I wish to welcome you all to New Orleans for the Ninth Annual Winter Meeting of the Society of Urodynamics and Female Urology. Being a native of New Orleans, this is a very special meeting and I am equally excited to welcome you to the “Big Easy!” As in previous years, this meeting includes contributions from the International Society of Pelvic Neuromodulation (ISPiN), the Geriatric Urological Society (GUS) and a stronger basic science component than ever before. Our scientific program remains very topic-oriented, but more case-based discussion is included in the plenary sessions. We will review topics related to basic science, urodynamics, female urology, neuromodulation, IC/PBS, neurogenic bladder and pelvic reconstructive surgery.

My program co-chairs, Drs. Quentin Clemens, Toby Chai and Steven Siegel, are honored to present a program, which we are excited about covering, in a format that is educational and more interactive. The meeting begins with a program dedicated to basic science and translational research, which extends over the next one and a half days. We believe the collaboration between clinicians and basic scientists is one of the outstanding and unique aspects of the meeting. Daily breakout sessions in various areas increase the breadth of topics covered and allow for more intimate discussion and sharing of ideas. We will have breakout sessions devoted to urodynamics, prolapse, reconstruction as well as other current topics of interest.

From Wednesday through Friday, we will have industry-sponsored symposia over lunch. We hope many of you will take advantage of these successful symposia, remembering that without the sponsorship of industry, the cost of this meeting would be prohibitive. We are very excited about the program but realize that participation from those attending the meeting enhances the educational experience for all. So, in addition to state-of-the-art lectures, podium and poster presentations and breakout sessions, we have allotted time for discussion.

Our hotel, the famous, historic Roosevelt Hotel in New Orleans, is one of the architectural icons in this city. It is an outstanding meeting venue, providing luxurious amenities, and is very close to all the famous restaurants and activities for which New Orleans is so popular. Join us for our welcome reception on Wednesday night for drinks and light hors d’oeuvres as you meet with industry partners in the exhibit hall. At the conclusion of the scientific program on Friday, we will have a cocktail reception and award presentations in the exhibit hall. There will be much to do and we will be happy to accommodate your needs.

My co-chairs and I are excited for yet another terrific meeting. We hope you enjoy it here in this unforgettable city.

J. Christian Winters, MD
SUFU Program Chair
THANK YOU TO REVIEWERS

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

Karl-Erik Andersson, MD, PhD  
Jennifer Anger, MD  
Katie N. Ballert, MD  
Charles Butrick, MD  
R. Duane Cespedes, MD  
Christopher Chermansky, MD  
Craig V. Comiter, MD  
Vivian Cristofaro, PhD  
Margot S. Damaser, PhD  
Sophie Fletcher, MD  
Matthew O. Fraser, PhD  
Gamal M. Ghoniem, MD  
Tomas Griebling, MD  
Howard B. Goldman, MD  
Magdy M. Hassouna, MD  
Adonis K. Hijaz, MD  
Michael J. Kennelly, MD  
Kimberly Kenton, MD, MS  
Adam P. Klausner, MD  
Kathleen C. Kobashi, MD  
Stephen R. Kraus, MD  
Deborah J. Lightner, MD  
Paul Pettit, MD  
Nirit Rosenblum, MD  
Steven W. Siegel, MD  
John T. Stoffel, MD  
E. James Wright, MD

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

2012 SUFU Meeting Program Chairs  
J. Christian Winters, MD  
J. Quentin Clemens, MD  
Toby Chai, MD  
Steven W. Siegel, MD

We would also like to thank the 2012 SUFU Essay Competition Reviewers:

Angelo E. Gousse, MD (Chair)  
Elise J.B. De, MD  
Matthew P. Rutman, MD
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>11:00 a.m. – 6:00 p.m.</td>
<td>Registration Open Location: Crescent City Ballroom Foyer</td>
<td>7:30 a.m. – 6:30 p.m.</td>
<td>7:00 a.m. – 6:00 p.m.</td>
</tr>
<tr>
<td>8:00 a.m. – 8:30 a.m.</td>
<td>2011 IC/Painful Bladder Syndrome</td>
<td>Welcome</td>
<td>IC Painful Bladder Case Presentations</td>
</tr>
<tr>
<td>9:00 a.m. – 10:00 a.m.</td>
<td>Urothelial Regulation of Bladder Function</td>
<td>President’s Address</td>
<td>President’s Address</td>
</tr>
<tr>
<td>10:00 a.m. – 10:30 a.m.</td>
<td>Break</td>
<td>Break – Visit Exhibits</td>
<td>Break – Visit Exhibits</td>
</tr>
<tr>
<td>10:30 a.m. – 11:00 a.m.</td>
<td>Bladder Remodeling and Effect on Function</td>
<td>NIH Sponsored Clinical Trials: Just the Facts</td>
<td>NIH Sponsored Clinical Trials: Just the Facts</td>
</tr>
<tr>
<td>11:00 a.m. – 12:00 p.m.</td>
<td>Lunch Location: Blue Room</td>
<td>Industry Sponsored Lunch Symposium Location: Conti/Lafitte Room</td>
<td>Industry Sponsored Lunch Symposium Location: Conti/Lafitte Room</td>
</tr>
<tr>
<td>12:00 p.m. – 12:30 p.m.</td>
<td>How to Make the Bladder Work After Spinal Cord Injury</td>
<td>NIDDK O’Brien Urology Centers</td>
<td>Female Urology / Incontinence Podium Session</td>
</tr>
<tr>
<td>12:30 p.m. – 1:00 p.m.</td>
<td></td>
<td>Advancing Benign Urology Research Career and Development</td>
<td>Blaivas Lectureship: Sensation: A Trip Through Your Bladder</td>
</tr>
<tr>
<td>1:00 p.m. – 1:30 p.m.</td>
<td></td>
<td>Perception and Modulation of Bladder / Urethral / Pelvic Floor Sensation</td>
<td>SUFU Post Prostatectomy Incontinence Study</td>
</tr>
<tr>
<td>1:30 p.m. – 2:00 p.m.</td>
<td>Break</td>
<td>ISPIN I: Update on Expanding Indications for Neuromodulation</td>
<td>ISPIN I: Update on Expanding Indications for Neuromodulation</td>
</tr>
<tr>
<td>2:30 p.m. – 3:00 p.m.</td>
<td>Mesenchymal Stem Cells</td>
<td>1. Basic Urodynamics Location: Chambers I &amp; III</td>
<td>2. Crash Course on Neuromodulation for Bowel Dysfunction Location: Conti/Lafitte</td>
</tr>
<tr>
<td>3:00 p.m. – 3:30 p.m.</td>
<td>Regulation of Bladder Smooth Muscle Contractility</td>
<td>3. Robotic Surgery in POP Location: Roosevelt Ballroom</td>
<td>3. Robotic Surgery in POP Location: Roosevelt Ballroom</td>
</tr>
<tr>
<td>4:00 p.m. – 4:30 p.m.</td>
<td>Break</td>
<td>Basic Science Poster Session II Location: Waldorf Astoria Ballroom</td>
<td>Female Urology / Incontinence Poster Session Location: Waldorf Astoria Ballroom</td>
</tr>
<tr>
<td>5:00 p.m. – 5:30 p.m.</td>
<td>Break</td>
<td>Welcome Reception with Corporate Members Location: Crescent City Ballroom</td>
<td>Male Incontinence / Urodynamics Podium Session Location: Roosevelt Ballroom</td>
</tr>
<tr>
<td>Time</td>
<td>Friday Session</td>
<td>Saturday Session</td>
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<tr>
<td>7:00 a.m.</td>
<td>Registration Open</td>
<td>7:00 a.m. – 12:00 p.m.</td>
<td></td>
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<tr>
<td>Location: Crescent City Ballroom Foyer</td>
<td>(Registration desk will be located in the Roosevelt Ballroom Foyer on this day only).</td>
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<tr>
<td>7:00 a.m. – 3:00 p.m.</td>
<td>Exhibit Hall Open</td>
<td>7:00 a.m. – 3:00 p.m.</td>
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<tr>
<td>8:00 a.m. – 5:00 p.m.</td>
<td>Speaker Ready Room Open</td>
<td>8:00 a.m. – 12:00 p.m.</td>
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<tr>
<td>Location: Directors Room</td>
<td>Location: Roosevelt Ballroom Foyer</td>
<td>Location: Roosevelt Ballroom Foyer</td>
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<tr>
<td>7:00 a.m.</td>
<td>Breakfast</td>
<td>Breakfast</td>
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<tr>
<td>Location: Crescent City Ballroom</td>
<td>Location: Roosevelt Ballroom Foyer</td>
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<tr>
<td>8:00 a.m.</td>
<td>Annual Business Meeting</td>
<td>Pelvic Organ Prolapse / Reconstruction Poster Session</td>
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<td>Location: Waldorf Astoria Ballroom</td>
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<tr>
<td>9:00 a.m.</td>
<td>Male Incontinence / Urodynamics Moderated Poster Session</td>
<td>Pelvic Organ Prolapse / Reconstruction Podium Session</td>
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<tr>
<td>Location: Waldorf Astoria Ballroom</td>
<td>Location: Roosevelt Ballroom</td>
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<tr>
<td>9:30 a.m.</td>
<td>Lapides Award Presentation</td>
<td>Prize Essay Award Presentations</td>
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<tr>
<td>10:00 a.m.</td>
<td>Announcement</td>
<td>Contemporary Management of Neurogenic LUTS</td>
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<tr>
<td>10:30 a.m.</td>
<td>ESFFU Lecture: Neurostimulation in Spinal Cord Injury Patients</td>
<td>Urologic Management</td>
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<tr>
<td>11:00 a.m.</td>
<td>State of the Art: Biologic Graft Materials—Is there a Role in 2012?</td>
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<tr>
<td>11:30 a.m.</td>
<td>Industry Sponsored Lunch Symposium</td>
<td>Adjourn</td>
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<td>12:00 p.m.</td>
<td>FDA Mesh Warning: Clinical Perspectives</td>
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<td>12:30 p.m.</td>
<td>Break</td>
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<td>1:30 p.m.</td>
<td>ISPIN Session II</td>
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<td>2:00 p.m.</td>
<td>PTNS for Urinary Symptoms</td>
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<td>2:30 p.m.</td>
<td>Break</td>
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<tr>
<td>3:00 p.m.</td>
<td>Fundamentals of Interstim Programming</td>
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<td>4:00 p.m.</td>
<td>ISPIN Podium Session</td>
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<tr>
<td>4:30 p.m.</td>
<td>ISPIN Podium Session</td>
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<td>5:00 p.m.</td>
<td>1. Managing Infections and Prolapse in Older Females</td>
<td>2. Advanced Urodynamics</td>
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<td>Location: Conti / Lafitte Room</td>
<td>Location: Roosevelt Ballroom</td>
<td>3. Male Incontinence</td>
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<td>Location: Orpheum Room</td>
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<td>Location: Roosevelt Ballroom</td>
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<td>5:30 p.m.</td>
<td>1. Managing Infections and Prolapse in Older Females</td>
<td>2. Advanced Urodynamics</td>
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<td>3. Male Incontinence</td>
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<td>Location: Orpheum Room</td>
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<td>Location: Roosevelt Ballroom</td>
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<tr>
<td>6:00 p.m.</td>
<td>Cocktail Hour and Award Presentations</td>
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Cleveland, OH

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University of Maryland Medical Center
Baltimore, MD

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J. Quentin Clemens, MD
Toby C. Chai, MD
Steven W. Siegel, MD

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Schaumburg, IL 60173
Phone: (847) 517-7225 • Fax (847) 517-7229
Website: www.sufuorg.com
Email: info@sufuorg.com

Executive Director
Wendy J. Weiser

Associate Director
Debbie Roller
NEEDS AND OBJECTIVES

Needs
The clinical science topics of bladder physiology, regenerative medicine, interstitial cystitis, vaginal surgical techniques, and neurogenic bladder are rapidly developing areas. Attendees of the SUFU program need to be aware of the latest updates and controversies in these topics. This meeting will provide active interactions between clinicians, investigators and basic scientists regarding diagnostic, therapeutics, and research topics related to urinary incontinence, chronic pelvic pain, neurogenic bladder dysfunction, and neuromodulation. Attendees will benefit from the ongoing review of these topics, which will assist them in assessing and providing the optimal patient care.

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

1) Describe the role of bladder smooth muscle and urothelial cells in the regulation of normal bladder function.
2) Report current research being conducted at NIDDK O’Brien Center sites.
3) Review the latest developments and controversies related to the use of vaginal mesh for the treatment of pelvic organ prolapse and stress urinary incontinence.
4) Identify appropriate management strategies for interstitial cystitis.
5) Describe the primary findings of the UITN and PFDN research networks.
6) Employ contemporary management principles and techniques for neurogenic bladder dysfunction.

CME ACCREDITATION

Accreditation Statement
This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the University of Oklahoma College of Medicine and the Society for Urodynamics & Female Urology (SUFU). The University of Oklahoma College of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

The University of Oklahoma College of Medicine designates this live activity for a maximum of 31.00 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Conflict Resolution Statement
The University of Oklahoma College of Medicine, Office of Continuing Professional Development has reviewed this activity’s speaker and planner disclosures and resolved all identified conflicts of interest, if applicable.

Equal Opportunity Statement
The University of Oklahoma is an equal opportunity institution.

General Disclaimer
The statements and opinions contained in this program are solely those of the individual authors and contributors and not of SUFU. The appearance of the advertisements is not a warranty, endorsement, or approval of the products or services advertised or of their effectiveness, quality or safety. The content of this publication may contain discussion of off-label uses of some of the agents mentioned. Please consult the prescribing information for full disclosure of approved uses. SUFU disclaims responsibility for any injury to persons or property resulting from any ideas or products referred to in the abstracts or advertisements.

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.
### Thursday, March 1, 2012

<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
<th>Location</th>
<th>Presenter(s)</th>
<th>Sponsored by</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m. – 1:00 p.m.</td>
<td>Industry Sponsored Lunch Symposium</td>
<td>Conti/Lafitte</td>
<td>“Neurogenic Detrusor Overactivity” David Ginsberg, MD, USC Keck School of Medicine</td>
<td>Allergan</td>
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</table>

### Friday, March 2, 2012

<table>
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<tr>
<th>Time</th>
<th>Event Description</th>
<th>Location</th>
<th>Presenter(s)</th>
<th>Sponsored by</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m. – 1:00 p.m.</td>
<td>Industry Sponsored Lunch Symposium</td>
<td>Conti/Lafitte</td>
<td>“Neuromodulation of Pelvic Floor” Karen Noblett, MD, University of California, Irvine; Kevin Benson, MD, Sanford Health and Urogynecology; Howard Goldman, MD, Case Western Reserve University</td>
<td>Medtronic</td>
</tr>
</tbody>
</table>
THANK YOU TO OUR 2012 PROMOTIONAL PARTNERS

**Platinum**

Allergan
Astellas Pharma US, Inc.
Medtronic

**Silver**

American Medical Systems
Coloplast

**Bronze**

Boston Scientific
Ethicon
Laborie
Uroplasty
THANK YOU TO OUR 2012 EXHIBITORS

Alphabetical as of 1/31/2012

Allergan
American Medical Systems
Astellas Pharma US, Inc
Bard Medical
Boston Scientific
Caldera Medical
Coloplast
ellura
Ethicon
Generic Medical Devices, Inc.
Laborie
Life-Tech, Inc.
Market Access Partners
Mediwatch USA, Inc.
Medtronic
National Association for Incontinence
Novasys Medical
SRS Medical Corp
The Prometheus Group
Uroplasty
Warner Chilcott
Watson Pharma, Inc.

THANK YOU TO OUR EDUCATIONAL GRANT PROVIDER

Alphabetical as of 1/31/2012

Allergan
Astellas Pharma US, Inc.
HOTEL MAPS

MAYOR’S SUITE LEVEL
### Registration / Information Desk Hours

*Location: Crescent City Ballroom Foyer*

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Tuesday, February 28, 2012</td>
<td>11:00 a.m. – 6:00 p.m.</td>
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<tr>
<td>Wednesday, February 29, 2012</td>
<td>7:30 a.m. – 6:30 p.m.</td>
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<tr>
<td>Thursday, March 1, 2012</td>
<td>7:00 a.m. – 6:00 p.m.</td>
</tr>
<tr>
<td>Friday, March 2, 2012</td>
<td>7:00 a.m. – 6:00 p.m.</td>
</tr>
<tr>
<td>Saturday, March 3, 2012</td>
<td>7:00 a.m. – 12:00 p.m.</td>
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### Exhibit Hall Hours

*Location: Crescent City Ballroom*

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Thursday, March 1, 2012</td>
<td>10:00 a.m. – 3:30 p.m.</td>
</tr>
<tr>
<td>Friday, March 2, 2012</td>
<td>7:00 a.m. – 3:00 p.m.</td>
</tr>
<tr>
<td>Cocktail Hour and Awards Presentation</td>
<td>6:00 p.m. – 7:30 p.m.</td>
</tr>
</tbody>
</table>

### Video Viewing in Speaker Ready Room

*Location: Directors Room*

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Wednesday, February 29, 2012</td>
<td>8:00 a.m. – 4:30 p.m.</td>
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</table>

*(Speaker Ready Room Open—No Video Viewing)*

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Thursday, March 1, 2012</td>
<td>8:00 a.m. – 5:00 p.m.</td>
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<tr>
<td>Friday, March 2, 2012</td>
<td>8:00 a.m. – 5:00 p.m.</td>
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<tr>
<td>Saturday, March 3, 2012</td>
<td>8:00 a.m. – 12:00 p.m.</td>
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MARK YOUR CALENDARS!

SUFU at the AUA 2012
May 19, 2012
Georgia World Congress Center
Atlanta, GA

SUFU 2013 Annual Meeting
February 26 – March 2, 2013
Caesar’s Palace
Las Vegas, NV

SUFU 2014 Annual Meeting
February 25 – March 1, 2014
Miami, FL

SUFU
Society for Urodynamics & Female Urology
PROGRAM SCHEDULE

2012 Winter Meeting
Society for Urodynamics and Female Urology
February 28 – March 3, 2012
TUESDAY, FEBRUARY 28, 2012

*All sessions meet in the Waldorf Astoria Ballroom unless otherwise specified*

11:00 a.m. – 6:00 p.m.  Registration

   Location: Crescent City Ballroom Foyer

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**SUFU BASIC SCIENCE RESEARCH MEETING**

1:00 p.m. – 2:30 p.m.  How to Make the Bladder Work After Spinal Cord Injury

   Moderator: Matthew O. Fraser, PhD
   Panelists: Michael R. Ruggieri, Sr., PhD
              Warren Grill, PhD
              Kenneth M. Peters, MD

2:30 p.m. – 2:45 p.m.  Break

   Location: Waldorf Astoria Ballroom Foyer

2:45 p.m. – 3:45 p.m.  Mesenchymal Stem Cells

   Presenter: Arnold Caplan, PhD

3:45 p.m. – 5:15 p.m.  Regulation of Bladder Smooth Muscle Contractility

   Moderator: Matthew O. Fraser, PhD
   Panelists: Michael R. Ruggieri Sr., PhD
              Mark T. Nelson, PhD
              George J. Christ, PhD

5:15 p.m. – 5:30 p.m.  Break

   Location: Waldorf Astoria Ballroom Foyer

5:30 p.m. – 7:30 p.m.  Basic Science Poster Session I

   (with Wine & Cheese)

   Moderators: Larissa V. Rodriguez, MD
               Adonis K. Hijaz, MD

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**Poster #BS1**  FABRICATION OF A 3-D SCAFFOLD FOR SKELETAL MUSCLE TISSUE ENGINEERING

   Gjanje Smith, MD¹, Jonathan McMichael, BS², Heather-Marie Wilson, PhD², Robert Vernon, PhD², Thomas Kean, PhD², Robert Welikson, PhD², Kathleen Kobashi, MD¹, James Dennis, PhD² and Margaret Allen, MD²

   ¹Virginia Mason Medical Center, Seattle, WA; ²Benaroya Research Institute, Seattle WA

   (Presented by: Gjanje Smith)

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**Poster #BS2**  WITHDRAWN
**Poster #BS3**

ALTERATIONS IN NEUROTRANSMITTER PROCESSING IN RODENTS EXPOSED TO CHRONIC WATER AVOIDANCE STRESS

A. Lenore Ackerman, MD, PhD¹, Una Lee, MD², Rong Zhang, DDS, PhD¹, Ngoc-Bich Le, MD³, Joanne Leung, MS¹, Sylvie Bradesi, PhD³ and Larissa V. Rodriguez, MD¹

¹Division of Pelvic Medicine and Reconstruction, Department of Urology, University of California, Los Angeles, Los Angeles, CA; ²Department of Urology, Virginia Mason Medical Center, Seattle, WA; ³Department of Digestive Diseases, University of California, Los Angeles, Los Angeles, CA

(Presented by: A. Lenore Ackerman)

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**Poster #BS4**

MOLECULAR AND PROTEIN IDENTIFICATION OF PDGFRα+ CELLS AND THEIR FUNCTIONAL ROLE IN THE MURINE DETRUSOR

Sang Don Koh, MD, PhD, Byoung Koh, BS, Haeyeong Lee, PhD and Salah Baker, PhD Reno, NV

(Presented by: Sang Don Koh)

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**Poster #BS5**

POST-PARTUM UPREGULATION OF STEM CELL HOMING CYTOKINES IN LYSYL OXIDASE LIKE-1 KNOCK OUT MODEL OF PELVIC ORGAN PROLAPSE

Bruna Couri, MD¹, Andrew Lenis, BS², Bruce Kinley, BS³, Brian Balog, BS⁴, Mei Kuang, MS⁵ and Margot Damaser, PhD⁵

¹Department of Obstetrics and Gynecology and Department of Biomedical Engineering, Cleveland Clinic; ²Department of Biomedical Engineering, Cleveland Clinic and School of Medicine, Case Western Reserve University; ³Louis Stokes Veterans Affairs Medical Center; ⁴Department of Biomedical Engineering, Cleveland Clinic; ⁵Department of Biomedical Engineering, Cleveland Clinic and Louis Stokes Veterans Affairs Medical Center, Cleveland, Ohio

(Presented by: Bruna Couri)

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**Poster #BS6**

DECREASED SMOOTH MUSCLE EXPRESSION FOLLOWING SHORT HAIRPIN MEDIATED KNOCKDOWN OF HOXA11 IN MURINE UTEROSACRAL LIGAMENTS

Alexandra McPencow, MD, Yan Ma, PhD, Marsha K. Guess, MD, MS, Alex M. Hennessey and Kathleen A. Connell, MD

Yale University School of Medicine, New Haven, CT

(Presented by: Alexandra McPencow)

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**Poster #BS7**

THE ROLE OF METABOTROPIC GLUTAMATE RECEPTOR SUBTYPE 5 (MGLUR5) IN MICTURITION AND BLADDER PAIN

David Song*, Lara Crock*, Philip Abbosh, MD, PhD, Chang Shen Qiu, MD, PhD, Robert Gereau IV, PhD and H. Henry Lai, MD

Washington University in St. Louis, St. Louis, MO

(Presented by: H. Henry Lai)

*Share first-authorship

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**Poster #BS8**

BLADDER DYSFUNCTION AFTER TRAUMATIC BRAIN INJURY IN RATS

Hai-Hong Jiang, MD, PhD, Olga Kokiko-Cochran, PhD¹, Kevin Li¹, Margot Damaser, PhD¹, Ching-Yi Lin, PhD¹, Vernon Lin, MD, PhD¹, Julian Cheng, PhD² and Yu-Shang Lee, PhD¹

¹Cleveland Clinic, Cleveland, OH; ²Department of Biomedical Engineer, University of California, Davis, CA

(Presented by: Hai-Hong Jiang)
Poster #BS9  
SPATIAL DISTRIBUTION AND MOLECULAR INTERACTION OF CAVEOLIN PROTEINS IN BLADDER SMOOTH MUSCLE  
Vivian Cristofaro, PhD, Subbarao V. Yalla, MD and Maryrose P. Sullivan, PhD  
VA Boston Healthcare System, Harvard Medical School, Boston, MA  
(Presented by: Vivian Cristofaro)

Poster #BS10  
EFFECT OF LIPOSOme ENCAPSULATION ON THE PHARMACOKINETICS OF TACROLIMUS AFTER INTRAVESICAL ADMINISTRATION  
Yao-Chi Chuang, MD¹, Chao-Cheng Huang, MD¹, Christopher Smith, MD², George Somogyi, PhD², Jonathan Kaufman, PhD³, Jayabalan Nirmal, PhD⁴, Pradeep Tyagi, PhD⁴ and Michael Chancellor, MD⁴  
¹Chang Gung Memorial Hospital; ²Baylor School of Medicine; ³Lipella Pharmaceuticals, Inc.; ⁴Oakland University William Beaumont School of Medicine  
(Presented by: Jayabalan Nirmal)  
*Not CME accredited

Poster #BS11  
INFLUENCE OF TIME COURSE AND PH IN BIOFILM FORMATION  
Chih-Ho Lai, Leah Gandee, Vanessa Sperandio, Cristiano Moreira, J.T. Hsieh and Philippe Zimmern, MD  
UT Southwestern Medical Center, Dallas, TX  
(Presented by: Philippe Zimmern)

Poster #BS12  
EVOKEd ELECTROMYOGRAPHIC ACTIVITY IN THE EXTERNAL ANAL SPHINCter MUSCLE OF NON-HUMAN PRIMATES DIFFERS FROM CORRESPONDING PATTERNS IN HUMANS  
Una Lee¹, Harriet Chang, PhD², Kari Christe, DVM³ and Leif Havton, MD, PhD²  
¹Seattle, WA; ²Irvine, CA; ³Davis, CA  
(Presented by: Una Lee)

Poster #BS13  
ANIMAL MODEL OF PELVIC FLOOR DYSTONIA AND CYSTOMETRIC EFFECTS ON URINARY DYSFUNCTION  
Sara Spettel, MD, Robert Levin, PhD, Andrew Dubin, MD and Elise De, MD  
Albany, NY  
(Presented by: Sara Spettel)

