repairs
          Jerilyn M. Latini, MD – Anterior Repairs
1. Call to Order - President, Roger R. Dmochowski, MD
2. Approval of 2006 minutes and thank you to program chairs - E. Ann Gormley, MD
3. Treasurer's Report – Victor W. Nitti, MD
4. Awards Committee Report – Delbert C. Rudy, MD
5. Membership Committee Report - Alan Wein, MD
6. Old Business
   (a) Fellowship Update – David R. Staskin, MD
   (b) Mentor Program Update – Eric S. Rovner, MD
   (c) Residency Core Curriculum Update – J. Chris Winters, MD
7. New Business
   (a) Announcement of 2008 meeting
   (b) Other
8. Adjourn
**Evening Events**

**WEDNESDAY, FEBRUARY 21, 2007**

**Welcome Reception**  
Time: 7:00 p.m. – 8:30 p.m.  
Location: Manchester Foyer/Terrace, Level 2  
Enjoy a beverage and light hors d’oeuvres as you meet with new and old colleagues to say hello at the 2007 SUFU Winter Meeting  
**Dress:** Business Casual

**FRIDAY, FEBRUARY 23, 2007**

**Annual Banquet**  
Time: 7:30 p.m. – 10:00 p.m.  
Location: Manchester Ballroom G-I, Level 2  
Finish off the Annual meeting with a fabulous dinner and light entertainment and say farewell to your colleagues.  
**Dress:** Business Casual

**Spouse and Guest Activities**  
One of San Diego’s most famous attractions is the San Diego Zoo, located in Balboa Park. Here, visitors can see thousands of animals, many of which are unique to this particular zoo, and in exhibits that mimic their natural habitat. Also visit Birch Aquarium, the public exploration center for world-renowned Scripps Institution of Oceanography. Discover a variety of Pacific marine life in more than 60 habitats. Engulf yourself in the world of sharks, seahorses, and living coral reefs, and admire oceanographic exhibitions that showcase the mysteries of ocean, air, and life through interactive displays and multimedia. Visitors can also enjoy a Harbor Tour. The North Bay tour includes the North Island Naval Air Station, Harbor and Shelter Islands, the Naval Sub Base, and the Cabrillo National Monument. There’s also the tour of the South Bay to see the Star of India, the U.S. Navy surface fleet, Coronado Bay Bridge, and busy shipyards. For those looking to learn more about the history of San Diego, there is a Historic San Diego Tour that takes participants through Old Town to see its cultural and architectural treasures. And of course there is Balboa Park, America’s largest urban cultural park, which covers 1,200 acres and is minutes from downtown San Diego. Whether your interest is photography, folk art, fossils, trains, mummies, baseball, or animals, Balboa Park has it all.
MARK YOUR CALENDARS!

SUFU-at-the-AUA 2007 Annual Meeting
   May 19, 2007
   Anaheim, California

SUFU 2008 Winter Meeting
   February 27- March 1, 2008
   Hyatt Regency Miami
   Miami, Florida
INVITED SPEAKERS’ LECTURE SUMMARIES
PODIUM AND POSTER SESSION ABSTRACTS
UP-REGULATION OF CONNEXIN GENE EXPRESSION IN URINARY BLADDER SMOOTH MUSCLE INDUCED BY MEDIATORS OF HYPERTROPHY

Urology Research, VA Boston Healthcare System, Harvard Medical School, Boston, MA

Introduction and Objectives: Gap junctions promote intercellular communication between urinary bladder smooth muscle cells and are comprised of different connexins proteins (Cx). Expression of Cx37, Cx40, Cx43 and Cx45 have been identified in the bladder. Although several studies suggest that bladder outlet obstruction is associated with alterations in connexin gene expression, the mechanisms responsible for these changes are unclear. In the present study, we investigated connexin gene expression in response to mediators of hypertrophic processes such as Angiotensin II (AngII) and mechanical force.

Methods: Rat bladders were isolated under anesthesia and placed in Krebs solution. After removal of the urothelium, longitudinal strips were stretched to 1.5 grams of force and equilibrated in organ baths maintained at 37°C. The contractile responses induced by continuous electrical field stimulation (EFS, 20-30V, 0.1Hz, 0.5ms) or AngII (1 µM) were recorded for 8h. Separate bladder strips were incubated with an AngII receptor antagonist (losartan-Los, 10 µM) and stimulated for 8 hours. Control strips were simultaneously prepared, but remained unstimulated for 8 hours in Krebs buffer. After 8 hours, total RNA was isolated and real-time PCR was performed to determine the expression of connexin 37, 40, 43, and 45 genes using Taq-Man probes and primers for each gene sequence.

Results: AngII induced a significant up-regulation of connexin 37, 40, 43, and 45 gene expression in urinary bladder smooth muscle after 8 hours of continuous stimulation in comparison with control, non-stimulated samples. Moreover, AngII significantly increased the amplitude of smooth muscle contraction during 8 hours in comparison to control strips. Continuous EFS caused a gradual and significant increase in contraction amplitude for 8 hours. A significant up-regulation of connexin 37, 40, 43, and 45 was detected after 8 hours of continuous EFS compared with unstimulated strips. Losartan significantly attenuated the up-regulation of all connexin genes caused by 8 hours of continuous stimulation.

Conclusions: These findings suggest that adaptive responses to physiologic stress induced by continuous smooth muscle stimulation and AngII receptor activation result from increases in Cx37, Cx40, Cx43 and Cx45 gene expression. Furthermore, the prevention of connexin upregulation by an Ang II receptor antagonist suggests a possible role for a local renin-angiotensin system in regulating the expression of specific connexins. Thus the coordination of the hypertrophic response of bladder smooth muscle to outlet obstruction may depend on cell-to-cell communication through gap junctions and appropriate regulation of connexin expression.

Supported by Research Service, Department of Veterans Affairs, Washington, DC
CAVEOLIN GENE EXPRESSION IN URINARY BLADDER SMOOTH MUSCLE IS REGULATED BY ANGIOTENSIN-II

Ziv Radisavljevic, Vivian Cristofaro, Tomasz Golabek, Subbarao V. Yalla and Maryrose P. Sullivan.
Urology Research, VA Boston Healthcare System, Harvard Medical School, Boston, MA

Introduction and Objectives: Signaling processes induced by Angiotensin II (AngII), the effector protein of the renin-angiotensin system, have been implicated in the hypertrophic response in many smooth muscle systems. Mechanical stretch of isolated bladder smooth muscle cells increases autocrine secretion of AngII. Previous studies have shown that caveolae, cholesterol enriched plasmalemmal microdomains involved in signal transduction regulation, mediate the contractile response to several agonists in bladder smooth muscle, including AngII. The goal of this study was to investigate the relationship between the AngII receptor activation and expression of caveolins, the structural proteins of caveolae.

Methods: Urinary bladders were obtained from anesthetized rats and the urothelium was carefully removed. Longitudinal strips were stretched with 1.5 grams of force in vitro in organ bath at 37ºC and equilibrated for 45 min. The amplitude and frequency of spontaneous and AngII (1 µM) induced activity were recorded for 8 hours. Control strips were similarly stretched and unstimulated force was recorded. After 8 hours, total RNA was isolated using RNeasy Kit and real-time PCR was performed to determine the expression of caveolin-1, 2, and 3 genes using Taq-Man probes and specific primers for each gene sequence.

Results: AngII (1 µM) induced a significant up-regulation of gene expression of caveolin-1 (6.6±1.8 fold), caveolin-2 (8.4±3.3 fold) and caveolin-3 (7.9±3.0 fold) in urinary bladder smooth muscle after 8 hours of stimulation in comparison with control non-stimulated samples. AngII significantly increased the amplitude of smooth muscle contraction of bladder tissue during 8 hours of stimulation. Contractile force of bladder tissue progressively and significantly increased during 8 hours of stimulation with AngII in comparison to the control bladder tissue.

Conclusions: AngII significantly increased bladder smooth muscle contraction during 8 hours of stimulation through up-regulation of caveolin-1, 2, and 3 gene expression. These findings may have important implications for pathophysiologic processes linked to alterations in AngII secretion such as the hypertrophic response to bladder outlet obstruction. Thus AngII induced upregulation of caveolin expression may play a substantial role in altered receptor-mediated signaling associated with bladder dysfunction.

Supported by Research Service, Department of Veterans Affairs, Washington, DC
THE EFFECT OF SILDENAFIL CITRATE ON BLADDER OUTLET OBSTRUCTION IN A MOUSE MODEL
Charles R. Beamon, M.D., Hardeep S. Phull, B.A., Craig V. Comiter, M.D.*: Tucson, AZ.
(Financial Support for this Study provided by Pfizer Pharmaceuticals)

Purpose: Sildenafil citrate, an oral phosphodiesterase type-5 inhibitor, is the most commonly prescribed medication for the treatment of erectile dysfunction. In addition, it has recently been demonstrated that sildenafil reduces penile fibrosis in a rat model of Peyronie’s Disease. Furthermore, phosphodiesterase type-5 has been identified in extra-penile tissues, specifically in the rat and rabbit bladders, and inhibition of this enzyme by sildenafil citrate has been shown to induce relaxation of isolated detrusor muscle strips. We investigated if sildenafil citrate can inhibit the fibrosis and detrusor overactivity that accompany bladder outlet obstruction (BOO) in a murine model.

Materials and Methods: Eighteen Balb/CAN mice were anesthetized with ketamine (60 mg/kg), xylazine (5 mg/kg), and acepromazine (5 mg/kg) via intraperitoneal injection. Lacrilube was applied to the eyes to prevent drying. The abdomen was shaved and the mice were placed on a heating pad regulated at 37 degrees Celsius. After sterile preparation of the operative site with betadine, a midline abdominal incision was made from the umbilicus to just cephalad to the genitalia. Through the incision, the bladder and proximal urethra were exposed. A 4-0 nylon suture was tied around the proximal urethra using PE-50 tubing as a guide to partially obstruct. The abdomen was closed with 3-0 vicryl suture. Mice were survived for 6 weeks (n=9). Half of the mice (n=9) at each time point were given Sildenafil daily (10 mg/kg) in their drinking water. Urodynamics was performed through an open incision at sacrifice. The filling rate utilized was 50 ul/min with PE-50 tubing. After urodynamics the bladder was harvested, at which point it was weighed and then placed into 10% formalin for histological evaluation. Trichrome scoring was performed. Scores were given of 1 for decreased collagen, 2 for normal collagen, and 3 for increased collagen deposition when compared to our control group. Hematoxylin and eosin scoring was done in a similar fashion, with a score of 1 for atrophy, 2 for normal appearing bladder, and 3 for hypertrophy, compared to control bladders. Normal histological values were based on control animals with no obstruction or treatment.

Results: BOO caused urodynamic changes and histological changes. BOO caused detrusor muscular hypertrophy, and fibrosis with collagen deposition. Treatment with sildenafil reduced this fibrosis and muscular hypertrophy. BOO also increased the bladder capacity. Treatment with sildenafil mediated an increase in bladder capacity when compared to obstructed non-treated mice (278 ± 46 µl versus 160 ± 22 µl, p<0.03). Histologically, trichrome staining revealed that the sildenafil treated obstructed mice had less collagen deposition (median trichrome score = 1) when compared to obstructed mice who were not treated with sildenafil (median trichrome score = 3) (p<0.001). In addition, hematoxylin and eosin staining demonstrated that sildenafil-treated mice had less detrusor hypertrophy (median detrusor hypertrophy score = 2) compared to untreated obstructed mice (median detrusor hypertrophy score = 3) (p<0.01). These results correlate when untreated unobstructed mice are compared to untreated obstructed mice for both detrusor hypertrophy and collagen scoring systems (p<0.001).

Conclusions: In a mouse model of bladder outlet obstruction, treatment with six weeks of oral sildenafil citrate commencing at the time of obstructive surgery resulted in significant urodynamic and histological differences compared to obstructed mice that were not treated with sildenafil citrate. Bladder outlet obstruction was associated with a significant increase in bladder capacity and hypertrophy of the detrusor muscle, as well as a significant increase in collagen deposition in the lamina propria and detrusor muscular layer. In obstructed mice treated with six weeks of oral sildenafil citrate, beginning at the time of obstructive surgery, the bladder capacity was significantly increased, and there was significantly less collagen deposition compared to those obstructed mice that were not given sildenafil citrate. Sildenafil appears to protect the partially obstructed bladder in a mouse model by increasing bladder capacity and decreasing collagen deposition.
THE EFFECT OF ANTI-MUSCARINIC AGENTS ON POST-VOID RESIDUAL URINE VOLUME (PVR) IN HIGH RISK MALE PATIENTS WITH LOWER URINARY TRACT SYMPTOMS (LUTS)
Alexandra E. Rogers, Medical Student
Dominick Carbone, Urology Assistant Professor
Scott MacDiarmid, Urology Associate Professor
Wake Forest University School of Medicine, Winston-Salem, NC

Introduction: Several studies have demonstrated the efficacy and safety of anti-muscarinics in male patients with lower urinary tract symptoms (LUTS), but few have evaluated their effects on post-void residual urine volumes (PVR) in men at higher risk for developing retention.

Objectives: To evaluate the short-term effects of anti-muscarinic agents on PVR in men with LUTS and who are at higher risk of developing urinary retention.

Methods: 28 high risk male patients (mean age 65 years, range 21 to 91 years) were evaluated. High risk was defined as men with LUTS with urodynamically demonstrated bladder outlet obstruction (BOO) [group 1, n=4]; and both BOO and PVR>100 ml [group 2, n=5]; those with neurogenic bladder (NGB) [group 3, n=11]; NGB with BOO [group 4, n=3] and NGB with BOO and PVR > 100ml [group 5, n=5]. Patients were treated with FDA-approved anti-muscarinic agents. A clinically significant increase in PVR was defined as an increase of > 100 ml and/or that requiring catheterization. 7 of the 28 men were on concomitant alpha1-receptor antagonists.

Results: The mean follow-up was 9 months (range 1 to 32 months). For all patients, the mean PVR increased from a baseline of 60.6 ml to 87.0 ml. A clinically significant increase in PVR occurred in 5 of 28 patients (17.9%): 0 [group 1], 2 [group 2], 1 [group 3], 0 [group 4], and 2 [group 5], respectively. No patients required catheterization. In these 5, the mean increase in PVR was 145.9 ml. 1 out of the 5 was clinically improved and continued on medication. 3 of 28 patients (10.7%) discontinued therapy due to an elevated PVR.

Conclusions: Anti-muscarinic agents may increase PVR in men with LUTS and who are at higher risk of developing urinary retention. Discontinuation of medication due to an elevated PVR occurs in a minority of cases. Studies with larger cohorts of patients and longer-term follow-up are recommended.
Podium #5

LOWER URINARY TRACT SYMPTOMS ASSOCIATED WITH OBSTRUCTIVE SLEEP APNEA IMPROVE AFTER TREATMENT WITH CONTINUOUS POSITIVE AIRWAY PRESSURE

Mara A. Monoski, Alexis E. Te, and Steven A. Kaplan
Department of Urology, New York Presbyterian Hospital Cornell University Weill Medical College, New York, New York

Introduction/Objectives: Data suggest that obstructive sleep apnea (OSA) may induce nocturia. The purpose of this study was to determine if men with OSA experience an improvement in lower urinary tract symptoms (LUTS) after treatment with continuous positive airway pressure (CPAP).

Methods: Eleven men with a medical diagnosis of OSA were evaluated pre and post treatment with CPAP for LUTS. Parameters including International Prostate Symptom Score (IPSS), quality of life (QOL), daytime frequency and nocturia were collected before and after the initiation of CPAP. Differences between pre and post CPAP data were compared using the Student’s t-test and Wilcoxon signed-rank test.

Results: The mean age of the patients was 61 years old. The mean BMI was 26 kg/m². All men had an improvement in LUTS and QOL after treatment of OSA with CPAP (IPSS (p=0.0001), QOL (p<0.0001), daytime frequency (p<0.0001), nocturia (p<0.0001)).

Conclusions: Men with OSA and associated LUTS experience an improvement in voiding symptoms and QOL after treatment with CPAP.

Podium #6

COMPLICATIONS OF ETHYLENE VINYL ALCOHOL COPOLYMER AS AN OFF-LABEL INTRA-URETHRAL BULKING AGENT IN MEN WITH STRESS URINARY INCONTINENCE

Eric A. Hurtado MD, Rebecca J. McCrery MD, Rodney A. Appell MD
Scott Department of Urology, Baylor College of Medicine, Houston, TX

Introduction: Intra-urethral bulking offers a minimally invasive treatment option for male stress urinary incontinence. Collagen has been the agent most widely used but has been demonstrated to lose efficacy over time in multiple studies. A new agent, Ethylene Vinyl Alcohol copolymer (Tegress™; C.R. Bard, Inc. Covington, GA, USA) was approved by the FDA in 2004 for use in women. The purpose of this case-series is to report the short-term safety of Ethylene Vinyl Alcohol copolymer in the off-label treatment of male stress urinary incontinence.

Material and Methods: The charts of all adult male patients who received Ethylene Vinyl Alcohol (EVA) copolymer between 2005 and 2006 were reviewed for demographics, physical examination findings, urodynamic findings, outcomes, and complications. Patients receiving other intra-urethral agents, children, or use of bulking agents not placed intra-urethrally were excluded. Erosions were defined as the presence of bulking agent passing through the urethral mucosa. Efficacy was reported on a subjective scale from 0% to 100% improved an was used to determine if other injection sessions were required.

Results: Seventeen of 18 males completed follow-up after receiving EVA during this time period. With an average of 1.4 injection sessions, 58.8% of patients experienced a complication related to the procedure with 41.1% of these complications being urethral erosion of the material and 22% experiencing severe pain upon injection of the material. Urethral erosion was associated with pain, frequency, urgency, and/or passage of material resulting in worsening stress incontinence symptoms. Subjective improvement of at least 50% was reported by 41.1% of patients. Ten of 17 patients reported 10% or less improvement in their stress incontinence symptoms after treatment. The mean follow-up period was 4.2 months.

Conclusions: Intra-urethral bulking agents are meant to be a minimally invasive procedure with lower complication rates than alternative procedures such as the artificial urinary sphincter and male sling. The off-label use of EVA in men in this case-series resulted in a significant number of adverse events. Urethral erosion was the most common complication creating severe dysuria, frequency, and loss of benefit with passage of material. Additionally, urethral erosion precluded further injection in the affected area often rendering sub-optimal bulking. Currently, the long-term effects of persistent material exposure in relation to voiding dysfunction and urethral compliance are unknown at this time. Furthermore, EVA used as an off-label intra-urethral bulking agent may be significantly less efficacious than the FDA data reported in women, especially with prior use of intra-urethral bulking agents. A long-term prospective study involving serial cystoscopy needs to be performed with EVA compared to a standard agent, such as collagen, in men before further off-label use of EVA in the treatment of male stress incontinence can be recommended.
Introduction and Objectives: The therapeutic potential of stem cells is enormous. Cell based therapies and tissue engineering treatments of diseases affecting the lower urinary tract using stem cells appear promising. Most of these diseases such as incontinence, affect predominantly the elderly yet most research of adult derived stem cells have been conducted in cells from young individuals. Thus, little is known about individual variations within characterized stem cell lineages and the multipotential capacity of these cells in the elderly. Adipose-derived stem cells (ASC) are an easily obtained source of stem cells that are attractive for clinical use. Previous studies of other adult stem cell populations have shown that adult mesenchymal stem cells from aged donors have decreased proliferation and differentiation, and increased senescence. We sought to compare the proliferative and differentiation capacities of ASC derived from young and elderly rats and evaluate the effects of senescence on these cells. In addition, variations between different sources of adipose tissue were evaluated.

Methods: Fat was harvested from the inguinal/abdominal, retroperitoneal, and gonadal regions of 3-month (human equivalent of 15 years) and 24-month (human equivalent 70 years) female Fischer 344 rats and processed to obtain ASC. P1 passage cells were plated for proliferation and differentiation studies. For determination of growth kinetics, cells were counted daily by hemocytometer. A colony forming unit was defined as >50 cells. Cells were differentiated in specific media as previously described. Osteogenic differentiation was assessed quantitatively and qualitatively for Ca\(^{2+}\) and Alkaline Phosphatase. Smooth muscle differentiation was assessed by the presence of smooth muscle specific markers by flow cytometry and immunohistochemistry. Senescence of the cells was measured by telomerase activity.

Results: Gonadal and retroperitoneal ASC from older rats have significantly decreased proliferation than ASC from younger animals. The ability of ASC from the gonadal and retroperitoneal regions to differentiate to osteoblastic and leiomyogenic lineages decreases with age. In contrast, inguinal/abdominal ASC from aged rats have an increased proliferation, clonogenic capacity, and osteoblastic differentiation capacity as compared to younger rats. Additionally, inguinal ASC maintain their ability to differentiate into smooth muscle as they age and show an increase in the expression of actin, calponin, and MHC. These differences parallel differences in the activation of the enzyme telomerase. Aged ASC from all adipose regions have increased telomerase activity compared to younger rats. However, the increase in telomerase activity associated with aging is greatest in the inguinal/abdominal region.

Conclusions: These are regional differences in the effect of aging in ASC obtained from different fat depots. Senescence of the cells may account in part for decreases in proliferation and differentiation capacity of ASC obtained from gonadal and retroperitoneal regions. The aged inguinal/abdominal fat maintains a population of ASC with high levels of telomerase activity that maintains normal proliferation and differentiation capacity. This telomerase up-regulation is typical of stem cells, and is maintained in the aged animals. This, combined with the ease of access of adipose tissue in this region, makes it an ideal source of stem cells for cell-based therapies in the elderly population.

Supported by NIH grant 5R01DK067198-03
Podium #8

THE EFFECTS OF AGING IN AN ANIMAL MODEL OF STRESS URINARY INCONTINENCE
Vanda Lopez Guenther MD, Dhiren Dave MD, Xiaoyong Zeng MD, PhD, Larissa V. Rodriguez, MD, University of California (UCLA), Los Angeles, California.

Introduction and Objectives: Urinary incontinence affects approximately 13 million Americans. The prevalence is variable between 21 to 52% and it increases with increasing age. The high prevalence of this condition in the aging population suggests that there are likely changes related to the aging process that might influence the development of SUI. A number of animal models have been developed to study SUI. To our knowledge, no model has systematically evaluated the effects of aging. We propose to evaluate the effects of aging in an established model of SUI studying an animal model well described in geriatric research.

Methods: Fisher (F344) rats were divided into two groups: (1) Young 3 month old rats, and (2) Aged 24 month old rats. These animals are equivalent to 60 y/o humans. All animals underwent transabdominal urethrolysis as previously described. All animals underwent cystometry and evaluation of urethral resistance by abdominal leak point pressure (ALPP) and retrograde urethral perfusion pressure (RUPP) pre-operatively and 2, 4, and 8 weeks postoperatively.

Results: Cystometry revealed similar baseline bladder capacity and for both groups (1.19 in both groups, P > 0.05). Aged rats had lower ALPP and RUPP at baseline when compared to young animals (22 vs. 20 cm H2O and 22 vs. 16 cm H2O for young and old rats, respectively). After urethrolysis, both values decreased significantly but similarly in both groups (p < 0.05). This decrease was maintained at all postoperative time points.

Conclusions: Aged animals have similar bladder dynamics than young animals with similar bladder capacity and voiding pressures. Increased detrusor overactivity was not observed. Aged animals appear to have lower baseline urethral resistance when compared to young animals. Although this animal model of decreased urethral resistance achieves durable low ALPP and RUPP in both groups, the lower baseline difference did not translate to measurable differences between both groups after urethrolysis. Larger studies need to be done to confirm these results and to evaluate the mechanism by which aging causes lower urethra resistance.
EVALUATION OF INCONTINENCE AND DISABILITY IN COMMUNITY-DWELLING OLDER WOMEN
Scott Macdiarmid, Eric Gwynn, Matteo Cesari, Jeff Williamson,
Department of Urology and Sticht Aging Center, Wake Forest University Health Sciences, Winston-Salem, NC

Introduction: It is well established that urinary incontinence significantly impacts on quality of life in the elderly population and is associated with a higher incidence of depression and fall-related fractures. However, the impact of urinary incontinence on physical function and disability has not been evaluated. We hypothesized that urinary incontinence in older women is associated with a higher prevalence of disability.

Objective: To characterize the relationship between urinary incontinence and physical function in community-dwelling non-demented older women and determine whether incontinence is associated with functional deficits.

Methods: We analyzed baseline data from the Women’s Health and Aging Study, a 3-year prospective cohort of 1002 mild to moderately disabled community-dwelling women. After adjusting for common comorbid conditions, the prevalence of self-reported physical disability and reduced performance on functional testing was compared in the continent population (n=360) to those with urinary incontinence (UI, n=642), stress incontinence (SUI, n=391), and urge incontinence (UUI, n=506).

Results: Difficulty walking across the room was reported in 25.1% of the continent patients compared with 37% (p=0.001), 28.1% (p=0.34), and 34.6% (p=0.003) of the UI, SUI, and UUI groups, respectively. On timed tests of physical function, women with UUI had significant poorer performance on the 4-meter walk speed (p=0.04) and the chair stand test (stands/sec) verses the continent population. Similar findings were demonstrated with activities of daily living.

Conclusion: This data suggests that urinary incontinence, especially those with urge incontinence, may be a risk factor for lower extremity physical disability in older women at high risk for functional decline. Further study is needed to determine whether early identification and treatment of urinary incontinence is a pathway to reducing disability and institutionalization in aging populations.
A MULTICENTRIC, PROSPECTIVE, RANDOMIZED CLINICAL TRIAL COMPARING TENSION-FREE VAGINAL TAPE SURGERY AND NO TREATMENT FOR THE MANAGEMENT OF STRESS URINARY INCONTINENCE IN ELDERLY WOMEN

Campeau L*, Tu LM**, Lemieux MC*, Naud A***, Karsenty G*, Corcos J*

*Department of Urology, Sir Mortimer B. Davis-Jewish General Hospital, McGill University, Montreal, **Department of Urology, Université de Sherbrooke, Sherbrooke, ***Department of Urology, Université Laval, Quebec, Canada

Introduction and Objective: The aim of our study is to test the hypothesis that elderly women undergoing tension-free vaginal tape surgery (TVT) will have a better quality of life (QOL) and satisfaction compared to non-treated women despite age- and technique-related potential morbidity.

Materials and Methods: This multicentric, prospective, randomized controlled trial enrolled a total of 69 women aged over 70 years who initially consented to be randomized to either undergo immediate TVT surgery or to wait for 6 months before submitting to the same surgery (control group). The main outcomes measured at every encounter (pre-randomization, 8-12 weeks and 6 months) consisted of the Incontinence-Quality of Life (I-QOL) Questionnaire, the Patient Satisfaction Questionnaire and the Urinary Problems Self-assessment Questionnaire, among others.

Results: The analysis included 31 patients in the immediate surgery group and 27 subjects in the control group. Peri-operative complications in the immediate surgery group were bladder perforation (22.6%), urinary retention (12.9%), urinary tract infection (3.2%) and de novo urgency (3.2%). At 6 months, the mean I-QOL scores for the TVT and control groups were respectively 96.5±15.5 and 61.6±19.8 (p<0.0001); mean Patient Satisfaction scores were respectively 8.0±2.7 and 2.0±2.4 (p<0.0001); and mean Urinary Problems scores were respectively 4.5±4.3 and 11.6±3.5 (p<0.0001).

Conclusion: At 6 months post-randomization, the group of elderly women who underwent immediate TVT surgery showed a significant improvement in QOL, patient satisfaction and less urinary problems compared to the group of women waiting for the same surgery.

Funded by Gynecare and Fonds de la recherche en santé du Quebec (FRSQ).
COMPARISON OF CYSTOMETRIC METHODS IN FEMALE RATS
Phillip P. Smith MD, Christopher P. Smith MD, Timothy B. Boone MD PhD, George T. Somogyi MD PhD, Scott Department of Urology, Baylor College of Medicine, Houston TX

Introduction: Cystometry in the rat has been used as a model for many aspects of investigation into voiding function and dysfunction. The effect of bladder and urethral instrumentation in rat studies might reasonably be considered to be a source of deviation of measured parameters from normal physiologic responses. We hypothesized that transurethral catherization would produce obstruction-related changes, and that suprapubic catheterization would limit volume-related functions as well as disrupt normal urothelial sensory function. The aim of this study was to evaluate the effect of cystometry on normal voiding by comparing physiologic voiding parameters with cystometric parameters, and comparing the voiding-associated abdominal wall responses to voiding (VAR), which are analogous to the visceromotor response to noxious stimuli (VMR).

Methods: Three groups of female SD rats 250-300 g under urethane anesthesia were studied. All rats had rectus abdominis EMG leads sewn in place for assessment of VAR. One group of rats (n=8) underwent cystometry via a transurethral catheter (TUCCMG). Urine was not collected in this group. In a second group of rats (n=6), physiologic voiding was assessed (“free void”, FV). In these rats, a femoral artery was cannulated for intravascular infusion (saline, 0.080 ml/min) and the animals were positioned prone over a urine collection cup. This group of animals was allowed to void in response to physiologic diuresis, without bladder or urethral instrumentation. A third group of rats (n=8) had a femoral artery catheter placed as well as a suprapubic catheter (SPC). These animals were positioned prone over a collection cup during study. This group of animals underwent free voiding study with intravascular infusion of saline (SPCFV), similar to the FV group. This was followed by cystometry via the suprapubic catheter (SPCCMG) using an instillation rate of 0.100 ml/min. Bladder pressure and EMG graphs were integrated to calculate bladder voiding impulse (BVI) and VAR intensity (VARI). Intercontraction interval (ICI), average uroflow rate (Qave), maximum bladder pressure (Pmax), and pressure threshold for VAR (Pvar) were determined for several sequential contractions in each rat. Parameters were compared among groups using ANOVA and t-testing.

Results: Results in the FV group represent physiologic voiding parameters. Per-void volume was 1.8 +/- 0.25 ml with an average flow rate of 0.2 +/- 0.03 ml/sec, ICI was 60 +/- 11.9 minutes, and VAR intensity of 140 +/- 17% of baseline. Placement of a SPC significantly decreased the ICI and per-void volume (0.9 +/- 0.21 ml), but did not alter VAR intensity in free voiding rats. Maximum bladder pressure was 22.9 +/- cm/water, BVI 129 +/- 32 gm sec/ml, and Pvar 21 cm/water. SPC-driven cystometry did not significantly alter any of these parameters compared to SPC-free voiding except for a shortened ICI. BVI and Pmax were significantly increased by TUC cystometry compared to all other catheterized groups; voided volumes were not quantitated in this group. Pvar was increased by TUC cystometry relative to SPC voiding/cystometry, and VAR intensity was increased by TUC cystometry when compared to FV.

Conclusions: Other than volume-related parameter changes probably related to surgical compromise of bladder capacity, suprapubic catheterization does not alter the cystometric and physiologic responses to voiding when compared to normal, uninstrumented voiding in urethane-anesthetized female rats. Transurethral cystometry appears to be obstructive and may activate nociceptive reflexes. Research in rats using cystometric endpoints should employ suprapubic and not transurethral catheterization.
DIFFERENCES BETWEEN THE DATA OF FREE FLOW AND INTUBATED FLOW IN WOMEN WITH URINARY INCONTINENCE. WHAT DO THEY MEAN?
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UMR S 731 INSERM/Université Pierre et Marie Curie-Paris 6, France.

Introduction and Objectives: Comparison between data from a free flow (FF) and an intubated flow (IF) in women has been little studied [1]. Our purposes were: 1) to search for differences between urodynamic data from FF and IF in women with urinary incontinence and 2) to use a mathematical model of micturition [2] to explain these differences.

Methods: Women with urinary incontinence have been evaluated between July 2002 and December 2004. Exclusion criteria were neurological diseases, diabetes mellitus and grade ≥ 2 prolapse. Urodynamics was performed with the Laborie’s Bonito® unit. Included files consisted of one FF (before cystometry) and one IF (10F triple-lumen urethral catheter) with voided volume >100 mL and continuous flow (voidings in privacy, in seated position). Analyzed parameters were 1) the volumes (initial $V_{ini}$, residual $V_{r}$), $Q_{max}$, the flow time $t_{mic}$ and the ratios $V_{r}/V_{ini}$, $Q_{max,IF}/Q_{max,FF}$ and $Q_{max}/Q_{ave}$, and during IF 2) $p_{det,open}$ and $p_{det,Qmax}$. Voidings with $V_{r}/V_{ini} > 20\%$ were labelled $V^+$, the others $V^-$. The VBN® model [2] allowed to evaluate for each recording the detrusor force, the urethra cross-section (each file must be interpreted with the same set of parameters) and to make simulations of pathophysiological hypothesis.

Results: a) Among 217 women, only 102 (47.0%), mean age 54.3 years [24-86], succeeded in FF and IF according to the required criteria. For these 102 women, the values of the voiding parameters are shown in the table.

<table>
<thead>
<tr>
<th></th>
<th>$V_{ini}$</th>
<th>$V_{u}$</th>
<th>$V_{r}/V_{ini}$</th>
<th>$Q_{max}$</th>
<th>$Q_{max}/Q_{ave}$</th>
<th>$t_{mic}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>FF</td>
<td>286±58 mL</td>
<td>277±161 mL</td>
<td>7.1±14.0%</td>
<td>27±13 mL/s</td>
<td>1.54±.18</td>
<td>19±10 s</td>
</tr>
<tr>
<td>IF</td>
<td>391±149mL</td>
<td>347±144mL</td>
<td>12.6±20.1%</td>
<td>15±8 mL/s</td>
<td>1.47±.22</td>
<td>49±23 s</td>
</tr>
</tbody>
</table>

p <.0001 <.0001 =.016 <.0001 n.s. <.0001

b) Comparing FF/IF, 69 files were $V^-/V^-$, 9 $V^-/V_+$, 20 $V^-/V_+$, and 4 $V_+/V^-$. $Q_{max,IF}/Q_{max,FF}$ was .45±.27 for the $V^-/V_+$ group, and .71±.49 for the $V^-/V^-$ group while its theoretical value, due to the obstructive effect of the catheter, was 0.75: the weak $Q_{max,IF}$ value in the $V^-/V^-$ group results from an additional phenomenon: fading of the detrusor excitation or/and incomplete sphincter relaxation (abnormal nervous control) due to the catheter in place.

c) No significant difference was found in $p_{det,open}$ (20.3±16.5 vs 20.0±13.7 cmH$_2$O) and $p_{det,Qmax}$ (24.2±13.1 vs 27.2±16.7 cmH$_2$O) between the IF($V^-$) and the IF($V^+$) groups. The increase of detrusor pressure must be sufficient to obtain complete bladder emptying. The theoretical time $\theta$ needed for achieve bladder emptying is $V_{ini}/Q_{ave} = (1.5*V_{ini})/Q_{max}$. In the $V^-/V_+$ group $t_{mic} < 0$. Modelling shows that this result is consistent with an inhibition of the voiding process for micturition of long duration.

Conclusion: In the population of women able to void during the pressure-flow study, significant differences are found between the data of FF and IF. These differences cannot be explained only by mechanical effects due to the presence of a urethral catheter and could involve, in addition to the anxiety of the patient, a urethral reflex. These findings underline the necessity to combine a FF with an IF during a urodynamic session in order to increase the reliability of the conclusions of the urodynamic investigation.

DOES URETHRAL FUNCTION AFFECT URODYNAMIC VOIDING PARAMETERS IN WOMEN WITH PROLAPSE?

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Introduction and Objective: We hypothesized that women with pelvic organ prolapse (POP) and overt stress urinary incontinence (SUI) would demonstrate less obstruction and retention because of the “release valve” effect of a less competent urethra. To evaluate this, we conducted a prospective supplementary study to the Colpopexy And Urinary Reduction Efforts (CARE) study. We compared voiding parameters and symptoms in 3 groups of women with POP: 1) women with no symptoms of SUI and no urodynamic stress incontinence (USI) during prolapse reduction, 2) women with no SUI symptoms but evidence of USI on reduction testing (occult USI) and 3) women with SUI symptoms (overt SUI).

Methods: We enrolled 225 women with stage II-IV POP. The two groups randomly selected from the CARE population differed only in the absence (N=67) or presence (N=84) of USI during prolapse reduction. Group 3 consisted of 74 women, recruited for this supplementary study, who were similar to CARE subjects except for reporting subjective SUI. Subjects completed the Pelvic Floor Distress Inventory, underwent a standardized Pelvic Organ Prolapse Quantification (POP-Q) examination, and a standardized non-instrumented uroflow (NIF), filling cystometry and pressure-flow studies using the standardized CARE urodynamics (UDS) protocol. We defined obstruction using the Blaivis-Groutz nomogram for women and urinary retention as a post-void residual (PVR) of ≥ 25% of total bladder volume.

Results: The subjects’ median age was 61 years with a median parity of 3. Eighty-seven percent of women had stage III or IV POP. Approximately one-third (38%) of the women had prior surgery for POP or urinary incontinence. Demographic variables were similar amongst the three groups except Group 2 (occult SUI) was older than Group 1 (p=0.02). Only 14% of women with pre-operative overt SUI (Group 3) demonstrated USI during UDS without prolapse reduction, increasing to 70% with reduction. Sixteen percent and 8% of 223 women demonstrated detrusor overactivity (DO) and detrusor overactivity incontinence (DOI), respectively. DO was more common in women with overt or occult SUI than women with no USI (24% and 17% vs. 6%, p=0.02) and DOI (15% and 8% vs. 0%, p=0.004). The PVR, median peak flow rate, and median detrusor pressure at peak flow across the three groups were similar. Of the 186 women for whom a voiding mechanism could be determined, 63% voided by detrusor contraction alone and 27% voided with detrusor contraction and strain. Voiding mechanism and voiding pattern did not differ by group. 59 percent of women were found to be “obstructed” based on the nomogram and 39% were in “urinary retention” based on the NIF. Rates of obstruction and urinary retention were similar between the 3 groups. While women with overt SUI were more likely to have higher irritative and obstructive symptom subscale scores, neither score differed according to whether urodynamics revealed DO or obstruction, respectively.

Conclusion: Women with POP have significant rates of urodynamic obstruction and retention, independent of their continence status. Further, symptoms of obstruction and retention correlate poorly with urodynamic findings in women with POP.
PRIMARY BLADDER NECK DYSFUNCTION: CAN WE DO BETTER IN SCREENING FOR IT AND MONITORING ITS RESPONSE TO THERAPY?
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Introduction and Objectives: Primary bladder neck dysfunction (PBND) is a distinct clinical entity often seen in young and middle aged adult males, and increasingly noted in females as well as children. PBND has lower urinary tract symptoms (LUTS) and clinical presentation similar to several other common non-neurogenic forms of voiding dysfunction. Formal diagnosis of PBND is based on the following videourodynamics (VUDS) criteria: 1) absent or delayed funneling of the bladder neck during voiding, 2) depressed uroflow despite a detrusor contraction of normal or elevated magnitude, 3) relaxed external urethral sphincter during voiding, 4) no associated anatomic obstruction or neurologic disease and 5) a prolonged opening time defined as the time between the start of a voluntary detrusor contraction and the start of flow. Considering that VUDS are not always readily available, that medical therapy is often started or terminated based on persistence of LUTS, we report on an innovative method to both screen for PBND and monitor therapeutic response. Based on the principle of pelvic floor relaxation being the first stage of normal voiding and immediately preceding a voluntary detrusor contraction, we developed the concept of pelvic floor electromyography (EMG) lag time. It is defined as the time interval between the start of pelvic floor EMG relaxation during a voluntary voiding effort and the start of urine flow as measured on uroflow/EMG. We previously reported that the EMG lag time on uroflow/EMG and opening time on VUDS were both markedly prolonged and statistically indistinguishable from each other in children with PBND, and now report on their relationship in adults with PBND.

Methods: The EMG lag time was measured on non-invasive uroflow/EMG and opening time was measured on VUDS for each individual in a cohort of symptomatic patients with documented PBND. These values were compared to each other and to a cohort of non-PBND controls. Additionally, a subset of the PBND group who underwent treatment with alpha-antagonists also had their pre and on treatment EMG lag times and flow rates analyzed.

Results: The PBND cohort consisted of 36 patients (28 male, 8 female; mean age 38.4, range 20-66 yrs.) and 27 non-PBND controls. In addition to the basic results listed in table 1, there were significant improvements noted in both uroflow rates and EMG lag time in 28 PBND patients undergoing treatment with alpha antagonists. The treatment group had a fall in mean EMG lag time from 36.7 to 4.5 sec. and an increase in maximum flow rate from 11.8 to 22.3 cc/sec on alpha antagonist therapy.

Conclusions: The pelvic floor EMG lag time, as measured on non-invasive uroflow/EMG is statistically indistinguishable from the opening time as measured on VUDS and both are significantly prolonged in PBND. Accordingly, a prolonged EMG lag time in a patient having both LUTS and abnormal uroflow parameters or pattern is highly suggestive of PBND. Its presence would justify a more invasive workup with VUDS or in select patients, initiating empiric medical therapy. Perhaps its greatest clinical utility is as an objective parameter to monitor treatment response thereby preventing premature termination of medical therapy in a disorder where LUTS often persist for some time after initiation of therapy and urodynamic improvement has begun.

Table 1. Mean Opening time and EMG Lag Time in Normals and in PBND

<table>
<thead>
<tr>
<th></th>
<th>Mean Opening Time (seconds)</th>
<th>Mean EMG Lag Time (seconds)</th>
<th>Mean Opening Time Vs. EMG Lag Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non PBND controls</td>
<td>1.5</td>
<td>1.9</td>
<td>1.5 vs. 1.9 p&gt;.550</td>
</tr>
<tr>
<td>(N = 27)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBND (N = 36)</td>
<td>24.7</td>
<td>27.7</td>
<td>24.7 vs. 27.7 p&gt;.550</td>
</tr>
<tr>
<td>Controls vs. PBND</td>
<td>1.5 vs. 24.7 p&lt;.001</td>
<td>1.9 vs. 27.7 p&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>
Objective: The purpose of this study was to explore the relationship of cystometric volume at the time of first detection of urodynamic stress incontinence to preoperative quality of life (QOL) and post-operative failure.

Methods: After obtaining IRB approval, we reviewed consecutive charts of all women who underwent a suburethral sling or Burch procedure at our tertiary care center. All patients completed the Incontinence Impact Questionnaire (IIQ-7) and the Urogenital Distress Inventory (UDI-6) at the initial visit. Standardized urodynamic testing with a microtip catheter was done in the standing position. Maximum urethral closure pressures (MUCP) were recorded at maximum cystometric capacity (MCC). USI volume was defined as the volume at the first detection of USI. Standardized postoperative assessment three months after surgery included IIQ-7 and UDI-6 and a standardized standing cystometrogram (CMG). Women were divided to four groups according to USI leakage volume. The groups were compared for MUCP, pre and post IIQ-7 and UDI-6 total score and USI volume leakage.

Results: One hundred sixty eight women with a mean age of 60 (34-89) years were included in this analysis. 52 women underwent sling and 116 women underwent Burch urethropexy. Overall, 27% of patients had persistent USI. The presence of persistent USI did not differ by surgical group (p=.52). USI volume was 100ml for 31%, 200ml for 17%, 300ml for 17% and ≥400ml for 35%. Baseline and postoperative UDI and IIQ, MUCP, and USI persistence did not differ by USI volume (table 1).

Conclusion: The volume at which leakage first occurs during urodynamic testing is not associated with objective surgical failure rates or preoperative quality of life in women undergoing sling or Burch procedures. In addition, USI volume was not associated with sphincter function and postoperative QOL.

Table: Quality of life and Postoperative Assessment by Pre-operative USI Volume Group

<table>
<thead>
<tr>
<th>USI at 100ml (n=52)</th>
<th>USI at 200ml (n=28)</th>
<th>USI at 300ml (n=28)</th>
<th>USI at ≥400 (n=60)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre IIQ-7 Median (range)</td>
<td>43 (0-86)</td>
<td>24 (0-90)</td>
<td>29 (0-100)</td>
<td>31 (0-90)</td>
</tr>
<tr>
<td>Pre UDI-6 Median (range)</td>
<td>61 (17-94)</td>
<td>39 (17-75)</td>
<td>44 (0-83)</td>
<td>50 (11-100)</td>
</tr>
<tr>
<td>Persistent USI (%)</td>
<td>29</td>
<td>15</td>
<td>19</td>
<td>35</td>
</tr>
</tbody>
</table>

* Kruskal Wallis **Chi-square test

Financial support: None
Objective: This is a prospective study analyzing the effects of repeated botulinum toxin-A (BTA) injections on several urodynamic parameters in patients suffering from neurogenic detrusor overactivity.

Methods: Between 2001 and 2006, patients with neurogenic incontinence refractory to high-dose anticholinergic medications were selected for prospective treatment. All patients emptied their bladder via intermittent catheterization and had severe detrusor hyperreflexia. Evaluation included a complete medical history, review of voiding diaries, physical examination, and cystometrogram on anticholinergic agents before BTA injection. A total of 300 units (30 mL) of BTA were injected cystoscopically at 30 detrusor muscle sites sparing the trigone. All patients were informed to taper off anticholinergic medications 1 week after BTA treatment. Cystometrograms were performed at baseline, 6 weeks following all BTA treatments and when the patients reported return of incontinence. Repeat BTA injections were allowed when cystometrogram documented return of detrusor hyperreflexia. Outcome parameters that were measured included continence level, maximum cystometric capacity, detrusor compliance, maximum detrusor pressure, and the presence of detrusor hyperreflexia. Clinical and urodynamic follow-up was obtained at 6 weeks, 24 weeks and yearly after treatment. Statistical significance was determined using the paired t test with significance set at p < .05. For non-parametric data, a Wilcoxon signed rank test was used with significance set at p < .05.

Results: Thirty-three patients (16 males, 17 females) with a mean age of 42.9 (range of 23-73 years) participated in our study. In our series 100% (33/33), 61% (20/33), 27% (9/33), 15% (5/33), and 12% (4/33) of patients received 2, 3, 4, 5, and 6 BTA treatments respectively. The median time between BTA injections was 287 days (range 133-1750 days) with a median of 294 days, 343 days, 266 days, 364 days and 251 days between first through sixth treatments respectively. Six weeks after BTA injections, 69.8% (p < .05), 88.9% (p=<.05), and 100% (p=<.05) of patients were continent following the first, second, and third injections respectively. Maximum cystometric capacity was increased following the first 3 BTA treatments by 154.64 mL (±132.39 mL), 188.73 mL (±140.93 mL) and 268.67mL (±87.76 mL) respectively (p < .05). Detrusor compliance significantly increased following the first 2 BTA treatments. Detrusor hyperreflexia resolved in 75%, 67%, 89%, 60%, 25% and 66% of patients after the first through sixth BTA injection respectively. There were no adverse events related to BTA injections.

Conclusions: In our series BTA injections appears to be a safe, minimally invasive and effective treatment option for patients with refractory neurogenic detrusor activity. Repeated BTA treatments significantly improved clinical and urodynamic outcomes that did not seem to decrease over time. Further long-term studies are needed to validate our preliminary findings.
Podium #17

ELEVATED SENSORY THRESHOLDS IN THE URETHRA OF WOMEN WITH IDIOPATHIC OVERACTIVE BLADDER CONSISTENT WITH C FIBER NEUROPATHY

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Introduction: Animal models and neuromodulation have demonstrated the importance of afferent neural pathways in regulating lower urinary tract function. While the etiology of overactive bladder remains unclear, increasing evidence suggests that alterations in sensation play a critical role. However, little data exists regarding the type or location (bladder or urethra) of afferent changes.

Objective: To compare 3 types of afferent nerves (A-β, A-δ, and C fibers) in the lower urinary tract of women with idiopathic overactive bladder and asymptomatic controls using Current Perception Threshold (CPT) testing.

Methods: After IRB approval, women without lower urinary tract symptoms (controls) were recruited from the community, and women with ≥1 urge incontinent episode per week on 7-day diary, seeking treatment (UUI) were recruited from our tertiary care referral practice. All participants underwent CPT testing in a standardized fashion using a Neurometer® CPT device (Neurotron Inc, Baltimore, MD) connected to ring electrode on a 14 French Foley catheter in the urethra and bladder. Testing was done in the urethra and bladder at 3 frequencies 2000 Hz, 250 Hz and 5 Hz corresponding to A-β, A-δ, and C fibers, respectively.

Mann Whitney test was used to compare age and CPT values between independent groups, and Chi² test of association was used for nominal variables. Backwards logistic regression was used to compare groups at each urethral CPT frequency.

Results: Forty-eight controls without lower urinary tract symptoms and 13 women with UUI were included in the analysis. Women with UUI were significantly older (mean±SD age 62±14 and 44±15, p<.0005) and more likely to be vaginally parous (p=.007) than control women. Urethral CPT at 2000 Hz, 250 Hz, and 5 Hz were significantly less sensitive in women with UUI than controls, while bladder CPT were not different between groups (Table I). * Mann Whitney test

<table>
<thead>
<tr>
<th></th>
<th>Controls N=48 Median (25th-75th IQR) milliAmperes</th>
<th>Urge Incontinence N=13 Median (25th-75th IQR) milliAmperes</th>
<th>*P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urethra</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000 Hz</td>
<td>1.15 (.76-1.53)</td>
<td>2.63 (1.31-5.39)</td>
<td>.005</td>
</tr>
<tr>
<td>250 Hz</td>
<td>.45 (.33-56)</td>
<td>1.39 (.69-2.06)</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>5 Hz</td>
<td>.11 (.7-24)</td>
<td>1.14 (1.01-1.86)</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>Bladder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000 Hz</td>
<td>4.08 (2.01-6.27)</td>
<td>1.92 (1.08-8.16)</td>
<td>.599</td>
</tr>
<tr>
<td>250 Hz</td>
<td>2.30 (.87-5.53)</td>
<td>1.01 (.39-4.56)</td>
<td>.251</td>
</tr>
<tr>
<td>5 Hz</td>
<td>1.38 (.22-2.90)</td>
<td>.55 (.07-3.06)</td>
<td>.325</td>
</tr>
</tbody>
</table>

Using logistic regression, to control for age and parity, urethral CPT at 5 Hz remained less sensitive in women with UUI than controls (p=.013).

Conclusion: Afferent nerve fibers (A-β, A-δ, and C fibers) in the urethra of older women are less sensitive than in younger women, suggesting sensory neuropathy in the lower urinary tract increases with age and may contribute to the increase in overactive bladder seen with aging. Independent of the effect of age, C fibers pathways are also less sensitive in women with UUI incontinence supporting the role of C fibers in overactive bladder. These changes in sensory nerve function were found in the urethra, but not the bladder, confirming the potential importance of urethral denervation in overactive bladder as well as stress incontinence.
IMPACT OF OVERACTIVE BLADDER AND INCONTINENCE ON MENTAL HEALTH AND HEALTH-RELATED QUALITY OF LIFE IN WOMEN
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1University of North Carolina, Chapel Hill, NC, USA; 2Sahlgrenska Academy at Göteborg University, Göteborg, Sweden; 3St. Thomas’ Hospital, London, UK; 4Pfizer Inc, New York, NY, USA

Introduction and Objectives: We evaluated depressive symptoms, health-related quality of life (HRQL), and bladder condition severity in women with overactive bladder (OAB), with or without urinary incontinence (UI), and in women with stress UI (SUI).

Methods: A population-based survey of adults was conducted in 5 countries. Computer-assisted telephone interviews were conducted with a geographically stratified random sample of the population (N=19,165). OAB and subtypes of UI, including mixed (MUI), urgency (UUI), and SUI, were defined per 2002 International Continence Society (ICS) definitions. Cases were individuals with OAB and/or SUI symptoms; controls were frequency matched by age, gender, and country from individuals without OAB or SUI symptoms. Cases and controls were asked in-depth questions about HRQL and depressive symptoms. The EuroQol (EQ-5D) measured overall HRQL (range of weighted utility scores, 0–1); Patient Perception of Bladder Condition (PPBC) assessed severity of bladder condition; and the Center for Epidemiologic Studies–Depression (CES-D) scale measured depressive symptoms (score range, 0–60). Lower EQ-5D scores indicated poorer HRQL, individuals reporting that their bladder condition caused at least minor problems were considered bothered, and a CES-D score ≥21 indicated major depressive symptoms.

Results: Results are summarized in the Table:

<table>
<thead>
<tr>
<th>Women</th>
<th>EQ-5D (Mean)</th>
<th>PPBC (% Bothered)</th>
<th>CES-D (% ≥21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls (n=932)</td>
<td>0.89</td>
<td>NA</td>
<td>4.6</td>
</tr>
<tr>
<td>OAB without UI (n=415)*</td>
<td>0.85†</td>
<td>22.9</td>
<td>9.4†</td>
</tr>
<tr>
<td>OAB with UI (n=507)*</td>
<td>0.81†</td>
<td>50.2‡</td>
<td>15.7†</td>
</tr>
<tr>
<td>UUI only (n=136)</td>
<td>0.83‡</td>
<td>46.0‡</td>
<td>13.0†</td>
</tr>
<tr>
<td>MUI (n=209)</td>
<td>0.80‡</td>
<td>60.1‡</td>
<td>17.0†</td>
</tr>
<tr>
<td>OAB with SUI only (n=131)</td>
<td>0.80‡</td>
<td>43.6‡</td>
<td>15.5†</td>
</tr>
<tr>
<td>OAB with Other UI (n=31)</td>
<td>0.78‡</td>
<td>29.0‡</td>
<td>20.7†</td>
</tr>
<tr>
<td>SUI only (no OAB) (n=532)</td>
<td>0.87</td>
<td>23.0</td>
<td>10.4</td>
</tr>
</tbody>
</table>

NA=not applicable, controls were not asked PPBC.
*Unable to determine continence status for 10 OAB cases; †P≤0.05 versus controls; ‡P≤0.05 versus OAB without UI.

Conclusions: This was the first multinational, population-based study to measure generic HRQL, symptom bother, and depressive symptoms using validated questionnaires and current ICS definitions. Women with OAB reported poorer HRQL and more depressive symptoms compared to controls. Diminished HRQL, increased symptom bother, and more depressive symptoms were most pronounced among patients with OAB and UI. Women with SUI without OAB reported less impact than those with OAB and any type of UI.
**Podium #19**

**THE IMPACT OF OVERACTIVE BLADDER (OAB) AND URINARY INCONTINENCE ON FEMALE SEXUAL FUNCTION USING VALIDATED INSTRUMENTS**

Paholo G. Barboglio MD, Brian Cohen MD, Angelo E. Gousse MD. University of Miami, FL

**Introduction and Objective:** There is limited data regarding the impact of urinary incontinence (UI) on female sexual function. Previous investigations have suggested an association between voiding dysfunction and female sexual function. However, no specific relationship has been previously demonstrated between the different types of voiding dysfunction and the various domains of female sexual dysfunction (FSD). The aim of this study is to evaluate the relationship between the Female Sexual Function Index (FSFI) Questionnaire and different OAB subtypes with and without associated Stress Urinary Incontinence (SUI).

**Material and Methods:** We retrospectively evaluated a database of 201 patients who presented for initial evaluation with OAB symptoms or SUI between June 2001 – July 2005. All patients who completed FSFI and subsequent urodynamics (UDS) study were included. The validated questionnaire was given to the patient at the beginning of the clinical visit and was answered in the waiting area, without the intervention of any health care practitioner. All patients were evaluated in an identical fashion by one clinician. UDS was performed on patients according to the ICS criteria. We calculated the FSFI scores for all six domains and compared them amongst the different sub-groups of voiding dysfunction: SUI, Urge UI (OAB-Wet), Mixed UI (MUI) and OAB without UI (OAB-Dry). ANOVA (one way), T-test and Pearson Chi-Square were used to test for statistical significance (p<0.05).

**Results:** A total of 199 female patients with a mean age of 53±15 (20-86) formed our database. There is no significant age difference amongst the different voiding dysfunction sub-groups (p>0.05). According to the chief complaint there were 55 (27%) patients with SUI, 53 (26%) with OAB-Wet(W), 60 (29%) with MUI and 36 (18%) with OAB-Dry(D). Table 1 illustrates the FSFI domain scores amongst the different sub-groups of voiding dysfunction: SUI, Urge UI (OAB-Wet), Mixed UI (MUI) and OAB without UI (OAB-Dry). ANOVA (one way), T-test and Pearson Chi-Square were used to test for statistical significance (p<0.05).

**Table 1**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Desire (0-6)</th>
<th>Arousal (0-6)</th>
<th>Lubrication (0-6)</th>
<th>Orgasm (0-6)</th>
<th>Satisfaction (0-6)</th>
<th>Pain (0-6)</th>
<th>Total Score (0-36)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI</td>
<td>55</td>
<td>4.6±/-1</td>
<td>2.8±/-2</td>
<td>2.9±/-1</td>
<td>2.7±/-1</td>
<td>3.4±/-1</td>
<td>3.2±/-3</td>
</tr>
<tr>
<td>OAB-Wet</td>
<td>53</td>
<td>4.3+/-2*</td>
<td>2.3+/-2*</td>
<td>2.8+/-1</td>
<td>2.5+/-1*</td>
<td>3.1+/-1*</td>
<td>3.4+/-3</td>
</tr>
<tr>
<td>MUI</td>
<td>60</td>
<td>4.5+/-1</td>
<td>3.3+/-2</td>
<td>3.0+/-1</td>
<td>3.0+/-1</td>
<td>3.4+/-1</td>
<td>3.1+/-2</td>
</tr>
<tr>
<td>OAB-Dry</td>
<td>36</td>
<td>5.0+/-1*</td>
<td>3.4+/-2*</td>
<td>2.9+/-1</td>
<td>3.2+/-2*</td>
<td>3.8+/-2*</td>
<td>3.4+/-2</td>
</tr>
</tbody>
</table>

**Table 2** *(OAB-W = OAB wet, OAB-D OAB Dry)*

<table>
<thead>
<tr>
<th>Groups</th>
<th>Desire</th>
<th>Arousal</th>
<th>Lubrication</th>
<th>Orgasm</th>
<th>Satisfaction</th>
<th>Pain</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUI vs OAB-W</td>
<td>0.209</td>
<td>0.175</td>
<td>0.714</td>
<td>0.286</td>
<td>0.255</td>
<td>0.730</td>
<td>0.219</td>
</tr>
<tr>
<td>SUI vs MUI</td>
<td>0.517</td>
<td>0.163</td>
<td>0.641</td>
<td>0.283</td>
<td>0.238</td>
<td>0.651</td>
<td>0.224</td>
</tr>
<tr>
<td>SUI vs OAB-D</td>
<td>0.186</td>
<td>0.097</td>
<td>0.995</td>
<td>0.087</td>
<td>0.167</td>
<td>0.754</td>
<td>0.152</td>
</tr>
<tr>
<td>OAB-W vs MUI</td>
<td>0.452</td>
<td>0.066</td>
<td>0.871</td>
<td>0.052</td>
<td>0.102</td>
<td>0.601</td>
<td>0.105</td>
</tr>
<tr>
<td>OAB-W vs OAB-D</td>
<td>0.022</td>
<td>0.004</td>
<td>0.795</td>
<td>0.018</td>
<td>0.042</td>
<td>0.988</td>
<td>0.034</td>
</tr>
<tr>
<td>MUI vs OAB-D</td>
<td>0.050</td>
<td>0.688</td>
<td>0.604</td>
<td>0.379</td>
<td>0.156</td>
<td>0.562</td>
<td>0.290</td>
</tr>
</tbody>
</table>

**Conclusion:** All subtypes of voiding dysfunction affect female sexual function. Overall, the desire domain is the least affected. Female patients with OAB wet appear to be the most affected. The four domains most affected in OAB wet female patients include: desire, arousal, orgasm, and satisfaction. Although there is a trend for OAB-Dry patients to be the least affected by FSD, the data was not statistically significant. Further studies evaluating the impact of voiding dysfunction subtypes on female sexual function is warranted.
**Introduction and Objective:** Intradetrusor Botulinum toxin type A (BTX-A) injection has emerged as a novel therapeutic option for the treatment of neurogenic overactive bladder (N-OAB). We designed an IRB approved prospective trial to evaluate changes in urodynamic findings, symptomatic improvement, and quality of life in N-OAB patients submitted to a scheduled re-injection BTX-A protocol.

**Methods:** 20 patients with urinary incontinence associated neurogenic detrusor overactivity and/or impaired compliance requiring clean intermittent self-catheterization were randomized to receive intradetrusor BTX-A (300 U or 400 U) as 10 U/ml/injection “trigone and dome sparing” (30-40 injections). We used Botox ® for BTX-A, which was funded by Allergan. The therapy was administrated every six months. Prior to injection, the patients were evaluated by: history, physical examination, Urogenital Distress Inventory-6 (UDI6), multichannel videourodynamics (V-UDS), and urine culture. Repeat V-UDS were obtained at 6 weeks, 6, 9, and 12 months. The above mentioned questionnaires were re-administered at every visit. Patients were re-injected using the same randomized dose and technique every 6 months regardless of response.

**Results:** Of the 20 patients who received the baseline injection, 10 patients have received a second injection and 6 a third one. During the first 6 months period after the treatment 3 patients withdrew the study. Two patients stated that they did not gain any improvement and one patient died during a motor vehicle accident. We observed a significant increase in maximum cystometric capacity (MCC) at all time points. The MCC remained higher than the baseline even after the next 2 injections until the 18 months period (Graphic 1). The maximum detrusor pressure revealed a decreasing trend that started at 6wks. This decrease reached statistically significance at 9 and 12 months after the first therapy. The study showed that detrusor overactivity and leakage are lower after 3 months of the first injection. The impaired compliance observed at baseline subsequently decreased during the study; however these values were not significant (Graphic 2).

**Conclusions:** Intramuscular injections of BTX-A into the detrusor repeated every 6 months can provide rapid, well-tolerated, clinically significant improvements urodynamic parameters. This is translated into a decrease in urinary incontinence associated with N-OAB. None of the responders became refractory after re-injection. These data indicate that repeat injections may be safe and efficacious in N-OAB patients.
Prize Essay Winner Presentations

Podium #21

DO WOMEN HAVE REALISTIC EXPECTATIONS OF TREATMENT FOR STRESS URINARY INCONTINENCE?
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Cleveland Clinic Florida, Weston, Florida

Introduction: American women have a prevalence of 30-40% of urinary incontinence depending on age.¹ This is a significant quality of life issue, and a woman’s decision for treatment is determined, in part, by her expectations of treatment.

Objective: Our objective was to determine what women find acceptable regarding treatment and outcomes for treatment of stress urinary incontinence (SUI), and correlate this to age, distress and quality of life (QOL).

Materials And Methods: This prospective IRB-approved study evaluated women with primary SUI. One hundred sequential women (mean age, 59 years) answered questionnaires on initial interview, including the Urinary Distress Index (UDI-6), the American Urologic Association QOL questionnaire, as well as other validated questions regarding treatment options and possible outcomes. SUI was confirmed with an affirmative answer to question number three on the UDI-6 indicating leakage with activity. Treatment options included major surgeries, minor surgeries, clinical procedures and medication. Beside each treatment choice was a description of efficacy and possible complications or side effects. Women were also asked to choose acceptable post treatment symptoms including never leaking; occasional small or large leak with cough or sneeze; wearing pantyliners just in case; constant pad use; and leakage with intercourse. Statistical analysis was performed using Chi Squared, Fisher Exact, and T tests as well as the Wilcoxon Rank Score.

Results: Of the 100 women who submitted questionnaires, 22% overall expected a complete cure, 57% a good improvement, 12% to be able to cope better, and 2% expected any improvement at all. We found this to be a realistic expectation of possible outcomes of treatment, with 79% expecting a good improvement or cure for their SUI. The women were also asked what type of treatment they found acceptable for their SUI: 22% found a major surgery (Burch or MMK) acceptable, 39% found a minor surgery (TOT or TVT) acceptable, 32% found a clinical procedure (bulking agent) acceptable and 7% found medication acceptable. These results were then analyzed for correlation to age, degree of distress (measured by UDI-6) and QOL (measured by AUA QOL score). The statistically significant correlations are listed in table1.

Table 1.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Correlation</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worse UDI-6</td>
<td>Surgery (major or minor)</td>
<td>Odds Ratio 10.7</td>
</tr>
<tr>
<td>Worse UDI-6 &amp; Younger Age</td>
<td>Surgery (major or minor)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Younger Age (50.7 y)</td>
<td>Major Surgery</td>
<td>0.026</td>
</tr>
<tr>
<td>Older Age (61.7 y)</td>
<td>Clinical Procedure</td>
<td>0.037</td>
</tr>
<tr>
<td>Better QOL</td>
<td>Medication Use</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>Lower Expectations</td>
<td>0.004</td>
</tr>
<tr>
<td>Worse QOL</td>
<td>Complete Cure</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>Good Improvement</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>Panty-liner Use</td>
<td>0.042</td>
</tr>
</tbody>
</table>

Conclusions: Women have overall realistic expectations of treatment for stress urinary incontinence. They are willing to accept varied results depending on their distress regarding incontinence. Choices regarding treatments are influenced by age, severity and quality of life. It may be beneficial to include the UDI-6, age and QOL score as a part of the work up and planning for treatment of stress urinary incontinence to better meet patient’s expectations.

¹ Proceedings of the national institute of diabetes and digestive and kidney disease international symposium on epidemiologic issues in urinary incontinence in women, Am. J. OB. GYN: vol 188 (6), June 2003, ppS77-S88
INCREASED EFFICACY AND POTENCY OF CARBACHOL IN INDUCING INCREASES IN INTRACELLULAR CALCIUM ([Ca2+]i) AND OUTWARD POTASSIUM CURRENTS (I0) IN OVERACTIVE BLADDER (OAB) AND INTERSTITIAL CYSTITIS (IC) HUMAN BLADDER UROTHELIAL CELLS (BUC)

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1Division of Urology, Department of Surgery, University of Maryland School of Medicine, Baltimore, MD
2Department of Neurosurgery, University of Maryland School of Medicine, Baltimore, MD
3Department of Biomedical Sciences, University of Maryland School of Dentistry, Baltimore, MD

Introduction and Objectives: BUC may play a role in bladder sensory transduction due to the fact that they can release neurotransmitters such as adenosine triphosphate (ATP), nitric oxide (NO), and acetylcholine in response to varied stimuli. Furthermore, BUC express receptors typically associated with sensory neurons such as capsaicin-receptor (TRPV1), muscarinic receptors (M2 and M3) and purinergic (ATP) receptors (P2X2 and P2X3). These findings led us to examine whether BUC respond to carbachol stimulation using electrophysiologic and intracellular calcium imaging techniques and whether there are physiologic differences in human BUC from patients with IC and OAB compared to controls.

Methods: BUC from IC and control subjects were obtained by cystoscopic biopsies and cultured in vitro as published previously. Macroscopic currents were recorded in intact cells using the conventional whole-cell configuration. For outward current measurements, the test potential was from -70 mV to 80 mV. [Ca2+]i was measured with fura-2 ratiometric microfluorimetry. Cell response curves were fitted with a modified Hill equation to obtain maximum carbachol effect (efficacy) and ED50 of carbachol (potency). To determine if changes in [Ca2+]i were due to extracellular calcium, calcium-free media was used in these experiments. Tolterodine was used to establish if these responses were mediated by muscarinic receptors.

Results: An outward potassium current was detected in IC BUC which was significantly increased with carbachol in a dose dependent fashion. Normal BUC responded with less outward current increases with carbachol. Carbachol’s efficacy to increase I0 was significantly greater in IC compared to normal BUC (72.64 ± 3.56% vs 51.42 ± 3.27%, p<0.01). Carbachol’s efficacy to increase [Ca2+]i, was significantly greater in IC and OAB compared to normal BUC (136.3 ± 5.1% and 142.7 ± 9.2% vs 92.4 ± 4.8% respectively, p<0.01). Carbachol’s potency to increase [Ca2+]i, was also significantly greater in IC and OAB compared to normal BUC (1.10 ± 0.14 µM and 0.95 ± 0.11 vs 3.36 ± 0.72 µM p<0.01). Removal of extracellular calcium completely blocked carbachol evoked increases in [Ca2+]i, in both IC, OAB and normal BUC as did application of tolterodine.

Conclusions: Carbachol induced an increase in BUC [Ca2+]i through extracellular calcium stores which results in increased outward potassium current. The potassium channel responsible for this is likely a calcium-dependent potassium channel of intermediate conductance (IK-channel). Furthermore, IC and OAB BUC were distinctly different in their response to carbachol compared to normal BUC. The significance of these findings are uncertain at this point, but these results further support the notion that IC and OAB BUC are phenotypically altered, even in an in vitro system, and could play a central role in the pathogenesis of IC and OAB clinical symptoms.

Supported by NIH R01-DK075728-01
INCREASED SUSCEPTIBILITY TO GENITOVAGINAL PROLAPSE ASSOCIATED WITH A POLYMORPHISM IN THE PROMOTER OF THE EXTRACELLULAR MATRIX PROTEIN LAMC1

Ganka Nikolova#, Christian Twiss*, Hane Lee#, Suzanne Berkovitz#, Nelson Stanley#, Janet Sinsheimer#†, Eric Vilain*# and Larissa Rodriguez*. Departments of Urology*, Human Genetics#, and Biomathematics†, UCLA, Los Angeles, California

Introduction and Objectives: Genetic factors are believed to account for about 30% of the incidence of genitovaginal prolapse, and yet are the least understood component of the disorder. Familial cases, particularly those in which prolapse manifests in young women, are especially valuable in finding genetic changes that might lead to this condition. These changes could help us understand the pathophysiology of genitovaginal prolapse not only in cases with a strong genetic component but also in sporadic cases.

Methods: We recently reported autosomal dominant transmission as the most likely mode of inheritance in a collection of families with hereditary prolapse. Of greatest interest was a family in which three generations of female relatives suffered from prolapse at a very young age, including identical twins both acquiring the condition at age 27, and the youngest affected member at age 22. A genome-wide linkage scan performed using the Affymetrix GeneChip Human Mapping 10K Array. Candidate genes were analyzed for expression in vaginal tissue by RT-PCR on samples of patients and controls. Genes confirmed to be expressed were further evaluated by sequencing and/or select single nucleotide polymorphism (SNP) genotyping for causative sequence variants in affected family members.

Results: Linkage analysis identified 10 possible regions associated with prolapse. Candidate genes within those regions were analyzed for expression in vaginal tissue by RT-PCR on samples from patients and controls. Genes confirmed to be expressed were further evaluated by sequencing and/or select single nucleotide polymorphism (SNP) genotyping for causative sequence variants in affected family members. We identified one such SNP in the promoter of the LAMC1 gene, which encodes for an extracellular protein that has been implicated not only in tissue fibrosis but also in structural changes of tissues. The rare variant segregating with the condition is present at a frequency of 5% in the general population and 22% among probands from our cohort of families. The single base change removes a binding site for E4BP4/NFIL3, a transcription factor that we verified to be co-expressed in vaginal tissue, possibly pointing to altered transcriptional regulation of the gene.

Conclusions: A polymorphism in the promoter of LAMC1 increases the susceptibility to early-onset genitovaginal prolapse. Determining the frequency of this polymorphism in a large sample of prolapse patients will allow evaluating its significance in the overall etiology of the disorder including those where genetic transmission is not observed.
SEXUAL FUNCTION BEFORE AND AFTER VAGINAL PROLAPSE SURGERY WITH ALLOGRAFT REINFORCEMENT
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Introduction and Objectives: Sexual dysfunction is a major concern among women undergoing surgery for Pelvic Organ Prolapse (POP). Prosthetic materials have been used to decrease rates of prolapse recurrence, with uncertain effects on sexual function. Little is known about the effect of dermal allograft reinforcement in advanced POP repair on sexual function. We conducted this study to assess change in sexual function and graft tolerability 1-year after POP surgery incorporating transvaginal anterior allograft.

Methods: This is an ongoing, prospective, longitudinal, cohort study, comprising all consecutive women with grade 3-4 cystocele, and or rectocele enrolled for pelvic reconstructive surgery with anterior allograft reinforcement from 09/2003 to 02/2006. Acellular dermal graft was incorporated in the anterior vaginal compartment following midline cystocele colporrhaphy. The acellular dermal graft (4-5 x 7-10 cm) was placed longitudinally and attached with permanent sutures at 3 levels to the Arcus Tendineous Fascia Pelvis (ATFP) forming a “six-point” attachment to the graft and recreating bilateral paravaginal support. Women reported on dyspareunia by using a visual analog pain scale and completed the short validated form of the Pelvic Organ Prolapse / Urinary Incontinence Sexual Questionnaire (PISQ-12) before and - year after surgery was used to compare responses to individual PISQ items pre- and postoperatively. Outcomes were compared between groups with t-tests, chi2 tests, McNemar’s test, or Fisher’s exact tests, as appropriate.

Results Obtained: Of 75 women who underwent surgery for POP with allograft reinforcement, 36 women completed over 1-year follow-up (range 6 -110 weeks). Preoperatively, 64 of 75 (85%) women in the study cohort reported to be sexually active, compared to 34 of 36 (94.4%), who reported to be sexually active at 1-year postoperatively. A midurethral sling was placed in 43 (59%) women for concomitant SUI. Median age and parity was 58 years (33-86), and 2 children (1-7), respectively. There were no cases of graft erosion. Self reported dyspareunia was present in 30/75 (40%) women preoperatively as compared with 4/34 (11.8%) 1-year postoperatively (p<0.001). Total mean sexual functioning scores based on the PISQ-12 improved by 17 points postoperatively at one year compared with preoperatively (p<0.001). For each individual PISQ question, analysis showed that 70.6% to 100% of the women had a resolution of their sexual complaint postoperatively. The percentage of responses to each individual question that remained unchanged ranged from 0 to 29%, and de novo sexual dysfunction was reported in zero to 12.5% of the questions (p< 0.008). Midurethral sling placement did not significantly affect postoperative total PISQ-12 scores (p= 0.503). Similarly, preservation of the uterus with sacrospinous hysteropexy compared to transvaginal hysterectomy with uterosacral or sacrospinous vault suspension, did not affect postoperative total PISQ-12 scores. Analysis of total mean PISQ-12 scores and individual questions revealed significant improvement in sexual function across all domains for every individual question. Size effect of the change pre- compared to one-year postoperatively for all questions but one, showed a large change (> 0.8). Size effect for the question assessing orgasm intensity showed a moderate change (0.62).

Conclusions: After one year, incorporation of dermal allograft for advanced cystocele repair appears to be safe and durable, with high rates of improved subjective self-assessment of dyspareunia and all aspects of sexual function addressed on the PISQ-12.

No financial funding was received
ISOLATED SACROCOLPOPEXY IMPROVES POSTERIOR COMPARTMENT DEFECTS
M. Guiahi, K. Kenton, L. Brubaker
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Introduction: While posterior repair has been shown to improve posterior vaginal topography, it is associated with high rates of dyspareunia and variable improvement in defecatory dysfunction. As a result, pelvic surgeons have increasingly focused on correcting the vaginal apex, believing that apical correction will improve posterior compartment topography as well.