Poster #BS14  
A NEW METHOD FOR OBJECTIVE ANALYSES OF DETERUSOR RYTHMIC CONTRACTION  
Michael D. Byrne MD¹, Ashley B. King MD¹, John E. Speich PhD², Adam P. Klausner MD¹ and Paul H. Ratz PhD³  
¹Department of Surgery/Division of Urology, Virginia Commonwealth University School of Medicine, Richmond, Virginia; ²Department of Mechanical Engineering, Virginia Commonwealth University School of Engineering, Richmond, Virginia; ³Departments of Biochemistry and Pediatrics, Virginia Commonwealth University School of Medicine, Richmond, Virginia  
(Presented by: Michael D. Byrne)
LENGTH-DEPENDENT REGULATION OF DETRUSOR SMOOTH MUSCLE MYOSIN LIGHT CHAIN PHOSPHORYLATION AND TONE DURING BLADDER FILLING
Jordan B. Southern, BS¹, Jasmine R. Frazier¹, Amy S. Minor, BA¹, Michael D. Byrne, MD², Ashley B. King, MD², John E. Speich, PhD³, Adam P. Klausner, MD² and Paul H. Ratz, PhD¹
¹Departments of Biochemistry and Pediatrics, Virginia Commonwealth University School of Medicine, Richmond, Virginia; ²Department of Surgery/Division of Urology, Virginia Commonwealth University School of Medicine, Richmond, Virginia; ³Department of Mechanical Engineering, Virginia Commonwealth University School of Engineering, Richmond, Virginia
(Presented by: Paul H. Ratz)

LENGTH ADAPTATION VIA AUTONOMOUS CONTRACTION (AC) IN RABBIT DETRUSOR AND VOLUME ADAPTATION IN MOUSE BLADDER
John E. Speich, PhD¹, Atheer M. Almasri, PhD¹, Cameron W. Wilson, MD², Jordan B. Southern, BS³, Adam P. Klausner, MD², Ashley B. King, MD², Michael D. Byrne, MD² and Paul H. Ratz, PhD³
¹Department of Mechanical Engineering, Virginia Commonwealth University School of Engineering, Richmond, Virginia; ²Department of Surgery/Division of Urology, Virginia Commonwealth University School of Medicine, Richmond, Virginia; ³Departments of Biochemistry and Pediatrics, Virginia Commonwealth University School of Engineering, Richmond, Virginia
(Presented by: John E. Speich)

EVIDENCE OF CENTRAL MODULATION OF BLADDER COMPLIANCE DURING FILLING PHASE
Phillip Smith, MD¹, Anthony DeAngelis, PhD² and Kuchel George, MD²
¹University of Connecticut Health Center, Farmington, CT; ²Center on Aging, University of Connecticut Health Center, Farmington CT
(Presented by: Phillip Smith)

AGONIST STIMULATED REGULATION OF THE TRAFFICING OF HUMAN BLADDER MUSCARINIC RECEPTOR SUBTYPES
Alan Braverman, PhD and Michael Ruggieri, PhD
¹Temple University, Philadelphia, PA
(Presented by: Alan Braverman)

TRANSMISSION ELECTRON MICROSCOPY ULTRASTRUCTURAL STUDY OF LIPOSOME DRUG DELIVERY UPTAKE BY UROTHELIUM
Jayabalan Nirmal, PhD¹, Loan Dang, BS², Pradeep Tyagi, PhD¹ and Michael Chancellor, MD¹
¹Oakland University William Beaumont School of Medicine; ²Oakland University
(Presented by: Jayabalan Nirmal)

EFFECT OF EARLY LIFE STRESS (ELS) ON BLADDER FUNCTION: A NEW MODEL FOR UNDERSTANDING THE PATHOGENESIS OF IC/BPS
Elias Veizi MD, PhD, Michael Kavran¹, Ifeanyi Ani, MD², C.A. Tony Buffington, DVM, PhD³ and Firouz Daneshgari, MD²
¹CWRU, Cleveland, OH; ²University Hospitals of Cleveland; ³Ohio State University
(Presented by: Elias Veizi)
SUCCESSFUL INDUCTION OF STRESS URINARY INCONTINENCE BY VAGINAL DISTENSION IN MICE DOES NOT DEPEND ON THE ESTROUS CYCLE
Yexiang Huang, MD, Firouz Daneshgari, MD and Guiming Liu
Department of Urology, Case Western Reserve University, Cleveland, OH
(Presented by: Guiming Liu)

PLATFORM SWIM STRESS RESULTS IN AN ALTERED VOIDING PHENOTYPE IN MALE MICE
Ariana Smith, MD¹, Erin McGonagle², Stephan Butler², Joanna Sliwoski², Rita Valentino, PhD², Douglas Canning, MD² and Stephen Zderic, MD²
¹University of Pennsylvania, Philadelphia, PA; ²Children’s Hospital of Philadelphia, Philadelphia, PA
(Presented by: Ariana Smith)

PUEDNAL NERVE STRETCH REDUCES EXTERNAL URETHRAL SPHINCTER ACTIVITY IN RATS
Kamran Sajadi, MD¹, Dan Lin, MD², James Steward, BS³, Brian Balog, BS³, Charuspong Dissaranan, MD³, Bradley Gill, BSE³, Hai-Hong Jiang, MD³, James Kerns, PhD⁴ and Margot Damaser, PhD²
¹Oregon Health and Science University, Portland, OR; ²Cleveland Clinic and Cleveland VAMC, Cleveland, OH; ³Cleveland Clinic, Cleveland, OH; ⁴Rush University Medical Center, Chicago, IL
(Presented by: Kamran Sajadi)

DIFFERENTIAL GENE EXPRESSION IN CELLS SLOUGHED IN THE URINE OF INTERSTITIAL CYSTITIS SUBJECTS
Kevin Benson, MD, MS¹, Michael Fiegen, MD, MS², Keith Hansen, MD² and Kathleen Eyster, PhD³
¹University of South Dakota School of Medicine; ²University of South Dakota School of Medicine Sanford Health, Sioux Falls, South Dakota; ³University of South Dakota School of Medicine Department of Basic Biomedical Sciences, Vermillion, South Dakota
(Presented by: Kevin Benson)

WITHDRAWN
WEDNESDAY, FEBRUARY 29, 2012

*All sessions meet in the Waldorf Astoria Ballroom unless otherwise specified.

7:30 a.m. – 6:30 p.m. Registration
Location: Crescent City Ballroom Foyer

8:00 a.m. - 4:30 p.m. Speaker Ready Room Open
Location: Directors Room

12:00 p.m. – 4:00 p.m. Executive Committee Meeting
Location: Bienville Room

SUFU BASIC SCIENCE RESEARCH MEETING

7:30 a.m. – 8:30 a.m. Breakfast
Location: Waldorf Astoria Ballroom Foyer

8:30 a.m. – 8:40 a.m. Welcome
J. Christian Winters, MD
Program Organizer
Victor W. Nitti, MD
SUFU President
Toby C. Chai, MD
Basic Science Committee Chair

8:40 a.m. – 10:10 a.m. Urothelial Regulation of Bladder Function
Moderator: Toby C. Chai, MD
Panelists: Lori A. Birder, PhD
Margaret A. Vizzard, PhD
Warren Hill, PhD

10:10 a.m. – 10:30 a.m. Break
Location: Waldorf Astoria Ballroom Foyer

10:30 a.m. – 12:00 p.m. Bladder Remodeling and Effect on Function
Moderator: Adam P. Klausner, MD
Panelists: George J. Christ, PhD
Samuel Chacko, PhD
Firouz Daneshgari, MD

12:00 p.m. – 1:30 p.m. Lunch
Location: Blue Room

1:30 p.m. – 3:00 p.m. NIDDK O’Brien Urology Centers
Moderator: Margot S. Damaser, PhD
Panelists: Rosalyn M. Adam, PhD
Samuel Chacko, PhD
Robert H. Getzenberg, PhD
3:00 p.m. – 3:20 p.m.  Advancing Benign Urology Research and Career Development
Robert Star, MD
NIH, Division Director, Kidney, Urologic & Hematologic Diseases

3:20 p.m. – 4:20 p.m.  Perception and Modulation of Bladder / Urethral / Pelvic Floor Sensation
Presenter: Emeran Mayer, MD

4:20 p.m. – 4:30 p.m.  Break
Location: Waldorf Astoria Ballroom Foyer

4:30 p.m. – 6:30 p.m.  Basic Science Poster Session II
Moderator: Deborah R. Erickson, MD
Toby C. Chai, MD

Poster #BS26  INHIBITION OF TNF-α IMPROVES THE BLADDER DYSFUNCTION THAT IS ASSOCIATED WITH TYPE 2 DIABETES IN MICE
Zongwei Wang, PhD¹, Zhiyong Cheng, PhD², Vivian Cristofaro, PhD³, Pablo Gomez, MD⁴, Maryrose Sullivan, PhD³, Rosalyn Adam, PhD⁴ and Aria Olumi, MD¹
¹Massachusetts General Hospital; ²Howard Hughes Medical Institute, Division of Endocrinology, Children’s Hospital Boston; ³VA Boston Healthcare System; ⁴Children’s Hospital Boston
(Presented by: Zongwei Wang)

Poster #BS27  PUDENDUAL NERVE ELECTRICAL STIMULATION IMPROVES URINARY CONTINENCE AFTER SIMULATED CHILDBIRTH INJURY IN RATS
Hai-Hong Jiang, MD, PhD, Raul Juarez, MS, Yolanda Cruz, PhD and Margot Damaser, PhD
Cleveland Clinic, Cleveland, OH
(Presented by: Hai-Hong Jiang)

Poster #BS28  RAT BONE MARROW DERIVED MESENCHYMAL STEM CELL THERAPY IN A PARKINSONIAN ANIMAL MODEL OF DETRUSOR OVERACTIVITY
Lysanne Campeau, MDCM¹, Roberto Soler, MD², Masanori Nomiya, MD¹ and Karl Erik Andersson, MD, PhD¹
¹Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC; ²Division of Urology, Federal University of Sao Paulo, Sao Paulo, Brazil
(Presented by: Lysanne Campeau)

Poster #BS29  RECOVERY OF BLADDER EMPTYING FOLLOWING REINNERVATION IN A CANINE MODEL
Sandra Gomez, DVM, Mary Barbe, PhD, Alan Braverman, PhD, Neil Lamarre, BS and Michael Ruggieri, PhD
Temple University, Philadelphia, PA
(Presented by: Sandra Gomez)
Poster #BS30

BONE MARROW MESENCHYMAL STROMAL CELL THERAPY FOR RESTORATION OF BLADDER WALL DEFECTS
Jacques Corcos, MD¹, Wally Mahfouz, MD¹, Oleg Loutochin, MD¹ and Jacques Galipeau, MD²
¹Department of Urology, Jewish General Hospital, McGill University, Montreal, Quebec, Canada; ²Hematology and Medical Oncology & Pediatrics, Emory University Winship Cancer Institute, Atlanta, Georgia
(Presented by: Jacques Corcos)

Poster #BS31*

BLADDER SENSORY SIGNALS ARE POSITIVELY MODULATED BY UROTHELIAL P2X3 AND P2X2/3 PURINERGIC RECEPTORS IN SPINAL CORD INJURED RATS
Alvaro Munoz, PhD¹, George Somogyi, MD, PhD¹, Timothy Boone, MD, PhD², Anthony Ford, PhD³ and Christopher Smith, MD⁴
¹Baylor College of Medicine, Houston, TX; ²The Methodist Hospital and VA Medical Center, Houston, TX; ³Afferent Pharmaceuticals, San Mateo, CA; ⁴Baylor College of Medicine and VA Medical Center, Houston, TX
(Presented by: Alvaro Munoz)
*Not CME accredited

Poster #BS32

REACTIVE OXYGEN SPECIES IN THE SACRAL SPINAL CORD CONTRIBUTE TO NEUROGENIC BLADDER DYSFUNCTION IN SUPRASACRAL CHRONIC SPINAL CORD INJURY
Matthew O. Fraser, PhD and Paul C. Dolber, PhD
Duke and Durham Veterans Affairs Medical Centers
(Presented by: Matthew O. Fraser)

Poster #BS33

SACRAL NEUROMODULATION AND MRI SAFETY: AN EX VIVO INVESTIGATION OF MRI-INDUCED HEATING OF THE INTERSTIM DURING HEAD IMAGING AT 1.5- AND 3-TELA
Leise R. Knoepp, MD, MPH¹, Frank G. Shellock, PhD, FACC²,³, Chi Chiung Grace Chen, MD⁴ and Edward J. Wright, MD⁵
¹Department of Obstetrics & Gynecology, Ochsner Medical Center, New Orleans, LA; ²Department of Radiology, Keck School of Medicine, University of Southern California, Los Angeles, CA; ³Shellock R & D Services, Inc., Los Angeles, CA; ⁴Department of Gynecology & Obstetrics, Johns Hopkins School of Medicine, Baltimore, MD; ⁵Department of Urology, Johns Hopkins School of Medicine, Baltimore, MD
(Presented by: Leise R. Knoepp)

Poster #BS34

INTRAVENOUS MESENCHYMAL STEM CELLS FACILITATE PUDENDAL NERVE RECOVERY VIA PARACRINE FACTORS AFTER SIMULATED CHILDBIRTH INJURY
Charuspong Dissaranan, MD¹, Emily Holthaus¹, Michelle Cruz¹, Brian Balog¹, Mark S. Penn, MD, PhD², Howard B. Goldman, MD¹ and Margot S. Damaser, PhD¹
¹Cleveland Clinic; ²Northeast Ohio Medical University
(Presented by: Charuspong Dissaranan)
Poster #BS35  
**INDUCED REGENERATIVE ELASTIC MATRIC REPAIR IN LOXL1 KNOCKOUT MICE: POTENTIAL THERAPY FOR PELVIC ORGAN PROLAPSE**
Lavanya Venkataraman, BE¹, Andrew Lenis, BS², Bruna Couri, MD³, Anand Ramamurthi, PhD¹,² and Margot Damaser, PhD⁴
¹Department of Bioengineering, Clemson University, Clemson, SC; ²Department of Biomedical Engineering, Cleveland Clinic, School of Medicine Case Western Reserve University; ³Department of Biomedical Engineering and Department of Obstetrics & Gynecology, Cleveland Clinic; ⁴Department of Biomedical Engineering and Glickman Urological & Kidney Institute, Cleveland Clinic, Louis Stokes Veterans Affairs Medical Center, Cleveland, Ohio  
(Presented by: Andrew Lenis)

Poster #BS36  
**THE EFFECT OF VAGINAL DISTENTION ON THE CONNECTIVE TISSUE AND SMOOTH MUSCLE PROTEINS OF THE MOUSE URETHRA**
Madeline A. Dick-Biascochea, MD, Jie Xu, PhD, Kathleen A. Connell, MD, Nejla Sinclair, BS, P. Antonio Maldonado, MD and Marsha K. Guess, MD  
Yale University, School of Medicine, Section of Urogynecology and Reconstructive Pelvic Surgery, New Haven, CT  
(Presented by: Madeline A. Dick-Biascochea)

Poster #BS37  
**ENHANCED MMP-1 TRANSCRIPTION: ROLE IN THE DEVELOPMENT OF SUI AND POP**
Tristan Keys, MD¹, Ilya Gorbachinsky, MD¹, Patrick Mckenzie, MD¹, Lysanne Campeau, MD², Jan Rohozinski, PhD², Karl-Erik Andersson, MD PhD², Carl Langefeld, PhD³ and Gopal Badlani, MD¹  
¹Wake Forest University School of Medicine, Department of Urology, Winston-Salem, NC; ²Wake Forest University Institute for Regenerative Medicine, Winston-Salem, NC; ³Wake Forest University Baptist Medical Center, Department of Biostatistical Science, Winston-Salem, NC  
(Presented by: Tristan Keys)

Poster #BS38  
**REGULATION OF TREK-1 CHANNEL BY ESTROGEN INJECTION FOLLOWING OVARIECTOMIZED STAGES**
Sang Don Koh, MD, PhD, Lauren Peri, BS, Byoung Koh, BS, Grace Ward, BS and Shawnice Kraeber, BS  
Reno, NV  
(Presented by: Sang Don Koh)

Poster #BS39  
**BLADDER FUNCTION IMPROVES WITH SPINAL CORD REGENERATION AFTER A COMPLETE SPINAL CORD TRANSECTION IN RATS**  
Yu-Shang Lee, PhD¹, Hai-Hong Jiang, MD, PhD, Marc DePaul, MS², Ching-Yi Lin, PhD¹, Brian Balog, BS¹, Margot Damaser, PhD¹, Vernon Lin, MD, PhD¹ and Jerry Silver, PhD²  
¹Cleveland Clinic, Cleveland, OH; ²Department of Neurosciences, Case Western Reserve University, Cleveland, OH  
(Presented by: Hai-Hong Jiang)
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<td>BS40</td>
<td>MICROSTRUCTURAL AND MICROMECHANICAL STUDIES OF SURGICAL MESH MATERIALS</td>
<td>Adam Smith¹, Efstathios Meletis¹, Robert Eberhart², Philippe Zimmern, MD² and Harry Tibbals²</td>
<td>¹UT Arlington, Arlington, Texas; ²UT Southwestern Medical Center, Dallas, Texas</td>
<td>(Presented by: Philippe Zimmern)</td>
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<td>BS41</td>
<td>PROSTANOID PROFILING USING ION-SPRAY TANDEM MASS SPECTROPHOTOMETRY: A POTENTIAL NEW MODALITY FOR OVERACTIVE BLADDER DIAGNOSIS AND SUB-TYPING.</td>
<td>Adam P. Klausner, MD¹, Ashley B. King, MD¹, Alberic Rogman, MD¹, John E. Speich, PhD², Michael D. Byrne, MD¹ and Paul H. Ratz, PhD³</td>
<td>¹Department of Surgery/Division of Urology, Virginia Commonwealth University School of Medicine, Richmond, Virginia; ²Department of Mechanical Engineering, Virginia Commonwealth University School of Engineering, Richmond, Virginia; ³Department of Biochemistry and Pediatrics, Virginia Commonwealth University School of Medicine, Richmond, Virginia</td>
<td>(Presented by: Ashley B. King)</td>
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<td>BS42</td>
<td>MONITORING OF DETRUSOR DYSFUNCTION IN PATIENTS WITH SPINAL CORD INJURY USING SIMULTANEOUS URODYNAMIC EVALUATION AND NEAR INFRARED SPECTROSCOPY</td>
<td>Babak Shadgan, MD, MSc, PhD, Lynn Stothers, MD, FRCS, Andrew Macnab, MD, FRCPC and Mark Nigro, MD, FRCS</td>
<td>University of British Columbia, Vancouver, Canada</td>
<td>(Presented by: Babak Shadgan)</td>
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<td>BS43</td>
<td>FEASIBILITY OF POST-OPERATIVE ADJUSTABILITY OF A NOVEL SINGLE-INCISION SLING: AN ANIMAL STUDY</td>
<td>Wendy Padilla, MD¹, Christopher Yang, MD¹, Ershad Forghani², Ales Sedlar, MD³ and Ervin Kocjancic, MD¹</td>
<td>¹University of Illinois at Chicago, Department of Urology, Chicago, Illinois; ²Western University of Health Sciences, College of Osteopathic Medicine of the Pacific, Pomona, CA; ³Ljubljana University Clinical Center, Department of Urology, Ljubljana, Slovenia</td>
<td>(Presented by: Ervin Kocjancic, MD)</td>
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<td>BS44</td>
<td>ASSOCIATION OF INFLAMMAGING (INFLAMMATION + AGING) WITH HIGHER PREVALENCE OF OAB IN ELDERLY POPULATION</td>
<td>Jayabalan Nirmal, PhD¹, Michael Chancellor, MD¹, Vikas Tyagi, PhD¹, Xianggui Qu, PhD¹, Hann-Chorng Kuo, MD³, Hsin-Tzu Lin, PhD³, Yao-Chi Chuang, MD³ and Pradeep Tyagi, PhD¹</td>
<td>¹Oakland University William Beaumont School of Medicine; ³Buddhist Tzu Chi General Hospital; ⁴Chang Gung Memorial Hospital</td>
<td>(Presented by: Jayabalan Nirmal)</td>
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**Poster #BS45**

**HISTOLOGIC CHANGES AFTER IMPLANTATION OF A NOVEL SINGLE-INCISION SLING: AN ANIMAL STUDY**

Wendy Padilla, MD¹, Christopher Yang, MD¹, Andre Balla, MD², Ales Sedlar, MD³ and Ervin Kocjancic, MD¹

¹University of Illinois at Chicago, Department of Urology, Chicago, Illinois; ²University of Illinois at Chicago, Department of Pathology, Chicago, Illinois; ³Ljubljana University Clinical Center, Department of Urology, Ljubljana, Slovenia

(Presented by: Wendy Padilla)

**Poster #BS46**

**TARGETED MOLECULAR ASSESSMENT OF PUDENDARAL NERVE NEUROREGENERATIVE RESPONSE**

Bradley Gill, BSE¹, Dan Li Lin, MD², Brian Balog, BS¹, Charuspong Dissaranan, MD¹, Hai-Hong Jiang, MD, PhD¹ and Margot Damaser, PhD¹

¹Cleveland Clinic, Cleveland, OH; ²Louis Stokes VA, Cleveland, OH

(Presented by: Bradley Gill)

**Poster #BS47**

**CHARACTERIZATION OF NEUROMODULATION FOR BLADDER CONTROL IN A RAT CYSTITIS MODEL**

Xin Su, Angela Nickles and Dwight Nelson

Neuromodulation, Medtronic Inc.

(Presented by: Angela Nickles)

*Not CME accredited*

**Poster #BS48**

**CITRATE SYNTHASE, SACROPLASMIC RETICULAR CALCIUM ATPASE, AND CHOLINE ACETYLTRANSFERASE ACTIVITIES OF SPECIFIC PELVIC FLOOR MUSCLES OF THE RABBIT**

Sara Spettel, MD, Elise De, MD, Catherine Schuler and Robert Levin, PhD

Albany, NY

(Presented by: Sara Spettel)

**Poster #BS49**

**SYNCHRONIZED VIDEO AND MULTICHANNEL WIRELESS EMG CAN BE USED TO STUDY PELVIC FLOOR MUSCLE RESPONSE TO MOVEMENT**

Cara-Louise Fox, MD¹ and Bruce Crawford, MD²

¹Center For Pelvic Floor Medicine, Reno, Nevada; ²Center for Pelvic Floor Medicine, University of Nevada School of Medicine, Reno, Nevada

(Presented by: Cara-Louise Fox)

7:00 p.m. – 8:30 p.m.  
**SUFU Welcome Reception with Our Corporate Members**

Location: Crescent City Ballroom
**THURSDAY, MARCH 1, 2012**

*All locations meet in the Roosevelt Ballroom unless otherwise specified*

7:00 a.m. – 8:00 a.m.  **Breakfast**  
*Location: Roosevelt Ballroom Foyer*

7:00 a.m. – 8:00 a.m.  **Residents and Fellows Breakfast**  
*Location: Chambers I & III*  
Moderators:  
Gary E. Lemack, MD  
Harriette M. Scarpero, MD  
Jason P. Gilleran, MD

7:00 a.m. – 6:00 p.m.  **Registration**  
*Location: Crescent City Ballroom Foyer*

8:00 a.m. – 5:00 p.m.  **Video Viewing in Speaker Ready Room***  
*Location: Directors Room*  
*All videos are NOT CME accredited*

**Video #1**  
**DORSAL VAGINAL GRAFT URETHROPLASTY FOR FEMALE URETHRAL STRicture DISEASE**  
Alexandra Rogers, MD and Steven Petrou, MD  
Department of Urology, Mayo Clinic Florida, Jacksonville, Florida  
(Presented by: Alexandra Rogers)

**Video #2**  
**ILEOCECAL AUGMENTATION CYSTOPLASTY: THE INDIANA AUGMENT**  
Judy Choi, MD¹, Joceline Liu, MD¹, Rose Khavari, MD², Timothy Boone, MD, PhD² and Sophie Fletcher, MD²  
¹Baylor College of Medicine, Houston, Texas; ²The Methodist Hospital, Houston, Texas  
(Presented by: Judy Choi)

**Video #3**  
**MANAGEMENT OF AN INTRAVESICAL TRANSVAGINAL TAPE MESH WITH CALCULUS FORMATION**  
Yvonne Koch, MD¹ and John Shields, MD²  
¹University of Miami, Miami, Florida; ²University of Miami, Department of Urology, Miami, Florida  
(Presented by: John Shields)

**Video #4**  
**NARROW BAND IMAGING IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME**  
Dominique El-Khawand, MD, Salim Wehbe, MD and Kristene Whitmore, MD  
Drexel University College of Medicine, Philadelphia, PA  
(Presented by: Dominique EL-Khawand)

**Video #5**  
**LAPAROSCOPIC MITROFANOFF APPENDICOVESICOSTOMY**  
Judy Choi, MD and Lars Cisek, MD, PhD  
Baylor College of Medicine, Houston, TX  
(Presented by: Judy Choi)
Video #6  
URETERAL STENT PLACEMENT: AN EDUCATIONAL VIDEO  
Andrea Crane, MD, Kristy Borawski, MD, Elizabeth Calloway, and Anna Marie Connolly, MD  
University of North Carolina at Chapel Hill  
(Presented by: Andrea Crane)

Video #7  
ROBOTIC SACRAL COLPOPEXY TIPS AND TRICKS FOR DIFFICULT SITUATIONS  
C.R. Powell, MD  
Indianapolis, IN  
(Presented by: C.R. Powell)

Video #8  
TRANSVAGINAL BLADDER NECK CLOSURE WITH URETHRAL FOLDING  
Majid Mirzazadeh, MD¹, Irina Stanasel, MD², John Smith, MD¹ and Gopal Badlani, MD¹  
¹Wake Forest University Baptist Medical Center, Department of Urology, Winston-Salem, NC; ²Wake Forest, Winston-Salem, NC  
(Presented by: Irina Stanasel)

Video #9  
THULIUM LASER VAPORIZATION OF THE PROSTATE: STEPWISE DEMONSTRATION OF TECHNIQUE AND SHORT-TERM DATA  
Olufenwa Famakinwa, MD¹ and Doreen Chung, MD, FRCSC¹,²  
¹University of Chicago Medical Center, Section of Urology, Chicago, Illinois; ²Mount Sinai Hospital, Chicago, Illinois  
(Presented by: Olufenwa Famakinwa)

Video #10  
ROBOTIC BLADDER AUGMENTATION  
Lee Zhao, MD, Elodi Dielubanza, MD, Stephanie Kielb, MD and John Hairston, MD  
¹Northwestern University, Chicago, IL  
(Presented by: Elodi Dielubanza)

Video #11  
REPAIR OF RECURRENT VESICOVAGINAL FISTULA WITH RIGHT PEDICLE GRACILIS FLAP  
Gareth Warren, MD, Christopher Pannuci, MD, Neil Haraway, MD, William Kuzon, MD, and Humphrey Atiemo, MD  
University of Michigan, Ann Arbor, MI  
(Presented by: Gareth Warren)

Video #12  
LAPAROENDOSCOPIC SINGLE-SITE (LESS) HYSTEROPEXY  
Michael Ingber, MD  
Saint Clare’s Health System, Denville, NJ  
(Presented by: Michael Ingber)