Objective: To determine posterior compartment topography 1-year after sacrocolpopexy (SC) without concomitant posterior repair or perineorrhaphy for advanced prolapse (POP).

Methods: After IRB approval, consecutive women who had SC without concomitant anterior or posterior repair for symptomatic POP at our tertiary care center were analyzed in a standardized fashion. Participants served as their own controls. All women underwent objective POP assessment in the standing strain position using the pelvic organ prolapse quantified (POPQ) system at baseline and 1-year after surgery. Individuals were included if complete objective POP-Q data was obtained per protocol at one year and no concomitant posterior compartment surgery occurred at the time of SC or in the intervening year. Wilcoxon Signed Ranks Test was used to compare baseline and postoperative POPQ points.

Results: One hundred forty-nine women met study criteria for this analysis. Study women had a mean±SD age of 56±15, BMI of 27±7, and median parity of 3 children. The majority were Caucasian (88%). At baseline, 35 women (24%) had stage IV POP, 101 (68%) stage III, and 12 (8%) symptomatic stage II. Thirty-one percent had a concomitant Burch and 11% a concomitant sling. Table I shows baseline and 1-year postoperative measurements for the position of the apex (point C), the most prolapsed points on the anterior (Ba) and posterior (Bp) vagina, and the genital hiatus (gh). The position of the apex, most prolapsed points on the anterior (Ba) and posterior (Bp) vagina, and genital hiatus (gh) were all significantly improved after SC. There was no significant change in the total vaginal length or perineal body size (.243 and .395, respectively).

Table I: Baseline & Postoperative POPQ Points

<table>
<thead>
<tr>
<th></th>
<th>Baseline (mean±SD)</th>
<th>1-year Postoperative (mean±SD)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ba (cm)</td>
<td>3.5±2.7</td>
<td>-2±1</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>C (cm)</td>
<td>1.1±5</td>
<td>-9±2</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>Bp (cm)</td>
<td>1+3.6</td>
<td>-2+1</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>Gh (cm)</td>
<td>4±2</td>
<td>3±1</td>
<td>.001</td>
</tr>
</tbody>
</table>

Three women (2%) had re-operation after SC. Two had subsequent posterior repair for stage IIIp POP, and one had re-operation for recurrent apical POP.

Conclusions: Concomitant posterior compartment surgery does not appear necessary for restoration of posterior vaginal topography in the majority of women with who undergo sacrocolpopexy.
MECHANISM OF FEMALE URINARY INCONTINENCE IN DIABETES
Courtenay Moore, Margot Damaser, Firouz Daneshgari
Cleveland Clinic, Cleveland, OH

Introduction: Diabetes mellitus (DM) causes debilitating and devastating complications of the lower urinary tract, such as urinary incontinence. Women with diabetes are twice as likely as non-diabetic women to develop stress urinary incontinence (SUI), independent of any other risk factors. Diabetes mellitus (DM) and vaginal birth trauma have been identified as primary risk factors for the development of SUI.

Current theories on the pathophysiology of lower urinary tract complications include neuropathic and myopathic dysfunction from DM. Similarly, the mechanism of incontinence due to vaginal delivery and birth trauma is thought to be via neuropathic and ischemic damage to pelvic floor tissues. A growing body of data has implicated the accumulation of advanced glycosylation end products (AGEs) in the pathogenesis of diabetic tissue damage. AGEs form as a result of prolonged hyperglycemia and affect tissue structure and smooth muscle function. Two agents, aminoguanidine and captopril, have been shown to interfere with the formation of AGE and AGE precursors by binding to tissue receptors and promoting breakdown of AGE deposits.

Previous studies from our lab have shown that vaginal distension (VD) in diabetic animals increases the severity of diabetic urinary incontinence symptoms, as measured by leak point pressure (LPP), and alters bladder contractility.

Objectives: To determine if the administration of aminoguanidine and captopril will ameliorate or lessen the effects of VD in diabetic animals, thereby reducing the severity of incontinence after vaginal distension.

Methods: Virgin female Sprague Dawley rats were divided into five groups: DM +VD, controls + VD, DM treated with aminoguanidine +VD, DM treated with captopril + VD, and DM treated with insulin +VD. After 10 weeks of treatment the animals were anesthetized and suprapubic tubes placed. Two days after suprapubic tube placement each animal underwent pre-VD LPP, followed by a 2 hour vaginal distension and post-VD LPP. On days four and 10 CMGs and repeat LPPs were done.

Results: Of the 50 animals only 35 survived to undergo day 10 CMG/LPP. Of those animals, aminoguanidine +VD, DM treated with captopril + VD had a significantly higher LPP than DM +VD and DM treated with insulin +VD.

Conclusion: Aminoguanidine and captopril both appear to have protective effects on continence in diabetic animals after VD, suggesting that the prevention of AGE accumulation decreases the risk of incontinence among diabetic animals.
RATE OF DE NOVO STRESS URINARY INCONTINENCE AFTER URETHRAL DIVERTICULUM REPAIR
Una J Lee, Sandip P Vasavada, Howard Goldman, Firouz Daneshgari, Raymond R Rackley, Glickman Urological Institute, Cleveland Clinic Foundation, Cleveland, OH

Introduction and Objective: The most recognized complications after urethral diverticulum repair are urethrovaginal fistula, urethral diverticula recurrence, and new onset urinary incontinence. Our goal is to determine the rate of stress urinary incontinence (SUI) after urethral diverticulum repair in patients without pre-existing genuine stress urinary incontinence.

Methods: A retrospective review was conducted of female patients who had undergone urethral diverticulum repair without a simultaneous anti-incontinence procedure between Jan 2000 and July 2005. While 50 of the 66 patients identified met criteria for this study, 16 were excluded because 14 had undergone a simultaneous anti-incontinence procedure, and 2 had undergone simultaneous urethrolysis. To determine the rate of SUI, we examined the response to domain 3 of the urogenital distress inventory-short form (UDI-6) post operatively, as well as the rate of subsequent procedures for the treatment of SUI.

Results: Of the 50 female patients who underwent urethral diverticulum repair surgery, the median age was 44 (range 24 to 73). 34 (68%) were Caucasian and 16 (32%) were African-American. 29 (58%) patients had a simple diverticulum, 19 (38%) patients had a saddlebag or “horseshoe” diverticulum, and 2 (4%) patients had a circumferential diverticulum. 6 (12%) had a history of recurrent urethral diverticulum. Median follow up was 23 months (range 3 to 67 months). 35/50 (70%) patients had completed UDI-6 results as follows: 18 (51%) patients reported no stress incontinence, 10 (29%) patients reported “a little bit,” 5 (14%) patients reported “moderate,” and 2 (6%) patients reported being “greatly” bothered by urinary leakage related to physical activity, coughing, or sneezing. There was also a trend toward more significant SUI in patients with more proximally located and more extensive or saddlebag diverticulum. 5/50 (10%) patients underwent a subsequent sling procedure for SUI. 3 patients underwent a sling procedure within 5-7 months, 1 was 1.5 years following, and 1 was 5 years after her diverticulum repair. Of these 5 patients, 3 patients reported no SUI, 1 patient reported being “a little bit” bothered, and 1 patient reports being “greatly” bothered by SUI.

Conclusions: 10% of patients who underwent urethral diverticulectomy required a subsequent post operative anti-incontinence procedure. Urethral diverticulum repair predisposes women to SUI in about one-half of cases, although most often the incontinence is mild.
WHICH SLING FOR THE OBESE WOMAN? EFFICACY AND PERIOPERATIVE COMPLICATIONS OF 3 PUBOVAGINAL SLING PROCEDURES
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Introduction and Objectives: Extremes in body habitus may make pelvic reconstructive surgery more challenging and there is no consensus on the ideal surgical therapy for obese women. We aimed to evaluate outcomes and complications of pubovaginal slings (PVS) constructed from autologous rectus fascia (ARF), acellular porcine dermis (PD), and polypropylene midurethral slings (PP) in obese women (BMI≥30).

Methods: 181 women with a BMI≥30 underwent PVS since January 2002 (40 ARF, 102 PD, 39 PP). All women were preoperatively evaluated with history, pelvic examination, video-urodynamics, and quality of life (QOL) questionnaires {Incontinence Impact Questionnaire (IIQ SF-7), Urogenital Distress Inventory (UDI-6), and global satisfaction visual analog scale (VAS)}. SEAPI scores were assessed (stress incontinence, emptying, anatomy, protection, inhibition). Postoperatively, all patients were evaluated with history, physical, SEAPI and QOL measures. Cure was defined as no incontinence of any type (SEAPI composite = 0), no pad use, and subjective satisfaction. Women were considered improved if they reported > 50% improvement in their incontinence and > 50% reduction in pad use. Statistical evaluation of perioperative variables was conducted using chi-square analysis.

Results: Mean follow-up was 32 months (minimum 12 months) for the entire cohort. Women undergoing PP PVS had a shorter mean follow-up period than the other 2 groups (14 months vs. 30 months, p<0.001). Demographics and preoperative pad use were not statistically (NS) different between the 3 groups. Patients receiving a PP PVS had higher valsalva leak point pressures; however, this was not statistically significant. Preoperative SEAPI scores, IIQ, UDI, and VAS were not statistically different for the 3 groups. While over 70% of women in each group had no intraoperative or postoperative complications (NS), women undergoing PP PVS had fewer postoperative complications overall (NS). Most adverse sequelae were due to transient urinary retention, delayed vaginal healing, and superficial abdominal wound infections. Cure rates were 67.5%, 59.8%, and 74.4% for ARF, PD, and PP, respectively (NS). Significant improvement in postoperative SEAPI scores, IIQ, UDI, and VAS was achieved for each group; however, the difference between groups was not statistically significant.

Conclusions: Sling surgery utilizing autologous, xenograft, and synthetic materials reveals similar durable outcomes in women with a BMI≥30. While the incidence of postoperative complications is not significantly different between the 3 groups, polypropylene midurethral slings appear to be associated with fewer overall complications in this population. This may be explained by limited operative dissection and no harvesting requirement. Obesity alone should not be a deterrent in considering, and offering, a variety of surgical procedures for treatment of stress incontinence.
SCIATIC NERVE INJURY INDUCES DE NOVO EXPRESSION OF THE CHEMOKINE MONOCYTE CHEMOATTRACTANT PROTEIN-1 (MCP-1/CCL2) AND ITS COGNATE RECEPTOR, CCR2, IN BLADDER-ASSOCIATED PRIMARY AFFERENT NEURONS.

Mary P. FitzGerald, Kara Brogan, Matthew Ripsch, Fletcher A. White. Loyola University Medical Center, Maywood, IL.

Objectives: Many patients with painful bladder syndrome can recall a somatic injury that predated the onset of their symptoms, suggesting that relevant somatic injury might alter visceral sensation and/or function. A prime candidate for this type of neuronal plasticity following peripheral injury is the chronic upregulation of the chemokine, monocyte chemoattractant protein-1 (MCP-1/CCL2). Prior animal studies from our center have demonstrated upregulation of MCP-1 and its cognate receptor, CCR2, in neurons directly impacted by a sciatic nerve injury (L4-L6 dorsal root ganglion (DRG)) as well as adjacent, uninjured neurons (L3 DRG). Our objective was to determine whether visceral sensory neurons present in the thoracic, lumbar and sacral DRGs might also exhibit upregulation of chemokines/receptors and hyperexcitability following somatic injury.

Methods: We used an established model of neuropathic pain (transient focal demyelination of the sciatic nerve) as a model of somatic injury. We utilized a combination of retrograde axon tracing techniques to label primary afferent neurons after bilateral injections into the rat bladder wall (cholera toxin β subunit conjugated to a fluorescent marker; CTB-555) to identify bladder afferent neurons, and used immunocytochemistry to identify chemokine/receptor-positive neurons in thoracolumbar and sacral DRGs. Control rats underwent retrograde labeling of bladder afferents but did not undergo sciatic nerve injury.

Results: CTB-555 positive bladder afferents were present in T13-L2 and L6-S2 DRGs. Many CTB-555-positive neurons in those ganglia also exhibited de novo expression of MCP-1/CCL2 and to a lesser degree, the chemokine receptor CCR2, following sciatic nerve injury (Figure). No such expression of chemokines was seen in control rats that underwent retrograde labeling of bladder afferents but did not undergo sciatic nerve injury.

Conclusions: In an animal model, sciatic nerve injury has been shown to produce neuronal phenotype changes in both the somatic primary afferent neurons in the DRGs directly impacted by the somatic injury and also in adjacent, uninjured visceral primary afferent neurons affiliated with the bladder. As MCP-1/CCR2 signaling is known to influence excitability of sensory neurons and neuropathic pain behavior; upregulation of this ligand/receptor pairing may impact visceral sensory neurons in a similar fashion and contribute to the symptomatology of PBS/IC.
CALCITONIN GENE-RELATED PEPTIDE RELEASE IS NOT INHIBITED BY ANTICHOLINERGICS IN ACUTE INJURY RAT BLADDER MODEL
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¹Department of Urology, ²Department of Anesthesia & Critical Care, University of Chicago, Chicago, IL

Introduction: Clinical and scientific data suggest that anti-muscarinic anticholinergic medications most commonly used to treat overactive bladder symptoms have effects on sensory nerves in addition to their familiar motor neuron activity. Calcitonin Gene-Related Peptide (CGRP) is a sensory neuropeptide commonly used as a marker of afferent nerve activity. We sought to evaluate the hypothesis that anticholinergic medications exert an inhibitory effect on sensory actions of the bladder in conditions of inflammation. Accordingly, the effects of tolterodine and solifenacin on the release of CGRP in an acute injury rat bladder model were studied.

Methods: Whole rat bladders were incubated in a series of tissue baths containing physiological salt solution (PSS). To induce bladder injury and evoke CGRP release, bladders were incubated in PSS containing HCl (0.04M). To measure the effect of anticholinergics on bladder injury, the tissue was incubated in an organ bath containing tolterodine, solifenacin or vehicle either before (pre-incubation group) or following (post-incubation group) HCl exposure. A dose of (100µM) was used for solifenacin studies. Doses ranging from 1µM to 500µM were used for tolterodine study to assess the effect of dose on drug action. CGRP release was determined by radioimmunassy.

Results: Mean baseline release of CGRP ± SEM was 9.5 ± 0.65 pg/gm for the pre-incubation group and 38 ± 8 pg/gm for the post-HCl incubation group. Exposure to HCl increased CGRP release by 90% over baseline for both arms (545 ± 101 pg/gm, p < 0.038 for pre-incubation and149 ± 28 pg/gm, p < 0.003 for post-HCl incubation). Application of either tolterodine or solifenacin did not affect the release of CGRP in either the pre- or post-incubation groups when compared with controls.

Conclusions: Neither tolterodine nor solifenacin inhibited the release of CGRP from afferent nerve terminals in an acute injury rat bladder model. Accordingly, the actions of anticholinergic medications on sensory neurons described by other authors may not occur through transient receptor potential (TRP)-mediated pathways. Further investigation of anticholinergic actions on purinergic- and neurokinin-mediated pathways is needed.
EVIDENCE FOR CENTRAL HYPEREXITABILITY IN PATIENTS WITH INTERSTITIAL CYSTITIS

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David Geffen School of Medicine at UCLA and Departments of Urology†, Psychology*, and Psychiatry and Biobehavioral Sciences**, and The UCLA –VA Center for Neurovisceral Sciences and Women’s Health‡, Los Angeles, CA

Introduction: The pain of interstitial cystitis (IC) appears to be a visceral pain syndrome with a significant central and neuropathic component. The overlap of IC with other conditions such as irritable bowel syndrome suggests sensitization to visceral stimuli via upregulation of central pathways of pain perception. The startle blink reflex (SBR) is a defensive reflex consisting of an involuntary eye-blink in response to sudden intense stimuli. This reflex is directly modulated by outputs from the amygdala, a component of the limbic system which is involved in the modulation of emotional states (i.e. fear or anxiety) and physical sensations (i.e. pain). Increases in SBR magnitude represent an objective, non-invasive index of affective response to specific stimuli, such as threat of pain. In order to test the hypothesis that IC patients have a possible upregulation of central pain modulation pathways, we compared the SBRs of healthy controls with that of IC patients.

Methods: SBRs were examined for 6 female IC patients and 19 healthy female controls under alternating threat and safe periods. During threat periods, subjects were warned that they may receive aversive electrical stimulation to their bladder region. Each threat period consisted of an early and late phase. If stimulation was to occur, it would occur during the late phase. No electrical stimulation was given during safe periods. To maintain anticipation, stimulation of moderate intensity was given once. SBRs (assessed by electromyographic response of the orbicularis oculi muscle following a 50 ms burst of white noise at 105dB) were measured during all phases. Mixed-effects analysis for repeated measures was applied to determine the influence of diagnosis (IC, Control), threat (Danger, Safe) and phase (Early, Late) on the square-root transformed SBRs.

Results: Significant main effects were observed for diagnosis (p=.008), threat (p<.001), and phase, (p<.001) as well as an interaction between all 3 parameters (p=.045). Patients with IC had significantly greater estimated mean SBRs than controls during early and late safe periods (mean±SE SBR 12.4±1.1 vs. 8.5±0.6, p=0.003, and 12.7±1.1 vs. 9.3±0.6, p=0.01, respectively) and during the early danger period (13.9±1.1 vs. 9.7±0.6, p=0.001, respectively). During the late danger period the SBRs of IC patients and controls were similar (15.1±1.1 vs. 14.1±0.6, p=0.46, respectively).

Conclusions: This initial data indicates that patients with IC have significantly greater SBRs than controls during baseline and during the non-imminent threat periods of the study. This pattern of a heightened startle response in the context of a threat, but not during the imminent threat of pain is indicative of an enhanced context-potentiated startle reflex in IC patients. A similar alteration of the startle reflex has been observed in humans with anxiety disorders and post-traumatic stress disorder. This data provides objective evidence that patients with IC may have upregulation of limbic responses involved in anxiety and stress which can in turn lead to altered pain perception and abnormal modulation of ascending afferent pain signals. Further investigation is needed to determine if this upregulation is a causative agent or a secondary effect of the IC disease process.

Supported by NIH grants P50 DK64539, R24 AT002681 and VA Medical Research, and the Fishbein Family IC Research Foundation.
Podium #32

THE ROLE OF THE NF-κB SIGNALING PATHWAY AND APF IN THE PATHOGENESIS OF INTERSTITIAL CYSTITIS
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* Division of Urology, University of Maryland School of Medicine, Baltimore, MD
+ Learner Research Institute, Cancer biology, Cleveland Clinic, Cleveland, Ohio

Introduction and Objectives: IC is a chronic debilitating urothelial inflammatory and cytodegenerative condition of the bladder. Our hypothesis is that the NF-κB signaling pathway is an essential signaling mechanism for the pathogenesis of the inflammatory and cellular change/loss response of the bladder urothelium in IC. To test this hypothesis, we have compared NF-κB signaling in primary cultures of normal urothelium (NU) to IC urothelium exposed to TNF-α, as well as, primary cultures of NU exposed to antiproliferative factor, APF, a biomarker produced by IC cells.

Methods: NU and IC cells were established in Keratinocyte-SFM. Expanded cells were switched to serum-free MEM for 24hrs before treated with TNF-α over a 24hr time course and whole cell extracts were prepared for EMSA and Western blot analyses. In situ cell death assays were performed in all cells treated with TNF-α for up to 96 hrs including NU cells first exposed to antiproliferative factor (APF) for 48hrs prior to TNF-α challenge. Apoptosis was detected by TUNEL assay.

Results Obtained: EMSA and Western blot analyses showed that IC cells have dysfunctional NF-κB signaling compared to NU when challenged with a one time dose of TNF-α. The NU cells always have an ~2 fold increase in NF-κB activation over baseline that declines after 30mins, but then is followed by weaker rebound activation around 6hrs. In comparative difference, the IC cells typically have a stronger activation at 30mins, but the second rebound wave never appears. The cytoprotective outcome of comparative NF-κB signaling was tested via in-situ cell death assays. Compared to NU that had no cell death increasing over time, apoptosis was induced in IC cells by TNF-α treatment. For NU cells exposed to APF prior to TNF-α challenge, apoptosis was inducible in the NU when challenged with TNF-α; thus confirming the ability of APF to induce an IC phenotype in NU cells.

Conclusions: Comparison of the TNF-α activated NF-κB signaling pathway in IC represents a dysfunctional urothelial response (aberrant internal cellular control of the signaling pathway) to extracellular stimulation. This dysfunctional signaling results in cytoprotective losses that lead to urothelial apoptosis.

Financial Funding: NIH-NIDDK-R21-DK 066135, NIH-NIDDK-R01-DK 52596 and NIH NCI RO1 CA84406
THE EFFECT OF INTRAVESICAL RESINIFERATOXIN, OXYBUTYNIN, AND LIDOCAINE ON THE AFFERENT AUTONOMIC BLADDER SENSORY THRESHOLD IN RAT

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Introduction: Clinical efficacy of intravesical administration of Resiniferatoxin (RTX), Oxybutynin and Lidocaine have previously been reported. However, details regarding mechanisms of these pharmacological agents remain unknown. Recently we have developed a novel animal model that allows assessment of neuro-selective bladder sensory function using Neurometer®, by measuring the bladder sensory threshold (BST).

Objectives: To evaluate the afferent fiber-selective effect of intravesical RTX, Oxybutynin, and Lidocaine on sensory thresholds of the bladder in rats.

Materials and Methods: A total of 28 female Sprague-Dawley rats were used. We implanted a newly developed device in the bladder to assess electrical sensory threshold. The Neurometer® electrostimulator was used to apply sine-wave electrical stimulation at 250 Hz and 5 Hz (reported to be selective for A-delta and C-fibers, respectively) using to the bladder mucosa at increasing intensity until a startle or vocalization response was observed. The minimum intensity, at which that response was seen, was defined as the bladder sensory threshold (BST). Three days after implantation, RTX, Oxybutynin, Lidocaine or saline was instilled intravesically. Conscious BST measures were recorded prior to administration and at 1 and 24 hours post-instillation.

Results: Intravesical administration of Oxybutynin or saline did not affect the BST values at either 250 or 5 Hz. A significant increase in BST was observed 24 hours post-instillation of RTX at a stimulus frequency of 5Hz (p=0.028). One hour post-instillation of Lidocaine, a significant increase in BST was observed at stimulus frequencies of 250 and 5 Hz (p=0.028, and p=0.028, respectively), however, 24 hours post-instillation BST returned to near baseline values.

Conclusions: We were able to assess fiber-selective responses of bladder afferent pathways by measurement of bladder sensory threshold. Our animal model could be used for assessment of afferent bladder pathways in various pathological conditions, as well as for evaluating the effect of therapeutic agents on afferent bladder sensory function.

Table: BST values prior to, 1 hour after, and at 24 hours after intravesical administration

<table>
<thead>
<tr>
<th>Agent</th>
<th>Frequency</th>
<th>Baseline BST</th>
<th>Post-instillation BST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 hour</td>
</tr>
<tr>
<td>Saline (n=7)</td>
<td>250 Hz</td>
<td>26.8±4.7</td>
<td>28.4±4.4</td>
</tr>
<tr>
<td></td>
<td>5 Hz</td>
<td>14.4±3.4</td>
<td>14.8±2.4</td>
</tr>
<tr>
<td>Oxybutynin (n=7)</td>
<td>250 Hz</td>
<td>32.7±7.0</td>
<td>30.0±7.9</td>
</tr>
<tr>
<td>(0.5mg/ml)</td>
<td>5 Hz</td>
<td>13.8±4.9</td>
<td>14.9±5.6</td>
</tr>
<tr>
<td>Resiniferatoxin</td>
<td>250 Hz</td>
<td>29.6±5.4</td>
<td>32.1±11.5</td>
</tr>
<tr>
<td>(n=7)</td>
<td>5 Hz</td>
<td>12.6±4.5</td>
<td>12.5±4.1</td>
</tr>
<tr>
<td>Lidocaine (n=7)</td>
<td>250 Hz</td>
<td>26.6±8.6</td>
<td>40.5±6.4</td>
</tr>
<tr>
<td>(4%Lidocaine solution)</td>
<td>5 Hz</td>
<td>12.5±5.3</td>
<td>22.9±6.8</td>
</tr>
</tbody>
</table>

Data are expressed as means ± standard deviations

*, P<0.05, statistically significant difference from baseline values using Wilcoxon sign-rank test

Funding Source: Supported by NIH Grant HD-04-018
Podium #34

URINARY HB-EGF, APF VARIATION WITH SYMPTOM SEVERITY AND MENSTRUAL CYCLE IN PATIENTS WITH PAINFUL BLADDER SYNDROME
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Introduction and Objectives: Urinary heparin-binding epidermal growth factor (HB-EGF) and ‘antiproliferative factor’ (APF) have been suggested as promising markers for the presence of IC. Our objectives were to determine whether similar findings were present in patients with symptomatically diagnosed PBS and to explore whether HBEGF/APF levels varied within PBS patients with symptom severity or with menstrual cycle phase.

Methods: We included ten menstruating PBS patients with PBS symptoms and monthly menses, ten nonmenstruating PBS patients with PBS symptoms and no menses, and ten asymptomatic controls with no PBS symptoms and monthly menses. Subjects donated midstream clean-catch urine samples weekly during a menstrual cycle. Samples were centrifuged and stored in aliquots at −80°C. HB-EGF concentration was determined by a direct capture method utilizing triplicate urine samples in an Immulon 4 HB Elisa plate, incubated overnight at 4°C. HB-EGF signal was revealed with a monoclonal antibody to HB-EGF (1:250, R&D) followed by goat anti-mouse IgG horseradish peroxidase (Santa Cruz). The signal was developed with an ABTS kit from KPL and measured spectrophotometrically at 405nm. HB-EGF concentration was determined by linear regression using a standard curve generated with carrier-free HB-EGF (R&D). APF activity was determined by using a standard MTS proliferation assay with T24 bladder carcinoma cells. T24 cells were plated in growth media containing 10% serum at a density of 10,000 cells per well in a 96-well plate, cells were allowed to attach overnight then changed to a serum free medium. Urine aliquots were adjusted to an osmolarity of 300mOms, sterile filtered and then added to the cell culture wells, at a concentration of 1/3 urine to 2/3 serum free media and allowed to grow for a further 36 hours. Cells were rinsed with buffer and fresh media containing MTS solution, readings were taken at 1, 2, 3, and 4 hours after addition of MTS. Data were expressed as a percentage of control, serum-free wells. We analyzed data to determine the effect of cycle week and diagnosis across the three patient populations by repeated measures ANOVA, controlling for age.

Results: There was considerable variability in HBEGF values during repetitive testing of individual patients, but mean HBEGF values were significantly lower in the PBS groups (median 29, range 24-51ng/mL) than in asymptomatic controls (median 36, range 27-47ng/mL;p=0.045). HBEGF did not vary significantly with age or with the week of menstrual cycle, nor with symptom ratings. There was no difference in T24 proliferation rates when patients with PBS were compared to controls. However, urine from two PBS patients demonstrated marked inhibition of T24 cell proliferation.

Conclusions: Our study supports and extends the findings of others concerning HBEGF as a possible marker for IC/PBS. In PBS patients, the mean of more than one urinary HBEGF value may prove to be a more discriminatory tool than single HBEGF values. Although two patients with PBS demonstrated considerable inhibition of T24 cell proliferation, consistent with the presence of APF, the urine from PBS patients overall did not inhibit proliferation and we were unable to extend prior findings with respect to APF and IC, to patients with symptomatically diagnosed PBS.

Funded by: NIH:DK066076
MECHANISM OF ACTION OF SACRAL NEUROMODULATION: CENTRAL OR PERIPHERAL?
Veronica Triaca*, Nasim Zabihi*, Christian Twiss*, Cheri Geist†, Shlomo Raz*, Daniel Silverman†, Larissa V. Rodriguez*
Departments of Urology*, Molecular and Medical Pharmacology†, and Nuclear Medicine†, and the Ahmanson Biological Imaging Division†, The Geffen School of Medicine at UCLA, Los Angeles, CA.

Introduction and Objectives: Sacral neuromodulation has been successfully utilized in the treatment of voiding dysfunction including symptoms of frequency, urgency, urge incontinence, urinary retention, and, more recently, painful bladder syndrome. The mechanism of action of sacral neuromodulation remains unknown. It has been suggested that sacral neuromodulation might exert some of its actions in the central nervous system (CNS). The purpose of this study was to evaluate the central effects of sacral neuromodulation.

Materials and Methods: Patients were selected from a database of individuals who had undergone sacral neuromodulation and had completed a set of validated questionnaires pre-operatively and 6 months post-operatively including the short form of the Urogenital Distress Inventory (UDI-6) and the Global Response Assessment questionnaire. Patients with over 50% improvements in the above questionnaires were classified as responders to therapy. Three responders and 3 non-responders participated in the study. PET scans were performed by dynamic imaging with a Siemens/CTI 953tomograph (Siemens Computer Technology Inc., Knoxville, TN). PET data was subjected to statistical parametric mapping analysis using the software package SPM95 (provided by K. Friston, MRC Cyclotron Unit, London, England) and by region of interest analysis. To rule out confounders in the data, all patients were scanned in the following four conditions: (1) neurostimulator device off, (2) anticipation of neurostimulation, (3) sacral neurostimulation at a threshold resulting in patient sensations, (4) sacral neurostimulation at a lower threshold resulting in no detectable sensations to the patient. This study design allowed for differentiation between responders and non-responders, and differentiation in CNS signals due to anticipation, to neurostimulation, and/or to sensory input from the device.

Results: Signals from the right premotor, somatosensory and supplementary motor cortices were silenced once the stimulation was turned on (p < 0.005). Additionally, the amygdala and frontal cortices were activated with stimulation (p < 0.005). The responder group had a more profound deactivation in the area of right premotor cortex and a stronger activation in some areas of the frontal cortex (p<0.005). There was not a significant difference between the anticipation state and the off state.

Conclusions: Sacral neurostimulation appears to modulate the CNS. The amygdala (important component of the limbic system) and parts of the frontal cortex seem to be up-regulated while the premotor, somatosensory and supplementary motor cortices appear to be down-regulated with sacral neuromodulation. These differences appear to be evident in patients who respond to therapy. It is not clear if modulation of the peripheral nerves leads to stimulation and changes in signaling in the CNS as a result of the plasticity of the nervous system or if sacral neuromodulation has a direct effect in CNS responses. More research is needed to elucidate the mechanism of action of sacral neuromodulation and the role of the CNS in modulating peripheral and voiding responses.

This project was funded by a grant from Medtronic Inc., Minneapolis, Minn., USA.
Introduction and Objectives: Stage I trials of unilateral sacral neuromodulation therapy (SNT) for treating urinary retention (UR) typically achieve a 50% progression rate to a Stage II implant with durable persistence. Our 1st objective was to compare the progression rate of a bilateral Stage I lead trial to previous results achieved in unilateral Stage I trials from our existing database. The 2nd objective was to compare whether the progression rate was associated with the final choice of a unilateral versus bilateral lead.

Methods: A cohort of 71 female patients with urinary retention has been treated with SNT over the last 4 years as identified in our single center, multi-physician database. More recently, 12 consecutive patients have undergone bilateral S3 lead placements at the time of Stage I and serve as a comparative cohort for evaluating progression rate outcomes. Patients undergoing bilateral S3 lead placements were randomized in the trial to the right versus the left lead during the initial use of both unilateral lead trials (5 days each) prior to a final bilateral lead trial (4 days) during the Stage I testing of 14 days.

Results Obtained: Of the 71 patients with UR who underwent a trial of unilateral Stage I S3 lead placements, 61 (86%) progressed to unilateral Stage II. Out of the 10 patients who had the explants done at Stage I, 2 were due to early lead infections. Twenty-two patients had explants following Stage II, 19 (86%) of these explants were due to lack of efficacy over time. Thus, 39 out of 71 patients (55%) continue to remain implanted and derive benefit from SNT. Out of the 13 patients who had bilateral S3 lead placements at the time of Stage I, 12 (92%) progressed to Stage II having achieved a satisfactory response; only 1 patient chose unilateral S3 lead placement following the randomized trial of unilateral and bilateral lead stimulation. One of 13 patients in this cohort has been explanted following Stage II for lack of a durable response.

Comparison between unilateral vs. bilateral lead placement Stage I trials of SNT for UR

<table>
<thead>
<tr>
<th>Stage I Trial Procedure</th>
<th>Total Stage I Trials</th>
<th>Stage I Lead Explants</th>
<th>Progression to Stage II</th>
<th>Stage II Explants</th>
<th>Final Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unilateral Stage I</td>
<td>71</td>
<td>10</td>
<td>61 (86%)</td>
<td>22</td>
<td>39 out of 71 (55%)</td>
</tr>
<tr>
<td>Bilateral Stage I</td>
<td>13</td>
<td>1</td>
<td>12 (92%)</td>
<td>1</td>
<td>11 out of 13 (85%)</td>
</tr>
<tr>
<td>Bilateral Stage I but chose unilateral for Stage II</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1 of 13 chose unilateral stimulation (8%)</td>
</tr>
</tbody>
</table>

Conclusions: Although the cohort of the patients trialed with bilateral leads at the time of Stage I is much smaller than the cohort undergoing a unilateral lead, the final success rate for a bilateral leads is much higher and only one patient ultimately chose unilateral stimulation for the Stage II procedure. A continuation of our prospective trial of bilateral placement with randomization of the unilateral lead trials prior to bilateral lead stimulation is warranted.

Financial Funding: None
Podium #37

MANAGEMENT OF NON-OBSTRUCTIVE URINARY RETENTION IN FEMALE PATIENTS WITH SACRAL NEUROMODULATION
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Department of Urologic Surgery, Vanderbilt University Medical Center, Nashville, TN, USA

Introduction: Idiopathic, non-obstructive urinary retention in the female patient is a challenging clinical problem without a gold standard management option. Sacral neuromodulation is an FDA approved treatment modality for refractory non-obstructive urinary retention. We sought to evaluate our experience with sacral neuromodulation in the management of female patients with idiopathic, non-obstructive urinary retention.

Materials and Methods: A retrospective review of our neuromodulation database between June, 2002 and March, 2006 identified 19 female patients who underwent sacral neuromodulation as treatment for non-obstructive urinary retention at Vanderbilt University. All patients underwent a comprehensive urologic evaluation consisting of history, physical examination, ultrasound post-void residual, cystoscopy, and fluoro-urodynamic studies. Exclusion criteria included patients with known neurogenic bladder dysfunction, urethral obstruction following SUI surgery, and patients with increased EMG activity on pressure-flow study (PFS). Sacral neuromodulation was performed as a 2 stage procedure with a 7 day test stimulation period. Patient’s demonstrating at least a 50% improvement (catheterization volume and/or frequency) subsequently underwent placement of the implantable pulse generator (IPG). Outcomes were assessed both subjectively and with voiding diaries.

Results: The mean age of our cohort was 52 years and average follow-up was 11 months. Overall, the mean post-void residual prior to neuromodulation was 352 ml and the average maximal detrusor pressure was 11.7 cm water. Four patients were unable to void during the PFS. 2 of these 4 responded to stimulation. Mean preoperative duration of symptoms 28.5 mo (12-70months). Seventeen patients responded favorably to test stimulation (decreased PVR and/or catheterization frequency) and underwent placement of the IPG. Following IPG placement, ten patients (59%) reported decreased CIC frequency and PVR less than 150 ml; 2 (12%) patients reported decreased CIC frequency with a persistently elevated PVR; 5 (29%) patients reported no improvements in CIC frequency and continued to have elevated PVR. Interestingly, 10 patients had a history of hysterectomy and 50% demonstrated subjective and objective benefit from sacral neuromodulation. PFS were not predictive of response to sacral neuromodulation.

Conclusions: Despite a high clinical response rate to test stimulation, only 10 patients demonstrated persistent objective benefit following IPG placement, suggesting that there is a significant placebo response when utilizing subjective outcome parameters during the test phase. Objective voiding diary parameters should be utilized to best select patients with non-obstructive retention who will achieve long-term benefit from sacral neuromodulation.
Podium #38

SACRAL NEUROMODULATION FOR THE TREATMENT OF FECAL INCONTINENCE AND VOIDING DYSFUNCTION IN WOMEN
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Introduction: Sacral neuromodulation (SNM) has been shown to be an effective treatment for voiding dysfunction (VD). Fecal incontinence may co-exist in 40% of VD cases and represents another aspect of pelvic floor dysfunction with few effective therapies outside of diverting colostomy. This pilot study aims to identify the efficacy of SNM in the treatment of fecal incontinence in patients presenting with concomitant VD.

Methods: A cohort of 281 female patients with VD undergoing SNM therapy was identified from a single center, multi-physician database. Females with VD +/- fecal incontinence were identified as cases and controls respectively. Relative risk for Stage I SNM success and Stage II explantation in the fecal incontinence group was calculated using multivariate analysis for a retrospective cohort study. Patient Global Assessment Scores for severity and improvement (PGII, PGIS) of symptoms were obtained.

Results: Twenty-six individuals with voiding dysfunction and fecal incontinence were identified. A statistical difference in parity was identified between the two cohorts (Table 1a). Stage I success rates and Stage II explant rates for the fecal incontinence groups were 88% and 9.5% respectively (Table 1b). When compared to controls, no statistical difference was identified. Using a multivariate model, a history of fecal incontinence was not a predictive factor or SNM explantation. At a 50% percent survey response rate, eight out of 12 patients (66%) reported an improvement in fecal incontinence symptoms. Seven of 12 patients (58%) reported either mild to normal status in terms of fecal incontinence severity. One patient with failure of SNM proceeded to have an end colostomy.