10:00 a.m. – 3:30 p.m.  
Exhibit Hall Open  
Location: Crescent City Ballroom
THURSDAY, MARCH 1, 2012

GENERAL SESSION

7:55 a.m. – 8:00 a.m.  Introduction
                        J. Christian Winters, MD

8:00 a.m. – 9:45 a.m.  SUFU – IC Painful Bladder Syndrome
                        Moderator: Deborah R. Erickson, MD

                        8:00 a.m.
                        2011 IC/Painful Bladder Syndrome – AUA Guidelines
                        Philip M. Hanno, MD

                        8:20 a.m.
                        IC Painful Bladder Case Presentations
                        Panelists: Robert D. Mayer, MD
                                  Robert M. Moldwin, MD
                                  Kristene E. Whitmore, MD

9:45 a.m. – 10:00 a.m.  President’s Address
                        Victor W. Nitti, MD

10:00 a.m. – 10:30 a.m.  Break—Visit the Exhibits
                        Location: Crescent City Ballroom

10:30 a.m. – 11:30 a.m.  NIH Sponsored Clinical Trials: Just the Facts
                        Moderator: Philippe E. Zimmern, MD

                        UITN
                        Stephen R. Kraus, MD

                        PFDN: An Investigator’s Perspective
                        Anthony G. Visco, MD

                        Measurement of Urinary Symptoms: Future Perspectives
                        Ziya Kirkali, MD

                        NIDDK Program Director, Clinical and Translational Research in
                        Urologic Diseases

11:30 a.m. – 1:00 p.m.  Industry Sponsored Lunch Symposium
                        Location: Conti/Lafitte Room
                        See page 8 for more information
THURSDAY, MARCH 1, 2012

1:00 p.m. – 2:20 p.m. Female Urology / Incontinence Podium Session
Moderators: Erin T. Bird, MD
Tracey S. Wilson, MD

Podium #1
LONG-TERM FOLLOW-UP OF PORCINE DERMIS PUBOVAGINAL SLINGS
Andre P. Broussard, MD¹, Thanmaya G. Reddy, BS¹, Clifton F. Frilot II, PhD¹, William S. Kubricht III, MD² and Alex Gomelsky, MD¹
¹LSU Health – Shreveport, LA; ²Urology Center for Women, Baton Rouge, LA
(Presented by: Andre P. Broussard)

Podium #2*
SHORT-TERM OUTCOMES OF VAGINAL MESH PLACEMENT AMONG FEMALE MEDICARE BENEFICIARIES
Jennifer Anger, MD, MPH¹, Karyn Eilber, MD¹, Aqsa Khan, MD², Stephanie Histed, BA³, Ning Wu, PhD⁴, Chris Pashos, PhD⁴ and J. Quentin Clemens, MD, MSCI⁵
¹Cedars-Sinai Medical Center, Los Angeles, CA; ²Department of Urology, University of California, Los Angeles, Los Angeles, CA; ³David Geffen School of Medicine at UCLA, Los Angeles, CA; ⁴United BioSource Corporation, Lexington, MA; ⁵Department of Urology, University of Michigan, Ann Arbor, MI
(Presented by: Jennifer Anger)
*Not CME accredited

Podium #3
FINAL OFFICE EVALUATION FINDINGS IN E-SISTER PARTICIPANTS AT ONE CENTER: A GLIMPSE INTO THE LONG-TERM RESULTS OF STRESS INCONTINENCE SURGERY
Philippe Zimmern, MD, Hong Zhao, Tamara Dickinson, Xian-Jin Xie and Gary Lemack, MD
UT Southwestern Medical Center, Dallas, Texas
(Presented by: Philippe Zimmern)

Podium #4*
PREVALENCE AND ASSOCIATION OF PELVIC FLOOR SYMPTOMS IN WOMEN SEEKING CARE IN AN OSTEOPOROSIS CLINIC
Jonathan Gleason, MD¹, Sarah Morgan, MD², Jeff Szychowski, PhD³, Goode Patricia, MD³, Howell Alice, RN¹, Kathryn Burgio, PhD⁴ and Richter Holly, PhD, MD¹
¹Urogynecology and Pelvic Reconstructive Surgery, University of Alabama at Birmingham, Birmingham, AL; ²Department of Medicine, University of Alabama at Birmingham, Birmingham, AL; ³Department of Biostatistics, University of Alabama at Birmingham, Birmingham, AL; ⁴Department of Veterans Affairs, Birmingham, AL
(Presented by: Jonathan Gleason)
*Not CME accredited

Podium #5
DOES TROCAR PUNCTURE OF THE BLADDER DURING MIDURETHRAL SLING IMPACT POSTOPERATIVE URINARY STORAGE AND VOIDING SYMPTOMS?
Elena Campbell, MD, Steven Thoma, BS, Clifton F. Frilot II, PhD and Alex Gomelsky, MD
LSU Health – Shreveport, LA
(Presented by: Elena Campbell)
Podium #6  WHICH OUTCOME MEASURE(S) TO SELECT FOR THE REPORTING OF A LONG-TERM STUDY ON THE SURGICAL TREATMENT OF STRESS URINARY INCONTINENCE (SUI) IN WOMEN?
Rubiao Ou, MD¹, Hong Zhao², Xian-Jin Xie² and Philippe Zimmern, MD²
¹Guangzhou First Municipal People’s Hospital, Guangzhou Medical College, Guangzhou, China; ²UT Southwestern Medical Center, Dallas, Texas
(Presented by: Philippe Zimmern)

Podium #7  IS THERE A RELATIONSHIP BETWEEN UROGENITAL DISTRESS INVENTORY 6 SCORE AFTER SURGERY FOR STRESS URINARY INCONTINENCE AND PATIENT-PERCEIVED SATISFACTION AND IMPROVEMENT?
Jason Kim, MD¹, Wai Lee, BA¹, Rosa Park, BA¹, Alvaro Lucioni, MD², Fred Govier, MD² and Kathleen Kobashi, MD²
¹Stony Brook, NY; ²Seattle, WA
(Presented by: Jason Kim)

Podium #8  DELAY IN DIAGNOSIS OF MESH-RELATED LOWER URINARY TRACT COMPLICATIONS RESULTS IN PROLONGED PATIENT MORBIDITY IN A RURAL POPULATION
Richard Kershen, MD
University of Vermont College of Medicine, Burlington, Vermont
(Presented by: Richard Kershen)

2:20 p.m. – 2:50 p.m.  Blaivas Lectureship: Sensation: A TRP Through Your Bladder
Timothy B. Boone, MD, PhD

2:50 p.m. – 3:20 p.m.  Break—Visit the Exhibits
Location: Crescent City Ballroom

3:20 p.m. – 3:30 p.m.  SUFU Post-Prostatectomy Incontinence Study
Victor W. Nitti, MD

3:30 p.m. – 4:35 p.m.  ISPiN I: Update on Expanding Indications for Neuromodulation
Moderator: Michele Spinelli, MD
Neuromodulation for Neurogenic Disorders
Howard B. Goldman, MD
Neuromodulation for Pain
Craig V. Comiter, MD
Experience with Bilateral Neuromodulation
Shlomo Raz, MD
4:35 p.m. – 5:35 p.m.

**BREAKOUT SESSIONS**

1. **Basic Urodynamics**  
   *Location: Chambers I & III*  
   Jerry G. Blaivas, MD (Director)  
   David A. Ginsberg, MD  
   Christopher Chermansky, MD

2. **Crash Course on Neuromodulation for Bowel Dysfunction**  
   *Location: Conti / Lafitte*  
   **A Simplified Evaluation and Treatment Algorithm**  
   David A. Margolin, MD (Director)  
   **Conservative Therapies Including PTNS**  
   Steven W. Siegel, MD  
   **SNM and Surgical Options for Bowel Indications**  
   David A. Margolin, MD

3. **Robotic Surgery in POP**  
   *Location: Roosevelt Ballrom*  
   Nirit Rosenblum, MD (Director)  
   Elizabeth R. Mueller, MD  
   Catherine Matthews, MD, FACOG, FACS

5:35 p.m. – 7:05 p.m.

**Concurrent Poster/Podium Sessions**

**Female Urology / Incontinence Moderated Poster Session**  
*Poster Session Location: Waldorf Astoria Ballroom*  
Moderators:  
Katie N. Ballert, MD  
Una J. Lee, MD

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**Poster #M1**  
**EXTERNAL AND INTERNAL STIMULI RELATED TO URINARY URGENCY AND URGENCY INCONTINENCE**  
Kathleen A. O'Connell, PhD, RN, Alex Torstrick, MA – Psychology and Elizabeth Victor, MA – Psychology  
Teachers College Columbia University  
(Presented by: Kathleen A. O’Connell)

**Poster #M2**  
**A SURPRISINGLY LOW PREVALENCE OF DEMONSTRABLE STRESS URINARY INCONTINENCE IN WOMEN WITH MULTIPLE SCLEROSIS FOLLOWED AT A TERTIARY NEUROUROLOGY CLINIC**  
Benjamin Dillon, MD, Casey Seideman, MD, Michelle Van Kuiken, Dominic Lee, MD, Elliot Frohman, MD and Gary Lemack, MD  
University of Texas Southwestern, Dallas, Texas  
(Presented by: Benjamin Dillon)
IMPACT OF URETHRAL CATHETER SIZE DURING VOIDING IN WOMEN: OBSTRUCTIVE OR NOT?
Pierre Nelson¹, Françoise Valentini¹ and Philippe Zimmern, MD²
¹ER6-University Pierre et Marie Curie, Paris, France; ²UT Southwestern Medical Center, Dallas, TX
(Presented by: Philippe Zimmern)

PUBOVAGINAL SLING IN THE TREATMENT OF CONCOMITANT FEMALE URETHRAL DIVERTICULA AND STRESS URINARY INCONTINENCE
Ekene Enemchukwu, MD¹, W. Stuart Reynolds, MD, MPH¹, Harriette Scarpero, MD², Melissa Kaufman, MD, PhD¹ and Roger Dmochowski, MD¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN; ²University of Miami Miller School of Medicine, Miami, FL
(Presented by: Ekene Enemchukwu)

REPEATED INTRA-DETRUSOR INJECTION OF ONABOTULINUM TOXIN-A IN PATIENTS WITH NEUROGENIC BLADDER
Matthew Fine, MD¹, Prashanth Kanagarajah, MD¹, Chris Gomez, MD² and Angelo Gousse, MD¹
¹Florida International University, Miami, FL; ²University of Miami Miller School of Medicine, Miami, FL
(Presented by: Matthew Fine)

CHALLENGES IN MANAGEMENT OF URINARY INCONTINENCE AFTER SUCCESSFUL JUXTA URETHRAL OBSTETRICAL VESICOVAGINAL FISTULA REPAIR IN MBARARA, UGANDA
Una Lee¹, Musa Kayondo, MD², Amy Stenson, MD³ and Christopher Tarnay, MD³
¹Seattle, WA; ²Mbarara, Uganda; ³Los Angeles, CA
(Presented by: Una Lee)

THE EFFECT OF THE INITIAL SPECIALIST ENCOUNTER: WHAT WOMEN WANT TO KNOW
Stephanie Histed, BA¹, Krista Kiyosaki, BS², Claudia Sevilla, BS¹, Sally Maliski, RN, PhD³ and Jennifer T. Anger, MD, MPH⁴
¹David Geffen School of Medicine at UCLA, Los Angeles, CA; ²John A. Burns School of Medicine, University of Hawaii, Honolulu, HI; ³School of Nursing, David Geffen School of Medicine at UCLA, Los Angeles, CA; ⁴Cedars Sinai Medical Center, Los Angeles, CA
(Presented by: Stephanie Histed)

COMPLICATION RATES OF SINGLE INCISION SLINGS—META-ANALYSIS OF THE WORLD LITERATURE
Crystal Dover, MD, Glenn Leverson and Sarah McAchran, MD
Madison, WI
(Presented by: Crystal Dover)

NEUROPATHIC PAIN AND URGE URINARY INCONTINENCE
Holly Langmuir, MD, MPH, Heidi Harvie, MD, MBA and Lily Aryan, MD
Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania
(Presented by: Holly Langmuir)
Poster #M10

EVALUATING PATIENTS SYMPTOMS OF OVERACTIVE BLADDER BY QUESTIONNAIRE: THE ROLE OF URGENCY ON URINARY FREQUENCY
Benjamin Brucker, MD, Daniella Kafer, MD, Maragrita Aponte, MD, Duane Hickling, MD, Christopher Kelly, MD, Nirit Rosenblum, MD and Victor Nitti, MD
New York University, NY, NY
(Presented by: Benjamin Brucker)

Poster #M10.5*

CENTRAL NERVOUS SYSTEM PENETRATION AND EFFECT ON MEMORY: COMPARISON OF TROPIUM CHLORIDE AND OXYBUTYNIN IN PATIENTS WITH OVERACTIVE BLADDER AND AGE-ASSOCIATED MEMORY IMPAIRMENT
David Staskin, MD¹, Gary Kay, MD², Howard B. Goldman, MD³, Cara Tannenbaum, MD, MSc⁴, Warren Tong, PharmD, MS⁵, Rina K. Patel, MS, CCRA⁶ and Michael G. Oefelein, MD⁷
¹Division of Urology, Caritas St. Elizabeth’s Medical Center, Tufts University School of Medicine, Boston, MA; ²Neurophysiology Division, Department of Neurology, Georgetown University School of Medicine, Washington, DC; ³Glickman Urologic and Kidney Institute, The Cleveland Clinic, Cleveland, OH; ⁴Department of Geriatric Medicine, Institut Universitaire de Gériatrie de Montreal, Montreal, Quebec, Canada; ⁵Allergan, Inc., Irvine, CA
(Presented by: David Staskin)
*Not CME accredited

NON-MODERATED*

*All non-moderated posters are NOT CME accredited

Poster #NM1

CYCLE OF MISUNDERSTANDING: COMMUNICATION BETWEEN PHYSICIANS AND SPANISH-SPEAKING LATINAS WITH PELVIC FLOOR DISORDERS
Alexandriah Alas, MD¹, Claudia Sevilla, BS², Cecilia Wieslander, MD³, Aqsa Khan, MD², Sally Maliski, PhD, RN⁴, Rebecca Rogers, MD⁵ and Jennifer Anger, MD⁶
¹Department of Obstetrics and Gynecology, Cedars-Sinai Medical Center, Los Angeles, CA; ²Department of Urology, UCLA David Geffen School of Medicine, Los Angeles, CA; ³Department of Obstetrics and Gynecology, Olive View Medical Center, Sylmar, CA; ⁴UCLA School of Nursing, Los Angeles, CA; ⁵Department of Obstetrics and Gynecology, University of New Mexico, Albuquerque, NM; ⁶Department of Urology, Cedars-Sinai Medical Center, Los Angeles, CA
(Presented by: Alexandriah Alas)

Poster #NM2

IS COMPLETE CURE NECESSARY FOR SATISFACTION IN PATIENTS UNDERGOING CONCURRENT ANTI-INCONTINENCE AND PROLAPSE SURGERY?
Jeffrey Wolters, MD, MPH¹, Ashley King, MD², Adam Klausner, MD² and David Rapp, MD²,³
¹VCU Medical Center, Richmond, VA; ²VCU School of Medicine, Richmond, VA; ³Virginia Urology Center for Incontinence and Pelvic Floor Reconstruction
(Presented by: Jeffrey Wolters)
THURSDAY, MARCH 1, 2012

Poster #NM3  THE USE OF A CADAVER LABORATORY AS A TEACHING TOOL IN THE FEMALE UROLOGY AND MALE RECONSTRUCTION CURRICULUM
Adam Mellis, MD and Gennady Slobodov, MD
University of Oklahoma HSC, Oklahoma City, OK
(Presented by: Adam Mellis)

Poster #NM4  CONTEMPORARY MANAGEMENT OF PRIMARY URETHRAL MELANOMA
Jonathan Warner, MD, Eric Wisenbaugh, MD, Christopher Wolter, MD and Robert Ferrigni, MD
Mayo Clinic, Phoenix, AZ
(Presented by: Jonathan Warner)

Poster #NM5  COMPLICATIONS OF MESH-AUGMENTED PELVIC ORGAN PROLAPSE AND INCONTINENCE REPAIRS: CASE SERIES OF 319 PROCEDURES
Lisa Rogo-Gupta, MD, Tamara G. Hartshorn, MD, Denise Chow, MD, Ngoc-Bich Le, MD, Forrest Jellison, MD, A. Lenore Ackerman, MD, PhD, Ja-Hong Kim, MD, Larissa V. Rodriguez, MD and Shlomo Raz, MD
UCLA Los Angeles, CA
(Presented by: Lisa Rogo-Gupta)

Poster #NM6  SINGLE-DOSE ORAL CIPROFLOXACIN VERSUS INTRAVENOUS CEFAZOLIN PROPHYLAXIS IN WOMEN UNDERGOING MIDURETHRAL SLING SURGERY
Alex Gomelsky, MD, Sarah E. Baker, BS, Jason McCourt, BS, Clifton F. Frilot II, PhD and Dennis D. Venable, MD
LSU Health, Shreveport, LA
(Presented by: Alex Gomelsky)

Poster #NM7  REPEATED INTRA-DETRUSOR INJECTION OF ONABOTULINUM TOXIN-A IN PATIENTS WITH IDIOPATHIC OVERACTIVE BLADDER
Matthew Fine, MD¹, Prashanth Kanagarajah, MD¹, Chris Gomez, MD² and Angelo Gousse, MD¹
¹Florida International University, Miami, FL; ²University of Miami Miller School of Medicine, Miami, FL
(Presented by: Matthew Fine)

Poster #NM8  IMPAIRED DETRUSOR CONTRACTILITY AND THE TREATMENT OF FEMALE STRESS INCONTINENCE
Rose Khavari, MD¹, Kumaran Sathyamoorthy, MD², Ricardo Gonzalez, MD¹ and Sophie Fletcher, MD¹
¹The Methodist Hospital, Houston, TX; ²Baylor College of Medicine, Houston, TX
(Presented by: Judy Choi, MD)

Poster #NM9  COMPLEX RECTOVAGINAL FISTULAS AFTER POSTERIOR COMPARTMENT REPAIR WITH SYNTHETIC MESH: IDENTIFICATION AND MANAGEMENT OF THIS DEVASTATING COMPLICATION
Judy Choi, MD¹, Vian Nguyen, MD¹, Michael Snyder, MD², Rose Khavari, MD² and Sophie Fletcher, MD²
¹Baylor, Houston, Texas; ²The Methodist Hospital, Houston, Texas
(Presented by: Judy Choi, MD)
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<tr>
<th>Poster #NM10</th>
<th>LONG-TERM DURABILITY OF THE DISTAL URETHRAL POLYPOLYPROPYLENE SLING PROCEDURE FOR STRESS URINARY INCONTINENCE: MINIMUM 10-YEAR FOLLOW-UP</th>
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<td>Lisa Rogo-Gupta, MD, Z. Chad Baxter, MD, Ngoc-Bich Le, MD, Shlomo Raz, MD and Larissa V. Rodriguez, MD</td>
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<th>Poster #NM11</th>
<th>REDUCING RADIATION EXPOSURE DURING UROLOGIC RADIOGRAPHIC STUDIES</th>
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<tr>
<td>Jonathan Warner, MD, Leah Nakamura, MD and Christopher Wolter, MD</td>
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<td>Mayo Clinic, Phoenix, AZ</td>
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<th>Poster #NM12</th>
<th>DATA FOR “FREE”: CAN AN ELECTRONIC MEDICAL RECORD PROVIDE OUTCOME DATA AFTER INCONTINENCE/PROLAPSE REPAIR PROCEDURES?</th>
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<tr>
<td>Matthew Steidl, MD and Philippe Zimmern, MD</td>
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<td>¹UT Southwestern Medical Center, Dallas, Texas</td>
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<th>Poster #NM13</th>
<th>ANTERIOR TRANSVAGINAL MESH—HOW “SERIOUS” ARE THE COMPLICATIONS AND ARE THEY REVERSIBLE?</th>
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<tr>
<td>Dominic Lee, MD¹, Benjamin Dillion, MD¹, Gary Lemack, MD¹, Alex Gomelsky, MD² and Philippe Zimmern, MD¹</td>
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<td>¹UT Southwestern Medical Center, Dallas, Texas; ²Louisiana State University Medical Center, Shreveport, LA</td>
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<th>Poster #NM14</th>
<th>EFFICACY OF TRIGONITIS FULGURATION IN THE MANAGEMENT OF RECURRENT URINARY TRACT INFECTIONS IN WOMEN</th>
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<tr>
<td>Jesse Mierzwiak, MD¹, Sunshine Murray, MD², Vanessa Sperandio, MD¹, Feras Alhalabi ¹ and Philippe Zimmern, MD¹</td>
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<tr>
<td>¹UT Southwestern Medical Center, Dallas, Texas; ²Urology Specialists of Oklahoma, Tulsa, Oklahoma (Presented by: Philippe Zimmern)</td>
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<th>Poster #NM15</th>
<th>SHORT AND LONG TERM DURABILITY OUTCOMES FOR FEMALE STRESS URINARY INCONTINENCE: A SYSTEMATIC REVIEW AND META ANALYSIS OF POLYDIMETHYLISOSOXANE INJECTION</th>
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<tr>
<td>Gamal Ghoniem, MD, FACS¹ and Christopher Miller, PhD²</td>
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<td>¹University of California, Irvine; ²Biostatistician, The Integra Group, Brooklyn Park, MN (Presented by: Gamal Ghoniem)</td>
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<th>Poster #NM16</th>
<th>SUCCESS OF MIDURETHRAL SLINGS IN OBESE PATIENTS</th>
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<td>Gjanje Smith, MD¹, Wai Lee, BA², Juzar Jamnagerwalla, BS², Alvaro Lucioni, MD¹, Fred Govier, MD¹ and Kathleen Kobashi, MD¹</td>
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<tr>
<td>¹Virginia Mason Medical Center, Seattle, WA; ²Stony Brook University Medical Center, Stony Brook, NY (Presented by: Gjanje Smith)</td>
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Poster #NM17  Efficacy of Dextranomer in Stabilized Hyaluronic Acid (Solesta®) for Treatment of Fecal Incontinence Secondary to Obstetric Trauma
Cedric Olivera, MD, MS, FACOG, FACS¹ and Alan Garely, MD, FACOG, FACS²
¹SUNY Downstate Medical Center; ²The Mount Sinai School of Medicine, NY, NY
(Presented by: Cedric Olivera)

Poster #NM18  Outcomes of Salvage Procedures for Bladder Outlet Obstruction Secondary to Prior SUI
Ahmed El-Zawahry, MD¹, Ross Rames, MD² and Eric Rovner, MD²
¹Urology Department, MUSC, Charleston, SC; ²MUSC, Charleston, SC
(Presented by: Ahmed El-Zawahry)

Poster #NM19  Effect of an Anticholinergic Medication on Cognitive Function in Postmenopausal Women
Elizabeth Geller, MD, Andrea Crane, MD, Ellen Wells, MD, Barbara Robinson, MD, Mary Jannelli, MD, Christine Khandelwal, DO, Anna Marie Connolly, DO, and Mary Jannelli, MD, Andrea Crane, PhD, Ellen Wells, MD, and Mary Jannelli, MD
University of North Carolina at Chapel Hill
(Presented by: Andrea Crane)

Poster #NM20  The Role of Three-Dimensional Endovaginal Ultrasound (3D EVUS) in the Assessment of Periurethral Distribution of Macroplastique and Its Association with Subjective Success
Aparna Hegde, Aimee Smith, MD¹, Carey Gross, MD¹, Leon Plowright, MD¹, Vivian Aguilar, MD², Gamal Ghonie, MD³ and Davila G. Willy, MD⁴
¹Clinical Fellow, Urogynecology, Cleveland Clinic Florida, Weston, Florida; ²Staff, Urogynecology and Reconstructive Pelvic Surgery, Cleveland Clinic Florida, Weston, Florida; ³Professor, Department of Urology, University of California, Irvine; ⁴Chairman, Department of Gynecology, Urogynecology and Reconstructive Pelvic Surgery, Cleveland Clinic Florida, Weston, Florida
(Presented by: Aparna Hegde)

Poster #NM21  Is Personality a Risk Factor for Sexual Dysfunction?
Catrina Crisp, MD¹, Apurva Pancholy, MD², Angela Fellner, PhD³, Steven Kleeman, MD¹ and Rachel Pauls, MD¹
¹Good Samaritan Hospital, Cincinnati, OH; ²Baylor School of Medicine; ³Hatton Institute, Cincinnati, OH
(Presented by: Catrina Crisp)

Poster #NM22  Validation of the Female Sexual Function Index (FSFI) for Web-Based Administration
Catrina Crisp, MD¹, Maria Estanol, MD¹, Angela Fellner, PhD², Steven Kleeman, MD¹ and Rachel Pauls, MD¹
¹Good Samaritan Hospital, Cincinnati, OH; ²Hatton Research Institute
(Presented by: Catrina Crisp)
<table>
<thead>
<tr>
<th>Poster #NM23</th>
<th>ASSOCIATION OF BLADDER SENSATION MEASURES AND BLADDER DIARY IN PATIENTS WITH URINARY INCONTINENCE</th>
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<tbody>
<tr>
<td>Ashley King, Jeffrey Wolters, MD¹, Adam Klausner, MD¹ and David Rapp, MD²</td>
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<tr>
<td>¹Virginia Commonwealth University, Richmond, VA; ²Virginia Urology Center for Incontinence and Pelvic Floor Reconstruction, Richmond, VA</td>
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<td>(Presented by: Ashley King)</td>
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<tr>
<th>Poster #NM24</th>
<th>TOPIX DISCUSSION BOARD: A QUALITATIVE INSIGHT INTO THE LIVES OF WOMEN AFFECTED BY TAPE COMPLICATIONS</th>
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<tbody>
<tr>
<td>Mio Yanagisawa and Philippe Zimmern MD</td>
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<tr>
<td>UT Southwestern Medical Center, Dallas, Texas</td>
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<td>(Presented by: Philippe Zimmern)</td>
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<tr>
<th>Poster #NM25</th>
<th>CLINICAL AND URODYNAMIC CORRELATION AMONG PATIENTS WITH OVERACTIVE BLADDER-DRY</th>
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<tbody>
<tr>
<td>Adam Stewart, MD, Wesley White, MD, Fred Klein, MD and Ragi Doggweiler, MD</td>
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<tr>
<td>University of Tennessee Graduate School of Medicine, Knoxville, TN</td>
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<td>(Presented by: Adam Stewart)</td>
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<tr>
<th>Poster #NM26</th>
<th>INCIDENCE AND TIME TRENDS IN THE SURGICAL MANAGEMENT OF STRESS URINARY INCONTINENCE</th>
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<tbody>
<tr>
<td>Michele Jonsson Funk, PhD¹, Pamela Levin, MD² and Jennifer Wu, MD, MPH²</td>
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<tr>
<td>¹University of North Carolina, Chapel Hill, NC; ²Duke University, Durham, NC</td>
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<td>(Presented by: Pamela Levin)</td>
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<tr>
<th>Poster #NM27</th>
<th>TREATMENT OF RECURRENT STRESS URINARY INCONTINENCE AFTER MID URETHRAL SYNTHETIC SLING WITH A PUBOVAGINAL SLING, A SINGLE INSTITUTION EXPERIENCE.</th>
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</thead>
<tbody>
<tr>
<td>Jennifer Rothschild, MD, MPH¹, Ekene Enemchukwu, MD, MPH¹, Lorraine Alexis, BS¹, W. Stuart Reynolds, MD, MPH¹, Harriette Scarpero, MD², Melissa Kaufman, MD, PhD¹ and Roger Dmochowski, MD¹</td>
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<tr>
<td>¹Vanderbilt University Medical Center, Nashville, TN; ²Associated Urologists, Nashville, TN</td>
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<td>(Presented by: Jennifer Rothschild)</td>
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<tr>
<th>Poster #NM28</th>
<th>CORRELATION OF PRE-OPERATIVE ABDOMINAL LEAK POINT PRESSURE WITH POST-OPERATIVE STRESS URINARY INCONTINENCE AFTER CYSTOCELE REPAIR AND SLING</th>
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<tbody>
<tr>
<td>Sam Kuykendall, MD, Sharron Mee, MD and Gary Leach, MD</td>
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<tr>
<td>Tower Urology, Los Angeles, CA</td>
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<td>(Presented by: Sam Kuykendall)</td>
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<tr>
<th>Poster #NM29</th>
<th>OUTCOMES OF URETHRAL TRANSECTION FOR RECONSTRUCTION OF THE DORSAL OR CIRCUMFERENTIAL URETHRAL DIVERTICULUM</th>
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<tr>
<td>Ahmed El-Zawahry, MD¹, Ross Rames, MD² and Eric Rovner, MD²</td>
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<tr>
<td>¹Urology Department, MUSC, Charleston, SC; ²MUSC, Charleston, SC</td>
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<td>(Presented by: Ahmed El-Zawahry)</td>
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THURSDAY, MARCH 1, 2012

Poster #NM30  PREVALENCE OF STRESS URINARY INCONTINENCE IN WOMEN WITH MULTIPLE SCLEROSIS
Alana Murphy, MD, Francois Bethoux, MD, Darlene Stough, RN, MSCN, CCRP and Howard Goldman, MD
Cleveland Clinic, Cleveland, OH
(Presented by: Alana Murphy)

5:35 p.m. – 7:05 p.m.  Male Incontinence / Urodynamics Podium Session
Podium Session Location: Roosevelt Ballroom
Moderators:  Brian J. Flynn, MD
            John C. Hairston, MD

Podium #9  ARE URODYNAMICS USEFUL IN THE SETTING OF OBSTRUCTION SECONDARY TO ANTI-INCONTINENCE SURGERY?
Margarita Aponte, MD¹, Sagar Shah, MD², Duane Hickling, MD¹, Benjamin Brucker, MD¹, Nirit Rosenblum, MD¹ and Victor Nitti, MD¹
¹Department of Urology, New York University School of Medicine, New York, NY; ²Department of Urology, St. Vincent’s Medical Center, Jacksonville, FL
(Presented by: Margarita Aponte).