Conclusion: Similar efficacy is achieved with SNM in VD patients with concomitant fecal incontinence as compared with controls. Significant patient satisfaction indicates that SNM appears to provide another therapeutic option for patients with complex pelvic floor dysfunction. Replication of this data and prospective trials comparing SNM in the setting of other pelvic health conditions that include fecal incontinence will better determine the role of SNM in the treatment of this disorder.

| Table 1a. Demographics for all patients split up by fecal incontinence status (N=281) |
|-----------------------------------|-----------------------------------|-----------------|
| Fecal incontinence (N=24) | No fecal incontinence (N=257) | p-value |
| N Mean (s.e.) | Median (range) / N (proportion) | N Mean (s.e.) | Median (range) / Proportion |
| Age 24 | 56 (2.6) | 55 (41, 83) | 257 | 52 (1.0) | 50 (18, 87) | 0.1975 |
| Parity 19 | 3.5 (0.7) | 3.0 (0, 11) | 196 | 2.0 (0.1) | 2.0 (0, 10) | 0.0283* |
| Parity greater than 2 19 | 11/19 = 58% | 196 | 70/196 = 36% | 0.0808 |
| Hysterectomy 23 | 15/23 = 65% | 250 | 129/250 = 51.6% | 0.2760 |
| Other pelvic surgery 24 | 8/24 = 33% | 257 | 93/257 = 36.2% | 0.8283 |
| Overactive bladder 24 | 22/24 = 91.7% | 257 | 216/257 = 84.0% | 0.5511 |
| Pelvic pain 24 | 3/24 = 13% | 255 | 67/255 = 26% | 0.2159 |
| Retention 24 | 2/24 = 8% | 257 | 69/257 = 27% | 0.0499* |
| Diabetes 24 | 5/24 = 21% | 257 | 31/257 = 12% | 0.2093 |

| Table 1b. Outcomes split up by fecal incontinence status (N=281) |
|-----------------------------------|-----------------|
| Fecal incontinence (N=24) | No fecal incontinence (N=257) |
| N Proportion | N Proportion |
| Stage II implantation (Stage I success) 24 | 21/24 = 88% | 257 | 213/257 = 82.9% |
| Stage II interstim explanted 21 | 2/21 = 9.5% | 213 | 23/213 = 10.8% |
MAGNETIC RESONANCE IMAGING FOLLOWING INTERSTIM™ THERAPY

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Introduction: Following FDA approval of neuromodulation, this treatment modality is being utilized with increasing frequency. As more patients are implanted, the complex problem of needing an MRI in patients with InterStim™ devices will be encountered. Although MRI following placement of InterStim therapy has not been approved by Medtronic or the FDA, one study has examined the safety or feasibility of performing an MRI. However this study did not include imaging inferior to the thorax. We present an institutional experience of patients undergoing MRI including the lumbar spine and pelvis after implantation of InterStim devices.

Objectives: To evaluate patient safety and InterStim function after MRI in patients with an InterStim unit in place.

Methods: A retrospective analysis of our InterStim database was undertaken. 10 patients after implantation of InterStim underwent MRI (including both open (0.6 Tesla (T)) and closed machines (1.5 T)). In 9/10 patients the following Interstim settings were used: the voltage amplitude was set to zero and the IPG was turned off, and the magnetic switch on the IPG was turned off. Following the MRI, we assessed the following: patient safety, interference of IPG device with radiologic interpretation, any change in function of the Interstim device, and any change in a patient’s perceived efficacy.

Results: 10 patients underwent MRI following implantation of InterStim. Our initial patient had a failure of the IPG device following MRI. For this patient the voltage amplitude was set to zero and the IPG was turned off. The patient underwent MRI uneventfully however upon reprogramming the device did not function at all. Since this patient we followed the same protocol but in addition turned the magnetic switch off on the IPG. Using this protocol, 15 MRIs on nine patients with InterStim devices were done. Nine MRIs were performed on 1.5 Tesla MRI and 6 on 0.6 Tesla MRI. The average time from implantation to first MRI was 754 days with a range of 183 to 2053. Nine of the 15 MRIs were of the lumbar spine and one was of the pelvis. The remainder of the exams involved imaging the brain or cervical spine. There were no adverse patient safety issues during or following the MRI. The IPG or sacral leads did not interfere with interpretation of the MRI examination. Six of the nine patients (11 total exams) had their InterStim reprogrammed following MRI. The InterStim devices functioned appropriately following re-programming. The other three patients had functioning InterStim units prior to MRI that were later removed because of a lack of efficacy unrelated to the MRI. There were no episodes of aberrant stimulation or lack of efficacy following the MRI studies in all patients who derived symptom improvement from the InterStim units.

Conclusion: Although MRI following placement of InterStim therapy has not been approved by Medtronic or the FDA, in our experience with the settings described above, MRI does appear feasible under controlled conditions without adverse effects.

- *Medtronic, Inc, Minneapolis, Minnesota
- No financial funding involved in this study.
Introductions and Objective: Few researchers examine female sexual dysfunction (FSD) and sexual distress in women with Interstitial Cystitis (IC). Some studies report dyspareunia or alterations in quality of life in women with IC, but specific areas of FSD have not been reported. The objective was to evaluate FSD and sexual distress in women with IC vs. a control group.

Methods: A mailed survey developed by the investigators was sent to 5000 randomly selected women from the United States (controls) and 407 women diagnosed with IC from a large referral center (cases). A total of 215 women with IC (53%) and 823 (16%) of the control group responded. This comprehensive survey utilized the validated Female Sexual Distress Scale (FSDS) and additional questions about sexual function, desire, orgasm and pain to explore the multiple dimensions of FSD. Student t-test was used to compare means and chi-square was used to compare proportions between cases and controls.

Results: The two groups were similar with respect to age, ethnicity and educational level. All of the cases and 98.4% of the controls stated they had sexual intercourse during adolescence and their levels of sexual desire and frequency of orgasm did not differ significantly. However, a higher proportion of the women with IC reported they had fear of pain and actually had pain with intercourse than controls in adolescence (32.5% and 18.5%, respectively). This difference was statistically significant (OR 1.76 CI 1.19 – 2.59). In adulthood, sexual activity was similar for cases (79.1%) and controls (78.5%).

A significantly higher proportion of women with IC (67.18%) vs. controls (18%) reported having pelvic pain (OR 3.75 CI 3.1-4.5). Fear of having pain during sexual intercourse was reported significantly more by cases (61.0%) than controls (17.3%) and dyspareunia was reported more by cases (74.6%) than controls (30%).

BEFORE the diagnosis of IC, 86% of cases reported moderate or high sexual desire compared to 78% of the controls (p=0.016). AFTER the IC diagnosis, the number of cases reporting moderate-high sexual desire declined significantly from 86% to 40% (p<0.00). BEFORE IC, the frequency rates of orgasm in both groups (frequently or very frequently) was similar (Cases=63%; Controls=61%). AFTER IC, this rate decreased to 44% in cases (p< 0.00).

The mean value of the FSDS was statistically significant. It was higher among established IC cases (18.5) compared to controls (8.3) (p<0.000). A score ≥ 15 on the FSDS is associated with sexual distress.

Conclusions: Women with IC have significantly more alterations in sexual function and more sexual distress than women without IC. Pelvic pain and dyspareunia is prevalent in women with IC and should not be ignored in clinical practice. In addition, sexual desire and the frequency of intercourse and orgasm significantly declined after their diagnosis of IC. Further study is needed to evaluate sexual dysfunction and sexual distress in women with IC in order to provide more comprehensive care to these women to improve their quality of life.

Funding Source: Ministrelli Program for Urologic Research and Education (MPURE)
Introduction and Objectives: We previously demonstrated that intravesical botulinum toxin A (BTX) instillation in the SCI rat bladder inhibited purinergic afferent pathways without affecting efferent bladder function (Khera et al., 2004). The purpose of these experiments was to examine the afferent and efferent effects of BTX rat bladder wall injections to simulate the injection paradigm currently used in human clinical studies.

Methods: Female Sprague-Dawley rats underwent spinal cord transection (SCI) followed two weeks later by baseline urodynamic studies. Subsequently, rat bladders were injected with bovine serum albumin (BSA, 0.5%) or BSA + BTX (2U). Urodynamic studies were repeated 48 hours after injection and the following parameters were compared with baseline studies: intercontractile interval (ICI) of all bladder contractions as well as of only voiding contractions, and amplitude of all bladder contractions as well as of only voiding contractions. A subset of SCI animals underwent injection of either BSA or BTX followed 48 hours later by in vitro contractile or hypo-osmotic evoked urothelial ATP release experiments.

Results: ICI of all contractions increased by 182% in rats treated with BTX (p<0.05) although there was no significant change in the ICI of voiding contractions alone. BTX did not change the average amplitude of all bladder contractions; however, the amplitude of voiding contractions was inhibited by 53% (p<0.05). No significant difference in any urodynamic parameters was observed in BSA injected animals. In vitro studies demonstrated a significant reduction in hypo-osmotic evoked urothelial ATP release in BTX compared to BSA treated rats (i.e. 86% reduction, p<0.01). No differences in electrically evoked contractile responses before or after atropine (1μM) were observed when comparing BTX and BSA preparations.

Conclusions: Our results demonstrate that, similar to intravesical application, BTX injection of the SCI detrusor wall inhibits afferent mediated bladder reflex pathways without significantly interfering with efferent nerve activity. These findings are congruent with clinical studies in patients with detrusor overactivity demonstrating inhibitory effects of BTX on bladder sensory pathways (Apostolidis et al., 2005).
EFFECTS OF AN ANTIephyptic -LEVETIRACETAM (KEPPRA®), ON NEUROGENIC
OVERACTIVE BLADDER IN CHRONIC PARAPLEGIC RATS
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Introduction and Objective: Levetiracetam (LEV) is the racemically pure S-enantiomer of a alpha-ethyl-2-oxo-1-pyrolidineacetatemid, a novel and potent antiepileptic drug. We studied the effect of different doses of LEV on urodynamic parameters of an animal model of overactive bladder (OAB).

Methods: 54 rats were used in this study. 6 rats were normal control, 48 rats underwent a T10 spinal cord transaction (ST). 12 of them served as paraplegic controls, remaining 36 rats were divided into 3 equal groups and received LEV at a dose of 17 mg/kg, 54mg/kg, and 108 mg/kg daily, respectively. The drug was delivered via an osmotic minipump inserted subcutaneously in the back of the animals 2 weeks after ST. Each “paraplegic control” and treatment group was further divided into two sub-groups (n = 6), and filling Cystometry (CMG) was done at 3 and 4 weeks after ST, respectively.

Results Obtained: All “paraplegic control” rats developed neurogenic detrusor overactivity (NDO). At 3 and 4 week after ST respectively, the mean frequency of contractions was 1.6±0.3 and 1.7±0.2 / min, contraction amplitude was 29.7±1.4 and 31.6±2.4 cmH2O and bladder capacity was 1.1±0.2 and 0.5±0.1 ml. Bladder capacity was 0.62±0.1 ml in the normal control group. After 1 week of treatment urodynamic parameters improved significantly* in a dose-dependent manner, however, improvements were more obvious at 2 weeks: Respectively for LEV dosages of 17, 54, and 108 mg/kg, the frequency of NDO went from 1.7±0.3 to 0.7±0.2*, 0.48±0.16*, and 0.5±0.17* contractions /min, the amplitude of NDO went from 31.7±2. cmH2O to 28.7±1.6, 32.3±3, and 25.3±1.9* cmH2O, bladder capacity increased from 0.51±0.1 ml to1.5±0.2*, 2.5±1.7*, and 2.6±0.3* ml, and the micturition pressure improved from 105.8±6.9 cmH2O to 73.8±6.8*, 58.6±8.9*, and 49.7±8.9* cmH2O.

Conclusions: Levetiracetam is effective in treatment of NDO after ST in rats. Knowing its excellent safety profile in humans, it may provide a novel alternative treatment of OAB. Follow up of these experimental results with clinical trial remains to be done.

* Asterisk indicates statistical significance (p < 0.05).

Source of Funding: USB pharma
Objective: To investigate the plasticity of non-adrenergic, non-cholinergic (NANC) contractions of the normal rat bladder and spinal cord injured (SCI) bladder in the presence of the cholinergic receptor agonist, carbachol.

Methods: Bladder strips were harvested from normal female Sprague-Dawley rats and from age-matched SCI rats 4 weeks after L6 spinal cord transection. The strips were stimulated electrically (20 Hz) to estimate baseline isometric contractions. In one group, 10 µM carbachol was added prior to 500 nM 4-DAMP (a selective muscarinic receptor antagonist). In the other group, no carbachol was added prior to 500nM 4-DAMP. The residual NANC contractions that remained after 4-DAMP administration (expressed as %, residual divided by baseline) were compared in the presence and absence of carbachol pre-treatment.

Results: In normal rat bladder, carbachol decreased the NANC contractions from 74.6±5.0% (no pre-treatment) to 32.0±3.2% (pre-treatment), p<0.0001. In SCI rat bladder, carbachol decreased the NANC contractions even more, from 78.5±21.9% (no pre-treatment) to 13.1±5.6% (pre-treatment), p=0.04. The muscarinic antagonist 4-DAMP became more effective after the bladder was treated with carbachol. This carbachol-induced plasticity was more pronounced in SCI bladder versus normal bladder (13.1±5.6% versus 32.0±3.2%, p=0.006). This observation suggested that cholinergic stimulation (carbachol) inhibited purinergic contractions (the main component of NANC). This plasticity may be mediated through interaction between cholinergic and purinergic receptors.

Conclusion: The NANC contractions of normal and SCI rat bladder is not constant, but is plastic and can be modulated by cholinergic agonist (carbachol).
ROLE OF INDUCIBLE NITRIC OXIDE SYNTHASE IN DIABETIC BLADDER DYSFUNCTION
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Introduction and Objectives: Pathophysiology of diabetic bladder dysfunction (DBD) include autonomic neuropathy and detrusor myopathy. Increasingly, an important role for nitric oxide (NO) in the function and diseases of the lower urinary tract (LUT) affecting the nerves and muscles is identified. The aim of our study was to examine if inability to produce inducible NO synthase (iNOS) would a) alter the function of the bladder; and b) would reverse the effects of diabetes mellitus (DM) on the bladder.

Methods: We employed a mouse strain with the targeted deletion of iNOS gene (iNOS-KO). The bladder function of four groups of mice was studied: C57BL/6 wild type (WT), iNOS-KO, WT with diabetes (WT-DM), and iNOS-KO with diabetes (iNOS-KO-DM). Diabetes was induced with intraperitoneal injections of streptozotocin. Animals were maintained for 8 weeks. 24-hour micturition habits were evaluated using metabolic cages. Two days after suprapubic bladder tube (SPT) implantation, conscious cystometrogram (CMG) was assessed by infusing normal saline into the bladder at 1mL/hour.

Results: WT-DM, iNOS-KO-DM groups had a higher frequency of micturition and urine output than WT and iNOS-KO groups as evidence by 24-hour micturition habits observations. iNOS-KO-DM group have a shortest intercontraction intervals compare to WT, iNOS-KO, and WT-DM during CMG (193.8±40.6, 430.5±29.8, 398.8±14.4, 327.5±37.4 sec, respectively). There was no significant difference in peak voiding pressure in four groups. Contraction time was lower in WT-DM and iNOS-KO-DM groups compare to WT and iNOS-KO groups (117.2±8.7, 115.9±22.8, 184.0±8.7, 169.4±15.2 sec, respectively). Bladder capacity and voided volume was significantly lower in iNOS-KO-DM group than other groups. There was no difference in body weight among the four groups. Blood glucose concentration and glycated hemoglobin A1c (HbA1C) level were significantly higher in WT-DM and iNOS-KO-DM groups compare to WT and iNOS-KO groups.

Conclusions: The micturition function is not affected by deletion of iNOS gene in mice. iNOS knockout does not reverse the effects of diabetes on the bladder function in mice, but showed more increased voiding frequency. Further work is necessary to elucidate the mechanisms of effects of iNOS on the bladder function.

Source of Funding: Supported by grants NIH-NIDDK-DK02631; U01-DK61018; Young-Investigator award of the National Kidney Foundation; Grant-in aid by the Diabetic Association of the Greater Cleveland; and Juvenile Diabetes Research Foundation Fellowship (to G. Liu).
Introduction and Objectives: The urethra is an important trigger zone for initiating reflexes regulating micturition, therefore any impairment of urethral afferents might disrupt their coordination and compound voiding dysfunction in lower urinary tract disorders. This study investigated the effects of diabetes mellitus (DM) on the response of the bladder to intraurethral chemical stimulation.

Methods: Fifty-nine 10-week streptozotocin-induced DM and age-matched female Sprague-Dawley control rats were used. A double lumen catheter for infusate delivery and measurement of urethral perfusion pressure was inserted through the bladder dome and seated in the proximal urethra, thereby separating the urethra from the bladder. A separate bladder catheter was used for measurement of isovolumetric bladder pressure and electrodes were placed in the external urethral sphincter (EUS) for electromyography (EUS-EMG). Escalating doses of capsaicin (CAP, 0.1-30 µM) or acetic acid (AA, 0.01-1%) were perfused intraurethrally. Some rats received the neuromuscular blocker α-bungarotoxin (BGT, 100 µg/kg) with or without hexamethonium treatment (25 mg/kg) or bilateral pudendal afferent neurectomy (PudNx) before intraurethral treatments.

Results: Intraurethral CAP (median 3 µM) inhibited bladder contractions in 6/7 controls. Slow urethral oscillations (SUOs; about 0.2 Hz and 5 mmHg) with corresponding phasic EUS-EMG activity were present in 5/6 controls with bladder inhibition. Strikingly, all 6/6 DM rats were entirely unresponsive to CAP. Intraurethral AA (median 0.1%) inhibited bladder contractions while inducing tonic EUS-EMG overactivity in both 6/6 controls and 5/6 DM rats. SUOs occured in 4/6 controls and 3/5 DM rats with bladder inhibition. Bladder inhibition and subsequent SUOs were not prevented by BGT, but were eliminated in rats with PudNx. SUOs were inhibited by hexamethonium.

Conclusions: These findings suggest the presence of an inhibitory urethrovesical reflex carried by pudendal afferent nerves independently of EUS activity. DM compromises some of the urethral afferents responsible, specifically, nociceptors with TRPV1 receptors. Distinctive SUOs are neurogenically mediated urethral smooth muscle activity and are accompanied by, and may be the cause for, EUS phasic activity and suggest the existence of another, as yet unknown, reflex pathway: smooth to striated muscle urethra-to-urethra reflex.

This study was supported by NIH DK6139
EXTERNAL URETHRAL SPHINCTER DYSFUNCTION IN DIABETIC RATS
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Introduction and Objectives: Lower urinary tract complications are one of the most prevalent complications in diabetes mellitus (DM). We and others have demonstrated that the temporal course of diabetic bladder function in small animal models of DM include compensated and decompensated bladder function. However, little is known about the effects of DM on urethral function. The aim of this study was to examine the effects of DM duration (6 and 20 week after DM induction) on external urethral sphincter (EUS) activity and its contribution to the temporal course of voiding dysfunction seen in diabetic rats.

Methods: 36 Male SD rats were divided into 3 groups: streptozotocin-induced diabetics, 5% sucrose-induced diuretics, and age, sex-matched controls. Cystometry (CMG) under urethane anesthesia and EUS electromyogram (EMG) were evaluated in all rats after 6 and 20 week of disease induction. After EMG measurement, the mid-urethra were harvested for morphological examination.

Results: Diabetes caused reduction of body weight compared to diuresis and controls, and the bladders of diabetic and diuretic rats weighed more than the controls after 6- or 20-week induction. CMG measurements showed diabetes and diuresis increase bladder capacity, contraction duration and high-frequency oscillations (HFO). Peak contraction amplitude increased in 6-week but not in 20-week diabetic and diuretic rats. EUS-EMG measurements showed frequency of EUS-EMG bursting discharge during voiding was significantly increased in 6-week (8.1±0.2, 8.2±0.5, 6.9±0.6/sec, respectively) but not in 20-week (5.8±0.3, 6.3±0.4, 6.0±0.2/sec, respectively) diabetic and diuretic rats compare to controls. EUS-EMG bursting period increased in 6-week (6.8±0.3, 5.5±0.1, 4.1±0.6 sec, respectively) and 20-week (7.5±0.6, 6.5±0.6, 4.3±0.4 sec, respectively) diabetic and diuretic rats compare to controls. EUS-EMG silent periods were reduced in 6-week (0.073±0.003, 0.080±0.008, 0.096±0.012 sec, respectively) but not in 20-week (0.135±0.015, 0.120±0.007, 0.115±0.005 sec, respectively) diabetic and diuretic rats compare to controls. Morphometric analysis showed atrophy of striated muscle in the EUS after 20 week but not 6 week of DM induction.

Conclusions: This data indicate that the urethral relaxation mechanism during reflex bladder voiding in rat is impaired in DM rat. Diabetes causes EUS-EMG abnormalities and anatomical alterations of the EUS, which may partially contribute to the time-dependent voiding dysfunction in diabetic rats. Diabetes-associated diuresis accounts for a portion of these changes.

Source of Funding: Supported by grants NIH-NIDDK-DK02631; U01-DK61018; Young-Investigator award of the National Kidney Foundation; Grant-in aid by the Diabetic Association of the Greater Cleveland; and Juvenile Diabetes Research Foundation Fellowship (to G. Liu).
TOLTERODINE DOES NOT AFFECT MEMORY ASSESSED BY PASSIVE-AVOIDANCE TEST IN MICE
Gregg D. Cappon,1 Richard H. Alper,1 Brian Bush,1 Donald Newgreen,2 Edmund Kadyszewski,1 Greg Finch1
1Pfizer Global Research and Development, Groton, CT; 2Pfizer Global Research and Development, Sandwich, UK

Introduction and Objectives: Antimuscarinics are first-line pharmacotherapy for overactive bladder (OAB). Central nervous system (CNS) cholinergic neurotransmission is involved in cognition, and CNS–permeable antimuscarinics scopolamine and oxybutynin affect memory. We evaluated the effect of tolterodine, an antimuscarinic for OAB, in a mouse passive-avoidance (PA) model of memory. Mice were chosen because mice and humans, but not rats, form the active metabolite of tolterodine, DD01.

Methods: For the PA test, male mice were placed in the illuminated half of an apparatus separated into light and dark chambers. Upon entering the dark chamber, mice received a mild electric shock. After initial experiences, mice either learned not to cross into the dark chamber or to take longer to do so. Two training trials were run in a single day (1-h intertrial interval) followed by a retention (memory) test about 24 hours later. Mice (n=24/group) were given tolterodine tartrate (1 or 3 mg/kg PO) or scopolamine (3 mg/kg IP) approximately 20 minutes before the first PA training trial. Satellite groups of 5 mice were given tolterodine, and blood was collected at the time of maximum concentration (Tmax; approximately 0.5 h postdose) for determination of the active moiety (tolterodine and DD01). This study was funded by Pfizer Inc.

Results: In the PA test, tolterodine at 1 or 3 mg/kg had no effect on memory; the latency to cross and percentage of animals crossing were comparable to controls. In contrast, scopolamine induced a memory deficit: the latency to cross was decreased, and the number of animals crossing was increased (Table). Total free active moiety at 0.5 hours postdose (approximate Tmax) was 0.74 and 7.99 nM at 1 and 3 mg/kg tolterodine, respectively (approximately 0.5- and 6-fold human maximum concentration achieved with the 4-mg extended-release formulation).

Conclusions: At a dose exceeding therapeutic exposure, tolterodine had no effect on memory in the mouse PA model, indicating that tolterodine does not disrupt cognitive function in this testing paradigm.

Table. Summary of PA Test Results

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Tested Animals, n</th>
<th>Animals That Crossed, n (%)</th>
<th>Latency, s (Mean ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>19</td>
<td>9 (47)</td>
<td>117.9±72.5</td>
</tr>
<tr>
<td>Tolterodine 1 mg/kg</td>
<td>22</td>
<td>11 (50)</td>
<td>124.0±70.6</td>
</tr>
<tr>
<td>Tolterodine 3 mg/kg</td>
<td>21</td>
<td>7 (33)</td>
<td>151.8±56.0</td>
</tr>
<tr>
<td>Scopolamine 3 mg/kg</td>
<td>23</td>
<td>18 (78)</td>
<td>70.1±69.1†</td>
</tr>
</tbody>
</table>

*The number tested is not equal to the initial group size because only animals meeting the training criteria were evaluated for memory.

†P<0.05 using the log-rank test.
Objective: The caveolin-1 knockout mouse has been proposed as an animal model to study impaired bladder contractility and detrusor overactivity. This study investigates the effects of aging on detrusor contraction in wildtype and caveolin-1 knockout mice.

Methods: Young (3-month-old, 3M) and old (1-year-old, 1Y) male caveolin-1 knockout mice (KO) and their age-matched male wildtype littermates (WT) were used. Longitudinal bladder strips were stimulated electrically (20 Hz) and pharmacologically using 1-10 µM carbachol (a non-subtype selective cholinergic receptor agonist), 10 µM α,β-methylene ATP (a purinergic agonist), and 100 mM potassium (a depolarizing agent). Isometric bladder strip contractions were compared between the young wildtype and knockout groups, and between the old wildtype and knockout groups.

Results: Bladder strips from 1-year-old knockout mice (KO 1Y) exhibited a 40-42% decrease in electrical neural contractions and carbachol-evoked contractions compared with 1-year-old wildtype controls (WT 1Y; p < 0.05). Even though bladder strips from 3-month-old knockout mice (KO 3M) demonstrated a smaller decrease (29-32%) in electrical neural contractions and carbachol-evoked contractions compared with age-matched controls (WT 3M), the trend did not reach statistical significance (p > 0.05). The post-junctional cholinergic pathway was specifically disrupted in caveolin-1 knockout animals since there was no difference in contractility between knockout and wildtype mice (young or old) when the bladders were stimulated by α,β-methylene ATP or potassium. The differences in cholinergic contractility between knockout and wildtype mice became significantly larger as the animals aged from 3-months-old (young bladders) to 1-year-old (aged bladders).

Conclusion: Caveolin-1 knockout mouse provides a much-needed animal model for the study of impaired detrusor contractility in the aging bladder.

Funding: AUA Foundation, National Institutes of Health
**Introduction:** Urinary incontinence affects approximately 1/3 of post-menopausal women. Circulating estrogen levels fall at menopause, but there is conflicting evidence whether voiding symptoms in these women are related to hypoestrogenism or aging itself. Although the innervation of the lower urinary tract and the spinal pathways to the pontine micturition center (PMC) in the brainstem are fairly well understood, the exact mechanisms by which higher brain centers modulate voluntary control of the micturition reflex have yet to be elucidated. The medial preoptic area (MPA) is a forebrain structure that has been identified by neuroanatomical and functional studies to be involved in micturition.

**Objective:** This neuroanatomical study was designed to determine whether specific central nervous system (CNS) pathways that project to the PMC (also known as “Barrington’s nucleus”) are estrogen sensitive in a rat model.

**Methods:** Using adult female Sprague-Dawley rats, stereotaxic procedures were used to accurately localize the PMC, using coordinates based on landmarks on the skull. A fluorescent retrograde neuroanatomical tracer was injected into the PMC to identify neurons in the MPA that project to the PMC. Immunohistochemistry was performed using antibodies directed against estrogen receptor-alpha (ERα) and estrogen receptor-beta (ERβ) to identify estrogen-sensitive neurons. The brain sections were examined using fluorescence microscopy to identify cells that project to the PMC (contain fluorescent tracer) and also express ER (are immunoreactive for ER).

**Results:** There are neurons in the MPA that are double labeled (contain fluorescent tracer and express ERα, but not ERβ), showing that subsets of neurons projecting from the MPA to the PMC are estrogen-sensitive.

**Conclusions:** Subsets of estrogen-sensitive neurons project from the MPA to the PMC in rats, raising the possibility that indirect estrogenic regulation of forebrain neuronal function may modulate the micturition reflex. Development of drugs that alter the function of these estrogen-sensitive CNS pathways may provide therapeutic strategies to treat post-menopausal incontinence.

There was no source of extra-institutional or commercial funding for this study.
ACUTE ANATOMICAL EFFECTS OF VAGINAL DISTENTION IN THE RAT
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Introduction and Objectives: Vaginal delivery is responsible for nearly two-thirds of stress urinary incontinence (SUI) cases and is the dominant risk factor in the development of this disorder. Trauma from vaginal delivery results in connective tissue damage of pelvic floor organs, but the exact mechanism of this injury and its correlation with SUI is unknown. Hypoxia of pelvic organ tissues in the second stage of labor during vaginal delivery may play a significant role in this process since increased second stage of labor has been correlated with subsequent development of SUI. These findings have been implicated in rat models of vaginal distention (VD) which emulate childbirth-induced SUI by placing fixed balloon catheters in the vagina for a fixed period of time. Although these models have demonstrated functional development of SUI, the acute effects of variable distention times on histology, morphology, and hypoxia in the urethra and vagina have not been investigated. In this project, we examined the levels of hypoxia, inflammation, edema, muscle damage, and overall morphological changes with varying durations of vaginal distention.

Methods: Twenty anesthetized Sprague-Dawley rats underwent vaginal accommodation followed by vaginal distention with a modified Foley catheter that was inserted into the vagina and filled with saline (3 mL) for a given duration (0 hr, 1 hr, 4 hr, or 6 hr). Sham animals (0 mL) underwent the same procedure but without balloon inflation. Control animals were anesthetized for 4 hours without catheter placement. Hypoxyprobe-1 reagent, which binds to areas of low oxygen concentration, was injected i.p. 1 hour prior to harvest. Urogenital organs were harvested after intracardiac perfusion of fixative to preserve the native structure that tissues conformed to during the procedure. Tissues were embedded, sectioned, and stained with Masson’s Trichrome and H&E. Regions of hypoxia were measured by immunohistochemistry for hypoxyprobe-1.

Results: Increasing distention duration demonstrated greater edema in the connective tissue of the vagina/urethra septum and greater disruption and fragmentation of striated and smooth muscle in the urethra. Early signs of inflammation, characterized by initial leukocyte infiltration into connective tissue, did not occur until 6 hours. Morphologically, the urethra appeared distorted into a crescent-moon shape within 1 hour of distention. The amount of hypoxyprobe staining decreased with increasing distension duration, with the most hypoxic areas localizing to the superficial and basal layers of the vaginal epithelium. There was focal staining in the areas of the external urethral sphincter and urethral smooth muscle.

Conclusions: Increasing duration of vaginal distention causes progressively greater tissue damage and morphological changes of the urethra. In contrast, the amount of hypoxia decreases with distension duration. These results suggest that compensatory mechanisms or a parallel blood supply may exist which could facilitate the oxygenation of tissues over time during vaginal distention during the 2nd stage of labor. Therefore, hypoxia may play a lesser role than gross tissue trauma during vaginal delivery leading to SUI.

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STEM CELL HOMING AND FUNCTIONAL RECOVERY AFTER VAGINAL DISTENSION IN FEMALE RATS

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Objectives: Innate stem cells home to injured or ischemic tissue in response to chemokine gradients, including that for MCP-3. We have previously demonstrated that urethral resistance is decreased and MCP-3 expression is upregulated in the rat urethra and vagina after simulated childbirth injuries using vaginal distension (VD). In addition, hypoxia in the urethra and vagina has been observed after VD in rats. Thus, innate stem cell homing may provide a mechanism both for understanding spontaneous recovery of function after VD and for development of a potential treatment to encourage pelvic tissue recovery after childbirth. In this project, we sought to determine if labeled transplanted stem cells home to pelvic organs after VD and if this results in increased recovery of continence function.

Methods: Virgin female rats were randomized to 4 hours of VD (VD+SC), sham distension (SH+SC), or control (C+SC). GFP-labeled mesenchymal stem cells were injected via the tail vein 1 hr after the assigned procedure in all animals in these groups. Leak point pressure testing was performed 1, 4, or 10 days post-procedure under i.p. urethane anesthesia. Peak bladder pressure at leakage (LPP) was taken as a measure of urethral resistance. A group of rats with 4 hours of VD and saline injected into the tail vein 1 hr later (VD+Sh) served as sham-injected controls and were assessed by LPP testing 10 days afterward. ANOVA followed by the Student-Newman-Keuls posthoc test was used to determine statistical significance between groups (p<0.05) at each time point. Data is presented as mean ± standard error. Immediately after LPP testing, the rats were euthanized and the pelvic organs were dissected and used to localize stem cells using immunofluorescence.

Results: One day post-procedure, LPP of the VD+SC group (30.3 ± 1.8 cmH2O) was significantly decreased compared to LPP of both the SH+SC (44.2 ± 3.2 cmH2O) and C+SC (48.3 ± 6.1 cmH2O) groups. Four days post-procedure, LPP of the VD+SC group (32.8 ± 1.9 cmH2O) was decreased compared to both the SH+SC (52.0 ± 4.4 cmH2O) and C+SC (42.1 ± 2.9 cmH2O) groups but only in comparison to the SH+SC group was this difference statistically significant. Ten days post-procedure, LPP of the VD+SC group had increased to normal values (40.4 ± 2.1 cmH2O) and was not significantly different from LPP of any of the other groups. In contrast, LPP of the VD+Sh group (35.4 ± 4.2 cmH2O) was the lowest of the groups and was not significantly different from LPP of any of the other groups. Qualitative immunofluorescence targeted to GFP demonstrated the presence of labeled stem cells in urethral smooth muscle of rats in the VD+SC group. The highest concentration of cells was observed 10 days after VD followed by 4 days after VD. Stem cells were not observed in SH+SC or C+SC groups at any time point, nor were stem cells observed in bladder or rectal tissues.

Conclusions: Intravenously-injected mesenchymal stem cells home to urethral tissues following VD-induced injury but do not home to non-injured tissues. Rats subjected to VD, then treated with stem cells, demonstrate recovery of urethral resistance to normal values by day 10. These findings suggest that stem cell homing after injury may be utilized to accelerate recovery after vaginal birth trauma.
ROLE OF PUBO-URETHRAL LIGAMENT INTEGRITY IN LEAK POINT PRESSURE ALTERATIONS IN THE RAT MODEL OF STRESS URINARY INCONTINENCE
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Introduction: The detailed studies of the female urethra by Petros and Ulmsten indicate that a deficient pubo-urethral ligament (PUL) may lead to urethral mobility and stress urinary incontinence (SUI). The PUL attachments lie between the ventral surface of the urethra and the pubic bone, and Petros and Ulmsten have described the role of the PUL as an “integral theory” into the pathophysiology of SUI. Hypermobility of the PUL has been demonstrated in women with SUI, but the precise functional changes of PUL-deficiency remain unclear. We investigated the role of PUL-deficiency in altering leak point pressures (LPP) in a rat model of SUI.

Materials and Methods: A total of 22 female age-matched Sprague-Dawley rats (Harlan, Indianapolis, Indiana) were randomly assigned to 1 of 5 groups: PUL-transection or sham-PUL transection with LPP measured at 4 days or 10 days post-op, and pudendal nerve transection (PNT) with LPP measured at 4 days post-op. Four or ten days post-procedure the leak point pressure was determined using anesthesia in each animal via a previously implanted suprapubic catheter. Wilcoxon rank sum tests were used to evaluate whether levels of measurements differed across and between groups.

Results: The PUL-transection group demonstrated significantly decreased LPP compared to the sham group at 4 days (16.3 cm vs. 36.6 cm H2O, p<0.00001) and 10 days (17.6 vs. 31.2 cm H2O, p<0.00001). The PNT group was also significantly lower than the sham group at 4 days (14.5 vs. 36.6 cm H2O, p<0.00001), and there was no difference between the PUL-transection group and the PNT group at 4 days (16.3 vs. 14.5 cmH2O, p=0.44).

Conclusion: The data demonstrate that deficiency of the PUL plays a role in SUI. Our newly created PUL-deficient rat model decreases the LPP leading to SUI in the short-term. This animal model could be used to address research questions related to SUI and its treatment relevant to the pubo-urethral ligament.
URINARY INCONTINENCE, BLADDER DYSFUNCTION AND PELVIC ORGAN PROLAPSE IN LYSYL OXIDASE LIKE-1 (LOXL1) MUTANT MICE: A COMPLETE ANIMAL MODEL FOR FEMALE PELVIC FLOOR DISORDERS?
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Objectives: Using a Loxl1−/− genetic knockout mouse model, we have previously shown that genetic deficiency of LOXL1, a lysyl oxidase-like enzyme which can polymerize elastin, results in pelvic organ prolapse and increased voiding frequency postpartum. The objective of this study was to determine if Loxl1−/− mutant mice demonstrate either urinary incontinence or decreased urethral resistance.

Methods: Female parous Loxl1−/− mice (n=5), in the stable postpartum period with pelvic organ descent, as well as age-matched female wild type (WT) mice (n=6) underwent conscious cystometry, measurement of residual urine, and leak point pressure (LPP) testing. After completion of testing, bladders were removed and muscle strips were used for contractility studies. Strips were stimulated by varying levels of KCl, electrical fields (EFS), adenosine 5'- triphosphate (ATP), and carbachol (CCh).

Results: There are no significant differences between the weights of the bladder. Loxl1−/− mice void more frequently during cystometry testing than WT mice, consistent with previous work demonstrating increased frequency in these mice. Loxl1−/− mice had a decreased micturition pressure during cystometry than WT mice. Residual urine was not significantly different between WT and Loxl1−/− mice, indicating that the urinary frequency is not a result of outlet obstruction. LPP was not significantly different between WT and Loxl1−/− mice. However, the volume at which LPP was measured was significantly lower in Loxl1−/− mice than WT mice, due to their frequency of voids. In addition, there are no significant differences between the responses of bladder strips from Loxl1−/− mice and WT mice in the responsiveness to various stimulus.

Conclusion: Loxl1−/− mutant mice in the stable phase of prolapse do not have decreased urethral resistance with limited bladder capacity. Confirmation of presence of urinary incontinence in view of previously observed increased frequency of voids in these mutant mice warrants further investigation into the function of lower urinary tract of the animals.

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VOLUME CHANGES AND HISTOLOGICAL RESPONSE TO INJECTED EXTRANOMER/HYALURONIC ACID COPOLYMER (ZUIDEX™) AND COLLAGEN (CONTIGEN®) IN RAT MODEL

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Objectives: To investigate the volume changes and local tissue reaction of dextranomer/hyaluronic acid implants with Collagen implants.

Methods: A total of 57 rats were included in this study. The rats were divided into 3 groups, control group (9 rats) Collagen injected group (24 rats) and Dx/HA copolymer injected group (24 rats). Under anaesthesia 0.35 ml a bulking agents were injected subcutaneously in the abdominal area (collagen and Dx/HA copolymer group). Nine rats were injected with normal saline to act as controls. At 1, 6, and 12 months, 8 animals of the 2 implant groups and 3 animals of the control group were sacrificed using an overdose of anaesthesia. The area of the injected material was carefully dissected in order to recuperate the bulking material without any surrounding tissue. The volume changes of the bulking material was measured by putting the implant in a graded tube containing saline and measuring the increase in volume. Surrounding tissues was also resected for histopathological examination.

Results: No postoperative complications were observed and no one of the animals died during the study period. The injected bulking agents were easily palpated at the injected site with no distant migration. No tumours were detected at implant site or at the surrounding tissues. The bulking material was well capsulated and dissected easily.

Mean volume changes in the Dx/HA copolymer group were 0.56±0.12, 0.43±0.08, and 0.28±0.26 ml at 1, 6, and 12 months respectively. Mean volume changes in the collagen group were 0.25±0.03, 0.21±0.08 and 0.21±0.01 at 1.6, and 12 months respectively. There is a significant change in volume at each time points in each group. Also there is a significant difference between volume changes in collagen and Dx/HA copolymer groups.

The histological examination showed fibroblast, inflammatory cell and foreign body giant cell reaction inside the implanted material. The degree of tissue reactions and fibrosis are more in the Dx/HA copolymer group at each time points of the study.

The difference between the volume changes in collagen and Dx/HA copolymer groups (-20% vs -40%) was significant at 12 months after injection (P< 0.002).

Conclusions: The volume of injected Dx/HA copolymer increased up to 6 months after injection however at 12 months it shows 20% reduction of volume. Boths material showed decrease in volume after 12 months with more volume reduction in collagen group.
ADVANCED GLYcation END PRODUCTS AND URODYNAMIC FUNCTION AFTER PUDENDAL NERVE CRUSH IN DIABETIC FEMALE RATS

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Introduction: Diabetes Mellitus (DM) increases the risk of stress urinary incontinence (SUI), contributing to the high prevalence of SUI among women. The injury of the pudendal nerve (PN) during vaginal delivery has been postulated as a mechanism of SUI in women. Further, accumulation of advanced glycation endproducts (AGEs) in the peripheral nerves has been linked to diabetic neuropathy. However, the relationship between DM, birth trauma and SUI is poorly understood.

Objective: The aims of this study were to determine: 1. If PN injury in DM animals results in increased severity of SUI symptoms; and 2. If the severity of SUI in DM animals are associated with increased accumulation of AGEs.

Methods: Sixty six female virgin Sprague-Dawley rats were divided into DM, diuretic (DU) and untreated control (C) groups with 22 each. Each group was subdivided into PN crush (PNC) and sham PNC (SPNC) groups. DM rats (8 weeks prior to PNC) were induced by injection (i.p) of Streptozotocin (35 mg/kg). DU rats were given 5% sucrose in their drinking water for 8 weeks. For PNC, the PN was crushed twice bilaterally by closing a Castroviejo needle holder over it for 30 seconds. For SPNC, rats underwent a dorsal skin incision only. All rats underwent awake cystometry (CMG) and leak point pressure (LPP) testing 4 days after PNC or SPNC. The bladder, urethra, vagina and PN were dissected and tested for accumulation of AGEs using gas chromatography/mass spectrometry (6/group) or embedded in paraffin (5/group) for histological assessment.

Results: DM rats with SPNC had significantly increased voiding pressure and volume voided during CMG compared to both DU and C rats with SPNC. The duration of void was not significantly different in DM rats with SPNC compared to DU and C rats with SPNC. DM rats with PNC demonstrated decreased voiding pressure and duration of void compared to DM rats with SPNC. The volume voided by DM rats with PNC was not significantly different from that of DM rats with SPNC. The abdominal pressure increase to leakage during LPP testing was significantly decreased after PNC compared to SPNC and there were no differences between the C, DU, and DM groups after either PNC or SPNC. Furosine and carboxymethyl-lysine (CML) were significantly increased in all tissues tested in DM rats compared to C and DU rats and were not significantly different between PNC and SPNC subgroups. Carboxyethyl-lysine (CEL) or 2-amino-adipic acid, an oxidation marker, showed no significant differences between the groups. Bladders and vaginas of DM rats weighed significantly more than those of DU and C rats. Bladders of DU rats weighed significantly more than those of C rats. Bladder lumen and wall thickness were increased in DM rats compared to DU and C rats. Pathology of the EUS was increased in rats with PNC compared to rats with SPNC in all groups.

Conclusions: DM rats with SPNC exhibit increased voiding pressure and increased urinary volumes typical of diabetic cystopathy. DM rats with PNC likely have a highly distensible urethra, enabling them to void the same increased volumes in a shorter time and with less voiding pressure. PNC leads to decreased urethral resistance as demonstrated by LPP testing in all groups. Therefore, PN injury may play an important role in the development of SUI in DM and elevated levels of some AGEs may contribute to the dysfunction.

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Incidence, Variation, and Severity of Pelvic Organ Prolapse in Parous Loxl1-Deficient Female Mice Compared to a Large Academic Mice Colony

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Introduction and Objectives: Parity and its frequency are among the recognized risk factors for Pelvic Organ Prolapse (POP) in humans. Mice lacking the Lysl oxidase-like 1 (Loxl1) protein have been reported to develop POP by 1-2 days post partum. Our objective was to describe the incidence, variability, and severity of the manifestation of POP during the post partum period and as it relates to parity in the Loxl1-deficient mice and in comparison to the incidence of POP in a large colony of mice at an academic institution.

Methods: Loxl1-/- mice on a mixed Sv129 and C57Bl/6 background were maintained in the Cleveland Wade Park VA animal research facility. Breeding was conducted with single male-female pairs of Loxl1-/- mice and harem breeding of two females and one male. Evidence of prolapse was observed over a nine month period. POP was graded on a scale of 0-4 for perineal bulge (0 none, 1 mild perineal bulge, 2 moderate perineal bulge, 3 severe perineal bulge, and 4 for overt external uterine prolapse) using a recently described MOPQ Scale. Rectal prolapse was also noted, and graded on a scale from 0-2 (0 none, 1 mild, 2 severe). In addition, a review of the veterinarian morbidity and mortality records at the Case Western University animal facility was conducted for a 6 month period (March to September 2006). This facility examines over 20,000 mouse cages which consist of over 50,000 mice.

Results: Nulliparous Loxl1-/- mice had no evidence of POP from birth until 12-16 weeks (n=16). Loxl1-/- mice with Cesarean section (C/S) did not have any evidence of POP by post partum day 4 (n=4). C/S was not ultimately protective of POP development as in one Loxl1-/- mouse which had shown no evidence of POP during 3 months post partum of the first C/S. This mouse developed grade 1 POP and grade 1 rectal prolapse 2 weeks post partum and progressed to grade 2 POP and grade 2 rectal prolapse 4 weeks post partum after her spontaneous vaginal delivery of the second pregnancy. We have noted further variation in POP development as demonstrated in 15 parous Loxl1-/- mice. Seven have no current evidence of POP: 3 have no POP after 1 delivery, 1 has no POP after 2 deliveries, 2 have no POP after 3 deliveries, and 1 has no POP after 4 deliveries. Eight Loxl1-/- mice have developed POP: 2 after the 1st delivery, 4 after the 2nd delivery, 1 after the 3rd delivery, and 1 after the 4th delivery. No mice have had more than 4 deliveries.

We observed that once POP develops, the grade of perineal bulge becomes more severe with age and parity. Mice are able to get pregnant and deliver with rectal prolapse (grade 1-2) and mild uterine prolapse (grade 1-2), but not with severe POP (Grade 3). No cervical descent was noted in our Loxl1-/- colony. All uterine prolapsed mice had concurrent rectal prolapse. Often, rectal prolapse preceded uterine prolapse, otherwise they appeared concurrently. Rectal prolapse also became more severe with time and age. No POP was observed in our colony of C57Bl/6 control mice with one exception. One C57Bl/6 mice developed grade 4 prolapse after delivery of her third litter. The POP subsequently regressed and no bulge was visible. She became pregnant again, and was euthanized for a post-mortum examination. This compares to an incidence of two uterine prolapses confirmed by the animal facility records; of which one was in a C57Bl/6 mouse and one was in a BDNF related mouse. Normal mice develop pelvic organ prolapse, although the incidence is quite rare.

Conclusion: Although variable, the incidence of POP in Loxl1-/- mice is higher than in a normal mouse population. Development of POP in Loxl1 deficient mice varies according to the status of their parentage (with or without prolapse); their genetic background (C57Bl/6, Sv129), and frequency of parity. Such variability in the manifestation of POP is representative of the clinical situation in which the influence of environmental factors (frequency of parity, mode of delivery) likely impacts upon a potentially genetically vulnerable background (altered elastin homeostasis). The Loxl1 deficient mice are a promising model for investigation of the clinical phenomena of pelvic organ prolapse in women.

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THE URETHRA AS SENSOR: CHARACTERIZATION OF VOIDING-ASSOCIATED ABDOMINAL WALL ACTIVITY IN THE RAT AND ITS ROLE IN NORMAL VOIDING
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Introduction: Normal voiding in the rat requires activation of the abdominal wall striated muscle during urine flow. This voiding-associated abdominal wall response (VAR) appears to be similar to the visceromotor response (VMR) to noxious visceral distension. Capsaicin-sensitive neuronal signaling is important in both nociception and normal voiding. The VMR is also sensitive to intravascular anesthetics and analgesics. We hypothesized that the voiding-associated abdominal wall activity would be altered by manipulations affecting the VMR and nociception. The aim of this study was to compare abdominal wall activation during voiding to the VMR by evaluating the cystometric and EMG responses to pharmacologic modulation of afferent signaling, and therefore further elucidate of the role of the VAR in normal voiding.

Methods: Female urethane-anesthetized SD rats, 250-300 g, were studied using a free-voiding technique which does not require instrumentation of the urethra or bladder during observation. Intercontraction interval, per-void volume, average flow rate, quantitative voiding-associated rectus abdominis EMG response, and hemodynamic parameters in rats treated with intravenous lidocaine (0.625 mg/kg/min and 2.5 mg/kg/min), c-fiber densensitization with subcutaneous capsaicin injection (25/50/50 mg), and urothelial TRPV-1 receptor desensitization with intravesical capsaicin (100 µM for 30 minutes) were compared to those in non-treated free-voiding rats.

Results: Intravenous lidocaine slightly decreased the intercontraction interval but did not alter any other voiding-associated parameter. Subcutaneous capsaicin preparation decreased the intercontraction interval by 62%. Intravesical capsaicin eliminated evidence of contractile voiding and increased the hemodynamic response. Vehicle and transurethral catheterization alone impaired voiding parameters, yielding decreased flow and decreased per-void volume, as well as enhancing the viscerovascular response, suggesting urethral obstruction. Average blood pressure was elevated in all treatment groups.

Conclusions: Voiding-associated abdominal wall activity (VAR) is a normal somatic response to a physiologic visceral function. We conclude that voiding-associated abdominal wall activity is predominantly an A delta neuronal response, and is the lowest threshold physiologic somatic response to visceral stimulation represented by the visceromotor response to noxious stimuli. The importance of the abdominal wall activation may be to provide a necessary increment of bladder voiding pressure, ensuring adequate urine flow into the mid-urethra during the critical pulsatile phase of rat voiding. If so, a positive feedback loop is established in which urine driven into the urethra activates afferents leading to continued VAR and pulsatile external sphincter activity, thus perpetuating the void until bladder volume is insufficient to maintain urine flow into the urethra. Activation of urethral afferents by transurethral catheter severely disturbs voiding. Normal rat voiding includes a somatic striated muscle activation in response to visceral stimulation, and thus may be a model for human voiding dysfunction.
A MECHANISM FOR THE PRODUCTION OF ANTIPROLIFERATIVE FACTOR FROM FRIZZLED-8

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Introduction and Objectives: Antiproliferative activity found in the urine of interstitial cystitis (IC) patients has been linked to a glycosylated nonapeptide, (antiproliferative factor, APF) with primary sequence matching that of the sixth transmembrane domain of the seven transmembrane receptor, frizzled-8 (FZD8). We propose that translation of FZD8 transcripts initiated at the methionine codon at amino acid position 530 results in processing of the protein product in the secretory pathway and cleavage of the APF peptide as a signal peptide in the endoplasmic reticulum.

Methods: The FZD8 protein sequence was analyzed using SignalP 3.0, neural network and hidden Markov models to predict signal peptide and cleavage sites for all possible in frame AUG translational initiation sites. Additional processing of the transcript as a possible cell membrane protein was investigated using TMHMM software. A fusion gene, 530FZD8-EGFP was constructed by joining the FZD8 coding sequence, from codon 530 to the putative termination codon, with the enhanced green fluorescent protein sequence in the pcDNA3 plasmid. UMUC3 cells, a urothelial cancer cell line were transfected with the expression plasmid. Expression of the fusion protein was visualized by live cell fluorescence microscopy as well as following fixation and counterstaining of DNA. Stably transfected cells were obtained by selection with genetcin.

Results: The SignalP program predicts that initiation of translation of FZD8 transcripts at position 530 will produce a protein with a signal peptide recognized and processed in the endoplasmic reticulum. Cleavage of the putative signal peptide is predicted between amino acids 549 and 550, corresponding to the carboxy terminal residue of the APF nonapeptide. TMHMM predicts that the 165 amino acid sequence from position 530 to the carboxy terminal residue of FZD8 could be inserted into the plasma membrane with the carboxy terminal on the internal surface. The 530FZD8-EGFP fusion protein distributed in a pattern consistent with ER/Golgi processing and stably transfected cells show green fluorescence on the cell membrane.

Conclusions: These preliminary results are consistent with our hypothesis that APF could be a product of an aberrant translation of a normal or aberrant FZD8 transcript. For an active APF to be produced a mechanism for glycosylation and an additional cleavage is presumably required. There remains the possibility that the abbreviated FZD8 protein inserted in the membrane could have biological activity that could contribute to the etiology of IC.

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ROLE OF NICOTINIC AND ESTROGEN SIGNALING DURING EXPERIMENTAL ACUTE AND CHRONIC BLADDER INFLAMMATION IN MICE
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Introduction: Inflammation is a physiological process that characterizes many bladder diseases such as interstitial cystitis (IC) which disproportionately affects women. The etiology of IC is not known, however afferent innervation on the bladder is thought to be involved. The nicotinic pathway associated with afferent neuronal signaling also regulates the production of inflammatory cytokines. Studies in vivo using a pancreatitis inflammation model have shown that nicotinic receptor agonists have anti-inflammatory properties. Estrogen has been reported to upregulate nicotinic acetylcholine receptor expression at the cell surface. In this study we used cyclophosphamide to induce both acute and chronic bladder inflammation in mice. We hypothesized that the nicotinic and the estrogen signaling can cooperate to down regulate bladder inflammation in this model.

Methods: After 2 weeks of ovariectomy, mice were treated with daily doses of 17β-estradiol. Acute bladder inflammation was induced by intraperitoneal (ip) injections of cyclophosphamide (200 mg/kg). Chronic bladder inflammation was induced by ip injections of cyclophosphamide (150 mg/kg) once every 3 days for 5 days. In both models, inflammation was induced after one week of daily doses of 17β-estradiol and bladder inflammation was preceded by pretreatment with mecamylamine (nicotinic receptor antagonist) or anabasine (nicotinic receptor agonist). Tissues were isolated 18 hours after the last cyclophosphamide injection. Bladder samples were fixed for histological analysis and frozen for RNA isolation and protein extraction. To analyze inflammation in the bladder a histology score based on number of inflammatory cells, edema and hemorrhage was assigned to each sample.

Results: Cyclophosphamide treatment resulted in elevated inflammatory infiltrates in the bladder lamina propria. Bladders that were treated with mecamylamine (nicotinic pathway antagonist) and cyclophosphamide showed more inflammation when compared with bladders that were treated with cyclophosphamide alone in the both models. RT-PCR analysis showed that treatment with 17β-estradiol and cyclophosphamide down-regulates the expression of lipocalin-2 and cathepsin D when compared with mice treated with cyclophosphamide alone in the acute model. Although the physiological role of lipocalin 2 remains to be fully elucidated, it has been link with inflammation. In addition, cathepsin D is an estrogen regulated lysosomal protease found in neutrophils. In the chronic model IL-6 expression was up-regulated by a 3 fold change in mice treated with mecamylamine and cyclophosphamide when compared with mice treated with cyclophosphamide alone. Also, treatment with 17β-estradiol reduced the expression of IL-6 by a two fold change when compared with mice treated with cyclophosphamide alone. IL-6 has a key role in the transition from acute to chronic inflammation by changing the nature of leucocyte infiltrate from polymorphonuclear neutrophils to monocytes/macrophages.

Conclusion: These results suggest that estrogen signaling and the nicotinic pathway are involved in the down-regulation of bladder inflammation during experimental bladder inflammation in mice based on histologic and inflammatory gene expression patterns. The use of agonists for the nicotinic pathway could be of critical relevance to treat and/or control inflammation in diseases that are characterized by bladder inflammation such as interstitial cystitis.
LINK BETWEEN CYTOKINE EXPRESSION AND PURINERGIC SIGNALING IN BLADDER UROTHELIAL CELLS (BUC)

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Introduction and Objectives: Cultured IC bladder urothelial cells (BUC), compared to normal BUC, have altered cytokine expression, including increased epidermal growth factor (EGF), increased antiproliferative factor (APF), and decreased heparin-binding epidermal growth factor-like growth factor (HB-EGF) secretion. Furthermore, IC BUC manifest increased purinergic signaling by releasing high amounts of adenosine triphosphate (ATP) when stimulated with exogenous ATP. In this study, we determined whether HPLC-purified APF or recombinant human EGF altered the purinergic phenotype of normal BUC. Because cytokines often affect protein phosphorylation, we also determined whether genistein, a non-specific blocker of phosphorylation, had an effect on ATP release. Suramin, a non-specific ATP-receptor antagonist, was also tested to determine its effects on the release of ATP from APF-treated BUC. Moreover, we measured the expression of the purinergic receptor P2X3 on the cell surface with cytokine treatment.

Methods: Cultured IC BUC were treated with genistein (100 µM) while normal BUC were exposed to rhEGF (10ng/mL and 20ng/mL), HPLC-purified mock APF, or HPLC-purified APF. APF pre-treated normal BUC were incubated with 40 µM suramin. 30µM of exogenous ATP was added to BUC to stimulate ATP release, and cell supernatants were collected over 3 hours to measure ATP using the luciferin-luciferase assay. Further, after the different cytokines were added and cells were stimulated by 30µM of exogenous ATP for 3 hours, expression of ATP receptor P2X3 was determined by fluorescence activated cell sorting (FACS) techniques.

Results: Genistein treatment significantly reduced ATP release by IC cells whereas rhEGF and APF treatment significantly increased ATP release by normal cells in response to exogenous ATP (Mock APF showed no effect on increase of ATP release by normal cells). Suramin significantly blocked the increased release of ATP induced by APF’s effect on normal BUC. We have published that suramin blocked increased release of ATP by untreated IC BUC. FACS analysis showed that normal BUC treated with rhEGF and APF had significantly increased expression of P2X3.

Conclusions: Genistein, rhEGF, and APF treatments altered the purinergic signaling phenotype (measured by response to ATP stimulus) of both normal and IC BUC. With rhEGF or APF treatment, purinergic receptor P2X3 expression was significantly increased in normal BUC, making them similar to IC BUC. Suramin significantly blocked release of ATP from normal BUC treated with APF and native IC BUC, restoring the cells to a normal phenotype. This suggests that there is a link between cytokine expression, protein phosphorylation, and purinergic signaling pathways in human BUC. With the availability of reversing the phenotypes of BUC, new therapeutic approaches, such as intravesical suramin, in treating interstitial cystitis could target these linked pathways.

Funding Sources: This study is supported by National Institutes of Health Grant R01-DK059441 (Dr. Toby Chai) and VA Merit Review grant/NIH grant R01-DK 52596 (Dr. Susan Keay).
Objectives: Interstitial cystitis (IC) is a chronic bladder disorder, manifested by frequency, urgency of urination, with plausible autoimmune pathogenesis. We aimed to examine the bladder function of our recently developed experimental autoimmune cystitis (EAC) model in female SWXJ mice.

Materials and Methods: Twenty SWXJ female mice were divided into two groups; EAC group injected with Completed Freund’s Adjuvant (CFA) containing bladder homogenate carried by M. Tuberculosis and control group injected with CFA alone. Six months after injections, bladder function of animals was studied with 24-hour micturition habits using metabolic cages. Subsequently, the animals underwent conscious cystometrogram (CMG) two days after implantation of suprapubic bladder tube. After completion of CMG, the animals were euthanized and their bladders were harvested for histologic examination. The data were analyzed using student t-test, with P<0.05 indicating a significant difference.

Results: 24-hour micturition habits showed EAC group to have a higher frequency of micturition than control group (p<0.05). Conscious CMG showed significantly shorter intercontraction interval in the EAC group compared to controls (163.84 ± 22.24 vs 487.30 ± 84.90 sec, respectively) confirming the higher frequency of micturition cycles in the EAC group. Voided volume per micturition was significantly lower in EAC group compared to controls (0.062± 0.005, 0.078± 0.005. respectively). There were no significant differences in peak voiding pressure between the experimental and control group (p=0.448). Histology examination showed the thickened lamina propria and significant infiltration of mast cells, lymphocytes and giant cells in the bladder of EAC animals.

Conclusions: Our experimental autoimmune cystitis model has similar features to those observed in human IC, and may provide a model for the study of the pathogenesis and treatment of interstitial cystitis. Further studies are warranted to characterize and investigate the autoimmune mechanisms of EAC model.

Source of Funding: Supported by grants NIH-NIDDK-DK02631; U01-DK61018; Young-Investigator award of the National Kidney Foundation; Grant-in aid by the Diabetic Association of the Greater Cleveland; and Juvenile Diabetes Research Foundation Fellowship (to G. Liu).
CANNABINOIDS (CBs), the active components of Cannabis sativa (marijuana) and their derivatives, have shown clinical promise as effective pain medications, though studies have been few in number. We reasoned that the CB system may represent an innovative target for genitourinary tract pain associated with interstitial cystitis (IC)/painful bladder syndrome (PBS). Consequently, as a proof-of-principle, we evaluated CB1 and CB2 mRNA and protein expression in female rat bladder and in cultured human bladder urothelial cells.

**Methods:** Bladder tissues were grossly dissected from adult female Sprague-Dawley rats. Immunofluorescence staining for CB1 and CB2 receptors was performed in rat bladder and in normal human (UROtsa) bladder urothelial cells. Expression profiles of CB1/CB2 mRNA and protein in (normal) UROtsa/(tumorigenic) T24 human bladder urothelial cells were analyzed by Real-Time quantitative PCR and Western blot analyses, respectively.

**Results:** Immunofluorescence staining for CB1 and CB2 proteins was localized predominantly to the urothelium of rat bladder. Cultured UROtsa bladder cells also demonstrated positive staining for both receptors. Analysis of CB1 mRNA expression revealed an approximate 13-fold increase in T24 bladder tumor cells in comparison to normal UROtsa bladder cells. In agreement, Western blot analysis indicated elevated CB1 protein expression in T24 cells compared to UROtsa cells, though only a 3-fold difference was observed. In contrast, relative to levels of CB2 mRNA expression in UROtsa cells, we noted a 3.5-fold reduction in CB2 mRNA levels in T24 cells, further confirmed by Western blot (protein) analysis.

**Conclusions:** Our results demonstrate that mRNA and protein for CB1/CB2 cannabinoid receptors are expressed in rat bladder and in normal/tumorigenic human bladder urothelial cell lines. The differential expression of CB1 and CB2 in normal/malignant bladder cells suggests a biological role for these receptors in bladder disease/dysfunction. We hypothesize that CB receptors play a critical role in the irritative voiding symptoms of IC/PBS and that administration of non-addictive synthetic and semi-synthetic cannabinoids can help alleviate these painful symptoms. Current studies are ongoing that will determine whether or not: 1) CB1 and CB2 receptors are differentially expressed in the urothelium of normal bladder versus bladder of IC/PBS patients and 2) cellular signaling mechanisms differ between normal and irritated (IC/PBS) human bladder tissues following CB receptor binding/activation.
FUNCTIONAL SIGNIFICANCE OF MUSCARINIC RECEPTOR EXPRESSION IN THE PROXIMAL AND DISTAL RAT VAGINAL MUSCULARIS

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1) Division of Urology, University of Pennsylvania 2) Department of Pharmacology and Physiology, Drexel University College of Medicine.

Introduction and Objectives: Muscarinic receptor stimulation of the inositol phospholipid signaling cascade is a major pathway of parasympathetic regulation of smooth muscle contraction in many tissues. Although the vaginal wall receives parasympathetic innervation, several investigators have reported that the contractile responses of vaginal smooth muscle to carbachol are weak or absent. Further studies are required to clarify the presence, or lack thereof, of muscarinic receptor mediated contraction in the vaginal muscularis. We have previously shown that the proximal and distal vagina differ in both molecular and functional characteristics and have shown that the proximal vagina is a phasic muscle molecularly designed for generating force quickly. Therefore, the objectives of this study were: 1) to determine the expression of muscarinic receptors in the proximal and distal vaginal wall and 2) test the functional significance of receptor expression via measurement of both force and inositol phospholipid production in response to carbachol stimulation. We hypothesize that the proximal and distal vagina will also differ in their response to carbachol, a muscarinic agonist.

Methods: Adult female Sprague-Dawley rats were sacrificed on the day of estrus and the vagina was dissected into a proximal (~upper 2/3rd) and distal (~lower 1/3rd) segment. Isolated RNA from proximal and distal segments underwent RT-PCR using primer pairs to amplify muscarinic receptor subtype 2 (M2) and 3 (M3) expression (n=3). Isometric force measurements were obtained using longitudinal tissue strips from the proximal and distal vagina mounted to a force transducer and equilibrated in physiological salt solution for 90 minutes (n=3). Strips were repeatedly stretched and contracted with KCl (110 mM) until the optimal length for maximal active contraction (Lo) was achieved. Strips were then activated with either 10 or 50 µM carbachol. Inositol triphosphate (IP3) production of tissue strips exposed to 50 µM carbachol for 0, 2, 15 and 20 minutes was measured using [3H] labeled inositol and Dowex column chromatography (n=3).

Results Obtained: We detected both M2 and M3 receptors at the message level in the proximal and distal vagina. Muscle bath studies indicated a resting tension at Lo of 0.55 ± 0.05 g and 0.26 ± 0.02 g in proximal and distal strips, respectively. Peak force generation in response to 10 µM carbachol (normalized to maximal KCl contractions) indicated a robust yet similar response of proximal (98.76 ± 6.40 %) and distal vaginal (97.37± 7.72%) strips. However, force generation of proximal strips in response to 50 µM carbachol increased to 145 ± 9.53 % whereas force generation of distal strips remained virtually unchanged. Accordingly, 50 µM carbachol stimulated greater IP3 production of proximal vaginal strips compared to distal strips at all time points following agonist addition.

Conclusions: We demonstrate for the first time a functional significance of muscarinic receptors in the vaginal muscularis through measurement of force generation and IP3 production in response to carbachol stimulation. We also show a regional difference in the muscarinic receptor mediated contractile pathway. These results strongly suggest that vaginal contraction is under parasympathetic control and raise the possibility of targeting muscarinic receptors in order to regulate vaginal contractility.
IDENTIFICATION OF THE OBESE MICE, WITH OR WITHOUT DIABETES, FOR INVESTIGATION OF BLADDER DYSFUNCTION AND URINARY INCONTINENCE IN OBESITY RELATED RESEARCH

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Introduction: Obesity, with or without associated diabetes mellitus (DM), is one of the contributing risk factors that is correlated with urinary incontinence (UI) and female pelvic floor disorders (FPFD). The pathophysiologic mechanisms of obesity related to UI or FPFD remain unknown. Animal models represent a valuable tool in the hierarchy of research for investigation of mechanisms of diseases.

Objectives: The aim of our study is to identify and test mice models of obesity, with or without associated diabetes, which demonstrate evidence of lower urinary tract dysfunction.

Methods: From the available mice models from the NIH-Animal Models of Diabetic Complications Consortium (www.amdcc.org) we obtained and evaluated the lower urinary tract function in several mice models with obesity including db/db on C57BLKS/J background, ob/ob on C57BL/6 background, Light Density Leptin receptor knock out (LDL-/-), LDL-/- with streptozotosin-induced diabetes (STZ), and wild type C57BL/6 female mice. In addition to the collection of data related to the animals’ weight and body mass index (BMI), mice in all groups (n=8) underwent placement of suprapubic tubes two days prior to undergoing conscious cystometry (CMG). After completion of CMG, the animals were euthanized and their bladders were harvested for future in-vitro and molecular studies.

Results: Db/db on the C57BLKS/J, ob/ob on C57BL/6 background, and LDL-/- (without STZ-induced DM) mice show two fold increases in their BMI compared to controls (Figure A). Db/db on the C57BLKS/J and ob/ob on C57BL/6 mice show evidence of hyperglycemia consistent with diabetes (Figure B). All three strains also show evidence of bladder dysfunction as evident by increased bladder weight (Figure C), frequency of micturition cycles, shortened intercontractile periods, and decreased peak micturition pressure at statistically significant levels compared to control mice (data not shown).

Conclusions: Our findings suggest that the db/db on the C57BLKS/J background, ob/ob on C57BL/6 background, and LDL-/- mice without STZ-induced DM would represent the more promising mice models of obesity, with or without diabetes, for mechanistic investigation of the effects of obesity on lower urinary tract function.
Poster #B25

PHOTOSELECTIVE VAPORIZATION OF THE PROSTATE (PVP) USING THE GREENLIGHT HIGH PERFORMANCE SYSTEM (HPS) IN THE CANINE MODEL
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Introduction and Objectives: Photoselective vaporization of the prostate (PVP) with the 80-watt (W), 532nm potassium-titanyl-phosphate (KTP) laser has been shown to be an effective and durable therapy for men with symptomatic benign prostatic hyperplasia (BPH). We investigate the use of the new, more powerful 10 to 120W Greenlight High Performance System (HPS, American Medical Systems, Inc.) laser in the canine model as an improved and faster treatment for BPH and to specifically analyze the effects of distance, power and time in a stationary application.

Methods: Five male beagles, aged 2 years and older, underwent general anesthesia and laparotomy. PVP was performed in antegrade fashion through a suprapubic cystotomy at 3 power settings (40, 80, and 120W) to create lesions in separate regions of the prostate for 3 different firing periods (5, 10, and 20 seconds) in a stationary application. Prostates were harvested at the end of the procedure, and histopathologic analysis performed. Both vaporization and coagulation depths for each laser setting were determined. Mean depths of vaporization and coagulation were calculated and compared using analysis of variance (ANOVA).

Results Obtained: Vaporization depth ranged from 1mm to full-thickness. Coagulation occurred 1.2 to 2.5mm deep to the vaporization zone for each application of the laser. Increasing laser power appeared to increase depth of vaporization while maintaining or decreasing depth of coagulation; increasing duration of lasing also behaved similarly (See Table). Microscopic pathology revealed damage to adjacent tissues only in areas of full-thickness vaporization.

Conclusions: The HPS laser demonstrated greater power than the 80W KTP system. Interestingly, HPS laser beam effects appeared more optically confined than its lower power brethren; it consistently vaporized more tissue over a given time period while maintaining a 1 to 2mm rim of coagulation like its predecessors. This implies that stationary application of the HPS laser beam at high power should be used only under specific circumstances and that fast sweep speeds are critical for safety and efficiency under general use.

<table>
<thead>
<tr>
<th>Power (W)</th>
<th>Mean Depth of Vaporization (mm)</th>
<th>Mean Depth of Coagulation (mm)</th>
<th>Time (s)</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>40</td>
<td>&gt;6</td>
<td>1.3</td>
<td>20</td>
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</tr>
<tr>
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<td>5 and &gt;7</td>
<td>1.8</td>
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<td>3</td>
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<tr>
<td>120</td>
<td>5 and &gt;6 and &gt;10</td>
<td>1.2</td>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>

Source of Funding: American Medical Systems, Inc.
ANALYSIS OF VIDEOURODYNAMIC RESULTS AND THE UTILITY OF LEAK POINT PRESSURE AS A MEASURE FOR INTRINSIC SPHINCTER DEFICIENCY IN WOMEN WITH STRESS URINARY INCONTINENCE

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Introduction and Objectives: We aimed to correlate history, symptoms, and urodynamic findings in a large cohort of women undergoing videourodynamic testing (VUDS) for the main complaint of non-neurogenic stress urinary incontinence (SUI). We also aimed to determine the utility of leak point pressure (LPP) as a means of predicting for intrinsic sphincter deficiency (ISD) without hypermobility, or the classical Type III.

Methods: 2230 women had 2510 studies over a 20-year period. Each patient underwent a standardized history. VUDS was carried out with subtracted detrusor pressure, filling and voiding studies, and SUI testing with LPP measurements. Upright radiographic SUI testing was classified according to Blaivas (Types I, IIA, IIB, III and 0). Data analyzed included symptoms, presence of detrusor overactivity (DO), and radiographic type of SUI. LPP was analyzed by radiologic type and receiver-operator characteristics (ROC) curves to determine the clinical utility of LPP measurements.

Results: Mean patient age was 58.0 years (range 19-92) and 45% had previous surgery. In addition to SUI, 86% of patients had storage symptoms, with 77% reporting urgency incontinence (UUI). DO was demonstrated in 25.8% of those with storage symptoms and only 10.3% of those without storage symptoms (P<0.05). Overall SUI was not demonstrated in 726 studies (28.9% Type 0). There were 472 patients with Type I, 627 with IIA, 395 with IIB, and 290 with III. Mean ages of patients with Types IIB (64.2 years) and III (62.4 years) were higher than those with Types I (57.7 years) and IIA (56.0 years) (P<0.001). Storage symptoms were significantly more common in Type III compared to Types I and IIA (P<0.05). Type III patients also had the highest rate of previous surgery (P<0.01). Mean LPP was lowest for Type III (67 cm water) and highest for Type IIA (87 cm water) (P<0.05), whereas Types I and IIB had similar LPP results (~79 cm water). The areas of the ROC curves of LPP were significantly more for Types III (0.6402) and IIA (0.6054) than for I and IIB (P<0.0001). The best cutoff value of LPP for predicting Type III was <78.5 cm water, which yielded a sensitivity of .62 and specificity of .61. Given the prevalence of Type III in our sample (16.3%), the positive predictive value of LPP<78.5 cm water as a cutoff for detecting Type III was .24, with a likelihood ratio of 1.33. Lower cutoff LPP values yielded higher positive predictive values up to .294, but were also associated with lower specificities.

Conclusions: Storage symptoms were present in the majority of patients. DO was found in a minority but primarily in those with storage symptoms. Most patients had some degree of hypermobility. Older patients with previous surgery were more likely to have either Type IIB or III. Although the mean Type III LPP was significantly lower than that of other types, there was considerable overlap in the values. LPP had no value in predicting for Types I and IIB, and some predictive value for IIA and III. While the optimal cutoff LPP for predicting the presence of ISD was found to be <78.5 cm water, this LPP cutoff was found to have a low positive predictive value, and hence was of limited value in detecting Type III over other types of SUI. These results suggest that the clinical utility of LPP alone is very low for predicting for the presence of Type III or ISD without hypermobility.
HEALTH CARE SEEKING FOR PELVIC FLOOR DISORDERS: A POPULATION BASED STUDY
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¹University of California, San Diego, CA, ²Kaiser Permanente, Pasadena, CA, ³Kaiser Permanente, San Diego CA

Objective: We sought to establish rates of care seeking for urinary incontinence (UI), pelvic organ prolapse (POP) and anal incontinence (AI) in a large population based sample. We also identified characteristics associated with care seeking behavior among these women.