Podium #10  PRE-OPERATIVE CLINICAL, DEMOGRAPHIC AND URODYNAMIC MEASURES ASSOCIATED WITH FAILURE TO DEMONSTRATE URODYNAMIC STRESS INCONTINENCE IN WOMEN ENROLLED IN TWO RANDOMIZED CLINICAL TRIALS OF SURGERY FOR STRESS URINARY INCONTINENCE
Gary Lemack, MD¹, Heather Litman, PhD², Charles Nager, MD³, Linda Brubaker, MD⁴, Jerry Lowder, MD⁵, Peggy Norton, MD⁶, Larry Sirls, MD⁷, Keith Lloyd, MD⁸ and John Kusek, PhD⁹
¹University of Texas Southwestern, Dallas, Texas; ²New England Research Institutes, Watertown, Massachusetts; ³University of California, San Diego, San Diego, California; ⁴Loyola University Medical Center, Maywood, Illinois; ⁵Magee-Women’s Hospital, University of Pittsburgh, Pittsburgh, Pennsylvania; ⁶University of Utah Health Sciences Center, Salt Lake City, Utah; ⁷Beaumont Hospital Medical Center, Royal Oak, Michigan; ⁸University of Alabama at Birmingham, Birmingham, Alabama; ⁹National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, Maryland
(Presented by: Gary Lemack)

Podium #11  RADIATION DURING VIDEOURODYNAMICS: ESTABLISHING A BASELINE
Benjamin Brucker, MD, Eva Fong, MD, Duane Hickling, MD, Margarita Aponte, MD, Justin Han, MD, Max Abramsky, MD, Nirit Rosenblum, MD and Victor Nitti, MD
New York University, NY, NY
(Presented by: Benjamin Brucker)

Podium #12  EMG LAG TIME AS A SPECIFIC FINDING IN THE DIAGNOSIS OF PRIMARY BLADDER NECK DYSFUNCTION
Steven Weissbart, MD, Leslie Schlachter, PA and Neil Grafstein, MD
Mount Sinai School of Medicine, New York, NY
(Presented by: Steven Weissbart)
Podium #13  COMPLEX ARTIFICIAL URINARY SPHINCTER REVISION AND REIMPLANTATION CASES—HOW DO PATIENTS DO COMPARED TO VIRGIN CASES?
H. Henry Lai, MD¹ and Timothy Boone, MD, PhD²
¹Washington University in St Louis; ²The Methodist Hospital, Houston, TX
(Presented by: H. Henry Lai)

Podium #14  DULOXETINE FOR THE TREATMENT OF POST-PROSTATECTOMY STRESS URINARY INCONTINENCE
R. Corey O'Connor, MD, Amy Guise, MD, Donald Neff, MD, Peter Langenstroer, MD, William See, MD and Michael Guralnick, MD
Medical College of Wisconsin, Milwaukee, Wisconsin
(Presented by: R. Corey O'Connor)

Podium #15  THE VIRTUE SLING FOR POST-PROSTATECTOMY INCONTINENCE—A NOVEL METHOD OF FIXATION IMPROVES OUTCOMT
Craig Comiter, MD, Christopher Elliott, MD, PhD and Patricia Glowe, BA
Stanford, CA
(Presented by: Christopher Elliott)

Podium #16  POST-OPERATIVE URINARY RETENTION AFTER MALE SLING INSERTION IS A POSITIVE PROGNOSTIC INDICATOR FOR SLING SUCCESS
Matthew Hall, MD, Steven Weissbart, MD, Steven Mock, MD and Neil Grafstein, MD
Mount Sinai School of Medicine, New York, NY
(Presented by: Matthew Hall)

Podium #17  DYNAMIC MRI EVALUATION OF CONTINENT AND INCONTINENT MEN POST RADICAL PROSTATECTOMY
Anne Suskind, MD, John DeLancey, MD, Jerilyn Latini, MD and Anne Cameron, MD
University of Michigan
(Presented by: Anne Suskind)
FRIDAY, MARCH 2, 2012

*All locations meet in the Roosevelt Ballroom unless otherwise specified*

7:00 a.m. – 8:00 a.m.  Breakfast
Location: Crescent City Ballroom

7:00 a.m. – 3:00 p.m.  Exhibit Hall Open
Location: Crescent City Ballroom

7:00 a.m. – 6:00 p.m.  Registration
Location: Crescent City Ballroom Foyer

8:00 a.m. – 5:00 p.m.  Video Viewing in Speaker Ready Room
Location: Directors Room

GENERAL SESSION

8:00 a.m. – 8:30 a.m.  Annual Business Meeting
Location: Roosevelt Ballroom

8:30 a.m. – 10:00 a.m.  Concurrent Poster/Podium Sessions
Male Incontinence / Urodynamics Moderated Poster Session
Poster Session Location: Waldorf Astoria Ballroom
Moderators: Charles L. Secrest, MD, R. Corey O’Connor, MD

Poster #M11  DOES SUBJECTIVE VALSALVA VOIDING PREDICT ITS PRESENCE ON URODYNAMIC TESTING?
Amul Shah, MD, R. Corey O’Connor, MD, Dan Eastwood, MS and Michael Guralnick, MD, FRCSC
Medical College of Wisconsin, Milwaukee, WI
(Presented by: Amul Shah)

Poster #M12  DIFFERENCES IN URODYNAMIC STUDY VARIABLES IN ADULT PATIENTS WITH NEUROGENIC BLADDER AND MYELOMENINGOCELE BEFORE AND AFTER AUGMENTATION ENTEROCYSTOPLASTY
Michael Vainrib, MD and David A. Ginsberg, MD
University of Southern California, Los Angeles, California
(Presented by: Michael Vainrib)

Poster #M13  URODYNAMIC FINDINGS IN FEMALE PATIENTS WITH DIABETES MELLITUS
Charles Chang, MD¹, Anastasia Osipova, MD², Natasha O’Gorman, PA-C², Kyungmin Kang², and Doreen Chung, MD²
¹Section of Urology, Department of Surgery, The University of Chicago Medical Center, Pritzker School of Medicine, Chicago, IL; ²Department of Urology, Mount Sinai Hospital, Chicago, IL
(Presented by: Charles Chang)
FRIDAY, MARCH 2, 2012

Poster #M14  DECREASE OF MAXIMUM FLOW RATE DURING INTUBATED FLOW IN WOMEN: TOWARDS IMPLICATION OF A URETHRAL REFLEX.
Françoise Valentini, MD, PhD, Gilberte Robain, MD, PhD, Dorothée Hennebelle, MD and Pierre Nelson, PhD
ER6-Université Pierre et Marie Curie (Paris 06) – Hôpital Rothschild Paris, France
(Presented by: Françoise Valentini)

Poster #M15  RENAL TRACT ULTRASONOGRAPHY FOR ROUTINE SURVEILLANCE IN SPINAL CORD INJURY PATIENTS
Leonard Edokpolo, BS and Harris Foster Jr., MD
Yale University School of Medicine, New Haven, CT
(Presented by: Leonard Edokpolo)

Poster #M16  BLADDER CAPACITY ON PREOPERATIVE URODYNAMICS MAY IMPACT THE OUTCOMES OF TRANSOBTURATOR MALE SLING
Gwen Grimsby, MD, Jonathan Warner, MD and Christopher Wolter, MD
Mayo Clinic
(Presented by: Jonathan Warner)

Poster #M17  IMPACT OF MALE URETHRAL SLING PLACEMENT ON POST-PROSTATECTOMY CLIMACTURIA
Stephen Mock, MD, Steven Weissbart, MD, Matthew Hall, MD and Neil Grafstein, MD
New York, NY
(Presented by: Stephen Mock)

Poster #M18  PRESENTING SYMPTOMS IN PATIENTS WITH ARTIFICIAL URINARY SPHINCTER CUFF EROSION
Ekene Enemchukwu, MD, MPH, Melissa Kaufman, MD, PhD and Doug Milam, MD
Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN
(Presented by: Ekene Enemchukwu)

Poster #M19  INDICATIONS FOR REVISION OF ARTIFICIAL URINARY SPHINCTER AND MODIFYING RISK FACTORS FOR DEVICE-RELATED MORBIDITY
Ifeanyi Anusionwu, MD and E. James Wright, MD
Johns Hopkins Medical Institution, Baltimore, MD
(Presented by: Ifeanyi Anusionwu)

Poster #M20  WITHDRAWN

Poster #M20.5  FULGURATION OF HUNNER’S ULCERS: LONG-TERM CLINICAL OUTCOMES
Joel Hillelsohn, BA, Zhamshid Okhunov, MD and Robert Moldwin, MD
The Arthur Smith Institute for Urology Hofstra North Shore – LIJ Hofstra School of Medicine, New Hyde Park, NY
(Presented by: Joel Hillelsohn)
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<th>SURGICAL PRACTICE PATTERNS FOR MALE URINARY INCONTINENCE AMONG CERTIFYING AMERICAN UROLOGISTS</th>
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<tr>
<td>Stephen Poon, MD¹, Jonathan Silberstein, MD¹, Will Lowrance, MD, MPH², Caroline Savage, MS¹, Alexandra Maschino, MS¹ and Jaspreet Sandhu, MD¹</td>
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<tr>
<td>¹Memorial Sloan-Kettering Cancer Center, NY, NY; ²University of Utah, Salt Lake City, UT (Presented by: Jaspreet Sandhu)</td>
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<th>Poster #NM32</th>
<th>TRANSURETHRAL RESECTION OF THE PROSTATE IN NEUROGENIC PATIENTS</th>
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<tr>
<td>Casey Seideman, MD, Benjamin Dillon, MD, Dominic Lee, MD, Claus Roehrborn, MD, Philippe Zimmern, MD and Gary Lemack, MD</td>
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<tr>
<td>University of Texas Southwestern, Dallas, Texas (Presented by: Benjamin Dillon)</td>
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<th>Poster #NM33</th>
<th>THE USE OF THE ARTIFICIAL URINARY SPHINCTER AND CLEAN INTERMITTENT CATHETERIZATION TO ACHIEVE CONTINENCE IN PATIENTS WITH DYSTROPHIC PROSTATIC CALCIFICATIONS AFTER RADIATION THERAPY FOR PROSTATE CANCER</th>
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<tr>
<td>Adam Mellis, MD and Gennady Slobodov, MD</td>
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<tr>
<td>University of Oklahoma HSC, Oklahoma City, OK (Presented by: Adam Mellis)</td>
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<th>Poster #NM34</th>
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<th>Poster #NM35</th>
<th>PATIENT PERCEPTION OF THE ARTIFICIAL URINARY SPHINCTER PUMP</th>
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<tr>
<td>Michelle Koski, MD¹, Austin Lutz, MD², Benjamin Whittam, MD³, Melissa Kaufman, MD³, Ryan Krlin, MD⁴, Douglas Milam, MD³ and J. Christian Winters, MD²</td>
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<tr>
<td>¹Department of Urology, Medical University of South Carolina, Charleston SC; ²Louisiana State University Health Sciences Center, New Orleans LA; ³Vanderbilt University Medical Center, Nashville TN; ⁴Cleveland Clinic, Cleveland OH (Presented by: Michelle Koski)</td>
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<th>Poster #NM36</th>
<th>OUTCOMES OF ARTIFICIAL URINARY SPHINCTER PLACEMENT IN MEN AFTER RADICAL CYSTECTOMY AND ORTHOTOPIC URINARY DIVERSIONS FOR THE TREATMENT OF STRESS URINARY INCONTINENCE: THE USC EXPERIENCE</th>
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<tr>
<td>Vannita Simma-Chiang, MD, David A. Ginsberg, MD and Stuart D. Boyd, MD</td>
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<tr>
<td>USC Institute of Urology, Los Angeles, CA (Presented by: Vannita Simma-Chiang)</td>
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<th>Poster #NM37</th>
<th>HANDLING MAJOR TRANSURETHRAL PROCEDURES IN PATIENTS WITH ARTIFICIAL URINARY SPHINCTER BY CUFF UNSNAPPING</th>
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<tr>
<td>Ifeanyi Anusionwu, MD and E. James Wright, MD</td>
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<tr>
<td>Johns Hopkins Medical Institution, Baltimore, MD (Presented by: Ifeanyi Anusionwu)</td>
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**Poster #NM38**
PRESENTATION AND MANAGEMENT OF COMPLICATIONS OF MALE PERINEAL SLINGS: ARE COMPLICATIONS UNDER-REPORTED?
Jessica DeLong, MD, William Jaffe, MD¹ and Arthur Mourtzinos, MD²
¹Philadelphia, PA; ²Burlington, MA
(Presented by: Jessica DeLong)

**Poster #NM39**
MALE STRESS URINARY INCONTINENCE: A COMPARISON OF THE COST OF CONSERVATIVE VERSUS SURGICAL MANAGEMENT
Jessica Delong, MD and Arthur Mourtzinos, MD
Lahey Clinic Medical Center, Burlington, MA
(Presented by: Jessica Delong)

**Poster #NM40**
POST-OPERATIVE URODYNAMICS IN OPEN VERSUS ROBOTIC RADICAL PROSTATECTOMY PATIENTS WITH STRESS URINARY INCONTINENCE.
Katherine Henderson, BS, Jack Zuckerman, MD, Paul McAdams, MD and Kurt McCammon, MD
Eastern Virginia Medical School, Norfolk, VA
(Presented by: Jack Zuckerman)

**Poster #NM41**
VOIDING DYSFUNCTION IN PATIENTS WITH DYSAUTONOMIA
R. Corey O’Connor, MD, Anand Shridharani, MD, Alexandru Barboi, MD and Michael Guralnick, MD
Medical College of Wisconsin, Milwaukee, Wisconsin
(Presented by: R. Corey O’Connor)

**Poster #NM42**
TRANSITIONING CARE IN ADULTS WITH MYELOMENINGOCELE—LESSONS LEARNED FROM A TERTIARY NEUROGENIC BLADDER CLINIC
Benjamin Dillon, MD, Casey Seideman, MD, Dominic Lee, MD and Gary Lemack, MD
University of Texas Southwestern, Dallas, Texas
(Presented by: Benjamin Dillon)

**8:30 a.m. – 10:00 a.m.**
Pelvic Organ Prolapse / Reconstruction Podium Session
Podium Session Location: Roosevelt Ballroom
Moderators: Donna Y. Deng, MD
            Farzeen Firoozi, MD

**Podium #18**
The Anatomic Relationship Between the Anterior Vaginal Wall and the Vaginal Apex in Women with Stage 2 or Greater Cystocele
Christopher Elliott, MD, PhD¹, Craig Comiter, MD¹, Bertha Chen, MD² and Eric Sokol, MD²
¹Stanford Urology, Stanford, CA; ²Stanford Obstetrics and Gynecology, Stanford, CA
(Presented by: Christopher Elliott)

**Podium #19**
The Prevalence of Pelvic Organ Prolapse is Low Among Women with Multiple Sclerosis Evaluated at a Tertiary Neuourology Clinic
Casey Seideman, MD, Benjamin Dillon, MD, Michelle Van Kuiken, BA, Dominic Lee, MD, Benjamin Greenberg, MD and Gary Lemack, MD
University of Texas Southwestern
(Presented by: Casey Seideman)
FRIDAY, MARCH 2, 2012

Podium #20*  PREDICTORS OF OUTCOMES OF PROLAPSE SURGERY AMONG FEMALE MEDICARE BENEFICIARIES: THE ROLE OF APICAL SUPPORT
Stephanie Histed, BA¹, Aqsa Khan, MD², Marianna Alperin, MD, MS³, Ning Wu, PhD⁴, Chris Pashos, PhD⁵, J. Quentin Clemens, MD, MSCI⁶ and Jennifer Anger, MD, MPH⁷
¹David Geffen School of Medicine at UCLA, Los Angeles, CA; ²Department of Urology, UCLA, Los Angeles, CA; ³Division of Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, Kaiser Permanente, West Los Angeles, CA; ⁴United BioSource Corporation, Lexington, MA; ⁵Department of Urology, University of Michigan Medical Center, Ann Arbor, MI; ⁶Cedars Sinai Medical Center, Los Angeles, CA
(Presented by: Stephanie Histed)
*Not CME accredited

Podium #21  RISK FACTORS FOR VAGINAL MESH EXPOSURE AFTER ROBOTIC-ASSISTED LAPAROSCOPIC SACROCLOPOPEXY: A RETROSPECTIVE COHORT STUDY
Dominique EL-Khawand, MD¹, Salim Wehbe, MD¹, Howard Goldstein, DO², Kristene Whitmore, MD¹ and Babak Vakili, MD²
¹Drexel University College of Medicine, Philadelphia, PA; ²Christiana Care Health System, Newark, DE
(Presented by: Dominique EL-Khawand)

Podium #22  APICAL AND POSTERIOR COMPARTMENT RECURRENCE AFTER CONCURRENT TOTAL HYSTERECTOMY AND ANTERIOR VAGINAL WALL SUSPENSION FOR BLADDER WITH UTERINE PROLAPSES
Dominic Lee, MD, Benjamin Dillon, MD, Karen Bradshaw, MD and Philippe Zimmern, MD
UT Southwestern Medical Center, Dallas, Texas
(Presented by: Philippe Zimmern)

Podium #23  FACTORS ASSOCIATED WITH VAGINAL MESH EXPOSURE USING THE ELEVATE® SYSTEM
Larry Sirls, MD, Miriam Bentley-Taylor, MD, Greg McLennan, MD, Kim Killinger, RN, MSN and Ken Peters, MD
William Beaumont Hospital, Royal Oak, MI
(Presented by: Larry Sirls)

Podium #24  TRANSLABIAL ULTRASOUND FOR LOCALIZATION OF VAGINAL MESH
Denise Chow, MD¹, Forrest Jellison, MD¹, Tamara Hartshorn, MD², Lisa Rogo-Gupta, MD¹, Ngoc Bich Le, MD¹, A. Lenore Ackerman, MD¹, Andrea, Staack, MD¹, Larissa Rodriguez, MD¹ and Shlomo Raz, MD¹
¹University of California, Los Angeles, Department of Urology, Los Angeles, CA; ²University of California, Los Angeles, Department of Obstetrics and Gynecology, Los Angeles, CA
(Presented by: Denise Chow)

Podium #25  INCONTINENT ILEOVESICOSTOMY IS A VALID OPTION FOR PATIENTS WITH NEUROGENIC BLADDER DYSFUNCTION: RESULTS FROM A SINGLE CENTER EXPERIENCE
Shubham Gupta, MD¹ and Charles Secrest, MD²
¹University of Mississippi, Jackson, MS; ²Mississippi Urology Clinic, Jackson, MS
(Presented by: Shubham Gupta)
### Podium #26

**A UNIQUE MODIFICATION TO AUGMENTATION CYSTOPLASTY WITH CATHETERIZABLE STOMA FOR NEUROGENIC PATIENTS: TECHNIQUE AND LONG TERM RESULTS**  
Rose Khavari, MD\(^1\), Jocelin Liu, MD\(^2\), Timothy Boone, MD\(^1\) and Sophie Fletcher, MD\(^1\)  
\(^1\)The Methodist Hospital, Houston, TX; \(^2\)Northwestern University, Chicago, IL  
(Presented by: Judy Choi, MD)

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>10:00 a.m. – 10:30 a.m.</td>
<td><strong>Break—Visit the Exhibits</strong></td>
<td><strong>Crescent City Ballroom</strong></td>
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<td>10:30 a.m. – 10:35 a.m.</td>
<td><strong>Announcements</strong></td>
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<td>J. Christian Winters, MD</td>
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<td>10:35 a.m. – 11:00 a.m.</td>
<td><strong>ESFFU Lecture: Neurostimulation in Spinal Cord Injury Patients</strong></td>
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<td>John Heesakkers, MD, PhD</td>
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<td>11:00 a.m. – 11:30 a.m.</td>
<td><strong>State of the Art: Biologic Graft Materials—Is there a Role in 2012?</strong></td>
<td></td>
<td>Alexander Gomelsky, MD</td>
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<td>11:30 a.m. – 1:00 p.m.</td>
<td><strong>Industry Sponsored Lunch Symposium</strong></td>
<td><strong>Conti/Lafitte Room</strong></td>
<td>See page 8 for more information</td>
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<td>1:00 p.m. – 2:30 p.m.</td>
<td><strong>FDA Mesh Warning: Clinical Perspectives</strong></td>
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<td>1:00 p.m.</td>
<td><strong>Background and Organized Urology Response</strong></td>
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<td>J. Quentin Clemens, MD</td>
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<td>1:15 p.m.</td>
<td><strong>FDA Perspective</strong></td>
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<td>Janine M. Morris,</td>
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<td><strong>FDA, Urology and Lithotripsy Devices Branch Chief</strong></td>
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<td>1:30 p.m.</td>
<td><strong>Patient Perspective</strong></td>
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<td>Colleen H. Kelly,</td>
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<td><strong>Executive Director, Women’s Health Foundation</strong></td>
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<td>Anna Albrecht,</td>
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<td><strong>Director of Wellness, Women’s Health Foundation</strong></td>
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<td>1:45 p.m.</td>
<td><strong>An Industry Perspective</strong></td>
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<td>Piet Hinoul, MD, PhD – Medical Affairs</td>
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<td><strong>Director, Ethicon, Women’s Health and Urology</strong></td>
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<td>*Not CME accredited</td>
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<td>2:00 p.m.</td>
<td><strong>Literature Review / Clinical Perspective</strong></td>
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<td>Howard B. Goldman, MD</td>
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<td>2:15 p.m.</td>
<td><strong>Questions and Answers</strong></td>
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FRIDAY, MARCH 2, 2012

2:30 p.m. – 3:00 p.m. Break—Visit Exhibits
Location: Crescent City Ballroom

ISPIN SESSION II
3:00 p.m. – 3:20 p.m.
PTNS for Urinary Symptoms
Scott MacDiarmid, MD

3:20 p.m. – 4:10 p.m.
Fundamentals of Interstim Programming
Moderator: Paul D. Pettit, MD
Science: Norbert Kaula, PhD
Art: Lisa Zwiers, PA-C

4:10 p.m. – 5:00 p.m.
ISPIN Podium Session
Moderators: Cindy L. Amundsen, MD
Raul C. Ordorica, MD

Podium #27
CHANGES IN SEXUAL FUNCTIONING IN WOMEN AFTER NEUROMODULATION FOR VOIDING DYSFUNCTION
Kenneth M. Peters, MD¹, Jessica M. Yih², Kim A. Killinger¹ and Judith A. Boura¹
¹Beaumont Health System, Royal Oak, MI; ²Wayne State University-Detroit, MI
(Presented by: Kenneth M. Peters)

Podium #28*
COST-EFFECTIVENESS OF SACRAL NEUROMODULATION AND BOTULINUM TOXIN-A FOR PATIENTS WITH REFRACTORY IDIOPATHIC OVERACTIVE BLADDER
J. Quentin Clemens, MD¹, Jennifer T. Anger², Michael L. Ganz³, Svetlana Denevich³, Dhvani Shah³, Angeline M. Carlson⁴, Michael R. Wittek⁵ and Chris L. Pashos³
¹University of Michigan; ²Cedars-Sinai Medical Center, Los Angeles, CA; ³United Biosource Corporation, Lexington, MA; ⁴Data Intelligence Consultants, LLC, Eden Prairie, MN; ⁵Medtronic, Inc., Minneapolis, MN
(Presented by: J. Quentin Clemens)
*Not CME accredited

Podium #29
WITHDRAWN

Podium #30
COMPARISON OF MOTOR AND SENSORY RESPONSE OF INTERSTIM FOR OVERACTIVE BLADDER
Jennifer Lee, MD¹, Kathryn Osann, PhD² and Karen Noblett, MD³
¹Orange, CA; ²University of California Irvine, Department of Medicine, Irvine, CA; ³University of California Irvine, Division of Urogynecology, Orange, CA
(Presented by: Jennifer Lee)

Podium #31
RADIATION EXPOSURE TO THE PATIENT AND PHYSICIAN DURING SACRAL NEUROMODULATION
Alana Murphy, MD, Courtney Lee, MD, Kevin Wunderle, Howard Goldman, MD and Sandip Vasavada, MD
Cleveland Clinic, Cleveland, OH
(Presented by: Alana Murphy)
FRIDAY, MARCH 2, 2012

5:00 p.m. – 6:00 p.m.