Methods: This is a sub-analysis of a previously reported postal survey of women from a managed health care population that was funded by the National Institute of Child Health and Human Development (RO1 HD41113).¹ The validated Epidemiology of Prolapse and Incontinence Questionnaire² was used to identify women with stress urinary incontinence (SUI), overactive bladder (OAB), POP, and AI. Of the women who completed the survey, those who reported having ever asked a healthcare provider for help with or having had surgery for UI, POP or AI were considered ‘care seeking’ for that disorder. Women with each disorder who had not asked for care and not had surgical treatment were defined as ‘non-care seeking’. Women were not asked to differentiate between SUI and OAB when asked about care seeking for UI therefore UI was defined as having SUI, OAB, or both. Demographic, socioeconomic and medical information were obtained through self-report. The two groups were compared by age, race/ethnicity, income, education, marital status, body mass index, menopause, hysterectomy, medical co-morbidities, estrogen use, smoking, and caffeine consumption. T-test, Mann-Whitney U, and chi-square tests were used to identify variables associated with care seeking. Logistic regression was used to adjust for confounders. Significance was determined at p<0.05. Results are given as adjusted odds ratios (OR) with 95% confidence intervals (CI).

Results: The table shows the number of women who had ever had each disorder and the percent who had sought care of the 4458 respondents.

<table>
<thead>
<tr>
<th>Group</th>
<th>UI n = 1249</th>
<th>POP n = 568</th>
<th>AI n = 1154</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care Seeking</td>
<td>61%</td>
<td>73%</td>
<td>28%</td>
</tr>
<tr>
<td>Non-Care Seeking</td>
<td>39%</td>
<td>27%</td>
<td>72%</td>
</tr>
</tbody>
</table>

Regression analysis found that increasing age was the most significant determinant of care seeking (p < 0.001) for UI (OR 1.04/year, 95% CI 1.02–1.05) and POP (OR 1.07/year, 95% CI 1.04–1.11). The percent of care seekers for POP and UI increased from 23% to 88% and 31% to 75% respectively from the 25-39 year age group to the 70-84 year age group. Care seeking for UI was associated with estrogen use (p=0.001, OR 1.28, 95% CI 1.29–2.45) and hysterectomy (p=0.019, OR 1.40, 95% CI 1.05–1.89), while care seeking for POP was also associated with hysterectomy (p <0.001, OR 4.30, 95% CI 2.16–8.55). Care seeking for AI was only associated with frequent urinary tract infections (p=0.033, OR 1.67, 95% CI 1.04–2.68).

Conclusions: Compared to previous reports, we found that care seeking rates for UI and AI in this population are high. Care seeking for POP has not been explored previously and interestingly is the condition for which women are most likely to seek care. AI care seeking is strikingly low compared to the other disorders. Care seeking for UI and POP is substantially age dependent. It is not clear if this is a function of age or of the increased length of time older women have had to seek care for these conditions. These data suggest that as the population ages the demand for pelvic floor treatment will rise even faster than anticipated.

THE EVOLUTION OF OBSTRUCTION-INDUCED OVERACTIVE BLADDER (OAB) SYMPTOMS FOLLOWING URETHROLYSIS FOR FEMALE BLADDER OUTLET OBSTRUCTION

Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN, USA

Introduction: Female urethral obstruction following stress incontinence (SUI) surgery may present with a spectrum of LUTS, including both obstructive and OAB symptoms. Following urethrolysis there is usually consistent resolution of obstructive symptoms, while similar improvement in OAB symptoms demonstrates a more variable natural history. We sought to evaluate the prevalence of persistent OAB symptoms in women following urethrolysis for postoperative bladder outlet obstruction (BOO).

Materials and Methods: A retrospective review of our urethrolysis database identified 39 patients who underwent surgery for relief of BOO following SUI surgery. All patients underwent a comprehensive urologic evaluation including history, physical examination, cystoscopy, and fluoro-urodynamic studies. Exclusion criteria included patients with genitourinary erosion, neurogenic bladder dysfunction, and a known history of pre-existing OAB. Clinical, surgical, urodynamic, and postoperative data were collected in all patients. Urethrolysis outcomes were determined by subjective bladder symptoms, as well as objective data, including measured postvoid residual urine, need for continued intermittent catheterization, and continued pharmacotherapy with muscarinic receptor antagonists. All statistical analyses were conducted using a standard statistical software package (Stata 9.0).

Results: Thirty-nine patients were included in the study. The mean age of our cohort was 56 years (32-83) and the length of followup was 11.6 months (3-38). Overall, the average delay from the initial SUI procedure to urethrolysis was 21 months (3-72). Indications for urethrolysis included clinical BOO (n=33) and new onset OAB symptoms (n=34) felt to be secondary to obstruction. Thirty patients presented with both obstructive and OAB symptoms. Obstructive symptoms resolved in 27 (82%) while OAB symptoms resolved completely in only 12 patients (35%) and improved in 4 (12%). Overall, 18 (53%) patients were taking antimuscarinic medications for persistent OAB symptoms and 5 ultimately required sacral neuromodulation. Detrusor overactivity was present in 12/18 (67%) of patients with persistent OAB symptoms compared to 6/16 (38%) patients whose OAB symptoms resolved (p < 0.05). No other clinical or urodynamic parameters were predictive of persistent OAB symptoms, including time delay from SUI surgery to urethrolysis. Recurrent SUI was observed in 4 patients.

Conclusions: Following urethrolysis, OAB symptoms secondary to urethral obstruction did not resolve in up to 50% of patients in our experience, consistent with other reports in the literature. Detrusor overactivity demonstrated on UDS may be useful in predicting who will develop persistent OAB symptoms, despite an effective urethrolysis procedure. This has important implications when counseling patients for urethrolysis to alleviate OAB symptoms.
NEARLY HALF OF WOMEN HAVING RECONSTRUCTIVE PELVIC SURGERY REPORT NEW PELVIC SYMPTOMS POSTOPERATIVELY
K Kenton, T Pham, L Brubaker
Loyola University Medical Center, Maywood, IL

**Introduction:** Patient satisfaction after reconstructive pelvic surgery (RPS) is associated with achievement of self-described surgical goals; however, 1-year after surgery, dissatisfaction is associated with overactive bladder symptoms regardless of goal achievement.

**Objective:** To determine rates of new pelvic symptoms after RPS and how new pelvic symptoms impact surgical outcomes.

**Methods:** After IRB approval, consecutive women scheduling RPS for symptomatic prolapse (POP) and/or incontinence were invited to participate. Women underwent standardized preoperative assessment, including urodynamics and pelvic organ prolapse quantification (POPQ). All women also completed the short form of the Pelvic Floor Distress Inventory, including urinary (UDI) and prolapse (POPDI) subscales. Women underwent standardized follow up 3 months after RPS:
* Pelvic organ prolapse quantification (POPQ)
* Cystometrogram (CMG)
* Questionnaire eliciting overall satisfaction and new pelvic symptoms
* PFDI
* Patient Global Impression of Improvement (PGI)

We defined objective cure conservatively: POP cure=stage 0 or I support; Urodynamic Stress Incontinence (USI) cure=no leakage on CMG. An answer of “very much better” or “much better” on the PGI was considered “improved”. An answer of “completely satisfied” on a 5 point Likert scale (“completely satisfied” to “completely dissatisfied”) was considered “satisfied”. Chi² test of association was used to compare nominal data, and Mann Whitney test was used to compare independent groups and continuous variables.

**Results:** Seventy nine women had RPS during the study period. Baseline mean±SD UDI and POPDI scores were 44±31 and 36±24. Half of participants (54%) had combined POP/USI procedures; 34% only USI; 12% only POP. Three months after surgery, nearly half (42%) of women reported new pelvic symptoms. New incontinence symptoms were most common (27%), followed by urinary urgency (25%) and frequency (23%), difficulty with defecation (22%), voiding difficulty (10%) and POP (2%). Baseline UDI and POPDI scores were not significantly different amongst women with and without new pelvic symptoms (p=.12 and p=.51) nor was type of surgery (p=.11). Women with new symptoms had lower postoperative mean UDI scores (23±21 vs 6±11, p<.0005) and POPDI scores (11±12 vs 4±9, p=.02) than those without new symptoms. Objective cure rates were 71% for USI and 64% for POP. Neither objective cure of POP (p=.306) or USI (p=.07) was associated with new pelvic symptoms. Only 58% of women with new symptoms were improved on PGI compared to 83% without new symptoms (p=.014). Likewise, 33% with new symptoms were completely satisfied compared to 83% without new symptoms (p<.0005). In multivariate analysis, satisfaction was significantly associated with new pelvic symptoms (p=.008), but not postoperative UDI or POPDI scores (p=.07 and p=.09).

**Conclusion:** Women undergoing RPS report high rates of new pelvic symptoms after surgery. Not surprisingly, new pelvic symptoms are associated with decreased self-reported improvement and satisfaction despite objective cure and improvement on validated quality of life (QOL) measures. Given this strong association between decreased satisfaction, new pelvic symptoms, and QOL, further investigation is necessary to determine optimal methods for assessing surgical success.
Introduction and Objective: To describe the validation of a new overactive bladder questionnaire (OABQ) and severity score (OABSS)

Methods: 225 subjects at 3 centers completed a questionnaire comprised of the following five fixed format and one global ten-point question:

A. What is the reason that you usually urinate? (convenience, mild, moderate, severe, desperate urge)
B. Once you get the urge to urinate, how long can you usually postpone it comfortably? (more than 60 min, about 30-60 min, about 10-30 min, less than 10 min, must go immediately).
C. How often do you get a sudden urge to urinate that makes you want to stop what you are doing and rush to the bathroom? (Never, rarely, a few times a month, a few times a week, daily).
D. How often do you get a sudden urge to urinate that makes you want to stop what you are doing and rush to the bathroom but you don’t get there in time (e.g. you leak)? (Never, rarely, a few times a month, a few times a week, daily).
E. In your opinion how good is your bladder control? (0 (perfect) to 10 (no control at all))

Participants were divided into 3 groups: 1) normal volunteers (N), 2) patients without lower urinary tract symptoms (P), 3) overactive bladder (OAB). An OABSS was constructed with a total possible score ranging from 0 (no symptoms) to 30 (worst symptoms). For test-retest reliability, the same scale was administered twice within 3 - 14 days. Simple Pearson correlations were performed for each item and for the total score between measurements at time 1 and time 2. Internal consistency (Cronbach’s alpha) was assessed by calculating the intercorrelations among the scale items. Group comparisons were performed using one-way analysis of variance on the average scale score among three groups. Discriminant validity was assessed by comparing the total score across the three groups at times 1 and 2, using a one-way analysis of variance and LSD post hoc tests.

Results: There were 127 men and 98 women. Internal consistency of the scale administered at time 1 was found to be very high; Chronbach’s alpha=.82. Test - retest reliabilities were as follows: item A=.76, item B=.83, item C=.84, item D=.88, and item E=.90. Test-retest reliability for the total score was .93 (p<.001). There was a significant difference between the total score across all 3 groups (p <.001) during both administrations. Normals obtained the lowest mean scale score 8.2 (5.5), the patients obtained the next higher mean scale score 10.8 (5.1) (p<.01), and the OAB group had the highest score 16.3 (5.5) (p<.001).

Conclusion: This OAB questionnaire is a valid instrument that distinguishes OAB patients from normal volunteers and patients without OAB. It is currently being expanded for use as an OAB outcome score.

Funding Source: Institute for Bladder and Prostate Research, Pfizer, Novartis
THE PITFALLS OF URODYNAMIC EVALUATION IN PATIENTS WITH GRADE 4 CYSTOCELE AND SYMPTOMS OF OBSTRUCTION
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Introduction and Objective: Symptoms of voiding dysfunction are common in patients with pelvic organ prolapse. In patients with grade 4 cystocele we have previously reported presenting symptoms to be obstructive voiding (OVS) in 44%. There is also evidence that the incidence and severity of these complaints increases with age. The value of urodynamic evaluation in patients with grade 4 cystocele is not yet well defined. The purpose of this study was to correlate the subjective voiding dysfunction symptoms with urodynamic (UDS) findings in patients with grade 4 cystocele and OVS.

Methods: We retrospectively evaluated a small subset of 59 patients who presented with urinary symptoms and were evaluated with videourodynamics between July 2005 and September 2006. These patients were all found to have Grade 4 cystocele on VCUG and physical examination. All patients underwent clinical evaluation, videourodynamics and cystoscopy. We looked at the following three criteria: 1) post-void residuals as determined on initial catheterization prior to UDS evaluation; 2) Obstruction using a definition of urodynamic obstruction as detrusor pressure of more than 25 cm H_2O and a Qmax less than 10ml/s (Urology. 2004 Oct;64(4):675-9); and 3). Bladder-neck obstruction or kinking defined as less than 45-degree angle between the bladder neck and the urethra on lateral cystography films between rest and straining with the patient in the standing position.

Results: Fifty-nine patients were evaluated during the study period. Of these 5 (8.5%) presented with SUI; 17 (28.8%) presented with UI; 6 (10.2%) presented with MUI and 30 (50.5%) presented with OVS as their chief complaint. The mean post-void residual for those patients presenting with symptoms other than obstruction was 106.5 cc. Of those patients with OVS, the mean post void residual was 178.3 cc (p<0.05). Using a detrusor pressure of more than 25 cm H_2O and a Qmax less than 10ml/s we identified 13 of 18 patients who voided for the study that were obstructed on urodynamics (22%). Of those 30 presenting with OVS, only 8 had urodynamic evidence of obstruction (26.7%). Five patients were found to be obstructed, but did not present with OVS (16.7%). Anatomic findings of bladder neck obstruction were also examined. Of 59 patients in the cohort, 41 patients (69.5%) had radiographic evidence of bladder-neck kinking. Of those patients presenting with obstructive voiding symptoms, 100% had evidence of bladder-neck kinking on strain. In addition, of those patients that were obstructed by pressure flow measurements, 11 of 13 (84.6%) also had radiographic evidence of bladder-neck kinking. Of those that were unable to void for the study, but generated detrusor pressures, 57.1% (4) also had evidence of bladder-neck kinking. Of the 30 patients that presented with OVS, 27 had evidence of bladder-neck kinking on lateral cystography (90%).

Conclusions: Patients with grade 4 cystocele often present with subjective voiding dysfunction. In this study, the most common presenting symptom was obstruction. In this cohort of patients, it was difficult to objectively demonstrate findings of obstruction on urodynamic evaluation since only a small portion of patients were able to void. However, this study showed that there is a 100% correlation between OVS and bladder-neck kinking, yet only 27% of OVS patients met criteria for obstruction in pressure-flow study. Because the primary mechanism of obstruction appears to be bladder-neck kinking, this renders pressure-flow measurements unreliable assessments of obstruction. Further, we found a significant difference in post-void residuals in patients presenting with OVS when compared to those presenting with other symptoms. Post-void residuals and lateral cystography appear to be sensitive determinants of obstruction in patients with grade 4 cystocele presenting with OVS. The role of UDS in patients with grade 4 cystocele remains to be defined.
Introduction: Surgical repair of the pelvic organ prolapse (POP) has historically been performed through abdominal or vaginal approaches. The International Consultation on Incontinence has recommended abdominal sacrocolpopexy (ASC) as the gold standard operation for advanced POP. New advances in robotic-assisted surgery make it possible to use minimally-invasive techniques in performing ASC. Robotic ASC combines the efficacy of abdominal sacrocolpopexy with the advantages of minimally invasive surgery for management of women with advanced FPOP.

Objectives: To assess management of advanced POP with robotic-assisted abdominal sacrocolpopexy (RASC) and evaluate outcomes using the pelvic organ prolapse quantification (POPQ) scale.

Methods: Women with symptomatic stages III and IV FPOP were evaluated at our institution. After complete clinical assessment, including POPQ-based physical examination and urodynamic studies, the patients underwent RASC with or without an anti-incontinence surgery in the presence (sacrouteropexy) or absence of uterus (sacrocolpopexy). The follow up exam at 3 months included POP-Q based examination and patient perception of improved quality of life questionnaire (QOLQ).

Results: Twelve women were consented for RASC; nine women underwent successful RASC, one patient required conversion to laparoscopic ASC, one to open ASC, and one to transvaginal anterior colporrhaphy due to extensive bowel adhesions involving the bladder. Mean patient age was 64 (50-79). Mean preoperative POP-Q stage was 3.1 (3-4). Mean preoperative POP-Q values were Aa: +0.9, Ba: +2, C: -1.0, Ap: -1.0, and Bp: -1.0. Mean postoperative values were Aa: -2.7, Ba: -4.7, C: -8.28, Ap: -2.29, and Bp: -4.14. Mean postoperative POP-Q stage was 0. Mean intraoperative EBL was 81cc (50-150). Mean hospital stay was 2.4 days (1-7 d). Five patients underwent concurrent placement of a TOT sling and one patient underwent concurrent Burch culposuspension for occult SUI. The patient perception of QOLQ improved significantly.

Conclusions: Our results demonstrate that RASC is safe and efficacious, and its outcomes compare favorably to the reported results for open or laparoscopic abdominal sacrocolpopexy.
**Poster #8**

**SCHEDULED REPEATED BOTOX™ INJECTIONS FOR IDIOPATHIC OAB: EVALUATING THERAPEUTIC TIME**

Angelo E. Gousse, MD, Paholo G. Barboglio, MD, Brian Cohen, MD, Dinorah Rodríguez, RN.
Miller School of Medicine, University of Miami, FL

**Introduction and Objective:** Intradetrusor Botulinum toxin type A (BTX-A) injection has emerged as a novel therapeutic option for the treatment of idiopathic overactive bladder (I-OAB) refractory to oral antimuscarinic agents. We designed an IRB approved prospective trial to evaluate time length of improvement using voiding diaries, urodynamic findings and symptomatic improvement of urinary frequency (UF) and urinary urge incontinence (UUI). Patients were submitted to a scheduled re-injection BTX-A protocol.

**Methods:** 34 Patients with I-OAB refractory to antimuscarinics were randomized to receive intradetrusor BTX-A (100 U or 150 U) as 10 U/ml /injection “trigone and dome sparing” (10-15 injections) with a 14 Fr. flexible cystoscopy. We used Botox® for BTX-A, which was funded by Allergan. Prior to injection, the patients were evaluated by: history, physical examination, Urogenital Distress Inventory-6 (UDI6), multichannel videourodynamics (UDS), and urine culture. Repeat UDS were obtained at 6 weeks and prior every injection. The above mentioned questionnaires, the 3 consecutive days voiding diaries, urinalysis, post-void residual volume were taken at every visit: 2wks, 6wks, 3mon and 6mon after every injection. Patients were reinjected using the same randomized dose and technique every 6 months regardless of response.

**Results:** Mean age was 56 years (22-80) at the beginning of the study. 29 Female and 5 male subjects were evaluated. 21 Patients had OAB-Wet and 13 OAB-Dry. Of the 34 patients who received the baseline injection, 20 received a second injection, 12 a third injection, 8 a fourth injection, 5 a fifth injection and 3 a sixth injection. In order to calculate the length of the improvement period, we analyzed the time length of improvement (greater than 20% from the baseline). Patient’s improvement was determined by voiding diaries. The distribution was significant when we analyzed the patient’s results. The UUI improvement wears off within 6-11 weeks on average, after the first injection. However the length was higher on the consecutive injections in 7 of the 13 patients who were first injected and had an improvement greater than 20%. The improvement did not wear off at 25 weeks after the 2nd and the 6th treatments, and wore off within 12 and 24 moths after the 4th, 5th BTX-A injections. The UF improvement, in average wears off within 12-24 weeks after BTX-A repeated injections. The improvement in UF and UUI were always significantly higher than the baseline (T test p<0.05) during the 6 BTX-A injections, except at 6wk-Inj1 on UF and at 6wk-Inj5, 12wk-Inj6. (Graphic)

**Conclusions:** BTX-A Intradetrusor injections provide rapid, well-tolerated clinical improvement in the urinary frequency and urge urinary incontinence episodes in patients with idiopathic detrusor overactivity with a length within 12 and 24 weeks. However not all the patients responded to the therapy. Patients who achieve a clinical improvement either in frequency or incontinence after the first injection never became refractory after subsequent therapy. UUI improvement is greater than that of UF, at all time intervals.

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**Graph:**

**Frequency and Urge Urinary Incontinence Improvement %**

- **UUI**
- **UF**

<table>
<thead>
<tr>
<th>Improvement %</th>
<th>1-Inj</th>
<th>2-Inj</th>
<th>3-Inj</th>
<th>4-Inj</th>
<th>5-Inj</th>
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<tr>
<td>20%</td>
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Introduction and Objective: Intradetrusor Botulinum toxin type A (BTX-A) injection has emerged as a novel therapeutic option for the treatment of idiopathic overactive bladder (I-OAB) refractory to oral antimuscarinic agents. We designed an IRB approved prospective trial to evaluate the improvement in urinary frequency (UF) and urge urinary incontinence (UUI) using voiding diaries (VD), urodynamic findings, validated symptomatic improvement, and quality of life in I-OAB patients submitted to a scheduled re-injection BTX-A protocol.

Methods: 34 Patients with I-OAB refractory to antimuscarinics were randomized to receive intradetrusor BTX-A (100 U or 150 U) as 10 U/ml /injection “trigone and dome sparing” (10-15 injections) with a 14 Fr. flexible cystoscopy. We used Botox ® for BTX-A, which was funded by Allergan. Prior to injection, the patients were evaluated by: history, physical examination, Urogenital Distress Inventory-6 (UDI6), multichannel videourodynamics (UDS), and urine culture. Repeat UDS were obtained at 6 weeks and prior every injection. The above mentioned questionnaires, 3 consecutive days VD, urinalysis, post-void residual volume were taken at every visit: 2wks, 6wks, 3mon and 6mon after every injection. Patients were re-injected using the same randomized dose and technique every 6 months regardless of response.

Results: Mean age was 56 years (22-80) at the beginning of the study. 29 Female and 5 male subjects were evaluated. 21 Patients had UUI (OAB-Wet) and 13 (OAB-Dry). Of the 34 patients who received baseline injection, 20 received a second injection, 12 a third injection, 8 a fourth injection, 5 a fifth injection and 3 a sixth injection. We analyzed the improvement in UF and UUI during the period of 6-12 weeks, comparing the outcome with the baseline status (T-test). The data was calculated from the voiding diaries and UDI-6. We took the answers from domains 1 and 2 from the UDI-6 in order to obtain the UF (UDI6-Q1) and UUI (UDI6-Q2) data. Patients who changed their baseline response from greatly or moderate to little or none after having received the BTX-A were correlated with (Spearman Correlation) the improvement on VD (Table 1-2).

Conclusions: There was a very strong correlation between VD and UDI6/Q1 on urinary frequency. The correlation was only strong after the first injection between VD and UDI6/Q2 on urge urinary incontinence. The improvement was greater in urge urinary incontinence than in urinary frequency when the outcome at 6-12 weeks was compared with baseline. VD correlated better with UDI-6 when evaluating UF rather than UUI.

Table 1

<table>
<thead>
<tr>
<th>Frequency Improvement in VD vs. UDI-6/Q1: “None or Little Urinary Frequency” within 6-12wks after each BTX-Injection</th>
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<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Inj *N</td>
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<tr>
<td>Freq Improvement</td>
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<td>32% *16</td>
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<tr>
<td>UDI-6/Q1 (N/L)</td>
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<td>Correlation</td>
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Table 2

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<th>Urinary Incontinence Improvement in VD vs. UDI-6/Q2: “None or Little Urinary Incontinence” within 6-12wks after each BTX-Injection</th>
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<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Inj *N</td>
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<tr>
<td>Urinary Incontine.</td>
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<tr>
<td>UDI-6/Q1 (N/L)</td>
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<td>Correlation</td>
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Are There Differences Between Women with Urge Predominant and Stress Predominant Mixed Urinary Incontinence?

Jack B. Lewis*, Alexander V. Ng*, R. Corey O’Connor*, Michael L. Guralnick *
*Dept. of Urology, Medical College of Wisconsin, Milwaukee, WI, ^College of Health Science, Marquette University, Milwaukee, WI

Introduction and Objectives: We sought to determine if there are differences in clinical and urodynamic parameters between women with urge predominant and those with stress predominant mixed urinary incontinence (MUI).

Methods: Charts of 99 female patients with complaints of MUI were reviewed. Patients were divided into 2 groups based on the subjective predominance of either stress incontinence (MSUI) or urge incontinence (MUUI). All patients completed a subjective evaluation including an AUA Symptom Index, Urogenital Distress Inventory (UDI-6), and Incontinence Impact Questionnaire (IIQ-7). Objective noninvasive measures included physical exam, 48-hour voiding diary, and a 24-hour pad test. Videourodynamics studies (VUDS), performed in all patients, were reviewed and the presence and characteristics of detrusor overactivity (DO) and stress incontinence were noted. There was no funding for this study.

Results: There were no significant differences between groups with respect to symptom scores. MUUI patients had significantly higher pad usage, and lower maximum and average voided volumes than MSUI patients. They were also more likely to have lower urodynamic bladder capacities and demonstrable DO (70% vs. 26%) on VUDS with contractions occurring at lower bladder volumes and with higher amplitude. MSUI patients were more likely to have demonstrable SUI on physical examination (63% vs. 16%) and on VUDS (100% vs. 61%).

Conclusions: There do appear to be differences in clinical and urodynamic parameters between patients with stress predominant and urge predominant MUI. These may help to determine which component of the mixed incontinence is more problematic.
CADAVERIC FASCIAL SLING: MINIMUM OF 24 MONTHS FOLLOW-UP
Tanya Nazemi, Kathleen C. Kobashi, Fred E. Govier, Brian S. Yamada
Virginia Mason Medical Center, Seattle, Washington

Introduction and Objectives: Allograft materials such as cadaveric fascia lata have been used as alternative grafts to autologous tissues for slings. Previous studies have demonstrated disappointing results in terms of durability and efficacy of cadaveric fascia grafts for use as transvaginal slings. We present our long-term outcomes with the cadaveric transvaginal sling (CaTS) using non-frozen solvent-dehydrated cadaveric fascia lata (Tutoplast, Mentor Corp., Santa Barbara, CA) at our institution.

Methods: We reviewed an ongoing prospective database on 353 patients who have undergone a CaTS procedure with or without a concomitant cystocele repair with a minimum of 24-months follow-up (range 24-93 months). Patients were asked to fill out quality of life questionnaires at 6 months and annually thereafter. Success was defined by a questionnaire response of < 1 stress incontinence episode per week or > 70% subjective improvement in those patients with ≥ 1 stress incontinence episode per week.

Results Obtained: From May 1998 to May 2006, 353 patients underwent CaTS with or without concomitant cystocele repair. Three hundred and forty-two patients are ≥ 24 months from surgery. Of those, 218 (64%) patients have minimum follow-up questionnaires of 24 months (mean 50 months). Seventy percent of patients with questionnaire responses reported none or < 1 episode of leakage per week, and 68% of patients reported none or < 1 episode of urge incontinence per week. Fifty-nine percent of patients reported a >70% overall improvement in symptoms. Of the responses received, 166 (79%) of procedures were considered successful. In addition, 62% of patients were ≥ 70% satisfied with the procedure, 73% would repeat the procedure, and 69% would recommend the procedure to a friend.

Conclusions: Cadaveric materials offer several advantages to autologous grafts such as decreased morbidity, operative time, and pain. They also offer the theoretical advantage of decreased graft rejection rates over synthetic materials. There are certain disadvantages reported including risk of disease transmission, high cost and questionable durability, and intermediate reports in the literature demonstrated questionable efficacy, although only few long-term series have been published. In our experience to date, the CaTS procedure has remained comparable to synthetic graft slings. As our field advances, long-term follow up with all procedures is imperative in order to provide an accurate picture of our outcomes. We endeavor to continue close follow up to assess the true long-term outcome with the non-frozen cadaveric fascia lata sling.
COMPLICATIONS OF LAPAROSCOPIC SACROCOLPOPEXY FOR TREATMENT OF VAGINAL VAULT PROLAPSE
Mia A. Swartz, MD, MS, Paul M. Kozlowski, MD, Fred E. Govier, MD, Kathleen C. Kobashi, MD
Virginia Mason Medical Center, Seattle, WA

Introduction and Objectives: Laparoscopic sacrocolpopexy is becoming increasingly utilized for the management of vaginal vault prolapse. The purpose of this study was to determine surgical complications associated with a minimally invasive approach.

Methods: The IRB approved database at Virginia Mason Medical Center was reviewed for laparoscopic sacrocolpopexies performed from 2002-2006. Cases that were converted to an open or transvaginal approach were excluded from further analysis. Information on patient and surgical characteristics was then abstracted from the computerized medical record. All procedures were performed by a single laparoscopic surgeon in combination with one of two female urologists. In all cases, a Y-configured mesh was sutured to the anterior and posterior vaginal walls and then anchored to the sacral promontory using the Straight-In Drill (AMS).

Results: Forty-five women were identified who had a successful laparoscopic sacrocolpopexy. There were an additional three cases converted to an open approach, and one that was converted to transvaginal approach secondary to extensive adhesions. Those who had a completed laparoscopic sacrocolpopexy had a mean follow-up of 6.1 months (range 2 weeks-27 months). The presenting chief complaint was vaginal bulging in all patients. The mean age was 66.7 years (SD 8.9 years) and all were postmenopausal. Most (51.1%) of the women were sexually active. Preoperative Baden-Walker grading was 2 (33.3%), 3 (46.7%) and 4 (17.8%). Seventeen (37.8%) of the patients had undergone previous abdominal surgery and 31 (68.9%) and 24 (53.3%) had a history of prolapse repair and surgery for incontinence, respectively. Nearly half (46.7%) underwent simultaneous procedures that included a sling, anterior or posterior colporrhaphy. Most of the women (96%) were discharged within 48 hours. The overall surgical complications included 4 (8.9%) mesh or suture erosions, 5 (11.1%) with new or persistent stress incontinence requiring a subsequent procedure, 3 (6.7%) nonspecific bowel symptoms, one vaginal injury repaired intraoperatively (2.2%) and one bladder injury managed with foley decompression (2.2%) and one recurrence (2.2%) at 20 months follow-up. Of those known to be sexually active, 5 (23.8%) had new onset dyspareunia postoperatively, and of these women, 3 (50%) did not have a concomitant procedure performed. No woman with dyspareunia had a simultaneous rectocele repair. The sole medical complication was a postoperative myocardial infarction with pneumonia.

Conclusions: We have had excellent short-term success with laparoscopic sacrocolpopexy, and this includes women who have had previous abdominal surgery. Although the mesh erosion rate using silicone was high, we have not had any cases of erosion since transitioning to polypropylene mesh. The observation of dyspareunia and bowel complaints postoperatively warrants further investigation. Laparoscopic sacrocolpopexy is a minimally invasive procedure with a unique set of complications for which the patient should be appropriately counseled.
COMMERCIAL PROLAPSE REPAIR “KITS” VS. TRADITIONAL TRANSVAGINAL PROLAPSE REPAIRS: A COMPARISON OF EFFICACY AND COST
Colin M. Goudelocke,¹ Rashel Haverkorn,¹ B. Jill Williams,¹ Basir Tareen,² Raymond A. Bologna,² Alex Gomelsky¹
Departments of Urology, LSU Health Sciences Center, Shreveport, LA¹, and SUMMA Medical System, Akron, OH²

Introduction and Objectives: To compare costs and short-term surgical outcomes following traditional transvaginal prolapse repair and commercial prolapse “kits.”

Methods: IRB approval was obtained to review office and hospital records of 60 consecutive women who underwent transvaginal prolapse repair at 2 training institutions. Group 1 (N=30) underwent anterior and posterior colporrhaphy and sacrospinous ligament fixation or iliococcygeus hitch. Group 2 (N=30) underwent similar compartment repairs with the APOGEE™ or PERIGEE™ kits (AMS, Minnetonka, MN). All had a concomitant sling procedure. Patients were matched for compartment of prolapse using both Baden-Walker and POP-Q grading. Abstracted costs were: operating room (OR), disposable materials (DM), and room and board (RB). Statistical analysis was performed with Mann-Whitney and Chi-square tests, where applicable.

Results: Mean follow-up was longer for group 1 (20 vs. 15 months, p<0.0001) and minimum follow-up was 12 months for both groups. Age, parity, body mass index, and pads per day were similar for both groups. Women in group 1 had a significantly higher degree of preoperative anterior compartment prolapse (mean Point Ba: 1.6 vs. -0.01, p=0.0232) and apical compartment prolapse (mean Point C: 1.07 vs. -1.38, p=0.001). Rates of postoperative transfusion and short-term urinary retention were not statistically different (NS). Postoperative resolution of anterior and posterior compartment prolapse was effective for both groups (NS); however, a significantly higher % of women in group 2 developed asymptomatic apical prolapse (32% vs. 7%, p=0.016). Two patients in each group required additional surgery for symptomatic prolapse {Group 1: posterior colporrhaphy, abdominal sacral colpopexy (ASC); Group 2: ASC (2)}. RB costs were significantly higher for group 1 ($1017 (95% CI: $800-$1234) vs. $732 (95% CI: $643-$821), p=0.037). OR time and cost were similar (NS). For group 2, DM cost ($2412 (95% CI: $2360-$2465) vs. $790 (95% CI: $658-$922), p<0.0001) and total cost ($5743 (95% CI: $5563-$5923) vs. $4558 (95% CI: $4267-$4848), p<0.0001) were significantly higher. Controlling for cost of sling materials and operative time did not significantly alter the cost profiles.

Conclusions: Currently, disposable materials account for the significant cost difference between the 2 types of repairs. A learning curve with “kit” surgery may shorten operative time and bring the cost profiles closer. During short-term follow-up, both repairs provide excellent support for the anterior and posterior compartment. There were a significant number of patients in group 2 that developed asymptomatic apical prolapse. Longer follow-up is needed to see if these patients eventually become symptomatic and require further surgery, which may contribute to a further difference in long-term costs.
Poster #14

IS AN ELEVATED POST-VOID RESIDUAL A RISK FACTOR FOR BACTERIURIA?
1University of California, San Diego, CA 2Naval Medical Center, San Diego, CA 3Urologic Specialists of Oklahoma, Tulsa, OK 4Kaiser Permanente, San Diego, CA

Objectives: It is a common assumption that an elevated post-void residual (PVR), like a stagnate pool, allows for bacterial growth and predisposes a patient to urinary tract infections. Previous studies have produced varied results in attempting to clarify this relationship. We sought to determine if elevated PVR is associated with bacteriuria.

Methods: We reviewed a clinical database of women seeking care for pelvic floor disorders. Inclusion criteria were a catheterized PVR recorded from the initial visit and urine culture results from within 30 days of the initial visit. Patients on antibiotics were excluded. Elevated PVR was defined as ≥100 mL. Bacteriuria was defined as greater than 10⁵ colonies per mL. Additional data obtained included age, parity, vaginal parity, menopausal status, diabetes history, prior anterior vaginal wall surgery, vaginal estrogen, sexual activity, body mass index (BMI) and pelvic organ prolapse quantification measurements. Anterior vaginal wall prolapse was defined as Ba ≥ 0. Anterior vaginal wall surgery was defined as any history of anti-incontinence surgery, anterior colporrhaphy, “bladder lift” or “bladder suspension” abstracted from the surgical history in the database. Vaginal estrogen described post-menopausal women using vaginal estrogen. Analysis of this variable included only post-menopausal women. Sub-analyses of the PVR cut offs 30 mL, 50 mL, and 150 mL were also performed using separate models to determine if a difference in the definition of elevated PVR would change the results. Prior to conducting the study, a power analysis was performed assuming that 10% of patients would have an elevated PVR and the baseline bacteriuria rate would be 10%. A clinically significant finding in patients with an elevated PVR would be a 25% bacteriuria rate. Based on these values a total of 507 women would be needed to achieve a power of 80% with a significance of 0.05. Women were grouped according to whether or not they had bacteriuria. These two groups were compared by PVR measurements and demographic data using T-test, Mann-Whitney U and chi-square. Variables that were significantly different on univariate testing were entered into a logistic regression to calculate adjusted odds ratios (OR) with 95% confidence intervals (CI). Significance was determined at p < 0.05.

Results: There were 1799 patients entered into the database. Of these entries, 604 (34%) patients had incomplete medical history, physical examination or no documented urine cultures available for review. An additional 373 subjects (21%) were excluded due to a lack of catheterized PVR measurement (i.e. had ultrasound PVR measurement) and 92 (5%) did not have a urine culture from within 30 days of the intake examination or were taking antibiotics at the time of initial evaluation. Of the 731 (41%) women who met inclusion criteria, bacteriuria was more prevalent in women with elevated PVR vs. normal (17% vs. 9%, p=0.019). Univariate analyses demonstrated that in addition to elevated PVR, age, anterior vaginal wall surgery, and not being sexually active were significantly positively associated with bacteriuria. After multivariate analysis elevated residual was no longer significantly associated with bacteriuria (p=0.31, OR=1.414, 95% CI 0.723–2.764). Increasing age was the only variable significantly associated with bacteriuria (p=0.03, OR=1.021 (per year), CI=1.002 – 1.040). Sub-analyses of the alternate PVR cut offs similarly found that age was the only predictor of bacteriuria, not PVR.

Conclusions: In this population of women seeking care for pelvic floor disorders, elevated PVR was not significantly associated with increased rates of bacteriuria when controlled for age and other confounding variables. Elevated PVR alone may not be as important a risk factor for bacteriuria as previously believed.
LOWER URINARY TRACT SYMPTOMS AND INCONTINENCE IN COLLEGIATE ELITE FEMALE ATHLETES AND MATCHED CONTROLS
Chad Huckabay, Megan Steiger, Art Erdman, Gerald Timm, University of Minnesota, Minneapolis, MN

Introduction and Objectives: Up to 80% of young elite athletes have reported urinary incontinence (UI) during their sport, and UI may be a barrier to exercise. Using a cross-sectional study design we compare the rate of UI and other lower urinary tract symptoms (LUTS) in young NCAA collegiate athletes and a matched control population.

Methods: 155 collegiate female athletes representing twelve sports and 131 college-age non-athlete controls completed a survey questionnaire assessing LUTS and UI. The response rates for athletes and non-athlete controls were 65% and 27%, respectively. Univariate statistical analysis was performed to compare the groups. P-values < 0.05 were statistically significant.

Results: No statistically significant differences in demographic variables between athletes and controls existed except in height (Table 1). Table 2 depicts proportions of athletes and controls reporting each symptom with respective p-values.

Table 1. Demographics

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Athletes (N=155)</th>
<th>Non-athlete Controls (N=131)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>19.75 ± 1.25</td>
<td>20.05 ± 1.6</td>
<td>NS</td>
</tr>
<tr>
<td>BMI</td>
<td>23.05 ± 2.4</td>
<td>23.27 ± 3.6</td>
<td>NS</td>
</tr>
<tr>
<td>Height (in)</td>
<td>66.98 ± 3.3</td>
<td>65.97 ± 2.7</td>
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</tr>
<tr>
<td>Weight (lbs)</td>
<td>147.7 ± 22.2</td>
<td>144.21 ± 24.4</td>
<td>NS</td>
</tr>
</tbody>
</table>

Table 2. Results—Percentage of Respondents with each symptom

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Athletes (N=155)</th>
<th>Non-athlete Controls (N=131)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary incontinence (any type)</td>
<td>21.9</td>
<td>21.3</td>
<td>NS</td>
</tr>
<tr>
<td>More than a mild problem</td>
<td>10.3</td>
<td>6.1</td>
<td>NS</td>
</tr>
<tr>
<td>Leakage with jumping/bouncing</td>
<td>38.1</td>
<td>18</td>
<td>0.0002</td>
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<tr>
<td>Urgency</td>
<td>37.4</td>
<td>19.8</td>
<td>0.001</td>
</tr>
<tr>
<td>Sanitary pad use</td>
<td>13.6</td>
<td>3.9</td>
<td>0.007</td>
</tr>
<tr>
<td>Bedwetting (childhood)</td>
<td>22.2</td>
<td>12.4</td>
<td>0.032</td>
</tr>
<tr>
<td>Bladder Pain</td>
<td>7.1</td>
<td>16.8</td>
<td>0.01</td>
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<tr>
<td>Straining to void</td>
<td>10.4</td>
<td>20.6</td>
<td>0.016</td>
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<tr>
<td>Dysuria</td>
<td>11.0</td>
<td>23.8</td>
<td>0.004</td>
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<tr>
<td>Leakage restricts activities</td>
<td>2.0</td>
<td>12.5</td>
<td>0.02</td>
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<tr>
<td>Social restriction</td>
<td>0.7</td>
<td>13.3</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Conclusions: Athletes reported significantly more leakage associated with their activity/sport but baseline overall urinary incontinence rates were no different from controls. Controls experienced more restriction based on some quality of life variables and had more lower urinary tract symptoms.
TWO TYPES OF URGENCY  
Jerry G. Blaivas, Georgia Panagopoulos, Jeffrey P. Weiss, Chandra Somaroo;  
Institute for Bladder and Prostate Research (IBPR)¹

**Aims:** The aim of this study is to determine whether urinary urgency, as defined by the ICS, is a discrete symptom (dichotomous variable), or simply an intensification of the normal sensation that occurs when micturition must be delayed once the urge (desire) to void is felt (continuous variable).

**Methods:** 48 consecutive patients who had urgency completed a validation study of two different questionnaires designed to answer the question posed above. The patients were divided into 2 groups of 24. For the test-retest, Group 1 completed questionnaire 1 twice within 3 – 10 days and group 2 did the same with questionnaire 2. On the second administration of the questionnaire, each subject crossed over and answered the other questionnaire. For the test-retest, since the data set is dichotomous (yes/no), the degree of agreement between the two sets of data was assessed by calculating the kappa coefficient.

**Results:** There were 37 women and 11 men ranging in age from 54 – 87 years. There was no difference in age and sex between the two groups (p = .19). Mean age for group 1 was 71.6 (SD 10.5 ) and for group 2, 75.3 (SD 8.4), but this was not statistically significantly different (p = .19). There were 21F/3M in group 1 and 16F/8M in group 2 (p = .09).

There was excellent agreement in the test-retest responses for both questionnaires (kappa = 1.0, p<.001). For questionnaire 1, the urge sensation was a continuous variable in 13 (54%) and it was dichotomous in 11 (46%). For questionnaire 2, it was continuous in 83% and dichotomous in 17%. In the crossover section, only 1 of 48 subjects changed their response.

**Conclusions:** Urgency is comprised of at least two different sensations. One is an intensification of the normal urge to void and the other is a different sensation. The implications of this distinction are important insofar as they may have different etiologies and respond differently to treatment. These data also suggest that the way the question is phrased may impact on whether the patient considers urge to be a continuous or dichotomous sensation. Alternatively, it is possible that group 1 & 2 are comprised of different diagnostic categories, but large studies need to be done to determine that.

¹Financial Funding from IBPR
PATIENT TOLERABILITY OF BOTULINUM TOXIN INJECTIONS UNDER LOCAL ANESTHESIA: A QUESTIONNAIRE-BASED STUDY
Katie N. Ballert, Diah Douglas, Victor W. Nitti, New York University, New York, NY

Introduction and Objective: Botulinum toxin has recently emerged as a novel and promising treatment for idiopathic and neurogenic detrusor overactivity. Very little information currently exists surrounding the tolerability of botulinum toxin injections under local anesthesia. A knowledge of the expected and actual severity of discomfort would be useful when educating patients and discussing potential treatment options. The purpose of this study is to determine the degree of anxiety and discomfort anticipated by patients undergoing botulinum toxin injection under local anesthesia and compare it to the actual degree experienced.

Methods: 18 patients with urgency, frequency and/or urge incontinence were prospectively evaluated and treated with cystoscopic injection of botulinum toxin. Patients received 100 or 200 units of botulinum toxin (100 U diluted in 10 ml NS) delivered in twenty injections (0.5-1 ml each) into the posterior and lateral walls and the trigone with a rigid cystoscopic injection system using a 22-gauge needle. Patients were given a questionnaire (Part 1) prior to the procedure that included a visual analog scale (1-10 cm) on which they reported their anticipated pain during the procedure as well as two questions regarding anxiety and expected pain. They were given another questionnaire post-procedure (Part 2) that included the same visual analog scale on which they recorded the pain that they actually experienced during the procedure. In addition, Part 2 also contained two questions comparing anticipated to experienced pain and asked the patient if they would be willing to undergo the procedure again if medically indicated. A t-test was performed to determine if there was a significant difference between patients’ anticipated and experienced pain as recorded on the visual analog scale.

Results: On a scale from 0 (no discomfort) to 10 (terrible discomfort) the mean anticipated pain score was 3.79 (± 3.24). The mean score for pain experienced was 2.04 (± 2.15). The difference approached, but did not reach statistical significance (p=0.07). Twelve (66.6%) patients reported the experience as being either “much better” or “better than expected”. Only 1 patient (5.5%) reported the experience as being “worse than expected.” Fourteen patients (77.8%) reported that they would undergo the procedure again under local anesthesia without reservation. Two (11.1%) additional patients reported that they would undergo the procedure again, but with some reservation. No patient reported that they would not undergo the procedure again under any circumstance.

Conclusions: Cystoscopic injection of botulinum toxin can be safely performed in an office setting using local anesthesia. It is well tolerated by the majority of patients. Our survey also suggests that the anxiety and discomfort anticipated is greater than what is actually experienced by the patients. It is important to inform patients that the results of botulinum toxin are often not permanent and will likely require repeat procedures. Most patients indicated that they would be willing to undergo a repeat procedure using local anesthesia.
ASSESSING THE EFFECTIVENESS OF BOTOX A INJECTIONS AS A TREATMENT OPTION FOR WOMEN WITH HIGH TONE PELVIC FLOOR MUSCLE DYSFUNCTION
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Kristene Whitmore, Amy Rejba, Pelvic & Sexual Health Institute, Graduate Hospital, Philadelphia, PA
Howard Goldstein, Cooper University Hospital Department of Pelvic Medicine and Reconstructive Surgery, Camden, NJ

Introduction and Objectives: High tone pelvic floor muscle dysfunction (HTPFMD) is a common problem that is often seen in patients who have interstitial cystitis. Botox A has been used effectively to treat skeletal muscles that are in spasm and there is one published case series reporting its use in treating HTPFMD with favorable results. We have used Botox A injections to treat patients with refractory HTPFMD that have failed more conventional modes of therapy. The purpose of this study was to determine if this is a viable treatment option.

Methods: Our method of injection is as follows: Patients are taken to the operating room and conscious sedation is administered. Pelvic floor muscles, namely coccygeus, iliococcygeus, pubococcygeus and obturator internus are palpated and assessed for hypertonicity. A total of 300 Units of Botox A is diluted in a volume of 10mls of water and each muscle group is injected with varying amounts of Botox A depending on the degree of hypertonicity. We then conducted a retrospective global assessment telephone survey for all patients who were injected in our practice during a 1 year period. We determined the duration of the effect of Botox A as well as the patients’ compliance with our recommendation to undergo physical therapy with internal thiele massage after the injection. We used Fisher’s Exact Test to determine if there was an association between the results of the global assessment and the patients’ compliance with physical therapy. There was no outside funding for this project.

Results: During the 12 month period we treated 25 patients diagnosed with HTPFMD with injections of Botox A. Twenty of these patients also had a diagnosis of interstitial cystitis. Some patients were treated more than once during this period. One patient was lost to follow-up, 9 were treated twice and 1 patient was treated three times. Counting each treatment as a separate event, we had a total of 35 injections of Botox A. We found 63% (22/35) felt improvement, 34% (12/35) felt the same and 3% (1/35) felt worse following the injection. The duration that patients noted improvement ranged from 2 weeks to 6 months. There was no association between how a patient felt after receiving Botox A and if they were in physical therapy (P=0.720). There were no adverse events reported.

Conclusion: Botox A injected directly into hypertonic pelvic floor muscles for women with HTPFMD appears to be a viable treatment option for this condition. The majority of women feel significant improvement following injection. We did not find an association between global assessment and physical therapy. A prospective trial is planned to determine if Botox A injections in conjunction with internal thiele massage is better than either treatment modality alone.
Introduction and Objective: Intradetrusor Botulinum toxin type A (BTX) injection has emerged as a novel therapeutic option for the treatment of idiopathic overactive bladder (I-OAB) refractory to oral antimuscarinic agents. We designed an IRB approved prospective trial to evaluate changes in voiding diaries, urodynamic findings, symptomatic improvement, side effects and complications in patients submitted to a scheduled re-injection BTX protocol.

Methods: 34 Patients with I-OAB refractory to antimuscarinics were randomized to receive intradetrusor BTX-A (100 U or 150 U) as 10 U/ml /injection “trigone and dome sparing” (10-15 injections) with a 14 Fr. flexible cystoscopy. We used Botox ® for BTX, which was funded by Allergan. A pain score scale, from 0 (no pain) to 10 (worst pain) was given to the patient during the first 5 injections and at the end of the procedure. Patients were evaluated by: history, physical examination, Urogenital Distress Inventory-6 (UDI6), multichannel videourodynamics (UDS), and urine culture. The above mentioned questionnaires, 3 consecutive days voiding diaries, urinalyses, post-void residual volume (PVR) were taken at every visit: 2wks, 6wks, 3mon and 6mon after every injection. A renal ultrasound to rule out hydronephrosis was ordered on asymptomatic patients with PVR greater than 199ml. Patients were re-injected using the same randomized dose and technique every 6 months regardless of response.

Results: Mean age was 56 years (22-80) at the beginning of the study. 29 Female and 5 male subjects were evaluated. 21 Patients had urge urinary incontinence (OAB-wet), 13 OAB-Dry. Of the 34 patients who received the baseline injection, 20 received a second injection, 12 a third injection, 8 a fourth injection, 5 a fifth injection and 3 a sixth injection. We assessed patient’s PVR at baseline and at 2, 6, 12, 24 weeks either with bladder scan or by catheterization when UDS was performed (Graphic). We compared the baseline PVR values with each of the post-injection periods. The PVR was significantly higher than baseline at 2 and 6 weeks after 2nd therapy and at 2 and 12 weeks after the 4th injection. Despite PVR values above 100ml there were only 4 female patients who needed clean intermittent catheterization (CIC). CIC for urinary retention was recommended in the symptomatic patients with PVR higher than 100ml or those asymptomatic with a PVR higher than 199ml with hydronephrosis on the renal ultrasound. Patients who presented Urinary Tract Infections (UTI) during the trial were all females. UTI, as an adverse event, was not significant when we compared each time period with the baseline status. Except on the 5th injection, UTI were more common than baseline. Pain score scale during and after the flexible cysto-intradetrusor BTX injection was never higher than 4/10 (mean 2.5), using a validated visual analog scale.

Conclusions: The risk of urinary retention requiring CIC was higher in patients who received 150 U when compared to those who received 100 U (Pearson $X^2 \ p<0.05$). Urinary retention caused by 150 U intradetrusor BTX is reversible by week #6 and tends to occur after the first injection. Patients on CIC should be followed closely to ensure compliance. Urinary Tract Infections are not significantly more common after intradetrusor therapy. Intradetrusor injection of BTX with the flexible cystoscopy represents a safe, tolerable and economic method. The patient’s mean pain score was always lesser than 4 in a scale 0 to 10.
INITIAL EVALUATION OF THE EFFECT OF INJECTION VOLUMES OF INTRAVESICAL BOTULINUM-A TOXIN INJECTIONS IN PATIENTS WITH OVERACTIVE BLADDER SYMPTOMS
Alvaro Lucioni, David E. Rapp, W. Stuart Reynolds, Edward M. Gong, Paula A. Fedunok, Gregory T. Bales, University of Chicago Hospitals, Chicago, IL

Introduction and Objective: Botulinum toxin Type A (BTX) has been shown to be effective in the treatment of patients with detrusor overactivity (DO). Despite this success, the protocol for BTX intravesical injection has not yet been standardized, particularly with regards to injection volume, dose, or injection sites. The optimal injection volume is of significant debate, as larger dilution volumes may allow for better BTX tissue diffusion and action whereas lower injection volumes may be associated with lessened discomfort. We report our initial results of a prospective, randomized study designed to compare the effect of injection volumes in patients receiving BTX for DO.

Methods: Patients failing high-dose anticholinergic therapy for DO underwent cystoscopy and bladder injection of BTX. All patients received a total of 200 units of BTX divided among thirty evenly distributed intramural injections. Patients were randomized to receive injection volumes of 0.1cc, 0.5cc, or 1.0cc per injection. Prior to injection patients were evaluated using validated UDI-6 and IIQ-7 questionnaires. DO was confirmed with urodynamic evaluation. Patient response to BTX was determined by UDI-6 and IIQ-7 questionnaires (subjective evaluation) as well as urodynamics (objective evaluation) performed at 6-8 weeks and 6 months after treatment.

Results Obtained: A total of 24 patients have received BTX injection, of which 17 have undergone post-operative urodynamic evaluation. Mean patient age was 59.6 years (33-88 years). Mean follow up after BTX therapy was 225 days (42-360 days). At 6-week follow-up, UDI-6 and IIQ-7 scores improved from 11 to 5.3 and from 9.4 to 4.2, respectively (p=0.001). Twelve of the 17 patients (71%) reported a complete or improved response following BTX injection. Urodynamic evaluation revealed an average increase in bladder capacity from 250cc to 398cc (59%, p<0.05) and an increase in bladder compliance by 2-fold from 32 to 77 ml/cmH20 (p<0.05). The post-void residual increased from 23cc to 146cc (p<0.05). No patients required treatment for urinary retention. In 7 of 17 patients, there was complete resolution of uninhibited detrusor contractions. Of two patients with continued uninhibited detrusor contractions, bladder capacity at first uninhibited contraction improved from 140cc to 270cc. Patients receiving 1.0cc injections had a statistically significant decrease in their total UDI-6 and IIQ-7 from 23 to 8.8 (p<0.05). The 0.1 and 0.5cc volume groups also exhibited symptom score improvement, although these results did not achieve statistical significance. No significant differences in urodynamic findings between the three injection volume groups were observed. There were no major adverse effects of toxin injection.

Conclusion: We report the first prospective evaluation comparing the use of different dilution volumes for intravesical injection of BTX in the treatment of DO. Accordingly, BTX demonstrates both subjective and objective improvements in the treatment of DO. Although only the 1.0 cc group achieved statistically significant improvements with respect to symptom score improvement, this finding may be related to the small patient number. In addition, no significant differences in urodynamic improvement were seen when comparing differing dilutions. Patient accrual and evaluation is ongoing to assess these issues in a larger cohort of patients.

Financial Funding: Research Grant by Allergan, Inc.
PREDICTIVE FACTORS FOR POST-ROBOTIC PROSTATECTOMY (RP) URINARY INCONTINENCE (UI) IN MEN WITH PRE-OPERATIVE LOWER URINARY TRACT SYMPTOMS (LUTS)- A PILOT STUDY
Rajiv Saini, Alexis E. Te, Ashutosh K. Tewari, Sandhya R. Rao, Steven A. Kaplan, Weill-Cornell Medical College, New York, NY

Introduction and Objective: Men with LUTS are often diagnosed with prostate cancer (PCa) during initial evaluation. For those that undergo PCa treatment, including RP, UI is a well-known complication. Post-prostatectomy UI is associated with factors related to surgical technique and the extent of cancer. This study was undertaken in men with LUTS and PCa to evaluate whether pre-RP urodynamic (UDS) and/or non-UDS factors could predict the time at which continence was regained post-RP.

Methods: An on-going study is being conducted to evaluate post-RP UI in men with pre-op LUTS. Evaluation of LUTS includes physical exam with digital rectal exam (DRE), UDS with peak flow rate (Qmax), post void residual (PVR), Abrams-Griffith number (AG), Bladder Contractility Index (BCI), and Bladder Compliance (BC), ultrasound prostate volume (PV), percent transitional zone volume (%TZV), International Prostate Symptom Score (IPSS), quality of life score (QoL), cystoscopy, and prostate-specific antigen (PSA). Men with abnormal PSA and/or DRE undergo prostate biopsy for further evaluation. All men with organ-confined PCa are offered RP as one treatment option. Those that have RP are then evaluated for UI. The time at which continence is regained is correlated to the pre-op UDS and non-UDS factors. Continence is defined as the earliest time at which the patient wears 1 or less liner per day after Foley removal. A cut-off of 6 months (m) is used to divide patients into 2 groups. This time period was chosen due to the 98% continence rate seen at 6 m at our institution.

Results: Since January 2005, 10 men seen in a voiding dysfunction practice underwent RP for PCa. Data on post-RP was correlated to the return of urinary continence. 6 and 4 men regained continence at less than, and greater than 6 m, respectively. Mean values for pre-op factors are seen in Table 1.

Conclusions: Preliminary data in this pilot study shows that there was a difference in the 6 m continence rate in men with LUTS (60% vs. 98%). Also, in men with LUTS, a higher PSA, Qol, BCI, and %TZV were strongly associated with delayed return of continence (> 6 m). Patients are being accrued in a prospective fashion. Further findings will be presented as they become available.

<table>
<thead>
<tr>
<th>Table 1- Results</th>
<th>Continence at &lt; 6 m (N = 6)</th>
<th>Continence at ≥ 6 m (N = 4)</th>
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<tr>
<td>Age (years)</td>
<td>63.17</td>
<td>64.75</td>
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<td>Time to Continence (months)</td>
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<td>PSA</td>
<td>6.52</td>
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<td>Qmax (mL/s)</td>
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<td>% Transitional Zone</td>
<td>58</td>
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Poster #21

TROSPIAM CHLORIDE EXTENDED-RELEASE FORMULATION PROVIDES EFFECTIVE RELIEF FOR THE SYMPTOMS OF OVERACTIVE BLADDER, IMPROVES PATIENT-REPORTED QUALITY OF LIFE, AND IS WELL TOLERATED: RESULTS FROM A MULTICENTER, PHASE III, PLACEBO-CONTROLLED STUDY

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1Vanderbilt University School of Medicine, Nashville, TN; 2UCLA School of Medicine, Los Angeles, CA; 3Feinberg School of Medicine, Northwestern University, Chicago, IL

Introduction and Objectives: Trospium chloride, a quaternary amine antimuscarinic agent, is approved for the management of overactive bladder (OAB). An extended-release (XR) formulation has recently been studied. This multicenter trial was conducted to evaluate the safety, efficacy, and tolerability of this new once-daily (QD) formulation.

Methods: Adults with OAB of at least 6 months’ duration with urinary urgency, frequency, and an average of >1 urgency urinary incontinence (UUI) episode per day, as assessed by a 3-day urinary diary, were eligible for inclusion in this 12-week, multicenter, parallel-group, double-blind, placebo-controlled trial. Participants were randomized to receive trospium XR 60 mg QD or placebo for 12 weeks. The primary efficacy variables were the change in the mean number of toilet voids/day and UUI episodes/day, which were assessed using 3-day urinary diary data at Weeks 1, 4, and 12. Changes in urgency severity and quality of life (QoL) were also assessed (using a validated urgency severity score [IUSS] and the Overactive Bladder Questionnaire [OAB-q], respectively) and adverse events were recorded throughout.

Results: In total, 564 subjects participated in the study, of whom 280 were treated with trospium XR and 284 received placebo. The reduction from baseline in the mean daily number of toilet voids was significantly greater with trospium XR than placebo at Week 12 (from >12 voids/day to 10.3 voids/day versus 11.1 voids/day, respectively [p<0.001]). Trospium XR was also associated with a significant reduction in the number of UUI episodes/day from baseline (>4 episodes/day) to 1.7 episodes/day with trospium XR at Week 12 compared with 2.4 episodes/day with placebo (p<0.001). In addition, trospium XR demonstrated significant reductions compared with placebo in urgency severity (p<0.001 at Week 12) and improvements in OAB-q health-related QoL total scores (p=0.001 at Week 12). At study end, 21.3% of subjects treated with trospium XR had achieved “normalization” (no UUI episodes and a mean of ≤8 toilet voids per day) compared with 11.2% of those who received placebo. The efficacy of trospium XR over placebo was apparent as early as Week 1 of treatment. Trospium XR was well tolerated throughout. The most frequent adverse events were dry mouth (trospium XR 12.9% versus placebo 4.6%) and constipation (7.5% versus 1.8%, respectively). Discontinuations were not associated with antimuscarinic adverse events and no serious adverse events related to treatment were noted. The incidence of central nervous system adverse events was comparable for subjects who received trospium XR versus placebo (dizziness, 0.7% versus 1.4%; headache, 5.4% versus 3.2%, respectively).

Conclusions: Trospium XR provided early relief from the symptoms of OAB and significantly improved patient QoL. In addition to the convenience of once per day dosing, the reported efficacy and absence of central nervous system effects of the twice-daily formulation were preserved with a significant improvement in dry mouth rates.

Acknowledgments: This study was supported by Esprit Pharma and Indevus Pharmaceuticals Inc.
ONCE-DAILY TROSPIUM CHLORIDE EXTENDED RELEASE IS EFFECTIVE AND WELL TOLERATED FOR THE TREATMENT OF OVERACTIVE BLADDER: RESULTS FROM A MULTICENTER, PHASE III TRIAL
Staskin DR, 1 Sand PK, 2 Zinner NR 3
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Introduction and Objectives: An extended-release formulation of trospium chloride (trospium XR) has recently been studied for the once-daily (QD) treatment of overactive bladder (OAB). The purpose of this multicenter trial was to investigate the safety, efficacy, and tolerability of trospium XR 60 mg QD in subjects with OAB with an urgency urinary incontinence (UUI) component.

Methods: Subjects with OAB and UUI were randomized (1:1) to receive trospium XR 60 mg once daily (QD) or placebo in this 12-week, multicenter, parallel-group, double-blind, placebo-controlled trial. The primary endpoints were change in the number of toilet voids/day and change in the number of UUI episodes/day. Secondary endpoints included UUI episodes/week, urgency severity associated with voids, volume voided/void, frequency of daily urgency voids, and OAB-Symptom Composite Score. Safety parameters collected during the study included clinical laboratory tests, 12-lead electrocardiograms, spontaneously reported adverse events, and vital signs.

Results: A total of 601 participants were randomized to receive trospium XR (n=298) or placebo (n=303). Trospium XR was associated with statistically significant improvements in both primary efficacy outcomes from as early as Week 1, with progressive improvement to Week 12. Subjects treated with trospium XR experienced a reduction in the mean number of daily voids from 12.8 at baseline to <10 at Week 12 (p<0.001). Similarly, subjects treated with trospium XR experienced a reduction in the mean number of daily UUI episodes from >4 at baseline to <2 at Week 12 (p<0.01). These improvements in the primary efficacy outcomes were reflected in the analysis of “normalization” (defined as no UUI episodes and a void frequency of ≤8 voids/day), such that nearly twice as many subjects treated with trospium XR (20.5%) achieved “normalization” at Week 12 (p<0.01) compared with those receiving placebo (11.3%). Treatment with trospium XR also resulted in significant benefits compared with placebo in the secondary outcome parameters as early as Week 1 onwards. Trospium XR was well tolerated. Dry mouth was reported in 8.7% versus 3% and constipation in 9.4% versus 1.3% of subjects administered trospium XR versus placebo, respectively. Central nervous system adverse effects, such as headache and dizziness, were reported with a higher incidence in the placebo group than in the trospium XR group.

Conclusions: Trospium XR provided early and sustained improvements in the key symptoms of OAB. Typical anticholinergic adverse events occurred at considerably lower levels with trospium XR than reported previously with twice-daily (BID) trospium, while efficacy remained comparable between the two formulations. Thus, in addition to the convenience of once-daily dosing, trospium XR maintained efficacy and improved tolerability compared with trospium BID and in this study demonstrated the lowest dry mouth rate of any current oral medication for OAB.

Acknowledgments: This study was supported by Esprit Pharma and Indevus Pharmaceuticals Inc.
Introduction and Objectives: Trospium chloride is a quaternary amine antimuscarinic for the treatment of overactive bladder. A once-daily (QD) extended-release formulation – trospium XR 60 mg – that utilizes both time- and pH-dependent release technologies is currently in development. The objective of this study was to characterize the pharmacokinetics (PK) and compare the relative bioavailability of trospium XR 60 mg when given to healthy subjects in a fasted state (treatment A), in a fed state (treatment B), and when coadministered with a potent antacid (treatment C).

Methods: This was a single-center, single-dose, open-label, randomized, three-period crossover, bioavailability study undertaken in healthy male (n=3) and female (n=9) adult subjects. Subjects were randomized to one of six treatment sequences (ABC, ACB, BAC, BCA, CAB, or CBA), which were separated by washout periods. Each subject received trospium XR 60 mg as a single dose with water at the beginning of each treatment period. During the fed and antacid treatment periods, subjects received a single dose of trospium XR 60 mg 30 min after the consumption of a high-fat meal (at least 50% fat content), or were fasted and then given trospium XR 60 mg 30 min after morning administration of Gaviscon® Extra Strength Liquid 20 mL, respectively. Treatment comparisons were made versus subjects in the fasted (reference) condition. PK parameters determined included Cmax (maximum concentration), Tmax (time taken to reach maximum concentration), AUC(0–24) (area under the concentration–time curve from time zero to 24 h), AUC(0–inf) (AUC from time zero extrapolated to infinity), AUC(0–Tlast) (AUC from time zero to time of last measurable concentration), HVD (half-value duration), and t1/2 (half-life). Similar rates of exposure were defined if the ratios of the point estimates for Cmax and AUC(0–Tlast) were within 80–125%.

Results: The concentration–time curve revealed similar PK profiles for trospium XR in the fasted and antacid conditions. The mean ratios for Cmax and AUC(0–Tlast) differed by no more than 10% and 5%, respectively, in the presence versus the absence of antacid in fasted subjects (Table 1). Median Tmax, mean t1/2, and HVD were also comparable in the fasted and fasted with antacid conditions. Exposure to trospium XR in the fed condition was 35–60% lower than in the fasted condition (Table 1), indicating a significant food effect. Median Tmax and mean t1/2 were comparable between fasted and fed subjects.

Table 1. Statistical comparison of PK parameters versus reference subjects

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bioequivalence ratio (versus fasted subjects)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Antacid (n=12)</td>
</tr>
<tr>
<td>AUC(0–Tlast) (pg·h/mL)</td>
<td>104.9</td>
</tr>
<tr>
<td>Cmax (pg/mL)</td>
<td>91.2</td>
</tr>
</tbody>
</table>

Conclusions: Trospium XR may be coadministered with antacids without alteration of the PK profile. However, administration of trospium XR with a high-fat meal resulted in lower exposure to trospium XR compared with administration during a fasted state. These data suggest that trospium XR should be taken on an empty stomach but without regard to antacid use.

Acknowledgments: This study was supported by Esprit Pharma and Indevus Pharmaceuticals Inc.
LONG-TERM SURGICAL OUTCOMES OF ILEOCYSTOPLASTY WITH CONTINENT ABDOMINAL STOMA
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Objective: To describe a 26-year experience with bladder augmentation and creation of a continent abdominal stoma in a cohort of patients with refractory incontinence.

Methods: We performed a retrospective chart review of all adults undergoing ileocystoplasty with a continent abdominal stoma at a single institution between 1982 and 2006. The procedure involved detubularized augmentation with an ileal segment combined with an intussuscepted nipple valve for continence. The efferent limb was also tapered in order to permit straight catheter access. Urethral continence procedures were done simultaneously as required and included a fascial sling with or without bladder neck tapering. If the urethra was too damaged for repair, bladder neck closure was carried out.

Results: Sixty-five patients (55 women and 10 men) underwent surgery at a mean age of 37.2 years (range 19-75). Fifty-eight were neurologically impaired, and 55 were wheelchair bound. The most common diagnoses were spinal cord injury (28 patients), spina bifida (12 patients), and multiple sclerosis (6 patients). Pre-operative bladder management was by Foley catheter (40 patients), Foley catheter plus diapers (6 patients), intermittent catheterization plus diapers (6 patients), diapers alone (6 patients), suprapubic catheter (5 patients), condom catheter (two patients), or intermittent catheterization alone (one patient). Four of 10 men underwent a concomitant bladder neck procedure (fascial sling plus tapering in two, and bladder neck closure in two). Forty-five of 50 women underwent a concomitant bladder neck procedure (fascial sling in 24, fascial sling plus tapering in 13, and bladder neck closure in 8). Patients were followed for a mean of 6.4 years (range 3 mo. to 16.5 years). 55 patients (85%) were continent from both the urethra and stoma at last follow-up. Mean bladder capacity improved from 222 ml pre-operatively to 435 ml post-operatively (P<0.05). Mean pressure at capacity decreased from 34.4 cm of H2O to 10.2 cm of H2O (P<0.05). Seven patients had hydronephrosis preoperatively, and this improved in all. There was no serious perioperative morbidity or death. Thirty-three patients (51%) required re-operation. Re-operative surgeries included 18 procedures for bladder stones, 9 valve revisions, 6 stoma revisions, two injections of collagen into the valve, two parastomal hernia repairs, one bladder neck closure, and one ileal conduit. There were no cases of bladder perforation, bowel obstruction, or malignancy.

Conclusions: Follow up of this group of patients reveals high rates of continence, and significant improvement in urodynamic storage parameters. Despite a high rate of re-operation over the long-term, ileocystoplasty with a continent abdominal stoma is an effective option for patients requiring augmentation, who are unable to perform urethral catheterization or have severely compromised bladder outlets. Restoring the competence of the bladder outlet also allows urethral access should the stoma fail, and permits transurethral access for stone treatment.
**Poster #25**

**SATISFACTION & IMPACT ON QUALITY OF LIFE FOLLOWING A MONTI CATHETERIZABLE STOMA**

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**Purpose:** The Monti catheterizable stoma is useful for patients with an obliterated, incompetent or surgically absent urethra. We present a single surgeon’s experience, including the first series of patients who completing a validated questionnaire following this diversion.

**Materials and Methods:** We identified 23 consecutive patients who underwent continent urinary diversion, by a single surgeon, using a Monti catheterizable stoma from 11/99-2/06. All patients either had an unusable native appendix (insufficient caliber or inadequate length) or had undergone previous appendectomy. We reviewed pre-operative indications, operative reports, post-operative hospital records and most recent clinical evaluation, including the Incontinence Symptom Index (ISI) and a questionnaire to assess quality of life.

**Results:** Of the 23 patients, 20 underwent a simultaneous augmentation cystoplasty. Fifteen patients had the procedure secondary to malignancy. Thirteen of these patients underwent external beam radiation. Five patients had a neurogenic bladder with urethral stenosis (2), an incompetent urethra (2) or a prior stenotic appendicovesicostomy (1). The remaining patients had either refractory strictures (2) or refractory incontinence from a previous continent diversion. Eighteen patients underwent a single Monti using a 2.5 cm segment of ileum and the remaining five patients underwent a spiral Monti. Mean follow-up was 32.2 months (SD - 24.4). Eleven patients required a second procedure and 5 required a third procedure. Four patients had difficulty catheterizing. Two of five (40%) patients with a spiral Monti experienced difficulty; whereas, only two with (11%) a single Monti had difficulty. Three patients had open stone removal. Three patients developed stomal leakage requiring two endoscopic injections and two open revisions. One patient with a history of radiation had necrosis of his anterior bladder wall requiring a cystectomy. The other patient developed a vesicocutaneous fistula following a redo augmentation and required two open fistula repairs. Sixteen patients completed the ISI at a mean of 34.7 months (2-76 months). The mean severity score was 9.7 (0-30). The mean bother score was 2.3 (0-8).

Twelve patients (75%) utilized 1 pad or less and 4 patients had significant incontinence (>4 pads per day). On a quality of life questionnaire, 67% never had difficulty catheterizing, 27% had difficulty one time per month or less and 6% (1 patient) had difficulty daily. Eleven patients (73%) were either mostly (5) or completely (6) comfortable and 4 patients (27%) were either barely or not at all comfortable with their diversion. Thirteen (87%) of 15 patients would repeat the surgery.

**Conclusion:** In intermediate term follow-up, 48% patients required a second operative procedure with the most common etiology being difficulty catheterizing. This observation has resulted in usage of only single segment Montis. Despite the re-operative rate, at a mean of 32.2 months 73% were highly satisfied. Overall, patients had minimal difficulty catheterizing and most patients had minimal incontinence. Patients with a history of radiation are more likely 62% to require a revision compared to non-radiated patients 30%.
EVALUATION OF URINARY OUTCOME AFTER REPAIR OF RECTO-URETHRAL FISTULA IN PATIENTS PREVIOUSLY TREATED FOR PROSTATE CANCER
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Introduction: Recto-urethral fistula (RUF) is one of the most serious complications that may develop after treatment of prostate cancer. Its treatment is a challenging problem; most of the patients require both fecal and urinary diversion prior to fistula repair. If the fistula heals, the fecal and urinary diversion may be reversed. To our knowledge, most studies in the literature focus on the incidence and risk factors of RUF development after treatment of prostate cancer. No study evaluated a single technique used to treat RUF. Moreover, these studies did not give clear data on urinary continence status after fistula repair.

Objectives: The primary objective is to evaluate the efficacy and safety of gracilis muscle interposition in the management of RUF in patients after treatment for prostate cancer. The secondary objective is to study the urinary outcome after this kind of repair.

Methods: After Institutional Review Board approval, a retrospective chart review of patients previously treated for prostate cancer who underwent a gracilis muscle interposition for RUF was done to assess the efficacy and safety of this operation. A one-page questionnaire was then mailed to all patients to assess the urinary outcome. The questionnaire included Urinary Distress Inventory (UDI-6), Visual Analogue Scale (VAS) for patient satisfaction, and the AUA Quality Of Life (QOL) score.

Results: Between May 1996 and July 2006, 25 patients with RUF after treatment of prostate cancer underwent gracilis muscle interposition. This is the largest reported series of RUF repair using this technique. The mean age was 68.5 years (range: 52-85). The etiology included radical prostatectomy in 8, radical prostatectomy and brachytherapy in 8, external beam radiation and brachytherapy in 4, external beam radiation alone in 3, and cryotherapy in 2. The main presenting symptoms were pneumaturia, fecaluria, and urine per rectum. Eight patients had a mean of 1.3 (1-2) prior attempts for repair. The mean operative time was 160 minutes (range: 110-300). Mean hospital stay was 5.3 days (range: 2-9). Two patients required a second gracilis interposition after failure of the first. Complications included cellulitis in 2, bladder neck contracture in 2, thigh pain in 1, and wound infection in 1. All patients, except the last one, underwent stoma closure 3 months after fistula repair. Regarding the urinary outcome, analysis of the responses of 12 patients who completed the questionnaire revealed that 7 patients were continent with good UDI-6, VAS and QOL scores (averages 21%, 91% and 2 respectively). Two patients expressed a mild degree of stress incontinence with moderate UDI-6, VAS and QOL scores (71%, 65% and 4 respectively). Three patients are totally incontinent and having bad quality of life (average UDI-6, VAS and QOL scores are 96%, 15% and 6 respectively). The predisposing factors for bad urinary outcome were: large fistula size > 2cm, radical prostatectomy followed by seeds, and cryotherapy.

Conclusion: Gracilis muscle transposition is a satisfactory procedure for treatment of RUF in patients previously treated for prostate cancer. However, additional concerns should be given to improve the urinary outcome after this kind of repair.
VESICOVAGINAL FISTULA REPAIR – 20 YEAR EXPERIENCE
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Introduction: The commonest cause of vesicovaginal fistulas (VVF) in Canada and the U.S. is abdominal hysterectomy. Controversy still exists regarding the optimal timing of repair which can be done successfully through either a transvaginal or transabdominal approach. The role of interpositional flaps in uncomplicated fistulas is also unclear.