**BREAKOUT SESSIONS**

1. Managing Infections and Prolapse in Older Females
   **Location:** Conti / LaFitte Room
   Gregory T. Bales, MD (Director)
   Tomas L. Griebling, MD, MPH

2. Advanced Urodynamics
   **Location:** Roosevelt Ballroom
   Victor W. Nitti, MD (Director)
   Eric S. Rovner, MD
   J. Christian Winters, MD

3. Male Incontinence
   **Location:** Orpheum Room
   Craig V. Comiter, MD (Director)
   Kurt A. McCammon, MD
   Timothy B. Boone, MD, PhD

6:00 p.m. – 7:30 p.m.

**Cocktail Hour and Award Presentations**

**Location:** Crescent City Ballroom
SATURDAY, MARCH 3, 2012

*All locations meet in the Roosevelt Ballroom unless otherwise specified*

7:00 a.m. – 12:00 p.m.  Registration  
Location: Roosevelt Ballroom Foyer

7:00 a.m. – 8:00 a.m.  Breakfast  
Location: Roosevelt Ballroom Foyer

8:00 a.m. – 12:00 p.m.  Video Viewing in Speaker Ready Room  
Location: Directors Room

GENERAL SESSION

Concurrent Poster/Podium Sessions

8:00 a.m. – 9:30 a.m.  Pelvic Organ Prolapse / Reconstruction Moderated Poster Session  
*Poster Session Location: Waldorf Astoria Ballroom*  
Moderators: Kristy M. Borawski, MD  
Joanna M. Togami, MD

Poster #M21  
**READMISSION AND REOPERATION FOLLOWING LAPAROSCOPIC SACROCOLPOPEXY**  
William Warner, MD¹, Eric Hurtado, MD², Sonali Vora, MD³, Jeffrey Welgoss, MD²,  
Nicolette Horbach, MD² and Walter von Pechmann, MD²  
¹Walter Reed National Military Medical Center, Bethesda, MD; ²Inova Fairfax Hospital,  
Falls Church, VA; ³George Washington University School of Medicine, Washington, DC  
(Presented by: William Warner)

Poster #M22  
**THE PESSARY PROCESS: SPANISH-SPEAKING LATINAS’ EXPERIENCE**  
Alexandriah Alas, MD¹, Cecilia Wieslander, MD², Claudia Sevilla, BS³, Aqsa Khan, MD³,  
Brita Mittal, BS³, Sally Maliski, PHD, RN⁴ and Jennifer Anger, MD⁵  
¹Department of Obstetrics and Gynecology, Cedars-Sinai Medical Center, Los Angeles,  
CA; ²Department of Obstetrics and Gynecology, Olive View Medical Center, Sylmar, CA;  
³Department of Urology, UCLA David Geffen School of Medicine, Los Angeles, CA; ⁴UCLA  
School of Nursing, Los Angeles, CA; ⁵Department of Urology, Cedars-Sinai Medical  
Center, Los Angeles, CA  
(Presented by: Alexandriah Alas)

Poster #M22.5  
**ANTERIOR COLPORRAPHY USING POLYPROPYLENE SUTURES: OUR TWO-YEAR EXPERIENCE**  
Ngoc−Bich Le, MD¹, Forrest Jellison, MD¹, A. Lenore Ackerman, MD, PhD¹, Lisa  
Rogo−Gupta, MD¹, Denise Chow, MD¹, Z. Chad Baxter, MD¹, Eric Treat, MD¹, Tamara G.  
Hartshorn, MD¹, Ja−Hong Kim, MD¹, Larissa V. Rodriguez, MD¹ and Shlomo Raz, MD¹  
¹UCLA, Los Angeles, CA; ²North Shore–Long Island Jewish Healthcare, New Hyde Park,  
NY  
(Presented by: Ngoc−Bich Le)
Poster #M23
DOUBLE BALLOON URETHROGRAPHY FOR THE DIAGNOSIS OF URETHRAL DIVERTICULA IN WOMEN – IS IT STILL RELEVANT IN THE 21ST CENTURY?
Jacob Golomb, MD¹, Noam D. Kitrey, MD¹, Tomer Erlich, MD¹, Orit Portnoy, MD², Yoram Mor, MD¹ and Jacob Ramon, MD¹
¹Department of Urology, Chaim Sheba Medical Center, Tel Hashomer, Israel; ²Department of Diagnostic Imaging, Chaim Sheba Medical Center, Tel Hashomer, Israel
(Presented by: Jacob Golomb)

Poster #M24
COMPARATIVE OUTCOMES OF ROBOTIC ASSISTED SACROCOLPOPEXY AND SACROCOLPOPERINEOPEXY: A COHORT STUDY
Salim Wehbe, MD, Dominique El Khawand, MD, Howard Goldstein, MD, Kristene Whitmore, MD and Babak Vakili, MD
Drexel University College of Medicine
(Presented by: Salim Wehbe)

Poster #M25*
PATTERNS OF PESSARY CARE AMONG MEDICARE BENEFICIARIES WITH PELVIC ORGAN PROLAPSE
Aqsa Khan, MD¹, Marianna Alperin, MD, MS², Emily Dubina, BS¹, Chris Tarnay, MD³, Ning Wu, PhD⁴, Chris Pashos, PhD⁴ and Jennifer Anger, MD, MPH⁵
¹Department of Urology, University of California Los Angeles, Los Angeles, CA; ²Division of Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, Kaiser Permanente, West Los Angeles, CA; ³Department of Obstetrics and Gynecology, University of California Los Angeles, Los Angeles, CA; ⁴United Biosource Corporation, Lexington, MA; ⁵Cedars-Sinai Medical Center, Los Angeles, CA
(Presented by: Aqsa Khan)
*Not CME accredited

Poster #M26*
TRENDS IN PROLAPSE MANAGEMENT AMONG MEDICARE BENEFICIARIES IN THE NEW MILLENNIUM
Aqsa Khan, MD¹, Karyn Eilber, MD², Marianna Alperin, MD³, Ning Wu, PhD⁴, J. Quentin Clemens, MD, MS², Chris Pashos, PhD⁴ and Jennifer Anger, MD, MPH²
¹UCLA Department of Urology; ²Cedars-Sinai Medical Center, Los Angeles, CA; ³Division of Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, Kaiser Permanente, West Los Angeles, CA; ⁴United Biosource Corporation, Lexington, MA; ⁵Department of Urology, University of Michigan, Ann Arbor, MI
(Presented by: Aqsa Khan)
*Not CME accredited

Poster #M27
ECONOMIC BURDEN OF PELVIC ORGAN PROLAPSE IN THE UNITED STATES: INPATIENT SURGICAL CARE
Tatiana Sanses, MD¹, Meatal Patel, MPH², Nicholas Schiltz, PhD³, Sepehr Salem, MD³, Firooz Daneshgari, MD³ and Siran Koroukian, PhD²
¹Department of Obstetrics and Gynecology, University Hospitals Case Medical Center; ²School of Medicine, Case Western Reserve University; ³Department of Urology, University Hospitals Case Medical Center
(Presented by: Tatiana Sanses)
**SATURDAY, MARCH 3, 2012**

**Poster #M28**

**PATTERNS OF CARE FOR URETHRAL TRAUMA IN PATIENTS WITH PELVIC FRACTURE**

A. Lenore Ackerman, MD, PhD¹, Paul Chestovich, MD², Emily Dubina³, Areti Tillou, MD² and Jennifer T. Anger, MD⁴

¹Division of Pelvic Medicine and Reconstruction, Department of Urology, University of California Los Angeles, Los Angeles, CA; ²Department of General Surgery, University of California Los Angeles, Los Angeles, CA; ³David Geffen School of Medicine, University of California, Los Angeles, Los Angeles, CA; ⁴Department of Urology, Cedars-Sinai Medical Center, Los Angeles

(Presented by: A. Lenore Ackerman)

**Poster #M29**

**DORSAL VAGINAL GRAFT URETHROPLASTY FOR FEMALE URETHRAL STRICTURE DISEASE**

Alexandra Rogers, MD, Steven Petrou, MD, Kristen Green, MD and Alexander Parker, PhD

Department of Urology, Mayo Clinic Florida, Jacksonville Florida USA

(Presented by: Alexandra Rogers)

**Poster #M30**

**THE IMPACT OF PHYSICIAN TRAINING LEVEL AND SPANISH PROFICIENCY ON DISEASE UNDERSTANDING AMONG LATINAS WITH PELVIC FLOOR DISORDERS**

Vannita Simma-Chiang, MD¹, Claudia Sevilla, BS², Cecilia Wieslander, MD³, Sally Maliski, RN, PhD⁴, Rebecca G. Rogers, MD⁵ and Jennifer T. Anger MD, MPH⁶

¹USC Institute of Urology, Los Angeles, CA; ²UCLA, Los Angeles, CA; ³Olive View – UCLA, Sylmar, CA; ⁴UCLA School of Nursing, Los Angeles, CA; ⁵University of New Mexico, Albuquerque, NM; ⁶Cedars Sinai Medical Center, Los Angeles, CA

(Presented by: Vannita Simma-Chiang)

**NON-MODERATED**

*All non-moderated posters are NOT CME accredited*

**Poster #NM43**

**RELATIONSHIP BETWEEN PHYSICAL EXAMINATION, DYNAMIC MRI, AND INTRAOPERATIVE FINDINGS IN THE TREATMENT OF PELVIC ORGAN PROLAPSE**

Forrest Jellison, MD, Ngoc-Bich Le, MD, A. Lenore Ackerman, MD, MPH, Lisa Rogo-Gupta, MD, Denise Chow, MD, Karim Chanie, MD, MSHS, Tamara G. Hartshorn, MD, Steven Raman, MD, Larissa V. Rodriguez, MD and Shlomo Raz, MD

¹UCLA, Los Angeles, CA

(Presented by: Forrest Jellison)

**Poster #NM44**

**ANATOMICAL, FUNCTIONAL, AND QUALITY OF LIFE OUTCOMES OF TRANSVAGINAL SACROURINE LIGAMENT SUSPENSION FOR VAGINAL VAULT PROLAPSE**

A. Lenore Ackerman, MD PhD, Ngoc-Bich Le, MD, Forrest Jellison, MD, Lisa Rogo-Gupta, MD, Denise Chow, MD, Tamara G. Hartshorn, MD, Larissa V. Rodriguez, MD and Shlomo Raz, MD

Division of Pelvic Medicine and Reconstruction, Department of Urology, University of California, Los Angeles, Los Angeles, CA

(Presented by: A. Lenore Ackerman)
SATURDAY, MARCH 3, 2012

Poster #NM45  EVALUATION OF OPERATIVE EFFICIENCY FOR ROBOTIC SACROCOLPOPEXY WITH AND WITHOUT HYSTERECTOMY
Elizabeth Geller, MD and Catherine Matthews
UNC at Chapel Hill, SOM, Chapel Hill, NC
(Presented by: Catherine Matthews)

Poster #NM46  MESH-RELATED COMPLICATIONS AFTER PROLAPSE REPAIR; HOW COMMON IS IT, AND WHAT IS THE BEST MANAGEMENT STRATEGY
Ifeanyi Anusionwu, MD, Stacy Loeb, MD, Stephen Jurashek, Lynda Mettee, PAC and E. James Wright, MD
Johns Hopkins Medical Institution, Baltimore, MD
(Presented by: Ifeanyi Anusionwu)

Poster #NM47  COMPREHENSIVE EVALUATION OF ANTERIOR ELEVATE SYSTEM IN THE TREATMENT OF ANTERIOR AND APICAL PELVIC FLOOR DESCENT: 1 YEAR FOLLOW-UP
Jeffrey Wolters, MD, MPH¹, Ashley King, MD², Bruce Rowe, MD²,³ and David Rapp, MD²,³
¹VCU Medical Center, Richmond, VA; ²VCU School of Medicine, Richmond, VA; ³Virginia Urology Center for Incontinence and Pelvic Floor Reconstruction
(Presented by: Jeffrey Wolters)

Poster #NM48  SAME DAY DISCHARGE FOR VAGINAL PELVIC ORGAN PROLAPSE REPAIR: ARE THERE PREDICTORS FOR RETENTION, ADMISSION, OR SHORT TERM COMPLICATIONS?
Bhavin Patel, MD¹, Wai Lee, MD², Alvaro Lucioni, MD¹ and Kathleen Kobashi, MD¹
¹Virginia Mason Medical Center, Seattle WA; ²Stony Brook, NY
(Presented by: Bhavin Patel)

Poster #NM49  SURGEON IMPACT ON PROLAPSE SURGERY OUTCOMES
Karyn Eilber, MD¹, Aqsa Khan, MD², Marianna Alperin, MD, MS³, J. Quentin Clemens, MD, MScI⁴, Ning Wu, PhD⁵, Chris Pashos, PhD⁵ and Jennifer Anger, MD, MPH¹
¹Cedars-Sinai Medical Center, Los Angeles, CA; ²UCLA Department of Urology; ³Department of Obstetrics and Gynecology, Kaiser Permanente, West Los Angeles, CA; ⁴Department of Urology, University of Michigan, Ann Arbor, MI; ⁵United Biosource Corporation, Lexington, MA
(Presented by: Karyn Eilber)

Poster #NM50  OUTCOMES AND PREDICTORS OF OUTCOME AFTER VAGINAL MESH REPAIR FOR PELVIC ORGAN PROLAPSE
Ifeanyi Anusionwu, MD¹, Stacy Loeb, MD², Stephen Jurashek¹, Lynda Mettee, PAC¹ and E. James Wright, MD¹
¹Johns Hopkins Medical Institution, Baltimore, MD; ²Johns Hopkins Hospital
(Presented by: Ifeanyi Anusionwu)

Poster #NM51  THE INCIDENCE AND RISK FACTORS OF POST-OPERATIVE URINARY TRACT INFECTION AFTER UTEROSACRAL LIGAMENT SUSPENSION
Christopher Chung, MD, Sheena Harris, Madeline McBride, Thomas Kuehl, PhD, Wilma Larsen, MD, Paul Yandell, MD and Bob Shull, MD
Scott and White Healthcare, Texas A&M Health Science Center College of Medicine, Temple, TX
(Presented by: Christopher Chung)
<table>
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<tr>
<th>Poster #NM52</th>
<th>LIGHTWEIGHT POLYPROPYLENE MESH SYSTEM WITH APICAL SUPPORT FOR PELVIC ORGAN PROLAPSE REPAIR</th>
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<td>Keith Xavier</td>
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<tr>
<th>Poster #NM53</th>
<th>TREATMENT OF FEMALE URETHRAL STRicture DISEASE: A SYSTEMATIC REVIEW OF THE LITERATURE</th>
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<tr>
<td>Cynthia Fok, MD¹, Elizabeth Mueller, MD, MSME¹, Rezoana Rashid, BS² and Jennifer Anger, MD, MPH²</td>
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<td>¹Departments of Urology and Obstetrics &amp; Gynecology, Loyola University Medical Center, Maywood IL; ²Department of Urology Cedars-Sinai, Los Angeles CA</td>
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<tr>
<th>Poster #NM54</th>
<th>NEUROGENIC BLADDER: A HETEROGENEOUS POPULATION WITH COMMON UROlogic NEEDS</th>
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<tr>
<td>Mohammad Ramadan, MD, Jonathan Heinlen, MD and Gennady Slobodov, MD</td>
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<td>University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma</td>
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<th>Poster #NM55</th>
<th>RESIDENT AND FELLOW BENCHMARKS FOR ROBOTIC PERFORMANCE TIMES</th>
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<tbody>
<tr>
<td>Andrea Crane, MD, Elizabeth Geller, MD and Catherine Matthews, MD</td>
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<tr>
<td>University of North Carolina at Chapel Hill</td>
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<td>(Presented by: Andrea Crane)</td>
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<th>Poster #NM56</th>
<th>UROLOGIC RECONSTRUCTIVE PROCEDURES IN CYtoREDUCTIVE SURGERY (CRS) AND INTRAPERITONEAL HYPERThERMIC CHEMOTHERAPY (HIPEC) FOR PERITONEAL SURFACE MALIGNANCY IN 934 CONSECUTIVE PROCEDURES</th>
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<tr>
<td>Brandon Craven, MD¹, Perry Shen, MD², Edward Levine, MD², Konstantinos Votanopoulos, MD², John Stewart IV, MD² and Majid Mirzazadeh, MD¹</td>
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<td>¹Department of Urology, Wake Forest University School of Medicine, Winston Salem, NC; ²Oncology Service, Department of General Surgery, Wake Forest University School of Medicine, Winston Salem, NC</td>
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<td>(Presented by: Brandon Craven)</td>
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<tr>
<th>Poster #NM57</th>
<th>ILEAL LOOP URINARY DIVERSION FOR NON-BLADDER CANCER INDICATIONS – LONG-TERM OUTCOMES AND COMPLICATIONS</th>
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<tr>
<td>Ellen Goldmark, MD, Melissa Heuer, BA and Toby Chai, MD</td>
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<td>Baltimore, MD</td>
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<th>Poster #NM58</th>
<th>UROLOGIC COMPLICATIONS AFTER ROBOTIC HYSTERECTOMY</th>
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<tr>
<td>Allen Haraway, MD¹, Gary Faerber, MD², Quentin Clemens, MD, MPH², Humphrey Atiemo, MD³ and Anne Pelletier-Cameron, MD²</td>
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<td>¹University of Michigan; ²Ann Arbor, MI; ³Detroit, MI</td>
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<td>(Presented by: Allen Haraway)</td>
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SATURDAY, MARCH 3, 2012

Poster #NM59  THE WEST AFRICA FISTULA FOUNDATION (WAFF) STAGING SYSTEM OF VESICO VAGINAL FISTULAS (VVF) TO PROVIDE EVIDENCE BASED OUTCOMES AND IMPROVE MANAGEMENT IN DEVELOPING COUNTRIES
Alexandra Rogers, MD¹ and Darius Maggi, MD²
¹Department of Urology, Mayo Clinic Florida, Jacksonville Florida USA; ²West Africa Fistula Foundation, Bo, Sierra Leone
(Presented by: Alexandra Rogers)

Poster #NM60  CAHPS SURGICAL CARE SURVEY
Allen Haraway, MD¹, Anne Pelletier-Cameron, MD², Humphrey Atiemo, MD³, Anne Oldendorf, MD², Jerilyn Latini, MD² and Quentin Clemens, MD, MPH²
¹University of Michigan; ²Ann Arbor, MI; ³Detroit, MI
(Presented by: Allen Haraway)

8:00 a.m. – 9:30 a.m.  IC / Pelvic Pain / Geriatrics / BPH Podium Session
Podium Session Location: Roosevelt Ballroom
Moderators:  Traci P. Beck, MD
             Priya Padmanabhan, MPH, MD

Podium #32  THULIUM LASER VAPORIZATION OF THE PROSTATE: INITIAL SHORT-TERM OUTCOMES
Olufenwa Famakinwa, MD¹ and Doreen Chung, MD, FRCSC¹,²
¹University of Chicago Medical Center – Section of Urology, Chicago, Illinois; ²Mount Sinai Hospital – Chicago, Illinois
(Presented by: Olufenwa Famakinwa)

Podium #33  Moved to Thursday, 5:35 p.m. – 7:05 p.m.: Female Urology / Incontinence Moderated Poster Session (Poster #M10.5)

Podium #34*  PREVALENCE AND CORRELATES OF URINARY INCONTINENCE AMONG OLDER, COMMUNITY-DWELLING CALIFORNIANS
Aqsa Khan, MD¹, Catherine Bresee, MS², Claudia Sevilla, BS³, Emily Dubina, BS³ and Jennifer Anger, MD²
¹UCLA Department of Urology; ²Cedars-Sinai Medical Center, Los Angeles, CA; ³UCLA David Geffen School of Medicine, Los Angeles, CA
(Presented by: Aqsa Khan)
*Not CME accredited
Podium #35  
**URINE CHEMOKINES LEVELS CORRELATE WITH TREATMENT RESPONSE TO PHOSPHODIESTERASE 4 INHIBITOR DRUG IN PROSTATITIS PATIENTS**
Pradeep Tyagi, PhD, Kim Killinger, MSN, Gregory McLennan, MD, Nirmal Jayabalan, PhD, Michael Chancellor, MD and Kenneth Peters, MD  
(Presented by: Pradeep Tyagi)

Podium #36  
Moved to: Friday, 8:30 a.m. – 10:00 a.m.: Male Incontinence / Urodynamics  
Moderated Poster Session (Poster #M20.5)

Podium #37  
**CAN URINE CXCL-1 AND CXCL-10 LEVELS SERVE AS NOININVASIVE MARKERS FOR HUNNER LESIONS IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME?**
Lauren Hendrix, MD and Deborah Erickson, MD  
Lexington, KY  
(Presented by: Lauren Hendrix)

Podium #38  
**UTILIZATION AND TECHNIQUE OF HYDRODISTENSION FOR INTERSTITIAL CYSTITIS: OUTCOMES OF A SOCIETY FOR URODYNAMICS AND FEMALE UROLOGY (SUFU) SURVEY**
Kristin Broderick, MD, Benjamin G. Martin, MD, L. Keith Lloyd, MD and Tracey S. Wilson, MD  
University of Alabama at Birmingham, Birmingham, AL  
(Presented by: Kristin Broderick)

Podium #39  
**MAST CELL INDUCES CHRONIC PELVIC PAIN IN EXPERIMENTAL AUTOIMMUNE CYSTITIS**
Fuat Bicer, MD¹,⁴, Cengiz Z. Altuntas, PhD¹, Kenan Izgi, MD¹,⁴, Ahmet Ozer MD¹,², Ismail Sayin, MS¹,³ and Firouz Daneshgari, MD¹  
¹Urology Institute, University Hospitals Case Medical Center, Cleveland OH, ²Department of Genetics; ³Department of Biology, Case Western Reserve University, Cleveland OH; ⁴Department of Clinical Chemistry, Cleveland State University, Cleveland OH  
(Presented by: Fuat Bicer)

Podium #40  
**POLY-SYMPTOMATIC, POLY-SYNDROMIC SOMATOFORM PRESENTATION IN PATIENTS WITH UROLOGIC CHRONIC PELVIC PAIN SYNDROME (UCPPS)**
H. Henry Lai, MD¹, Carol North, MD, MPE², Gerald Andriole, MD¹, Gregory Sayuk, MD, MPH¹ and Barry Hong, PhD¹  
¹Washington University in St. Louis, St. Louis; ²University of Texas Southwestern Medical Center, Dallas, TX  
(Presented by: H. Henry Lai)

9:30 a.m. – 9:40 a.m.  
**Lapides Award Presentation**
Moderator: Tomas L. Griebling, MD, MPH

**ANALYSIS OF TRP RECEPTORS INVOLVED IN PELVIC ORGAN CROSS-SENSITIZATION IN RATS**
Akira Furuta, MD, PhD, Shin Egawa, Michael B. Chancellor, Naoki Yoshimurua  
Department of Urology, Jikei University School of Medicine, Tokyo, Japan  
(Presented by: Akira Furuta)
SATURDAY, MARCH 3, 2012

9:40 a.m. – 10:00 a.m.  Prize Essay Winner Presentations
Moderator:  Angelo E. Gousse, MD

Podium #41*  COMPARATIVE OUTCOMES OF OPEN VERSUS LAPAROSCOPIC SACROCOLPOPEXY AMONG FEMALE MEDICARE BENEFICIARIES
Jennifer Anger, MD, MPH¹, Aqsa Khan, MD², Marianna Alperin, MD³, Ning Wu, PhD⁴, J. Quentin Clemens, MD, MSCI⁵, Emily Dubina, BS⁶ and Chris Pashos, PhD⁴
¹Cedars-Sinai Medical Center, Los Angeles, CA; ²Department of Urology, UCLA David Geffen School of Medicine, Los Angeles, CA; ³Division of Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, Kaiser Permanente, West Los Angeles, CA; ⁴United Biosource Corporation, Lexington, MA; ⁵Department of Urology, University of Michigan, Ann Arbor, MI; ⁶Department of Urology, University of California, Los Angeles, Los Angeles, CA
(Presented by: Jennifer Anger)
*Not CME accredited

Podium #42  NEUROTROPHIN THERAPY IMPROVES RECOVERY OF THE NEUROMUSCULAR CONTINENCE MECHANISM FOLLOWING SIMULATED BIRTH INJURY IN RATS
Bradley Gill, BSE¹, Brian Balog, BS¹, Charuspong Dissaranan, MD¹, Hai-Hong Jiang, MD, PhD¹, James Steward, BS¹, Dan Li Lin, MD² and Margot Damaser, PhD¹
¹Cleveland Clinic, Cleveland, OH; ²Louis Stokes VA, Cleveland, OH
(Presented by: Bradley Gill)

10:00 a.m. – 12:00 p.m.  Neurogenic Bladder
Moderators:  J. Christian Winters, MD / Eric S. Rovner, MD

10:00 a.m.  Contemporary Management of Neurogenic LUTS
Edward J. McGuire, MD

10:40 a.m.  Urologic Management
Moderators:  J. Christian Winters, MD / Eric S. Rovner, MD

Advances in Neurourology
Anne P. Cameron, MD

Advances in the Use of Botulinum Toxin for Neurogenic Bladders
Christopher P. Smith, MD

Future Treatment of Neurogenic Bladder
Timothy B. Boone, MD, PhD
ANNUAL BUSINESS MEETING AGENDA

Society for Urodynamics and Female Urology
Friday, March 2, 2012
8:00 a.m. – 8:30 a.m.
Location: Roosevelt Ballroom

1. Call to Order – President, Victor W. Nitti, MD
2. Approval of 2011 Minutes and Thank You to Program Chairs – J. Christian Winters, MD
4. Treasurer’s Report – Eric S. Rovner, MD
5. Awards Committee Report – Roger R. Dmochowski, MD
6. Membership Committee Report – Alan J. Wein, MD, PhD / Victor W. Nitti, MD
7. Old Business
8. New Business
   (a) Announcement of 2013 Meeting
   (b) Other
9. Adjourn
**EVENING EVENTS**

**Wednesday, February 29, 2012**

Welcome Reception  
7:00 p.m. – 8:30 p.m.  
*Location: Crescent City Ballroom*  
Attire: Business  
Enjoy a beverage and light hors d’oeuvres as you meet with Promotional Partners in the exhibit hall.