Objectives: Our objective was to review the data from our fistula repairs with regard to risk factors, etiology, surgical approach, success rate, and litigation rate.

Methods: Between January 1986 and June 2006, 47 vesicovaginal fistulas were repaired. Charts were retrospectively reviewed to examine etiology of fistula, location, presentation, surgical approach, perioperative complications, whether a previous repair had been attempted, long-term complications, litigation rate, and overall cure rate. The surgical approach for the abdominal approach was to enter the plane between the bladder and vagina. The bladder was not bi-valved. Multiple layer closure was carried out with omental interposition. The transvaginal approach involved a similar multi-layer closure with flap interposition as required. Suprapubic catheters were left indwelling for 4-6 weeks. The outcome was determined by cystogram and symptoms.

Results: Mean patient age was 43.11. Forty-four patients (95.6%) had undergone previous pelvic surgery. Etiology of the fistula was hysterectomy in 32 patients (69.6%), C-section in 7 patients (15.2%), forceps delivery in 2 patients (4.3%), and catheter erosion in 2 patients (4.3%). Mean fistula size was 8.79 mm. Mean time from fistula occurrence to repair was 6.9 months (range 2-22). Fistula location was posterior to the trigone in 30 patients (65.2%), trigone in 11 patients (23.9%), and bladder neck in 6 patients (13.0%). All patients presented with continuous incontinence. Out of 47 VVF’s, 38 were complicated (80.85%). 25 patients (54.3%) had already had an attempted failed repair. 26 (55.3%) of the VVF repairs were performed using an abdominal approach and 19 (40.4%) using a transvaginal technique. Two repairs were performed using both transvaginal and abdominal approaches. Some patients who had had previous failed abdominal repairs were able to be repaired through a transvaginal approach. We used tissue flaps in all of the abdominal and combined repairs and 4 (21.0%) of the vaginal repairs. Mean hospital stay was 5.72 days. Mean follow-up time was 20.15 months (range 0.17-132.93). All of the fistulas were successfully repaired. At follow-up 7 (15.2%) experienced urge incontinence, 6 (13.0%) stress incontinence, 5 (10.9%) urgency, 3 (6.5%) frequency, and 1 (2.2%) chronic pain. 23.4% of patients, who had fistula repairs at our institution, initiated litigation against a previous physician.

Conclusions: Abdominal and vaginal vesicovaginal fistula repairs are highly successful. Management techniques include multi-layer closure, flap interposition as required, and suprapubic drainage. There does not appear to be a mandatory wait time between time of injury and repair, provided the tissues appear to be healthy. The litigation rate from VVF is very high suggesting a profoundly negative impact on quality of life.
**EFFECT OF EXTERNAL BEAM RADIOTHERAPY VERSUS BRACHYTHERAPY ON ARTIFICIAL URINARY SPHINCTER (AMS 800) IN PROSTATE CANCER PATIENTS: IS OUTCOME AFFECTED?**

Paholo G. Barboglio MD, Brian Cohen MD, Angelo Gousse MD. University of Miami; FL.

**Introduction and Objective:** Since the introduction of the Artificial Urinary Sphincter (AUS) in 1972, it has remained the gold standard for treating intrinsic sphincteric deficiency (ISD) in male patients (pts) affected with post-operative stress urinary incontinence (SUI). Patient satisfaction with the AUS has been shown to remain high in several series. However, concerns have arisen about the safety and efficacy of AUS pts who have received radiation (RT) for prostate cancer treatment. The aim of this study is to investigate whether there is any difference on surgical outcome in prostate cancer pts who have received pre-AUS External Beam RT or (EBRT) Brachytherapy (BT) as part of their oncologic treatment.

**Materials and Methods:** We retrospectively evaluated the records of 80 well characterized pts who underwent AUS placement between 1999 to 2005 by a single surgeon. All selected pts were incontinent pre-operatively, wearing more than 2 pads/day. Evaluation included a complete clinical history, physical examination, cystoscopy and urodynamics before surgery. A bulbar cuff 4cm or 4.5 cm / 61-70 cm H20 Pressure Regulating Balloon was used in all pts. Activation of the device was performed 6 week after insertion, and deactivation at night was not performed. 72 Pts with complete data were evaluated: (mean age 68; 52-89) of which 45 (63%) had ISD from Radical Retropubic Prostatectomy (RRP) and 27 (37%) received RT. We utilized Pearson Chi-Square to analyze the differences between the RT and the Non-RT pts, as well as the 12 pts who received EBRT (45%) vs 15 BT pts (55%).

**Results:** Table 1 shows the patient distribution according to treatment received. 33 Pts required transurethral resection of bladder neck contracture (TUR-BNC): 16 RRP, 5 EBRT, and 12 BT prior to AUS placement. BT pts had more TUR-BNC than the other two groups. 5 Pts developed urinary retention within one week of the AUS placement requiring 12 Fr urethral Foley catheter drainage for less than 10 days. Urinary Retention did not significantly correlate with AUS removal. Two pts required a second procedure, one related to scrotal pump migration, the other related to scrotal tubing discomfort (unexposed) in a EBRT patient. 17 (24%) of the pts developed complications which required removal of the AUS: 13 (76%) of the explanted pts had infection and/or urethral erosion, 4 (24%) had mechanical failure or sub-optimal outcome which required revision. The mean follow-up was 24 (6-84) months. The number of pads decreased significantly (p=<0.001 T-test) in all sub-groups after the AUS insertion (mean=0.5+/-.7 two years after) in comparison with baseline (mean=4.8+/-.2.3). 52/55 (94%) of pts with functional AUS were satisfied with the device regardless of previous or mode of RT. We did not identify any outcome differences in comparing the sub-groups.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>TREATMENT OUTCOME</th>
<th>First 2 Years Outcome (N=)</th>
<th>Explant (0-24) months</th>
<th>Functional</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiated / RT</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>EBRT</td>
<td>27</td>
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<td>EBRT only</td>
<td>3</td>
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<td>3</td>
<td></td>
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<tr>
<td>EBRT/RRP</td>
<td>9</td>
<td>5</td>
<td>4</td>
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<tr>
<td>Brachytherapy (BT)</td>
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<td>BT only</td>
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<td>BT/Cryo</td>
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<tr>
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<tr>
<td>BT/EBRT</td>
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<tr>
<td>RRP</td>
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<td>8</td>
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</tr>
<tr>
<td>TOTAL</td>
<td>72</td>
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<table>
<thead>
<tr>
<th>Table 2</th>
<th>2 Years Outcome in AUS Pts:</th>
<th>Radiated Vs. Non Radiated</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$X^2$ p = &gt;0.05 AUS</td>
</tr>
<tr>
<td>Radiation</td>
<td></td>
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</tr>
<tr>
<td>RT</td>
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<tr>
<td>Non - RT</td>
<td>37</td>
<td>8</td>
</tr>
<tr>
<td>Total (Tot)</td>
<td>55</td>
<td>17</td>
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</table>

AUS Explan AUS - AUS + Functional +
**Conclusion:** Although the AUS provides high patient satisfaction rate (90%) and has remained the gold standard for the treatment of ISD in male pts, the explant rate by 14 months is high at (24%) in our series. Our cohort included numerous complicated pts with associated BN. The complication rate has a range of 4.5% to 67% for early infection/erosion[**]. Similar to Gomha et al et al, we did not find that RT affected complication rate or outcome. Furthermore, Brachytherapy pts had similar outcome to External beam radiation pts. A larger cohort of pts with longer follow-up may indicate differences in outcome. 


**Gomha MA and Boone TB. J Urol, 167: 591,2002

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**Poster #29**

**DORSAL GENITAL NERVE STIMULATION FOR THE TREATMENT OF REFRACTORY OVERACTIVE BLADDER SYMPTOMS**

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**Introduction and Objectives:** The dorsal genital nerves, a component of the pudendal nerve, carries afferent sensory information to the sacral spinal roots. Previous studies indicate that electrical stimulation of this nerve can abolish hyper-reflexive bladder contractions and increase bladder capacity in patients with an overactive bladder. The purpose of this study was to evaluate the acute effects of electrical stimulation on cystometric parameters and the pudendal anal (PA) reflex and to determine if electrodes could be properly placed and be effective and tolerated by subjects during a 1-week home use testing period.

**Methods:** This was a prospective, multicenter study. The primary diagnosis was urge incontinence in the recruited subjects. After a 5 day anticholinergic wash out period, baseline data including demographics, a 3 day bladder diary, and a 24 hr. pad test were obtained. Subjects underwent percutaneous placement of a coiled fine-wire electrode using local anesthetic in the clinic procedure room. Test stimulation was applied to confirm electrode placement and cystometry was conducted with and without application of electrical stimulation. In addition, pudendal anal reflex activity was observed visually and using surface electromyography electrodes. A 7 day testing period with the electrode connected to an external pulse generator was performed as well as a 3 day post treatment period. Bladder diaries, 24 hr pad tests and adverse events queries were obtained during these periods.

**Results Obtained:** 21 females were enrolled with an average age of 52.7 years. Average duration of incontinence was 6 years, 52% were Caucasian, 33% African American, and 14% Hispanic. The average body mass index was 33.8 (range 19.2 to 47.1). Electrode placement was well tolerated requiring 5 to 10 minutes to achieve correct placement. The stimulation sensation was also well tolerated by subjects. There were no relationships between the effect of stimulation on cystometry and the clinical results during the home use testing period. In addition, the PA reflex was not a reliable indicator for placement nor did the presence of a PA reflex correlate with continence during the testing period. Pad weight was reduced by 50% or greater in 13 of 17 subjects (77%) and 47% of subjects reported 50% or greater reduction in leaks. Furthermore, 81% of subjects who reported severe urgency at baseline experienced a 50% or greater improvement. Symptom relief appeared to continue during the 3 day post treatment period for many subjects. 7 subjects experienced 9 mild adverse events which ranged from skin irritation under the surface electrode or tape to pain and bruising around the electrode exit site.

**Conclusions:** This study confirmed that electrodes can be placed near the dorsal genital nerves using a minimally invasive pre-pubic approach which is well tolerated by the subject. Cystometry and PA reflex information did not predict response during the testing period. Results from home use testing suggest that dorsal genital nerve stimulation may reduce overactive bladder symptoms.

Supported in part by the National Institute of Aging (grant nos. R43AG21851, R43AG22292) and by NDI Medical, LLC
Poster #30

DOES CURRENT PERCEPTION THRESHOLD TESTING SELECTIVELY MEASURE DIFFERENT POPULATIONS OF AFFERENT?
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Objective: Increasing data supports the role of afferent neural pathways in regulating lower urinary tract (LUT) function. As a result, clinical investigators are increasingly using current perception threshold (CPT) testing to study LUT innervation in women with and without overactive bladder. CPT testing is thought to selectively activate and measure 3 types of afferent nerves; however, it has not been standardized or compared to better studied methods of sensory testing. Quantitative sensory testing (QST) using vibratory and heat thresholds is reproducible and commonly used in the diagnosis of peripheral neuropathies. In a review of CPT testing, The American Association of Neuromuscular and Electrodiagnostic Medicine recommended further investigation of the CPT testing reproducibility and validity by comparing it to an “appropriate standard.” The aims of this study were: (1) to determine the relationship between CPT testing (2000Hz, 250 Hz and 5 Hz) and QST using vibratory and heat thresholds to find if the methods are selectively activating the same afferent neurons; and (2) to determine, the test-retest reliability, of both methods.

Methods: After IRB approval, 20 women without LUT symptoms, chronic pain or neurological problems participated in the study. Each woman underwent CPT and QST on a single day by different examiners blinded to the results of the first test. CPT testing was done using a Neurometer® CPT device (Neurotron Inc., Baltimore, MD). Stimuli at 3 frequencies, 2000Hz, 250Hz and 5Hz (corresponding to A-β, Aδ, and C fibers, respectively) were applied to the volar forearm, 10 cm above the wrist of the non-dominant hand (C6). QST was done using the Thermal and Vibratory Sensory Analyzer or TSA/VSA (Medoc, Ramat-Yishai, Israel). Thermal (C fibers), vibratory (A-β fibers) and cold (A-δ and C fibers) sensations were measured on the volar forearm 10 cm above the wrist. CPT, thermal and vibratory thresholds were determined by the method of limits. Half of the women (n=10) underwent repeated CPT and QST according to the same protocol 1 week later to determine test re-test reliability. Spearman’s correlations were used to compare CPT with thermal and vibratory thresholds. Friedman’s test was used to determine the test-retest reliability of CPT and QST measures at 2 time points.

Results: Participants had a mean age of 43 ± 11 years. Thermal thresholds were moderately correlated with CPT at 5 Hz (r=0.61, p=0.004). Vibratory thresholds and CPT at 2000 Hz were also moderately (r=0.46, p=0.04). Cold thresholds were inversely correlated with CPT at 5 Hz (r=-0.42, p=0.066), but did not correlate with CPT at 250 Hz stimuli (p=0.270). Thermal and vibratory thresholds were highly correlated one week apart (r=. 95 and r=0.722, respectively) indicating good test-retest reliability. CPT at 5 HZ, 250 Hz and 2000Hz did not demonstrate good test-retest reliability (p>.05).

Conclusions: CPT testing and QST seem to be measuring similar afferent nerve fiber populations, supporting continued investigation of CPT testing in the LUT; although, QST had better test-retest reliability than CPT. Further studies should compare CPT and QST in the LUT. The moderate correlation might be a result of non selective measurement of one or both tests.

Financial support: None
A STUDY OF THE THERAPEUTIC USE OF GUIDED IMAGERY FOR WOMEN WITH INTERSTITIAL CYSTITIS
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Introduction and Objective: Guided imagery and relaxation techniques have been successfully used to decrease pain and increase relaxation in cancer pain, low back pain and postoperative pain. However, to our knowledge, a randomized controlled trial of the use of guided imagery for women with interstitial cystitis (IC) has not been done. The objective of this study was to explore the effect of guided imagery on women with IC, hypothesizing that their IC symptoms will decrease and self-efficacy will increase.

Methods: This prospective, randomized pilot study was comprised of women diagnosed with IC by cystoscopy and hydrodistention who were referred to Beaumont Women’s Initiative for Pelvic Pain and Sexual Health (WISH) Program. Thirty women were randomized into two equal groups. Baseline assessment questionnaires (IC Self-Efficacy Scale, IC-SIPI, VAS, global response assessments), a 2 day voiding diary and 24 hour pain diaries were completed by each subject. One group (treatment) listened to a 25 minute guided imagery CD that we created specifically for women with pelvic pain and IC twice a day for 8 weeks, and the other group (controls) rested by sitting or lying down for 25 minutes, twice a day for 8 weeks. A 2 day voiding diary and the assessment questionnaires were completed again at 8 weeks. Student t-test was used to compare treatment to control and paired t-test was used to compare baseline to post-treatment.

Results: The two groups were similar with respect to age, ethnicity and educational level. The 24-hr pain score for the treatment group was statistically significantly improved (p=0.027) from 5/10 at the start to 3/10 at the end of the study, with a nonsignificant improvement in the controls (p=.187). The average episodes of urgency significantly declined in the treatment group from 16 to 12 (p=0.02), with no significant change in the controls (p=.684). The IC-SIPI scores declined in both groups from the start to the end of the study, but this was not statistically significant. The treatment group felt statistically significantly better (5.5 SD 1.0) than controls (4.5 SD 1.0) at the end of the study and reported significantly higher confidence (3.3 SD 1.1) than controls (2.2 SD 0.9) that the prescribed intervention helped. Although there was no statistically significant difference on the global response assessment or change in self-efficacy for both groups, 45.5% of the treatment group compared to 14.3% of controls noted on their global response assessments a “moderate or marked improvement” in IC symptoms. This may be a reflection of a lack of power of this study.

Conclusions: Guided imagery may be a useful tool to offer women with IC for pain and IC symptom management. It is an intervention without negative side effects, is readily available, and shows a trend toward improvement of IC symptoms. A large-scale powered study based on these results is planned to further evaluate the efficacy of the use of guided imagery in women with IC.

Funding Source: Ministrelli Program for Urologic Research and Education (MPURE)
Poster #32

SACRAL NERVE STIMULATION IN NEUROGENIC VOIDING DYSFUNCTION
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Objective: The purpose of this study was to review our institution’s experience with sacral nerve stimulation (SNS) for the treatment of neurogenic voiding dysfunction.
Methods: We performed a retrospective review of our database containing information about patients who received an implantable pulse generator (IPG) from December 1993 through December 2004. This time period reflects an evolution in SNS, including PNE trials, non-tined (bone or fascial anchored) leads, percutaneous tined leads with two-staged procedures, and percutaneous pudendal trials.
Results: The study population included a total of 106 patients, 10 (9%) of whom had refractory neurogenic voiding dysfunction with urinary urgency/frequency (U/F) and/or urge incontinence (UI). Causes of voiding dysfunction in this cohort included cerebrovascular accident (CVA) in 6 (60%), multiple sclerosis in 2 (20%), and partial spinal cord injury in 2 (20%). The average age at implantation was 60 (range 38-80). Duration of symptoms prior to implantation was 79 months (range 24-196 months). With SNS therapy, the average number of voids per 24 hours decreased from 11 (±5.3) to 7 (±2.2), the average number of voids per night decreased from 2.9 (±2.1) to 1 (±0.6), and the average number of leaks per 24 hours decreased from 4.9 (±3.5) to 1.6 (±1.8). Overall mean lead durability was 25 months (range 9 – 37 months). Three patients experienced reportable events (30%), all of which were mild to moderate in severity including one loss of efficacy, one pain at IPG site, and one development of uncomfortable sensation with stimulation. The patients experiencing loss of efficacy and pain at IPG site were successfully treated with revision, and the patient experiencing uncomfortable sensation with stimulation was successfully treated with reprogramming of the IPG.
Conclusions: Although not FDA approved for use in neurogenic voiding dysfunction, SNS looks promising for the treatment of urinary urgency, frequency and urge incontinence in this patient population.
Poster #33

SACRAL NEUROMODULATION (INTERSTIM®) AND ITS EFFECTS ON NON-OBSTRUCTIVE URINARY RETENTION IN MEN
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Introduction and Objectives: Sacral neuromodulation is currently indicated for the treatment of medically refractory urgency/frequency syndromes, urinary urge incontinence, and non-obstructive urinary retention (NUR). We evaluated our experience with sacral neuromodulation in the management of men with NUR.

Methods: We performed a retrospective chart review of all the patients who had undergone placement of the Interstim® device at Vanderbilt University from June 2002 to July 2006 and identified 12 men with a diagnosis of non-obstructive urinary retention. Four patients with documented neurologic disease were excluded, leaving 8 patients that form the cohort of this study. All patients underwent a peripheral nerve evaluation (PNE) in the GU clinic and those who responded with either 1) a decrease in catheterization volume or 2) decreased frequency of clean intermittent catheterization (CIC) or 3) those who reported a ≥ 50% subjective improvement in their voiding ability underwent placement of an implantable pulse generator (IPG). Clinical, surgical, urodynamic, and postoperative data was collected for all patients and outcomes determined based upon clinical response following PNE and IPG placement.

Results: During this four year period, 8 neurologically intact men with NUR underwent test stimulation via PNE. Average patient age was 58 (range 37-77) and mean preoperative post-void residual (PVR) was 550 ml (range 244-1200). Average Pdet@Qmax was 39 cm H2O (23-53) at an average Qmax was 4.4 ml/sec (0-6). Two of our eight patients (25%) showed objective improvement with a PVR less than 50ml and discontinuation of CIC following IPG placement. Four patients (50%) demonstrated short-term improvement in catheterization frequency and PVR volumes that did not persist with long term follow-up. Two patients (25%) did not undergo placement of the IPG, due to lack of subjective or objective improvement during the test-stimulation period. Thus, overall response to PNE was 6/8 (75%) while durable response following IPG placement was 2/6 (33%).

Conclusion: In our small experience, male patients with NUR rarely demonstrate objective improvement in their urinary retention. The long-term improvement in 33% of those who had the IPG placed when compared to the initial 75% response rate to PNE suggests that a staged procedure with a longer trial period may be more effective in predicting those who would benefit from IPG placement. Utilization of objective rather than subjective parameters to more appropriately select patients will guide a future prospective trial in this patient population.
Poster # 34

MALE SLING FOR MODERATE TO SEVERE STRESS URINARY INCONTINENCE: EFFICACY AND MECHANISM
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Introduction and Objectives: Stress urinary incontinence (SUI) after prostate surgery has significant impact on patient’s quality of life. Recently, bulbourethral sling has gained popularity for the treatment of this condition as previous series showed encouraging results. We present further evaluation of this procedure using objective, subjective measurements and dynamic magnetic resonance imaging (MRI).

Methods: A total of 33 consecutive men (mean age 68) underwent the bulbourethral bone anchored sling for post prostatic surgery SUI. The procedure was performed with the AMS InVance™ male sling kit. Pre and postoperative evaluation consisted of physical examination, history (including AUA symptoms score, incontinence/quality of life questionnaire, UCLA/RAND), cystoscopy, ICS1H pad test and videourodynamic study. Reassessment was done 2, 6, 12 months after the surgery and yearly thereafter. One third of the patients were randomly selected to have a pelvic dynamic MRI before and 6 months after the male sling.

Results: The median follow-up time was 20.6 months. Seven patients (21.2%) have had adjunctive radiotherapy. Incontinence was described as moderate (2-3 pads per day) by 14 (42.4%) and severe (more than 3 pads) by 19 (57.6%). ICS1H pad test done 6 months after the surgery was negative in 72.7% of the patients. Seventeen (51.5%) were dry, 11 (33.3%) used 1 to 2 pads and 5 (15.1%) used more than 3 pads. Post operative videourodynamic demonstrated unobstructed voiding patterns, clinically none of the patients had de novo voiding or filling symptoms. Mean results reported on the visual analogic scale about discomfort caused by SUI were 75.8% and 20.0% before and after the male sling respectively. Twenty six patients (83.9%) said to be satisfied/very satisfied from the surgery and 22 (71%) said to be cured/almost cured. Outcomes were not significantly affected by the degree of SUI neither by adjunctive radiotherapy. Dynamic MRI and fluoroscopic images did not show any difference in bladder neck position or mobility. Instead, the mesh seemed to dynamically compress and elevate the posterior bulbar urethra by creating a kink at this level.

Conclusion: This study shows that bone anchored male sling appears to have high success rate, both subjectively and objectively in patients with moderate to severe SUI. Mechanism of action could be dynamic posterior compression with a secondary elevation of the bulbar urethra, allowing better transmission of intra-abdominal pressure.
Introduction and Objective: The male perineal sling has recently become an option for the treatment of male stress urinary incontinence. The purpose of this study is to discuss the complications of the male perineal sling and our management of these complications.

Methods: 78 men with urinary stress incontinence underwent an InVance sling at a single institution between April 2002 and August 2006. Data regarding post-operative complications and their management was collected prospectively.

Results: The overall complication rate was 23.7%. De novo urge incontinence was present in one patient. Urge incontinence and the absence of outlet obstruction were confirmed with urodynamics, and he was treated with anticholinergics. Three patients experienced prolonged obstructive symptoms (>1 month). Two patients had an elevated PVR and required intermittent catheterization. All three patients underwent sling revision with one patient requiring subsequent sling removal. All three men were eventually able to void effectively. Perineal and/or scrotal parathesia lasting greater than three months was present in 4 patients. All patients were managed with watchful waiting and non-steroidal anti inflammatory drugs as they were not significantly bothered by their symptoms. Five patients experienced prolonged (>3 mos) perineal pain. Two patients had pain severe enough to warrant further evaluation with imaging. A CT scan was unremarkable in each; however, one patient subsequently required removal of the sling secondary to progressive pain at nine months post op. At the time of surgery he was found to have an infected sling. Infection of the sling occurred in a total of six men, one acutely (within one week of surgery), 4 at 6-9 months post op, and one of which occurred with a urethral erosion 20 months after surgery. One patient has been managed with intermittent oral antibiotics secondary to his reluctance to have the sling removed. The other 5 required removal. We attempted salvage of the infected sling in two patients using the irrigation protocol described for salvage of infected artificial urinary sphincters (AUS). The salvage procedure was unsuccessful, and both patients required subsequent removal of the sling. The patient with the urethral erosion had an indwelling catheter for 3 weeks. Two of the patients, including the patient with erosion, have undergone insertion of an artificial urinary sphincter.

Conclusions: The male perineal sling is a valid treatment for post-prostatectomy incontinence. The procedure does have potential complications that need to be discussed with the patient preoperatively, including infection (which can present late) and obstruction. Perhaps changing to a polypropylene mesh would reduce the rate of infection. The male perineal sling does not appear to be salvageable by the irrigation protocol previously described for AUS, at least not without removing the sling. Further investigation is needed to determine the etiology and significance of prolonged perineal and/or scrotal parathesias or pain in patients undergoing a male perineal sling.
BONE ANCHORED MALE SLING IN THE MANAGEMENT OF POST PROSTATECTOMY INCONTINENCE- FIVE YEARS EXPERIENCE FROM SINGLE INSTITUTION
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Introduction and Objectives: Since its introduction in 2001, Bone anchored male sling (BAMS) has emerged as an effective alternative procedure in mild to moderate post-prostatectomy incontinence. We had previously reported short term results of BAMS. In the present study, we report our five years experience with this procedure.

Methods: From 2001-2006, a total of 87 patients underwent bone anchored male sling. Eighty three patients underwent radical prostatectomy or radiation therapy for prostate cancer, three had neurogenic bladder and one patient had pelvic trauma. Absorbable biomaterial was used for male sling in first 16 patients and 77 patients had composite graft (mesh with dermis). A total of 60(68.9%) had mild-moderate (1-3 pads) and 27(31.1%) had severe (>3pads) incontinence. Urodynamic evaluation was performed in all patients to determine valsalva leak point pressure (VLPP), maximal flow rate (Q Max) and post voiding residual volumes (PVR) and the presence of detrusor overactivity (DO). UCLA/RAND questionnaire scoring was used pre and post operatively to evaluate the outcome of the procedure.

Results Obtained: The mean age of the patients was 65.5 (range 30-81) years. The mean follow up period was 36 (range 6- 60) months. There were no intra-operative complications related to the surgery. No urethral erosions were seen. Sling infection occurred in 2 patients which were treated with sling removal. None of the patients went into permanent urinary retention. SUI was cured in 44 (52.87%) and significantly improved in another 22 (25.29%) patients with a cured/improved rate of 78.16%. A total of 19(21.8%) patients failed the procedure. All these patients had either severe incontinence pre-operatively or absorbable biomaterial was used as sling material. The post-operative urodynamic study in failed patients revealed SUI with low valsalva leak pressures. Thirteen of these failed patients later underwent artificial urinary sphincter placement with good results. Sling was removed in 2(2.3%) patients secondary to mesh infection.

Conclusions: As seen in prior short term studies, non-absorbable bone anchored male sling still remains a safe and effective treatment in men with mild-moderate SUI.

References:

Note: No funding obtained for this project.
Poster #37

A NOVEL NEUROMUSCULAR ELECTROSTIMULATION TREATMENT FOR INTERSTITIAL CYSTITIS PATIENTS

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Introduction and Objectives: Interstitial Cystitis, (IC) is a chronic condition of the lower urinary tract characterized by urgency, frequency and bladder or pelvic pain in the absence of bacterial infection or other definable pathology. Multimodality behavioral and pharmacological treatment, bladder instillations, and hydro distension are commonly used for treatment of IC. All treatment modalities have limited efficacy in the majority of patients. Often symptoms return after a short period of improvement or relief.

Methods: We identified women with severe IC by looking at symptoms of pelvic pain, urinary frequency and urgency. All women had undergone the commonly used standard treatments described above and had failed them.

All study subjects underwent cystoscopy to determine bladder capacity. Following peri-urethral test stimulation that determined if a subject would respond to neuromuscular electrostimulation, responders underwent surgical procedure for chronic device implantation.

During the surgical procedure, a pocket for the chronic pulse generator was created a few centimeters cephalad from the pubic symphysis. A chronic bipolar stimulation lead was implanted peri-urethrally. The lead was tunneled pre-pubically towards the pocket and connected to the pulse generator. The system was activated via a telemetry device to deliver intermittent pulses to the pelvic floor.

Results Obtained: 82 patients, mean age 55 years (21 - 72), were enrolled in this study. 23% patients were excluded from the study, because they failed the initial test stimulation. Another 23% of patients withdrew their consent to participate in the study after 1-25 months post implantation because of self determined lack of efficacy.

44 active patients have completed a mean follow up period of 24 months (2 – 52) and were statistically evaluated using a two-tails student’s t test. A P-value of less then 0.05 was considered statistically significant.

Efficacy was calculated according to symptoms pre- and post-implantation. Symptoms were collected with voiding- and pain- diaries and quality of life questionnaires Short-Form McGill Pain Questionnaire (SF-MPQ) and by the O’Leary-Sant IC Symptoms and Problems Indices (O’Leary-Sant).

At follow up, all 44 patients demonstrated improvement in all parameters. Pain (on a visual analogue scale of 0 –no pain to 10- worse pain) decreased significantly from 5.9±2.0 to 3.2±2.3 (p<0.0001). A decrease was observed in the O’Leary-Sant and SF-MPQ scores from 31.1±4.0 and 36.2±11.4 to 20.2±9.7 and 17.6±11.7 (p<0.0001) respectively and kept the same trend throughout the study. Frequency decreased from an average of 24.0±14.5 times to 18.0±11.8 times per day at the average follow up study period (p=0.01).
EFFECTS OF PRIOR THERAPY ON HEALTH-RELATED QUALITY OF LIFE FOLLOWING TREATMENT WITH TRANSDERMAL OXYBUTYNNIN

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Introduction and Objectives: Overactive bladder (OAB) has a negative impact on health-related quality of life (HRQOL). The Multicenter Assessment of Transdermal Therapy in Overactive Bladder With Oxybutynin (MATRIX) study was conducted to determine the effects of treatment with transdermal oxybutynin (OXY-TDS) on HRQOL and other measures for individuals with OAB. This analysis examines the relationship between prior treatment for OAB and HRQOL outcomes.

Methods: MATRIX was an open-label, multicenter, community-based, prospective study in adults with symptoms of OAB. Participants were stratified into 3 categories by prior OAB therapy: never treated (naïve), treatment stopped <30 days before enrollment (recently treated), or treatment stopped ≥30 days before enrollment (lapsed). All participants in the study received OXY-TDS at the US Food and Drug Administration (FDA)-approved dosage of 3.9 mg/day (2 patches per week) for up to 6 months. HRQOL impairment was assessed with King’s Health Questionnaire® (KHQ) at baseline, 3 months, and 6 months. Satisfaction with OXY-TDS was assessed via monthly telephone interviews. The primary end point was change from baseline to end of study in KHQ domain scores for the intent to treat (ITT) population, comprising participants who received ≥2 doses and had ≥1 postbaseline assessment. P values were derived from analysis of covariance (ANCOVA) (last observations carried forward) and a 1-sample, 2-tailed t test.

Funding support was provided by Watson Laboratories.

Results: Of 2878 enrolled participants, 12.8% were men and 83.6% were Caucasian; mean age was 62.5±14.8 years (range, 18–100 y). Most participants (57.1%) had been treated previously for OAB; of these, 31.6% had received multiple medications. The most common prior medications were extended-release tolterodine (31.0%) and extended-release oxybutynin (18.2%). In the intent-to-treat (ITT) population (n=2593), 42.5% of participants were naïve, 33.5% were recently treated, and 24.0% were lapsed; participants in the 3 groups had significantly (P≤.0033) different baseline scores in 7 of 10 KHQ domains, with naïve participants having a higher HRQOL than those who were recently treated or lapsed. The study population as a whole showed significant improvement in all domains of the KHQ at end of study (P<.0001), except General Health Perception. Although all subgroups experienced clinically meaningful improvement in ≥7 of 10 domains, significant differences in response magnitude were seen between groups in 6 of 10 domains. Most participants (63.4%) previously treated for OAB reported greater satisfaction with OXY-TDS therapy, relative to their prior medications. This is comparable with the overall satisfaction rate in the entire study population, in which 69% of participants reported that they were “very satisfied” or “satisfied” with OXY-TDS.

Conclusions: Participant HRQOL improved after patients received OXY-TDS, regardless of OAB treatment history.
Introduction and Objectives: Management of complex voiding dysfunction following hysterectomy with sacral neuromodulation represents an expanding indication for this promising treatment modality. Herein we describe our experience treating women with voiding complaints related to surgical hysterectomy with sacral nerve stimulation (SNS).

Methods: A retrospective review of the Vanderbilt Sacral Neuromodulation Database was performed to identify patients who presented with voiding conditions whose onset corresponded to the time of their hysterectomy. Patient charts were evaluated for demographics, presenting symptoms, medical management regimens, urodynamic findings, and results from implantation of SNS including postoperative complications.

Results: Nine patients were identified that presented with voiding symptoms temporally associated with prior hysterectomy. Average patient age was 43 years (range 38 - 51 years). Five patients (63%) presented with findings of nonobstructive urinary retention. Two of these patients with retention had superimposed symptoms of urgency-frequency. The remaining 4 patients had diagnoses of urgency-frequency. Average duration of symptoms prior to presentation was 2.6 years (range 1 - 4 years). All patients with urinary retention were treated with clean intermittent catheterization prior to successful neuromodulator test response and subsequent SNS generator implantation. Patients with urgency-frequency were given a trial of anticholinergic medication preceding surgical intervention. There were no consistent urodynamic findings predicting success with SNS. Average length of follow up was 11 months (range 1 – 37 months). 4 patients had minor complications of wound infections, with 3/9 (33%) requiring lead revision or replacement of the SNS device. 7/9 patients (78%) recorded considerable subjective improvement (>90%) in voiding symptoms following neuromodulation with the remaining two patients reporting minimal or no improvement. Although 4/5 (80%) of the urinary retention patients indicated symptom improvement, 60% also continued to utilize clean intermittent catheterization at least once daily at last follow up. Only one patient remained on anticholinergic medications postoperatively and aside from revisions of the neuromodulator, no patient underwent further urologic surgeries for their voiding symptoms.

Conclusions: Sacral neuromodulation is gaining appreciation as a powerful tool in the urologic armamentarium for the treatment of complex voiding dysfunction. We present our experience with neuromodulation in a cohort of patients with voiding symptoms generated by prior hysterectomy. In the majority of cases in this select group sacral neuromodulation provided a substantial improvement in voiding complaints. Particularly in patients with nonobstructive urinary retention following hysterectomy, SNS appears to provide considerable symptom resolution with reasonably low morbidity.
Objective: The purpose of this study was to review our institution’s experience with sacral nerve stimulation (SNS) for the treatment of refractory voiding dysfunction in men.

Methods: We performed a retrospective review of our database containing information about patients who received an implantable pulse generator (IPG) from December 1993 through December 2004. This time period reflects an evolution in SNS, including PNE trials, non-tined (bone or fascial anchored) leads, percutaneous tined leads with two-staged procedures, and percutaneous pudendal trials.

Results: The study population included a total of 106 patients, 13 (12%) of whom were male. In this cohort of patients, the average age at implantation was 52 (range 27-77). Duration of symptoms prior to implantation was 106 months (range 9 – 583). The most frequent primary indication for implantation was refractory urgency/frequency in 11 patients (85%). Five (38%) of the urgency/frequency patients had previously been diagnosed with nonbacterial prostatitis. Nonobstructive urinary retention (NOUR) was the primary diagnosis in the two remaining patients (15%). In the U/F group, the average number of voids per 24 hours decreased from 13 (± 1.4) to 9 (±2.1), the average number of voids per night decreased from 2.9 (±2.1) to 1.4 (±1.1), and the average number of leaks per 24 hours decreased from 7.1 (± 6.9) to 1.5 (±1.4). In the NOUR group the number of catheterizations per day decreased from 5 to 1. Overall mean lead durability was 29 months (range 8 – 52 months). Four men experienced reportable events (31%), all of which were mild to moderate in severity. The most common reportable event was loss of efficacy in three patients (23%), followed by infection in one patient (8%). All four reportable events were successfully treated with surgical revision.

Conclusions: In this cohort of men, SNS was an effective, durable treatment for voiding dysfunction from multiple etiologies.
VIDEOS

The following videos will be available to be viewed in the Speaker Ready Room, Show Managers Office 4, from 8:00 a.m. – 5:00 p.m. on Friday, February 23, 2007 and 8:00 a.m. – 1:00 p.m. on Saturday, February 24, 2007.

VIDEO #1 THE ADVANCE MALE SLING SYSTEM
David Rapp, MD, University of Chicago Hospitals, Alvaro Lucioni, MD, University of Chicago, W Stuart Reynolds, MD, University of Chicago, Lyon Mark, MD, University of Chicago and Bales Gregory, MD, University of Chicago (Presented By: David Rapp, MD, University of Chicago Hospitals)

VIDEO #2 TRANSURETHRAL BLADDER NECK INJECTIONS WITH A LASER CYSTOSCOPE SYSTEM - AN ALTERNATIVE TECHNIQUE
John Milleman, MD, Scott and White Urology and Erin Bird, MD (Presented By: John Milleman, MD, Scott and White Urology)

VIDEO #3 ENDOUROLOGICAL MANAGMENT OF BLADDER ENDOMETRIOSIS
Humphrey Atiemo, MD, Cleveland Clinic, Amy Park, MD, Sarah McAchran, MD, Tommaso Falcone, MD and Howard Goldman, MD (Presented By: Humphrey Atiemo, MD, Cleveland Clinic)