**Friday, March 2, 2012**

Awards Reception  
6:00 p.m. – 7:30 p.m.  
*Location: Crescent City Ballroom*  
Attire: Business  
Finish off the annual meeting with an evening of cocktails, mingling and award presentations.

**ABOUT NEW ORLEANS**

New Orleans is one of the world's most fascinating cities. Steeped in a history of influences from Europe, the Caribbean, Africa and beyond, it is a brilliant mosaic of culture, food and music. You'll find brimming bowls of gumbo, late nights in jazz clubs, strolls through historic neighborhoods and tantalizing festivals throughout the year. In New Orleans, you’ll experience one of America’s most culturally and historically rich destinations.

**Dining**  
New Orleans offers one of the most diverse options in cuisine. While some people eat to live, those from this city live to eat. With more than 1,000 restaurants, you will find just the right flavor to satisfy your hunger. Some of the neighborhood hotspots include Mother’s, Gumbo Shop and Café du Monde. At these culturally unique eateries you can indulge in New Orleans Fusion, in which the rising star chefs take their own spin on classic New Orleans dishes.

**Shopping**  
Shopping in New Orleans is an experience quite different from the typical mall. The Big Easy features an old-world market place with a mix of specialty shops, designer boutiques and galleries. Downtown you can visit the French Market, America’s oldest operating public market or find an antique item at the furniture, décor and jewelry shops on Royal Street in the French Quarter. Magazine Street, known as the “Street of Dreams” is a must for those who love to shop. With six miles of shops, boutiques, art studios, galleries and spas, it truly is a shopper’s dream.

**Arts & Culture**  
The culture continues to thrive in New Orleans, where the first operas in America were performed in the 1790s. “The city that care forgot” was known as the cultural capital of the South with Greek revival mansions, foods featuring several cultures including Cajun and Creole and the variety of musical offerings. Today, the Big Easy is still known for these unique features and offers tourists a view into the history of the town with several world-class museums including The National World War II Museum and the Ogden Museum of Southern Art.

**Weather and Dress**  
New Orleans weather in early March is usually warm and sunny, with average highs in the low 70s and lows in the low 50s. Evenings can be cool, so a light sweater or jacket is suggested.
MARK YOUR CALENDARS!

SUFU at the AUA 2012
May 19, 2012
Georgia World Congress Center
Atlanta, GA

SUFU 2013 Annual Meeting
February 26 – March 2, 2013
Caesar’s Palace
Las Vegas, NV

SUFU 2014 Annual Meeting
February 25 – March 1, 2014
Miami, FL
How to Make the Bladder Work After Spinal Cord Injury

Moderator: Matthew O. Fraser, PhD
Panelists: Michael R. Ruggieri, Sr., PhD, Warren Grill, PhD, Kenneth M. Peters, MD
Tuesday, February 28, 2012 • 1:00 p.m. – 2:30 p.m.

How to Make the Bladder Work After Spinal Cord Injury
Michael R. Ruggieri, MD

Bladder and bowel dysfunction is frequently associated with spinal cord injury and developmental spinal disorders such as spina bifida. In a survey study of 681 spinal cord injury (SCI) patients, regaining bladder and bowel function was of shared importance to both paraplegics and quadriplegics. It was even rated as more important than recovering ambulation in paraplegics. Although the Brindley Vocare sacral root stimulator is one of the most successful functional electrical stimulation (FES) treatments, it is ineffective when the neural connections between the bladder and spinal cord are disrupted. To address these “lower motoneuron” injuries of the lower urinary tract, we developed a canine animal model.

After a complete L6 and partial L5 and S1 vertebral laminectomy, the nerve roots causing bladder contraction induced by electrical stimulation are severed bilaterally resulting in a flaccid bladder paralysis. Following over 7 months of this preganglionic bladder denervation, we found that the intramural, pre-junctional nerves innervating the bladder smooth muscle are functionally intact and thus have the potential to be reinnervated.

Nerve transfer surgeries were carried out immediately and after 1 and 3 months of bladder denervation by lumbosacral nerve root transection. Direct intraoperative pelvic nerve stimulation one year after the nerve transfer surgeries induced increase bladder pressure and urethral fluid flow in 14 of the 17 (82%) animals with nerve transfer:

- 3 of 3 animals with immediate coccygeal nerve transfer
- 3 of 4 animals with immediate genitofemoral (GF) nerve transfer
- 3 of 4 animals with GF nerve transfer 1 month after nerve transection
- 5 of 6 animals with GF nerve transfer 3 months after nerve transection.

To reinnervate the urethral and anal sphincters, motor branches of the femoral nerve were transferred to pudendal nerve branches as they emerged from the pudendal (Alcock’s) canal bilaterally in 3 animals. Activation of radiofrequency micro-stimulators interfaced with cuff electrodes surrounding the transferred nerves resulted in increased urethral and anal sphincter pressures in 4 of the 6 nerve transfers.

Three weeks before euthanasia the bladder was injected with fluorogold for retrograde tracing of the spinal origin of the bladder innervation. In the GF nerve transfer animals there was 6 fold more lumbar spinal cord cell bodies labeled than sacral cell bodies. Likewise, in the 4 coccygeal nerve (CG) nerve transfer animals there were over 6 fold more coccygeal cell bodies labeled than sacral cell bodies. The diameter of the coccygeal cell bodies are larger than either the sacral cell bodies or the lumbar cell bodies indicating that α motoneurons reinnervated the bladder from the CG nerve transfer whereas γ motoneurons reinnervated the bladder from the GF nerve transfer. Postmortem lipophilic dye tracing studies showed that in sham operated normal controls the pelvic nerve only innervates bladder muscle indirectly, through intramural parasymathetic ganglia whereas in the root repair and GF nerve transfer animals, the new neural pathway reinnervates both intramural ganglia as well as bladder muscle directly by the regenerated nerves.

Ten human cadavers were dissected to determine feasibility of the femoral to pudendal nerve transfer. A long motor branch of the femoral nerve was followed into the distal vastus medialis muscle for a distance of 17.4 ± 0.8 cm, split off from the main femoral nerve trunk and transferred medially and superiorly to the pudendal nerve in Alcock’s canal, a distance of 13.6 ± 0.71 cm. This was performed using a perineal approach. The cross sectional area of the pudendal nerve was 5.64 ± 0.49 mm², and the femoral nerve motor branch at the suggested transection site was 4.40 ± 0.41 mm². Thus in humans, use of a femoral nerve motor branch to the vastus medialis muscle for heterotopic nerve transfer to the pudendal nerve is surgically feasible, based on anatomical location and cross sectional areas.
These studies provide a great degree of confidence that similar surgical approaches in human patients with spinal injury are not only technically feasible but likely to be successful. The advantage of performing the nerve transfer close to the end organ as opposed to other procedures in which the nerve transfer is performed inside the dura of the spinal cord are the shorter distance for nerve regeneration and potentially providing a more specific pathway for regeneration to occur.

REFERENCES

RESTORATION OF BLADDER FUNCTION IN THE SPINAL CORD INJURED PATIENT
Kenneth M. Peters, MD
The concept of joining healthy nerves to injured nerves to improve function is not new. In 1828, Flourens showed that the distal end of one transected nerve could make functional union with the proximal end of another nerve. In 1907, Kilvington proposed that the neurogenic urinary bladder might be reinnervated by somatic nerves to improve function. He even attempted this in one patient but was unsuccessful.

During the past century, numerous studies have been conducted in animals and humans to evaluate the possible functional consequences of bladder reinnervation using somatic-autonomic nerve cross union. In 1967, Carlsson and Sundin reported on a 4 year old spina bifida patient who underwent rerouting of the thoracic 10-11 ventral (motor) roots to S1-S2 ventral root. After eight months of recovery, reflex micturition and bladder sensation appeared. Despite this previous interest in nerve rerouting to reinnervate the neurogenic bladder, it was Xiao and his colleagues who further pursued this concept. Elegant studies were first done in animals, confirming that the bladder could be reinnervated by a somatic nerve and that reflex micturition could occur. This was followed by reports of some clinical success in humans with both spinal cord injury and spina bifida.

Xiao described how he created a somatic-central nervous system-autonomic pathway in 15 patients with hyperreflexic neurogenic bladders and detrusor external sphincter dyssynergia secondary to complete suprasacral spinal cord injury. A microanastomosis was made between the L5 ventral root and the S2\3 ventral root to allow the motor axons to reinnervate the autonomic preganglionic nerves. These patients were followed up with post-operative urodynamic evaluations for an average of 3 years of postoperatively. In 10 of the 15 patients, bladder function, including storage and emptying, was improved. Similar to the animal models, cutaneous stimulation of the appropriate dermatome activated the skin-CNS-bladder reflex causing micturition. Interestingly, 4 of these 10 patients had resolution of their hyperreflexia with DESD to normal voiding with low post-void residuals. The remaining 6 had no change in their DESD, but they were able to use the new reflex to successfully void with low residuals.

The procedure was then performed on twenty children with spina bifida. Preoperatively, fourteen had an areflexic detrusor with small bladder capacity, open urethral outlet and incontinence. The remaining six suffered from hyperreflexic bladder with detrusor external sphincter dyssynergia, similar to the suprasacral SCI patients. Seventeen of the twenty (85%) recovered acceptable bladder storage and function. Those with atonic bladders had an average increase of bladder capacity (94.3ml to 177.83ml) and decrease in post void residuals (70.17ml to 23.67ml) with only two patients failing to see any improvement.
Of those with detrusor external sphincter dyssynergia, five were able to void spontaneously with a significant decrease in mean detrusor pressure. Five of the twenty developed a motor deficit in L4 or L5, ranging from slight muscle weakness to visible foot drop. No other complications were reported.

We recently completed our 36-month study on lumbar to sacral nerve rerouting in 9 subjects with spina bifida (AUA 2011). Of 9 patients (6 female; median age 8 years), 8 had transient post-operative lower extremity weakness and 1 developed permanent foot drop. Two patients did not return for 3-year follow-up (non-responders). In the remaining 7, maximum cystometric capacity (MCC) increased from 210.4 ml to 293 ml. Only 1/4 with neurogenic detrusor overactivity (NDO) at baseline still had NDO. Median compliance improved from 17 ml/H2O to 28.4 ml/H2O, and all 3 with compliance <10 at baseline normalized. 2/9 voided small amounts at baseline. At 36 months, 6/7 were voiding with a 248cc (mean) volume and 72% efficiency on uroflow. Most (6/7) had discontinued catheter and antimuscarinic use. All had stable renal function but 6/7 still had stress incontinence. At baseline, 3/7 considered their bowels normal and 1/7 were continent of stool. At 36-months, 6/7 considered their bowels normal, 4/7 were continent of stool, and 6/7 would undergo the procedure again.

Lin, et al. in 20099, published an alternative to lumbar to sacral nerve rerouting. The study used the Achilles heel tendon reflex as an initiator of micturition. An anastomosis was made between the unilateral ventral S1 root and S2-S3 nerve root. After adequate time for reinnervation, stimulation was performed by percussion of the Achilles tendon, and within ten seconds micturition began. This was done in twelve patients with compete suprasacral spinal cord injury whose neurogenic bladder consisted of hyperreflexia and detrusor external sphincter dyssynergia. The patients were followed for a mean of 3 years with urodynamic, renal function, and questionnaire evaluation. At 12 months post-operative, nine out of twelve (75%) of the patients had significant improvement in bladder capacity, postvoid residual, and substantial improvement, if not resolution, of voiding dyssynergia.

Neuromodulation to restore voiding in spinal cord injury has been used for years in Europe. The Brindley stimulator combines S2-S4 intradural electrodes with sacral posterior rhizotomy. The deinnervation step is skipped in cases of genital sensation and reflex erections. Neuromodulation has been reviewed with good results. Over a retrospective review of 500 patients with a Brindley stimulator, 411 were still in use with the patients “pleased.”10

Restoring voiding in patients with spinal cord injury remains a challenge, but there is hope that through reinnervation and neuromodulation that further advances can be made to achieve this goal.

REFERENCES
ELECTRICAL STIMULATION OF PUDENDAL AFFERENTS TO RESTORE CONTINENCE AND MICHTURITION FOLLOWING SPINAL CORD INJURY

Warren M. Grill, PhD

The primary functions of the lower urinary tract are to store urine (continence) and expel urine (micturition). Spinal cord injury often results in uncontrolled reflex contraction of the bladder at low bladder volumes (termed neurogenic detrusor overactivity or bladder hyperreflexia) and uncoordinated co-contraction of the bladder and external urethral sphincter (termed bladder sphincter dyssynergia). This pathophysiology results in both urinary retention and incontinence and can lead to frequent urinary tract infections, damage to the organs of the urinary tract, and skin breakdown.

Electrical stimulation of pudendal sensory nerve fibers can generate either inhibition or activation of the bladder and holds promise as an approach to restore continence and micturition. Differential control of bladder function can be obtained by selective stimulation based on anatomical segregation of pudendal afferents or by stimulation at different frequencies. I will present preclinical studies and clinical translation of pudendal afferent stimulation to inhibit the bladder and promote continence in neurogenic detrusor overactivity resulting from spinal cord injury. I will present complementary studies demonstrating that pudendal afferent stimulation can excite the bladder and produce bladder emptying. Collectively, these studies demonstrate that activity in pudendal afferents can generate either inhibition or activation of the bladder, and that electrical stimulation of pudendal afferents holds promise as an approach to restoration of continence and micturition following spinal cord injury.

ACKNOWLEDGMENTS

Collaborators on this work include Cindy Amundsen, MD, Eric Horvath, Meredith Jones, George Webster, MD, Brian Wenzel, PhD, John Woock, PhD, and Paul Yoo, PhD. This work is supported by NIH grant R01NS050514 and by a grant from The Craig H. Neilsen Foundation.

REFERENCES

Marrow derived adult Mesenchymal Stem Cells (MSCs) can be isolated and culture expanded. Although these cells are capable of differentiating into lineages that result in the fabrication of bone, cartilage, muscle, marrow stroma, tendon/ligament, fat and other connective tissues, MSCs have recently been shown to be intrinsically therapeutic. Such culture expanded adult/MSCs are immuno-modulatory especially in muting T-cells and, thus, allogeneic MSCs have been used to mute or cure graft-versus-host-disease and Crohn's disease and are now being tested in certain autoimmune diseases. Furthermore, these allo-MSCs set-up a regenerative micro-environment which is anti-apoptotic, anti-scarring, mitotic for tissue intrinsic progenitors and angiogenic. These immuno and trophic activities result from the secretion of powerful bioactive molecules that, in combination, support localized regenerative event. The MSCs reside in every tissue of the body and function as perivascular cells (pericytes) until a focal injury occurs. At sites of injury, the pericyte is released and functions as a MSC that provides molecular assistance in activities leading to tissue regeneration. Such assistance involves many tasks involving the immuno-protection and trophic activities provided by the MSCs. Although it is proposed that all MSCs are pericytes and have common capacities, it is expected that MSCs from different tissues location or anatomical sites of injury will not be equivalent. Thus, adipose-derived and marrow-derived MSCs naturally reside as pericytes and have different functional capacities. The fact that uncultured, freshly isolated autologous "stromal vascular fraction (SVF)" from fat has been shown to be therapeutically effective in horses and dogs, strongly argues that the MSCs in the SVF are a potent multi-drug and site-specific delivery vehicle. Human MSCs have been used in animal models of urinary incontinence and should be considered for other injuries. Surprisingly, the human MSCs can be induced to synthesize and secrete powerful antibiotic molecules and are now being used for treatment of sepsis and other organ and systemic infections. This full thesis that adult MSCs are potent therapeutic agents is the theme of this lecture.
Regulation of Bladder Smooth Muscle Contractility
Moderator: Matthew O. Fraser, PhD
Panelists: Michael R. Ruggieri, Sr., PhD, Mark T. Nelson, PhD, George J. Christ, PhD
Tuesday, February 28, 2012 • 3:45 p.m. – 5:15 p.m.

REGULATION OF BLADDER SMOOTH MUSCLE CONTRACTILITY
Michael R. Ruggieri, MD
The major mechanism of urinary bladder smooth muscle contraction is activation of muscarinic receptors by neuronally released acetylcholine. Previous investigations attempting to determine which subtype of muscarinic receptor mediates the contraction suffered from the erroneous assumption that only one of the 5 subtypes is responsible. If the M₃ receptor subtype exclusively mediates contraction, then the potency of the M₃ selective antagonist darifenacin for inhibition of cholineric agonist induced contractions would always be within the range of darifenacin’s potency for M₃ receptors (pK₈ 8.4-8.9). We found, in a large series of 44 human bladder specimens obtained from organ transplant donors, that the potency of darifenacin to inhibit carbachol induced contractions ranged from a low pK₈ of 7.2 to a high of 9.3 with a median of 8.0. This indicates that in some human bladder specimens, muscarinic receptors other than the M₃ subtype (likely the M₂ subtype) also participate in mediating the contraction.

In these 44 different human bladder specimens there is no correlation between the density of detrusor smooth muscle M₂ or M₃ receptor subtypes and the potency of darifenacin. In contrast, there is a statistically significant negative correlation between darifenacin potency and the density of both M₂ and M₃ receptors in the mucosal layer. This led to the hypothesis that a diffusible factor released from the mucosa influences the contraction of the underlying detrusor. We demonstrated the existence of this inhibitory factor by co-incubating the mucosa from low darifenacin potency human bladders with rat bladder strips and found that it not only reduced the maximal carbachol contraction, it also reduced the potency of darifenacin for inhibiting rat bladder contractions by 2.5 fold. The bathing solution from these human mucosa/rat bladder experiments was analyzed for diamines by HPLC and revealed 6 fold more spermidine and over 2 fold more N-acetyl spermidine from co-incubation of human mucosa from low darifenacin potency bladders than mucosa from high darifenacin potency bladders. Addition of exogenous spermidine to mucosa intact but not mucosa denuded rat bladder muscle strips also reduces both the maximal contractile response to carbachol and the potency of darifenacin. Likewise, addition of exogenous spermidine reduces the maximal carbachol response and darifenacin potency in high darifenacin potency human bladder muscle strips only if the human bladder mucosa is co-incubated with the human bladder muscle strips. This suggests that spermidine may be acting as an autocrine factor that induces release of a secondary substance which inhibits bladder smooth muscle contraction.

To address the question of the role of mucosal M₃ receptors in this process we produced mice with the M₃ receptor deleted only from the urothelium (uroM₃ KO) by crossing transgenic M₃ floxed mice with transgenic mice that have Cre recombinase gene downstream from the uroplakin II promoter that is only expressed in urothelial cells. Carbachol potency is significantly greater in mucosa intact uroM₃ KO than in wild type bladder strips. While removing the mucosa has no effect on carbachol potency or the carbachol maximal contraction in wild type bladder strips, carbachol potency is reduced following mucosa removal from uroM₃ KO bladder strips. The M₃ selective antagonist darifenacin is highly potent (pK₈=9.2) in inhibiting carbachol induced contractions in mucosa intact uroM₃ KO mice bladder strips, similar to wild type (pK₈=8.8) and consistent with M₃ receptors mediating contraction. In mucosa intact strips only, darifenacin appears to act like a non-competitive antagonist because low concentrations attenuate the maximal contraction. Thus M₃ receptors in the mucosa may release a substance that allows maximal muscarinic receptor responsiveness of the smooth muscle. In vivo cystometry experiments in these animals demonstrated that the M₃ selective muscarinic antagonist 4-DAMP is significantly less potent in reducing micturition pressure in uroM₃ KO than wild type animals. Thus urothelial M₃ receptors may mediate a negative feedback that reduces carbachol potency in vitro and possibly micturition pressure in vivo.
REGULATION OF BLADDER SMOOTH MUSCLE CONTRACTILITY
Mark T. Nelson, PhD

A central function of the urinary bladder is the translation of neural inputs into a normal micturition response, a function that is disrupted in disease. Effective urine voiding requires the coordinate contraction of urinary bladder smooth muscle (UBSM) and relaxation of the urethra. In adults, this process is under voluntary control, and reflects the integration of neural and smooth muscle mechanisms. At the myocyte level, the contractile function of smooth muscle involves the functional interplay of multiple cellular processes, including neurotransmitter receptor activation, intracellular Ca\(^{2+}\) signaling, and ion channel regulation of membrane excitability. Failure at the level of neural regulation or smooth muscle contractile function can result in a failure to adequately void urine, leading to irritative voiding symptoms and/or incomplete bladder emptying.

The urinary bladder is extensively innervated. Stimulation of parasympathetic nerves induces the co-release of the neurotransmitters adenosine triphosphate (ATP) and acetylcholine (ACh), which act directly on smooth muscle purinergic and cholinergic receptors, respectively, to induce contraction. Cholinergic signaling mechanisms appear to predominate under normal conditions, with purinergic pathways making variable contributions, depending on the pathophysiological state of the tissue, experimental conditions, and species. The urinary bladder generates spontaneous phasic contractions that are triggered by action potential. Parasympathetic nerve stimulation coordinates this myogenic activity, giving rise to forceful bladder contraction and micturition.

ATP acts on P2X1 receptor channels to cause influx of Ca\(^{2+}\) and Na\(^{+}\) which causes a rapid increase (<0.5 s) in action potential frequency (Heppner et al., 2005; Heppner et al., 2009). In contrast, activation of the G\(_{q11}\)-coupled m3 receptor by ACh stimulates phospholipase C-dependent phosphoinositide biphosphate hydrolysis, liberating diacylglycerol (DAG) and IP\(_3\), which activate protein kinase C (PKC) and induce Ca\(^{2+}\) release through SR membrane IP\(_3\)Rs, respectively. It has been generally accepted that the actions of ATP and ACh are independent. However, we have found that purinergic (ATP) signaling suppresses the subsequent, slower cholinergic/muscarinic (ACh) stimulation of bladder excitability and contractility (Heppner et al., 2009). The strength of this interaction will influence bladder contractility, and would confound possible interpretations of changes in purinergic/cholinergic components in disease. It has also been thought that Ca\(^{2+}\) released from intracellular stores by IP3 is a major source of the Ca\(^{2+}\) required for cholinergic contraction. Contrary to expectation, we found that cholinergic stimulation increases UBSM contractility through an elevation of excitability (action potentials), without any obvious participation from IP3-mediated Ca\(^{2+}\) release (Nausch et al., 2010).

The various phases of the UBSM action potential reflect the coordinated action of distinct membrane conductances. The upstroke of the action potential is attributable to Ca\(^{2+}\) entry through dihydropyridine-sensitive voltage-dependent calcium channels (VDCCs) (Heppner et al., 1997). The repolarization phase is mediated by the activity of both voltage-dependent K\(^{-}\) (K\(_{V}\)) channels and large conductance, calcium-sensitive potassium (BK) channels. Following the spike and repolarization, the action potential in UBSM displays a prolonged after-hyperpolarization, which is mediated by K\(_{V}\) channels and apamin-sensitive small conductance Ca\(^{2+}\)-sensitive K\(^{-}\) (SK) channels. Blocking BK channels with iberiotoxin causes a dramatic increase in action potential amplitude, duration, and frequency and a substantial increase in phasic and nerve-evoked contractions. We have used transgenic mouse models to specifically explore the roles of the BK channel \(\alpha\) pore forming subunit (Meredith et al., 2004; Thorneloe et al., 2005). Loss of BK channel function (\(\alpha\) subunit KO) lead to diminished bladder capacity, overactive detrusor and urinary incontinence in vivo. The BK channel opener drug, NS11021, decreased action potential frequency and phasic contractions in a BK channel-dependent manner (Layne et al., 2010). Activation of BK channels by NS11021 restored normal urodynamics in vivo following partial outlet obstruction.

REFERENCES


REGULATION OF SMOOTH MUSCLE CONTRACTILITY IN REGENERATING BLADDER

George J. Christ, MD

Alterations in smooth muscle contraction are common, and moreover, are thought to contribute, at least in part, to age and disease-related bladder dysfunctions (i.e., diabetes, obstruction). Numerous molecular targets have been identified as potential therapeutics, but little progress has been made in clinical applications. However, a recent clinical trial suggests that K channel-based gene transfer diminishes the uninhibited contractions observed in post-menopausal women with OAB. Regardless of the target of interest, the majority of approaches currently being explored to treat bladder dysfunction will be defined provide symptomatic relief. An alternative approach is to develop regenerative medicine technologies that not only have the potential to treat symptoms, but also to elicit bladder repair and regeneration, thereby providing curative therapies.

As a first step in this direction we have begun investigations of bladder regeneration in rats following trigone-sparing subtotal cystectomy (STC: removal of approximately 70% of the bladder). The rationale is that improved understanding of the mechanistic basis for regeneration in relevant mammalian organ systems will lead to novel and improved clinical applications. In this regard, in young adult rats STC is followed by a robust proliferative response that results in fully functional bladder regeneration within 8 weeks; restoring bladder capacity, pressures and micturition volumes to pre-STC levels. All of this is achieved in the face of a significant 60% decrease in contractility of isolated detrusor smooth muscle strips to muscarinic-, adrenergic- and electrical field stimulation (EFS)-induced contractile responses. Interestingly, there was an increase in the atropine-resistant component of the efs-induced response. Our most recent data indicates that the regenerative process per se is impaired in older animals, and this is reflected by even further diminutions in the contractility of isolated bladder strips retrieved from these animals. Most recently we have begun to examine gene expression profiles in detrusor smooth muscle during early stages of the regenerative process (within 1 week) when the most robust proliferative responses are observed. KEGG (Kyoto Encyclopedia of Genes and Genomes) pathway analysis reveals a general decrease in mrna expression levels for key modulators of both calcium signaling and detrusor contractility including, but not limited to, adrenergic, cholinergic and purinergic membrane receptors, protein kinase C, myosin light chain kinase, caldesmon, IP₃, calcium/calmodulin-dependent protein kinase, phospholambam and voltage-dependent calcium channels. More specifically, this pattern of changes in gene expression is indicative of a general decrease in transcription for genes important to calcium mobilization and sensitization, and thus, the modulation of detrusor smooth muscle tone. These data suggest that the early phenotype of the detrusor smooth muscle cell may be a critical determinant of the ultimate degree of contractility observed in the detrusor smooth muscle of the regenerated bladder. Future work will further evaluate the impact and correlation of these findings at the mRNA level with observations at the protein and cellular levels during the course of regeneration.
BEYOND NEURONS: CYSTITIS, CO-MORBID DISORDERS AND ASSOCIATED EPITHELIAL DYSFUNCTION
Lori A. Birder, PhD

A hallmark of chronic visceral syndromes, including painful bladder syndrome/interstitial cystitis (PBS/IC) is the absence of readily demonstrable pathology of the viscera or associated nerves. These disorders are currently defined by symptom criteria in the absence of organic disease. There is also evidence that functional pain syndromes such as PBS/IC are associated with alterations in the urothelium. Though the urothelium maintains a tight barrier to ion and solute flux, a number of local factors as well as conditions such as PBS/IC can alter or degrade the barrier function of the urothelium.

Alterations of urothelium at both the molecular and structural levels have been identified in both human patients with PBS/IC, and in cats diagnosed with feline interstitial cystitis (FIC). This naturally occurring disease in cats share nearly all the characteristics of the non-ulcerative form of PBS/IC found in humans. For example, some of the changes within the urothelium in FIC include a disruption of the integrity of the urothelium barrier with changes in cell adhesion molecules. Changes in the urothelial barrier can permit water, urea, and noxious substances present in the urine to pass into the underlying tissue (neural and/or muscle layers) that may acutely result in symptoms of urgency, frequency, and pain during bladder filling and voiding.

Urothelial cells also exhibit plasticity with alteration in expression and/or sensitivity of a number of urothelial-sensor molecules. In addition, our data also suggests that altered production of chemical mediators and trophic factors may influence afferent excitability as well as urothelial membrane function. For example, we have identified an increase in nerve growth factor (NGF) and substance P (SP) in FIC urothelium as compared to urothelium from unaffected (control) bladders. The elevated NGF expression by FIC urothelium is a possible cause for the increased cell body size of DRG neurons from cats with FIC. In addition, FIC urothelium exhibits altered sensitivity to both mechanical as well as chemical stimuli. In this regard, increased sensitivity of urothelial receptors can lead to release of mediators that can enhance smooth muscle contractions and activation of nearby afferents.

Changes in epithelial signaling/barrier function are not unique to the urinary bladder. For example, airway epithelia in asthmatic patients as well as keratinocytes in certain types of skin disease also exhibit a number of similar abnormalities and compromised repair processes. In addition, it has also been shown that patients with various functional and inflammatory gastrointestinal esophageal symptoms exhibit alterations of esophageal epithelial structure and function. Taken together, modification of the epithelium and/or loss of epithelial integrity in a number of pathological conditions can result in passage of irritating substances and/or release of neuroactive substances from the epithelium. These can lead to changes in the properties of sensory nerves and sensory symptoms.

OVEREXPRESSION OF NGF IN MOUSE UROTHELIAL LEADS TO PELVIC SENSITIVITY AND CHANGES IN URINARY BLADDER FUNCTION
Margaret A. Vizzard, PhD

NGF has been suggested to play a role in urinary bladder dysfunction by mediating inflammation, as well as morphological and functional changes, in sensory and sympathetic neurons innervating the urinary bladder. To further explore the role of NGF in bladder sensory function, we generated a transgenic mouse model of chronic NGF overexpression in the bladder using the urothelium-specific uroplakin II (UPII) promoter. NGF mRNA and protein were expressed at higher levels in the bladders of NGF-overexpressing (NGF-OE) transgenic mice compared with wild-type littermate controls from postnatal day 7 through 12–16 wk of age. Overexpression of NGF led to urinary bladder enlargement characterized by marked nerve fiber hyperplasia in the submucosa and detrusor smooth muscle and elevated numbers of tissue mast cells. There was a marked increase in the density of CGRP- and substance P-positive C-fiber sensory afferents, neurofilament 200-positive myelinated sensory afferents, and tyrosine hydroxylase-positive...
sympathetic nerve fibers in the suburothelial nerve plexus. CGRP-positive ganglia were also present in the urinary bladders of transgenic mice. Transgenic mice had reduced urinary bladder capacity and an increase in the number and amplitude of nonvoiding bladder contractions under baseline conditions in conscious open-voiding cystometry. These changes in urinary bladder function were further associated with an increased referred somatic pelvic hypersensitivity. Thus, chronic urothelial NGF overexpression in transgenic mice leads to neuronal proliferation, focal increases in urinary bladder mast cells, increased urinary bladder reflex activity, and pelvic hypersensitivity.

Additional NGF-mediated pleiotropic changes might contribute to the increased voiding frequency and pelvic hypersensitivity observed in these transgenic mice, such as modulation of other growth factor/receptor systems. We examined NGF, brain-derived neurotrophic factor (BDNF), and associated receptor [p75NTR, tropomyosin related kinase (Trk) receptor A, TrkB] transcript and protein expression in urothelium and detrusor smooth muscle of NGF-OE and littermate wild-type mice, using real-time quantitative reverse transcription-polymerase chain reaction, ELISAs, and semiquantitation of immunohistochemistry. We focused on these growth factor/receptors given the established roles of NGF/TrkA, NGF/p75NTR, and BDNF/TrkB systems in bladder function. Increased voiding frequency in NGF-OE mice was confirmed by examining urination patterns. BDNF, TrkA, and TrkB protein expression was significantly reduced and p75NTR protein expression was significantly increased in urinary bladder of NGF-OE mice. The NGF-OE-induced changes in neurotrophic factor/receptor expression in urinary bladder may represent compensatory, yet insufficient, changes to reduce voiding frequency in the NGF-OE mouse. It remains to be determined whether NGF-overexpression causes additional phenotypic or excitability changes in bladder sensory afferents or urinary bladder that might contribute to the bladder hyperreflexia and pelvic hypersensitivity in NGF-OE mice.

The NGF-OE transgenic mice represent a novel animal model of NGF-mediated urinary bladder dysfunction caused by chronic urothelial-specific overexpression of NGF. Our findings support and extend many previous studies in rodents demonstrating a role for NGF in mediating changes in urinary bladder function or referred hyperalgesia in response to inflammation or tissue injury. Although most rodent studies to date have focused on transient, exogenous administration of NGF into the bladder, or the use of NGF or NGF receptor blockade in models of chemical/irritant-induced bladder dysfunction, the NGF-OE transgenic mice offer a genetically stable model of chronic NGF overexpression from early postnatal development. The phenotype of these mice uniquely reflects many of the known roles of NGF in modulating the growth/maintenance of sensory and sympathetic nerve fibers, local mast cell responses, urinary bladder hyperreflexia, and referred hyperalgesia. Accordingly, the NGF-OE transgenic mouse model should provide new opportunities for exploring the role of NGF in urinary bladder and visceral-somatic sensory function.

**LOSS OF B1-INTEGRIN FROM UROTHELIUM RESULTS IN VOIDING DYSFUNCTION**

*Warren G. Hill, PhD*

Integrins are a family of proteins which function to link the inside of cells to the outside world. They exist as heterodimers in the plasma membrane and are comprised of an α and a β subunit. On the outside of the cell they have large extracellular domains which bind to components of the extracellular matrix (ECM) and on the inside, are linked to the actin cytoskeleton through a complex array of multiple adaptor proteins. Although integrins are the main receptors for ECM proteins, they are also involved in cell-cell interactions and in addition are receptors for pathogens (e.g. viruses and bacteria) (2). Integrins act as finely tuned molecular conduits for information flow between the cell and its environment (3). Different cells express unique repertoires of integrins with different affinities for ECM molecules. Cell division, cell spreading/migration and maturation/differentiation are all dependent on cues received from the ECM and the surrounding microenvironment. These cues are often transmitted through integrins exposed to changing physical and chemical microenvironments (4).

It is now believed that the urothelium has dynamic sensory and signaling properties which allow it to respond to the physical distention which occurs when the bladder fills and empties. In response to stretch for example, the urothelium releases ATP, opens ion channels and traffics intracellular vesicles into the plasma membrane. However, the urothelial mechanoreceptors which sense filling are poorly defined and their function unclear. Because integrins sense force in other tissues (1, 4) we hypothesized that they might play an important role in urothelial mechanotransduction. The available literature suggested predominant urothelial integrin isoforms were α2β1, α3β1 and αvβ1, therefore we
decided to delete β1-integrin which was common to all. Laser scanning immunofluorescent confocal microscopy revealed a gradient of β1-integrin in bladder with high levels in detrusor smooth muscle, intermediate expression in lamina propria and modest expression along the basal aspect of the urothelium at the lamina propria interface. Urothelial localization was confirmed by colocalization with aquaporin 3, a urothelial-specific protein. We used a Cre-LoxP conditional targeting strategy to delete β1-integrin specifically from the urothelium of mice (β1-cKOs). We created a transgenic mouse expressing uroplakin II-promotor driven Cre recombinase (UPII-Cre). To demonstrate specificity of expression we crossed it with an R26R-stop-YFP floxed reporter mouse and demonstrated YFP expression solely in urothelium. UPII-Cre mice crossed with β1-integrin floxed mice resulted in 50% of the offspring lacking functional urothelial integrins. Urothelium from β1-cKOs was morphologically normal as assessed by H&E staining, transmission electron microscopy and scanning electron microscopy. Interestingly, β1-cKO bladders maintained normal barrier function as measured by transepithelial resistance and water and urea permeability in modified Ussing chambers.

Voiding behavior was examined by urine spot assay on filter paper and by cystometry. Normal mice exhibit sanitary voiding in one corner of the cage or along one edge. β1-cKO mice however appeared incontinent since there was significantly greater urine spotting over the entire cage floor. Urine spot number (P<0.01) and urine spot area fraction covered (P<0.05) were greater. Cystometrograms on urethane anesthetized mice revealed abnormal urodynamics in β1-cKOs with three times as many non-voiding contractions (P<0.01) and 80% longer intercontractile intervals (P<0.05) consistent with overfilling. Peak void pressures were not different. ATP secretion into the lumen of the bladder during cystometry was two-fold greater in β1-cKOs than controls (P<0.05) suggesting a possible purinergic signaling defect or inappropriate activation of signaling pathways. Further evidence for alterations to mechanosensitive pathways came from short circuit current measurements in Ussing chambers. Upon application of a small hydrostatic pressure, β1-cKO mice exhibited two-fold higher short circuit currents than controls (P>0.05) suggesting altered gating of mechanosensitive ion channels. These observations lead us to speculate that β1-integrin containing heterodimers may be part of the mechanosensory apparatus that communicates information on bladder fullness to sensory afferents. Furthermore, because selective ablation of a single protein from the urothelium dramatically disrupts normal voiding, these results offer definitive proof that urothelium acts as an important sensor of bladder filling and is able to regulate the voiding cycle. It is possible that loss of appropriate mechanosensation by urothelium may play a role in some forms of incontinence or overactive bladder.

This work was supported by NIH grant DK083299.

REFERENCES
**Introduction**

In general, activation of smooth muscle requires myosin regulatory light chain (MLC20) phosphorylation by the Ca\(^{2+}\)/calmodulin-dependent myosin light chain kinase (MLCK). Under certain physiological conditions, smooth muscles have been shown to produce tone without an increase in cytosolic Ca\(^{2+}\) to activate the MLCK. This phenomenon termed “calcium sensitization” is achieved by lowering the activity of myosin light chain phosphatase (MLCP). This is accomplished by inactivation of the MLCP by (a) phosphorylation of the myosin-targeting subunit of MLCP (MYPT) by RhoA-activated kinase (ROK), and (b) inhibition of the protein kinase C (PKC)-mediated phosphorylation of CPI-17, increasing the binding of this MLCP inhibitory protein to MLCP. These mechanisms are believed to play an important role in maintaining the normal tone, especially in visceral smooth muscles. Partial bladder outlet obstruction (PBOO)-induced remodeling of detrusor smooth muscle (DSM) is associated with modulation of cell signaling that regulates DSM contraction. In animal models and in men with BPH-induced PBOO, removal of the obstruction returns the bladder function close to normal in most instances. However, in some men and in animal models, the bladder function does not
return to normal and the reason for this is not understood, but most likely due to the failure of altered signaling mechanisms to reverse back to normal.

**Aim of the study:** We determined the temporal regulation of Rho A and ROK in DSM from obstructed mice and men with benign prostatic hyperplasia (BPH)-induced DSM hypertrophy. In addition, the expression of these two proteins involved in Ca\(^{2+}\)-sensitization was also determined after cell stretch and hypoxia, which are thought to be the initial factors that induce PBOO-induced DSM hypertrophy.

**Methods:** DSM from normal and 1, 3-, 7-, and 14-day obstructed male mice and from men with normal and obstructed bladders were analyzed by PCR, western blotting and immunofluorescence microscopy. Primary detrusor myocytes from mice and human were seeded on type I collagen-coated silicone sheeting membrane at a density of \(1 \times 10^5\)/well in M199/10%FBS and grown to \(\sim 80\%\) confluence. Cells were subjected to cyclic stretch or 1 % hypoxia independently for 24 and 48 hours and analyzed for the expression of RhoA and ROK.

**Results:** The RhoA and ROK expression begins to show an upregulation 24 hrs after PBOO in mice. These proteins are also upregulated in men with BPH-induced PBOO. Cell stretch caused a significant increase of RhoA and ROK \(\beta\) expression in cultured murine and human detrusor myocytes. Contrary to this, the expression of RhoA and ROK \(\beta\) in these cells decreased following 24 and 48 hrs after hypoxia.

**Conclusion:** Expression of RhoA and ROK \(\beta\) increased in obstructed groups compared to control bladders both at mRNA and protein levels in both mice and men. Cell stretch caused by bladder over-distension in PBOO is the likely mechanism that initiates the overexpression of these proteins.

**Funding:** Supported by George O'Brien Urology Research grant P50 DK DK052620.
The overarching goal of our project is to create a center of excellence devoted to multidisciplinary basic and translational studies of urologic disease. Unlike the prostate and kidney, our understanding of fundamental mechanisms underlying pathophysiology of tissues comprising the bladder wall and urethra is relatively limited. The absence of fundamental knowledge of urinary tract organs severely limits the development of new and innovative medical and/or surgical options for therapy for many urologic diseases. Our center focuses on the theme of Urinary Incontinence: Bladder Dysfunction and Development. In spite of the high medical costs attributable to incontinence (> $16 billion per year in North America), in many cases the physiologic and mechanistic basis for incontinence is unknown. The overall goal of our center is to advance significantly our understanding of potential treatment options for incontinence. To accomplish this we are employing a wide range of complementary approaches, including cutting edge investigative tools and animal modeling strategies. The center comprises 3 lead projects, 2 cores, a pilot and feasibility program and an education and enrichment program, selected aspects of which are outlined below.

Primary projects are entitled (1) Network Analysis in Bladder Smooth Muscle, which uses state-of-the-art quantitative proteomics approaches to interrogate signaling networks in smooth muscle cells exposed to pathophysiologic stimuli, with the goal of identifying key regulatory nodes and potential “druggable” targets; (2) Neuropilins in Bladder Function, the goal of which is to understand the role of neuropilins in bladder wall contractility; and (3) Mammalian lower urinary tract development, which focuses on the role of a transcriptional complex, Six1-Eya1, in morphogenesis of lower urinary tract structures. Pilot projects have focused on the use of novel biomaterials and cell sources for urinary tract tissue engineering, the use of urinary proteomics to identify potential disease biomarkers, and the investigation of neurotrophic facilitators to ameliorate the lower urinary tract complications of spinal cord injury. Together these projects span a range of disciplines, from fundamental studies of gene and protein regulation, to bladder wall physiology and therapeutic interventions, and take advantage of the highly interdisciplinary nature of our center.
III. Four Projects
Project 1: Social-stress-induced urinary dysfunction: a model of dysfunctional voiding (PI, Rita Valentino, PhD)
Project 2: Bladder wall remodeling following alteration of urothelial structure (PI, Pam Howard, PhD)
Project 3: Mechanism for obstruction-induced detrusor remodeling: Role of hypoxia & stretch (PI, Samuel K. Chacko, DVM, PhD)
Project 4: Extracellular Matrix Changes in Response to Obstruction (PI, Edward Macarak, PhD)

IV. Two Cores
Core A: Administrative (PI, Samuel Chacko)
1. Educational Enrichment Program
2. Pilot & Feasibility Program to support two new projects per year

Core B: Bladder Tissue Core (PI, Stephen Zderic M.D., Co-PIs: Drs. Alan J. Wein Samuel K Chacko
Animal Models:
Rabbits, rats, and mice with partial bladder outlet obstruction
Rats and mice with social stress-induced bladder dysfunction
Transgenic animals with gene mutation and gene knockout

V. External and Internal Advisory Committees

VI. Website: http://www.uphs.upenn.edu/surgery/labs/chacko/George_O'Brien.html

VII. Summer Urologic Research Experience
The NIH/NIDDK funded George M. O'Brien Urology Center in the Department of Surgery at the University of Pennsylvania for applications from medical, post-baccalaureate and undergraduate students.
Goal: The Program is designed to introduce students to the field of Urology research and acquire basic science and translational research experience in the laboratory of an expert investigator. The selected students will work with a faculty mentor during the scholarship period (8 weeks) on a short research project. A detailed report and an oral presentation are mandatory at the end of the training.

NIDDK O'BRIEN UROLOGY CENTERS
Robert H. Getzenberg, PhD

I. The George M. O'Brien Urology Research Center at Johns Hopkins University
   A. Established September 30, 2009

II. Focus is on BPH/LUTS
   A. Most common urologic condition(s) in aging men
      1. IPSS score
      2. Central measurement in each of the projects
   B. Measurement of disease severity as well as progression
   C. Questions being evaluated are translatable
   D. Utilizing patient samples and populations

III. Three Projects
   A. Project 1: Intraprostatic Inflammation in the Etiology of Lower Urinary Tract Symptoms (Elizabeth Platz)
   B. Project 2: JM27 as a Potential Biomarker of Symptomatic BPH (Robert Getzenberg)
   C. Project 3: Identification of Genetic Risk Factors for BPH (William Isaacs)

IV. Two Cores
   A. Core 1: Administrative (Robert Getzenberg)
      1. Educational Enrichment Program
         • Coordinated with the T32 (Donald Coffey)
2. Pilot & Feasibility Program
   - Annual program to support two new projects per year

B. Core 2: Biostatistics (Bruce Trock)

V. External and Internal Advisory Committees

VI. Website
   A. http://urology.jhu.edu/O%27Brien/

VII. Summer Urologic Research Experience
   A. Very exciting program
   B. Students: 8-12
   C. Goal: To create a one-of-a-kind 10-week program aimed at educating and training young scientists who seek a broad and balanced view of the modern issues in research based on the study of urological diseases that is intense, but, at the same time very inspiring and rewarding.
   D. Content:
      1. Integrated lectures and laboratories will provide a comprehensive coverage of the paradigms, problems, and technologies in urological research.
      2. Students will be exposed to a wide variety of conceptual topics such as the importance of epithelial-stromal interactions, hormones & growth factors involved, parallels between embryonic development and disease, BPH, bladder dysfunction, genomics & genetics and new therapeutic approaches.
      3. Students will be trained in a variety of analytical and experimental techniques used to explore various urological conditions using state-of-the-art instrumentation and methodology.
During his presentation, Dr. Robert Star will discuss a vision and NIDDK plan's for advancing benign urology research that was jointly developed by the NIDDK, AUA, and other urology professional societies. The vision is that the NIH, in association with the urology community, needs to develop a vibrant, sustainable, and innovative urologic research and training community that efficiently translates fundamental clinical and basic knowledge to address critical benign urology health needs.

Dr. Star will discuss plans to improve urologic science by moving from collection of symptoms to disease and by seeding multi- and trans-disciplinary collaboration. To address investigator pipeline concerns, he will discuss efforts to attract new and established investigators through early trainee recruitment and facilitating their training in a modern research environment and also retain established investigators. Dr. Star will also discuss more broad-reaching efforts to educate study section reviewers, help improve institutional culture, and collaboration with research community and scientific, professional, and advocacy groups.

Among other issues of concern in the urology research community, Dr. Star will address the importance of fostering interdisciplinary research such as basic research (PhD candidates) with clinical research (MD). It is thought by many in this field that lack of communication between groups has impeded the benign urology research community. NIDDK has funded the following types of grants in an effort to improve multidisciplinary research: Urology O'Brien Centers (P50), Urology Interdisciplinary Team Seeding Grants (P20), and Collaborative Research Grants (R24).

Finally, Dr. Star will discuss a vision for advancing scientific opportunities in urinary incontinence.
Interstitial Cystitis/Bladder Pain Syndrome (IC/BPS) is a potentially devastating condition that impacts not only a patient’s physical function, but also their psychosocial function and quality of life. As a result, the AUA’s IC/BPS guideline aims to provide direction on recognizing IC/BPS, conducting an appropriate diagnostic examination, and treating IC/BPS. IC/BPS patients experience pain, urgency, and frequency. It is important that treatment approaches reduce symptoms and improve patient quality of life without increasing adverse events and patient burden.

This guideline addresses a topic which has not been addressed previously by AUA. It provides a useful synthesis of the evidence along with panel guidance. The panel has emphasized that treatment of IC/BPS is individualized; the most effective approach for a particular patient is best determined by the individual clinician and patient. To guide physicians, the panel has developed a treatment algorithm which includes elements for a basic assessment as well as available first-line through sixth-line treatments. These guidelines will be reviewed annually to determine if new medical literature requires that they be revised.

REFERENCES

NIH Sponsored Clinical Trials: Just the Facts
Moderator: Philippe E. Zimmern, MD
Presenters: Stephen R. Kraus, MD, Anthony G. Visco, MD, Ziya Kirkali, MD
Thursday, March 1, 2012 • 10:30 a.m. – 11:30 a.m.

URINARY INCONTINENCE TREATMENT NETWORK (UITN)
Stephen R. Kraus, MD
1. Rationale
   A. Status of incontinence research prior to 2000 extremely poor
      i. Few comparative clinical trials
         1. Despite multiple treatment options
         2. Lack of rigorously conducted clinical trials
         3. Paucity of prospective randomized trials
      ii. Poor quality
         1. Methodological weakness
            a. Lack of long term follow-up
               i. Short follow-up
               ii. Assume durability – carry last observation forward
            b. Inadequate sample size
            c. Unclear selection criteria
            d. Unclear outcome definition
      2. Inadequate measures of other important outcomes
         Ex: Quality of life, Patient reported outcomes, Complications
   3. Prone to operator bias
      a. Reputation of the surgeon at stake
      b. Selection bias (surgeon investigator includes only the most ideal)
   4. Confirmed by Findings from the AUA Guidelines Panel 1997
      a. Lack of prospective, randomized, controlled trials.
      b. Lack of standardized diagnostic criteria.
      c. Lack of standardized outcomes criteria.
      d. Lack of specific time intervals over which results were reported.
      e. Lack of uniformity in terminology describing surgical procedures.
      f. Failure of authors to indicate whether study population was a new or updated series
      g. Failure of authors to describe the complications and morbidities of the surgery.

   A. Aims: assess the long-term outcomes of most commonly utilized treatments (surgical, behavioral and medical) to correct urinary incontinence in adult women
   B. Specific Goals
      1. To determine the long-term effects and outcomes, including complications, of the most commonly used surgical procedures for women with urinary incontinence
      2. To document the use and evaluate the effects of adjuvant therapy, including behavioral and medical treatment, in women who have undergone surgery for urinary incontinence
      3. To determine which surgical procedure(s) provides the most beneficial outcome and fewest complications for different categories of urinary incontinence patients defined at baseline
      4. To develop uniform clinical definitions for the various categories of urinary incontinence patients
      5. To develop standardized outcome measures, including questionnaires, to evaluate quality of life and patient satisfaction
      6. To determine the influence of race/ethnicity and co-morbid medical conditions such as diabetes, obesity, and child-bearing, on treatment outcomes and complication.
7. To determine the prognostic utility of urodynamic testing for surgical success and as a measure of outcome.

C. The Network
i. Combination of Investigators
   1. Principal and Co-PI: Combination of urologists and urogynecologists
   2. Other specialists with expertise in UI: geriatricians, behavioral scientists, physical therapists, nursing

ii. Network Structure
   1. 9 Clinical Sites plus 1 Biostatistical Coordinating Center
   2. Sponsor and Supervision: NIH (NIDDK, NICHD), Data Safety and Monitoring Board
   3. Executive Committee: Steering Committee Chair, BCC-Principal Investigator, NIDDK Project Scientist
   4. UITN Steering Committee: PI and Co-PI from each clinical site
   5. Standing Committees (Ex: Publications and Presentations)
   6. Working Groups: established to handle specific operational details usually under the guidance of SC or Protocol Committee
   7. Writing Groups: Led by concept originator, representation from each site

3. Accomplishments:
   A. Clinical Trials Completed or in Process
   i. SISTEr (Stress Incontinence Surgical Treatment Efficacy Trial) (and E-SISTER): Randomized Clinical Trial of the Burch Modified Tanagho and Autologous Fascia Sling Procedures.
   ii. BE-DRI (Behavior Enhances Drug Reduction of Incontinence) to test if the addition of behavioral treatment to drug therapy for the treatment of urge incontinence will increase the number of patients who can discontinue drug therapy and sustain a significant reduction of incontinence.
   iii. TOMUS (E-TOMUS): Trial Of Mid-Urethral Slings: To compare objective and subjective cure rates for urinary incontinence at 12 and 24 months between Retropubic Transobturator MUS.
   iv. VALUE (Value of Urodynamic Evaluation): To determine if women desiring surgery for predominant SUI who receive a basic office evaluation only have non-inferior treatment outcomes compared to women who receive both office evaluation and preoperative.
   v. Biomarkers
      1. Biorepository: enhance ability to discover & validate molecular targets in field of UI
      2. Urinary Markers after Continence Surgery (UMACS): Measure changes in urinary marker levels pre- and post-continence surgery.
   vi. Mixed Incontinence: Medical Or Surgical Approach (MIMOSA): compare patient-reported outcome for 2 distinct clinical approaches to MUI treatment –initial surgical vs. initial nonsurgical intervention (drug and behavioral therapy) with allowance for additional treatment(s)

C. Publications and Presentations:

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PFDN: AN INVESTIGATOR’S PERSPECTIVE
Anthony G. Visco, MD

The Pelvic Floor Disorders Network (PFDN) is a clinical trials research network that was originally formed in 2001 and supported by The Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health. The PFDN grew in 2011 from seven to eight clinical sites at medical centers across the United States and includes a data coordinating center and active involvement from the NIH Project Scientist.

The mission of the PFDN is to conduct multicenter randomized clinical trials and prospective observational studies to improve the diagnosis, treatment and prevention of female pelvic floor disorders. During the second cycle the PFDN embarked on translational research to help bridge the gap between bench knowledge and clinical decision-making and practice.

The PFDN members work together to identify and prioritize research questions and objectives, develop sound scientific approaches to design studies best able to address the research aims and to perform research studies in as high-quality and cost-efficient manner as possible. In this way, studies can be done more quickly than if the medical centers were working independently. Doctors from a variety of specialties, nurses, physical therapists, other health care workers, and support staff all play important roles.

Designing, implementing and monitoring high quality multicenter research involves many challenges, among them issues of research design and methodology, managing staff and site resources to maximize recruitment and retention, fiscal accountability and responsibility to provide the largest number meaningful research studies without sacrificing data or research quality.

The cooperative agreement mechanism provides a robust infrastructure by which multidisciplinary staff can efficiently develop, implement and maintain progress on multiple research projects simultaneously while disseminating research findings in a timely fashion. This organization provides a continuous flow of activities in contrast to the typical start up and slow down process often associated with single RO1 studies.

The PFDN consists of a Steering Committee that is comprised of the eight clinical site principal investigators, the principal investigator from the data coordinating center, an external Steering Committee chair and the NICHD project scientist. Each of the 11 members has a vote. In general, decisions are made by the Steering Committee for protocol development, policy changes and distribution of protocol capitation funds.

Protocols for index studies are initially presented as concept proposals, generally at an in-person meeting and include a hypothesis, objectives, research design, a preliminary sample size calculation and an initial budget estimate. Feasibility is critical at this stage as we work to avoid spending valuable PFDN resources in the development of a protocol that will ultimately prove impractical due to a lack of an adequate study population or insufficient resources.

Concepts proposals that are accepted move, the presenting PI forms a protocol committee and progresses towards mini-protocol. If the mini-protocol is approved by a vote of the Steering Committee, it proceeds to full protocol. If several protocols reach full protocol, a prioritization vote occurs to determine which of the protocols will proceed to implementation first.

Two additional types of study are ancillary studies and supplementary studies. Ancillary studies are those that use existing data but do not require the collection of new data. Supplementary study is linked to an index study however requires the collection of additional data either via questionnaire, biologic samples or diagnostic testing.

The Steering Committee meeting agenda and associated documents are circulated 2 weeks prior to the in-person meetings allowing the participants ample time to review the materials. Telephone conference calls are scheduled between the in-person meetings to maintain momentum and allow for all individuals to remain engaged in the process.
of protocol development. The in-person meetings, which occur quarterly, are critical to success of the network as they maximize the investigators' ability to reach consensus even amongst very controversial topics.

Through the above structure and processes, the Pelvic Floor Disorders Network strives to complete timely research studies with high-impact in order to significantly improve the lives of women suffering from pelvic floor disorders.

**MEASUREMENT OF URINARY SYMPTOMS: FUTURE PERSPECTIVES**

Ziya Kirkali, MD

Lower urinary tract symptoms (LUTS) are common both in men and women. Both incidence and prevalence rates increase with age; consequently, the financial burden to the nation pose a major challenge as our population get older. Those patients with symptoms of lower urinary tract dysfunction (LUTD) suffer considerable morbidity resulting in a significant decrease in quality of life for both the patient and his/her partner.

Symptoms of LUTD encompass all urinary symptoms including storage, voiding, incontinence, and post-micturition symptoms. Conventional thought presumes that dysfunction in specific organs are responsible for these individual symptoms. However, recent research suggests that common pathophysiological changes (e.g. inflammation, fibrosis, connective tissue, vascular or neurologic factors) in more than one urologic organ may be responsible for a group of symptoms. Moreover, involvement of non-urological adjacent organs (e.g. colon), remote organs (e.g. brain), other diseases/conditions (e.g. diabetes), medication (e.g. diuretics), or lifestyle factors (e.g. drinking habits) may contribute to the development of urinary symptom complexes. Thus, the underlying causes for symptoms of LUTD appear more complex than previously appreciated and potentially involve both organ/tissue-specific and more systemic contributions. To address this evolving view, new and novel approaches are needed to better define and categorize different lower urinary tract symptom complexes and identify the underlying cause(s) of observed symptoms and their proportional contribution to overlapping symptom profiles seen in numerous urologic conditions.

Although there are many validated instruments used in research evaluating LUTD, they are usually burdensome and do not capture all symptoms related to the lower urinary tract. Thus; there is a need for better measurement tools which focuses on patient reported outcomes (PRO) to quantify early, late, transient, and persistent symptoms of LUTD both in men and women. Meeting on Measurement of Urinary Symptoms (MOMUS) organized by NIDDK in November 2011 underlined the necessity to develop better, fit-for-purpose, more patient focused measurement tools to measure the right concept to be used in the right context. The currently published Symptoms of Lower Urinary Tract Dysfunction Research Network (LURN) FOA, (RFA-DK-11-026) is aiming to establish a network of investigators to develop new measurement tools and better phenotype patients with LUTD.
Early reports showing intravesical capsaicin’s effect on micturition over two decades ago turned conventional therapy for bladder dysfunction on its head. Following the initial excitation of the afferent system, single doses of capsaicin were able to produce an increase in bladder capacity, delay the first sensation to void and change the pressure threshold for micturition. This landmark finding by Maggi and associates launched the birth of afferent pharmacology on a 20 year journey of discovery and innovation extending therapeutic options beyond anticholinergic drugs targeting detrusor muscle control. Resiniferatoxin (RTX) followed with its thousand-fold intravesical potency over capsaicin and similar amazing increases in bladder capacity with reduced incontinence were reported in patients with neurogenic bladder dysfunction. Numerous basic science investigations ensued to locate capsaicin’s site of action in the bladder which drew attention to a new class of ubiquitous sensory receptors. Along with the discovery of the urothelium’s central role in bladder physiology, purinergic and vanilloid receptor function have advanced to significance as well over the last decade.

Transient Receptor Potential (TRP) channels are evolutionarily conserved from invertebrates to humans. TRP channels are expressed in almost every cell type in both excitable and non-excitatory tissue. There is little doubt that TRP channels represent the primary sensory transducing mechanism for most organ systems, including the lower urinary tract. TRP channel activation plays a critical role in vision, taste, olfaction, hearing, touch, pain, thermosensation and osmosensation. Mammalian TRP channels are categorized into 6 subfamilies based on sequence homology. Compelling evidence has accumulated over the last 10 years showing pivotal roles for TRPV1, TRPV4, TRPM8 and TRPA1 in normal and pathological lower urinary tract function. The weakly voltage dependent TRP channels transduce stretch, chemical irritation and temperature into specific cellular reactions initiating a cascade of events providing “sensation”. While many more details remain to better understand how TRP channels measure forces and environmental change, there is tremendous opportunity ahead to exploit their central role in afferent lower urinary tract physiology. Molecular and genetic investigation is revealing a number of TRP channelopathies underlying human disease across many organ systems.

This lecture will review the current TRP channel literature with a focus on lower urinary tract function and dysfunction. Despite reports of capsaicin and RTX action on the bladder through TRPV1 receptor activation over 20 years ago, no clinically available compounds have come to urology for treatment of bladder overactivity or pain. TRP channel physiology and our understanding of lower urinary tract “channelopathies” should yield targets for drug development.

REFERENCES
NEUROMODULATION FOR NEUROGENIC DISORDERS
Howard B. Goldman MD

Neuromodulation has become one of the accepted mainstays for the treatment of intractable OAB and retention in patients who do not respond to first-line treatments. For the last 15 years sacral nerve stimulation (SNS) has been the primary method of neuromodulation and while not approved for use in patients with neurogenic dysfunction it has been widely used for that indication (in fact the Medtronic information regarding Interstim indications and warnings states “Safety and effectiveness have not been established for ….. patients with neurological disease origins such as multiple sclerosis”). Recently percutaneous tibial nerve stimulation (PTNS) has become available and indicated for the treatment of patients with OAB and associated symptoms of urinary urgency, urinary frequency, and urge incontinence. Of interest there is no differentiation between idiopathic and neurogenic etiologies for the use of PTNS. There are also other experimental technologies or variations on the use of SNS that have been utilized for patients with neurogenic voiding dysfunction.

There have been a number of studies that have evaluated the success rate of SNS in patients with neurogenic dysfunction. Many have shown positive results. This data will be reviewed. One of the concerns however, with implantation of a permanent device is that many of these patients with neurogenic disorders may need magnetic resonance imaging in the future and the implanted device may prohibit that. Whether this is something of concern or not will be reviewed. Recently, encouraging studies utilizing PTNS for patients with neurogenic dysfunction have been published. These will be reviewed.

Other innovative uses of SNS and PTNS in this patient population as well as other techniques of neuromodulation will be reviewed as well.

NEUROMODULATION FOR PAIN
Craig V. Comiter, MD

Neuromodulation: a physiological process in which the influence of the activity in one neuronal pathway modulates the pre-existing activity in another through synaptic interaction. Biological neuromodulators include vanilloids such as capsaicin and resiniferatoxin, and denervators such as botulinum toxin. Electrical neuromodulation typically is accomplished via sacral, pudendal or tibial nerve stimulation.

To date, vanilloid compounds for the treatment of pelvic pain are largely investigational, including intravesical capsaicin and resiniferatoxin: which excite, then desensitize C fiber afferents. Resiniferatoxin is 1000x more potent than capsaicin, and is not associated with acute pain and burning during instillation. In clinical trials, both compounds are associated with a 33-50% reduction in incontinence and pain.

Botulinum toxin is an attractive idea for the treatment of pelvic pain, as pelvic skeletal muscle injury can cause pelvic pain in 2 ways – via direct injury, and if secondarily involved, via reflex protection against pain (splinting). Botulinum toxin allows these muscles to rest, similar to immobilizing an injured axial muscle. Botulinum toxin injection has been described as a successful treatment for vaginismus, pelvic muscle spasm, vestibulodynia, anal fissure, constipation, and volvodynia, as well as interstitial cystitis.

Patients with interstitial cystitis often appear to have an abnormal hypersensitivity component, displaying a complex visceral pain syndrome with neurogenic inflammation, primary afferent overactivity, and central sensitization. Neuromodulation affects these afferent and efferent nerve fibers passing through pelvic nerves – balancing neurological
stimuli between viscera and somatic muscles of the pelvis; restoring a balance of excitatory/inhibitory impulses to/from pelvic viscera at sacral/suprasacral levels; and downregulating C fiber activity.

Pudendal neuromodulation involves stimulation of the pudendal nerve – a peripheral nerve composed mainly of afferent sensory fibers from S1-S3. When offered pudendal versus sacral nerve stimulation, patients more often chose the pudendal stimulation, which was also more efficacious than the sacral route.

Posterior tibial nerve stimulation has also been tried for interstitial cystitis, but has not shown efficacy in 2 recent clinical trials.
Basics
The purpose of urodynamic testing is to record physiologic variables during bladder filling (storage) and emptying (voiding) in order to understand the cause of the patient’s symptoms. Because it is an interactive test between the patient and examiner, it is important that the examiner has all relevant clinical information in his consciousness as the urodynamic study progresses. To this end, the pre-urodynamic assessment is comprised of the following: 1) A focused history and physical examination, 2) Urinalysis +/- culture, 3) A 24 hour bladder diary, 5) A 24 hour pad test (for patients with incontinence), 6) uroflow (Q), 7) post-void residual urine (PVR). In order to properly interpret urodynamic studies, the following information should be available to the examiner before the start of the study: 1) What symptoms are you trying to reproduce? 2) What is the bladder capacity (maximum voided volume on the voiding diary PVR)? 3) What is the post-void residual urine? 4) What is the uroflow? 5) Is there a neurologic disorder that could cause neurogenic bladder?

Q & PVR should be performed prior to invasive urodynamics whenever possible. The flow rate is a composite measure of the interaction between the pressure generated by the detrusor and the resistance offered by the urethra. Thus, a low Q may be caused by either bladder outlet obstruction or impaired detrusor contractility (Chancellor et al, 1991). PVR is the volume of urine remaining in the bladder immediately following a representative void. There is considerable intra-individual variability in PVR and for that reason serial measurements are often necessary (Birch et, 1998; Griffiths et al, 1996; Stoller and Millard, 1989).

Invasive urodynamics is comprised of a filling phase and a voiding phase. Filling studies include cystometry (CMG), leak point pressure (LPP), sphincter electromyography EMG), and cystogram. Voiding studies are (detrusor) pressure/uroflow, EMG and voiding cystourethrogram.

Urodynamic technique: Prophylactic antibiotics are administered prior to the study. The patient is asked to void and a double lumen urodynamic catheter is passed into the bladder and a rectal catheter placed in the rectum to measure vesical (pves) and abdominal pressure (pabd) respectively. PVR is measured. The pressure transducers are zeroed to atmospheric pressure at the level of the symphysis pubis. They should be calibrated periodically. Pves and abd are displayed and detrusor pressure pdet is electronically calculated by subtracting pabd from pves and displayed on a third channel. Other channels display sphincter EMG, infused bladder volume, voided volume and uroflow. For videourodynamic, fluoroscopy images are sampled periodically during filling and voiding.

During bladder filling, vesical sensations and the presence or absence of involuntary detrusor contractions (detrusor overactivity or DO) are noted and bladder compliance is measured. If DO is documented, the patient’s awareness, concern and ability to contract the sphincter, abort the stream and prevent incontinence are noted. These characteristics are used to classify the type of OAB. Incontinent patients are asked to cough andValsalva and LPP is measured. Resting and straining cystograms are obtained.

During voiding or attempted voiding Pdet & Q are measured synchronously and voiding cystourethrogram is obtained. Bladder outlet obstruction is defined by pdet/Q criteria which are different for men and women.
Artifacts – Sampling Error is of two generic kinds, physiologic and temporal. From a physiologic standpoint, remember that urodynamic studies represent a snapshot at a single point in time and may not be representative. Temporal sampling errors relate to how frequently the data points are recorded and displayed.

Uroflow – The influence of voided volume: Q’s @ voided volume of < 150 ml are unreliable. Q increases with increasing voided volume, but decreases at larger volumes. To avoid temporal sampling only Q events lasting > 2 seconds should be reported.

Multichannel Urodynamic Studies – Abdominal and vesical pressure should always go up equally during coughing and straining and pdet should be unchanged if the pves and pabd transducers are zeroed & calibrated properly. The two most common problems with unequal pressure transmission are damping, (figure 3) and unequal transducer calibration (fig 4). Damping reduces the amplitude of the pressure. The two most common causes of damping are air bubbles in the line and obstruction of the catheter because it is up against the wall of the bladder or rectum. Another source of artifact occurs when, one of the catheters moves or is expelled. Another cause of artifact is rectal contractions. Since pdet is electronically derived by the subtraction of pabd from pves, spontaneous rectal contractions cause an artifactual rise in pdet. The urodynamic catheter may affect uroflow. It may cause obstruction or the patient may not void in his usual fashion. A common cause of an erroneous diagnosis of detrusor areflexia is failure to fill the bladder to capacity; bladder filling should continue until the patient feels a strong urge to void or an uncomfortable fullness before concluding that the bladder does not contract. Further, failure of detrusor contraction during urodynamics is very common and should not necessarily be considered pathologic. EMG artifacts are so common in adults that they should be interpreted with great caution and only when there is good correlation between changes in EMG and changes in detrusor pressure and uroflow.

REFERENCES


Urethral Obstruction

Detrusor pressure during voiding is a function of outlet resistance. Urethral obstruction is characterized by increased detrusor pressure and reduced urine flow rate. Pressure flow studies (PFS) diagnose urethral obstruction by measuring the synchronous values of flow rate and detrusor pressure. Urethral obstruction is most often seen as Bladder Outlet Obstruction (BOO), which in men is often due to benign prostatic obstruction and in women is sometimes seen after suburethral sling surgery. Other etiologies of urethral obstruction include high stage pelvic organ prolapse (POP), Detrusor External Sphincter Dyssnergia (DESD), and Acquired Voiding Dysfunction (AVD). During AVD the patient involuntarily (and subconsciously) contracts the external urethral sphincter during micturition. A healthy bladder overcomes urethral obstruction by contracting more forcefully. Although the flow may be slower, the healthy bladder does empty. In the face of untreated urethral obstruction, the bladder can decompensate by no longer generating the necessary pressure needed to overcome the obstruction. Over time, this decompensation results in detrusor underactivity which manifests clinically as either incomplete bladder emptying or urinary retention.

BOO in men is often diagnosed with either the Abrams Griffith nomogram the Schafer nomogram, or the ICS nomogram. Although all 3 nomograms are accurate in diagnosing BOO and no obstruction, each one has an equivocal zone. The ICS Nomogram defined the BOO Index (BOOI) as $P_{det}Q_{max} - 2 \times Q_{max}$. Men are obstructed if the BOOI is > 40, unobstructed if the BOOI is < 20, and equivocal if BOOI is > 20 and < 40. PFS show consistent reproducibility in the diagnosis of BOO in men. However, it is difficult to diagnosis BOO in the face of impaired contractility using any of these nomograms in men. Finally, BOO can lead to such storage abnormalities as DO or impaired compliance. Fortunately, the treatment of BOO can resolve DO and improve compliance.

BOO in women is less well defined because of variability in female voiding dynamics. Many women empty their bladders by simply relaxing the pelvic floor and some augment voiding by abdominal straining. Minor increases in detrusor pressure or decreases in flow rate can signify BOO in women. Lemack and Zimmern found that $Q_{max} < 12$ ml/sec and $P_{det}Q_{max} > 25$ cm H$_2$O predicted BOO in women with the highest sensitivity and specificity. Nitti and colleagues showed that the addition of fluoroscopy to urodynamics (FUDS) was helpful in the diagnosis of BOO in women. Women were classified as obstructed if there was radiographic evidence of obstruction between the bladder neck and distal urethra in the presence of a sustained detrusor contraction of any magnitude. In addition, concomitant fluoroscopy localizes the site of obstruction. Finally, Blaivas and Groutz use both noninvasive uroflow and $P_{det\max}$ (from 2 separate voids) in their nomogram for defining BOO in women. BOO is defined as either $Q_{max} < 12$ ml/sec with $P_{det}Q_{max} > 20$ cm H$_2$O or obvious radiographic obstruction with $P_{det}Q_{max} > 20$ cm H$_2$O or inability to void with catheter in place despite $P_{det}Q_{max} > 20$ cm H$_2$O. There is still no universally accepted definition of BOO in women. One must have a high index of suspicion in diagnosing BOO in women on the basis of LUTS, incomplete bladder emptying, and a history of surgery for either SUI and/or POP.

Incontinence

Urinary incontinence is the involuntary loss of urine which denotes a symptom, a sign and a condition. The purpose of urodynamic testing is to reproduce the incontinence (the sign) and thereby document the underlying cause (the condition). Incontinence may be urethral or extraurethral. Extraurethral incontinence is caused by urinary fistula or ectopic ureter. The conditions which cause urethral incontinence are 1) bladder abnormalities, 2) sphincter abnormalities, 3) cognitive/neurologic abnormalities Bladder abnormalities causing urinary incontinence include detrusor overactivity and low bladder compliance. Detrusor overactivity is a generic term for involuntary detrusor contractions which can be of neurologic or non-neurologic etiology. Low bladder compliance describes an abnormal pressure/volume relationship wherein there is a high incremental rise in detrusor pressure during bladder filling. Bladder, cognitive and neurologic abnormalities are assessed by cystometry.
Sphincter incontinence denotes sphincter weakness. In both sexes, sphincter function is measured by leak point pressure (LPP); the lower the LPP, the weaker the sphincter and vice-versa. In women, there is another dimension – urethral mobility, that is measured by Q-tip test, stress cystogram and ultrasound.

**Caveats:**
1) Bladder and sphincter abnormalities often co-exist in incontinent patients, so it is important to check for each during urodynamic studies.
2) Incontinence may co-exist with urethral obstruction and urethral obstruction is a common cause of detrusor overactivity that causes incontinence. Thus, a detrusor pressure / uroflow study should a routine component of the urodynamic evaluation of incontinence.
3) When incontinence is suspected, but not demonstrated during the urodynamic study, the bladder should be refilled after the PFS study (before the catheter is removed) and the patient checked for incontinence with a comfortably full bladder.

**Neurogenic Bladder**

Neurogenic bladder (NGB) is the lower urinary tract dysfunction noted in the presence of a neurologic disorder. Neurologic diseases that commonly lead to a NGB include spinal cord injury (SCI), multiple sclerosis (MS), Parkinson’s Disease, stroke and spina bifida. Two of the primary responsibilities of the healthcare provider managing NGB include the clinical management of the lower urinary tract (with optimization of continence) and minimization of bladder storage pressures. Management options for the patient with NGB include: indwelling catheter (per the native urethra or suprapubic), reflex voiding to a toilet, diaper or condom catheter, clean intermittent catheterization (often combined with anticholinergics and/or botulinum toxin injections) and lower urinary tract reconstruction.

Urodynamics is an important tool in the clinical management of NGB and is what allows for the evaluation of bladder storage pressures. Patients with elevated bladder storage pressures (Pdet >40 cm H2O) are at risk for renal injury and, if left untreated, possible progression to renal failure. Depending on the type of neurologic insult, possible bladder abnormalities include neurogenic detrusor overactivity, detrusor underactivity/areflexia, and loss of compliance. Possible issues related to the outlet include sphincteric incompetence and detrusor-external sphincter dysynergia.

This portion of the Basic Urodynamics course will focus on the urodynamic evaluation of patients with NGB. Issues to be covered include:

- When should a UDS be initially performed
- When and at what intervals should follow-up UDS be performed
- The basic UDS evaluation of a pt with NGB will be reviewed. This includes:
  - PVR
  - Complex cystometrogram
  - Pressure-flow study
  - Measurement of leak point pressures (Detrusor & Abdominal)
- The clinical significance of poor compliance and abnormal detrusor and abdominal leak point pressures
- The potential benefit of simultaneous fluoroscopic imaging in certain patients
- The unique issues potentially associated with performing these studies in patients with NGB
  - Latex allergy
  - Autonomic dysreflexia
- The understanding of how these studies should be interpreted in a patient with NGB
SNS FOR FECAL INCONTINENCE

David Margolin, MD

Fecal incontinence, the loss of anal sphincter control leading to the unwanted release of stool or gas, is a physical and psychological handicap that has a tremendous impact on an individual’s quality of life. From a societal point of view fecal incontinence is the second most common cause of institutionalization in the US. While medical management is the mainstay of therapy, the FDA has recently approved sacral nerve stimulation (SNS) has for the treatment of fecal incontinence. While the direct mechanism of action is unknown it is thought that during sacral nerve stimulation two reflex arcs are activated by excitation of the S2-S4 afferent nerves. This increases sympathetic hypogastric activity and parasympathetic lower motor neuron activity to the anal sphincter resulting in direct voluntary contraction of the sphincter. The activation of the internal sphincter is mediated by sympathetic and parasympathetic fibers causing tonic stabilization of internals sphincter or an inhibition through a sacral interneurons arc of rectal muscle contraction.

The implantation of sacral nerve stimulation involves two stages. First the leads are implanted and the individual undergoes test stimulation. With the patient in prone position the S2, S3 and S4 foramina are located through bony landmarks. Under local anesthesia and fluoroscopic guidance a 20-gauge insulated needle in passed percutaneously into the S3 foramina. The needle is stimulated causing a contraction of the pelvic floor. To confirm which nerve roots that are being stimulated another needle is passed into the S2 foramen.. Once S3 placement is confirmed a permanent lead is placed and connected to an external stimulator. The stimulator provides a unipolar monophase impulse with a rectangular pulse wave at 210 microsec, frequency of 25Hz and amplitude of 2-8 V depending on patient tolerance. After initial adjustments changes in voltage are made to optimize the patient function and tolerance. In approximately 1 to 2 weeks the lead is tunneled subcutaneously and attached to an implanted pulse generator.

In April 2011, the FDA approved the sacral nerve stimulator (InterStim®, Medtronics) for the treatment of chronic fecal incontinence in patients who have failed or are not candidates for more conservative treatments. While there are long term results for urinary incontinence the initial published results for the treatment of fecal incontinence are encouraging. And this therapy offer another treatment option for this debilitating problem

CONSERVATIVE THERAPIES INCLUDING PTNS
Steven Siegel, MD

There are non-surgical remedies for fecal incontinence that may be effective and should be offered to patients before considering more extensive testing or surgical interventions such as SNM or sphincteroplasty. To a large degree, the appropriate interventions are similar in concept and often in implementation to those used for urinary symptoms. Therefore, many of us who treat urinary incontinence are already familiar with, have access to, and can implement appropriate non-surgical care for fecal incontinence.

A. Initial
1. Assess bowel habit (diary) and toilet access
2. Diet and fluid intake
3. Medication
4. Coping strategies

B. Secondary
1. Pelvic floor muscle exercises/biofeedback
2. E-stim
3. PTNS
C. Tertiary

1. Additional evaluations
   a. Ano-rectal physiologic testing
   b. Anal ultrasound
   c. Endoscopy

2. SNM
3. Sphincteroplasty or other surgical intervention

The timing of additional evaluations and ability of them to discriminate meaningful treatment options for fecal incontinence deserves careful consideration. Parallels to the role of urodynamic testing may be drawn. While some experts insist on complete evaluation prior to instituting any incontinence therapy, many feel comfortable with conservative/reversible measures first, and resort to UDS testing when these prove unsuccessful, or prior to surgical interventions. As in the case of urinary incontinence, the predictive value for therapy outcome from anal manometric testing may be limited. A trial of SNM for fecal incontinence may have the better predictive value for a specific therapy outcome. The limitations of this approach should be scrutinized carefully.
ROBOT-ASSISTED LAPAROSCOPIC SACROCOLOPEXY
Elizabeth R. Mueller, MD, MSME, FACS
The use of a synthetic mesh to resuspend a prolapsed vaginal apex to the sacrum was first described by Fredrick Lane in 1962(1). Level I evidence supports the superiority of open abdominal sacrocolpopexy (ASC) to vaginal reconstructive procedures for anatomic correction of apical prolapse (2, 3). Numerous case-series consistently report anatomic success rates of 76-100% after ASC (4-8). Assessing functional outcomes is more complex as most studies do not clearly report preoperative symptoms and are limited by non-validated pre and postoperative symptom measures. Lower urinary tract symptoms (LUTS) and bowel dysfunction are common in women with advanced pelvic organ prolapse undergoing sacrocolpopexy. The CARE study rigorously characterized the pre-operative and post-operative LUTS and bowel dysfunction in 322 urine “continent” women undergoing ASC who were randomized receive a concomitant prophylactic Burch urethropexy (9). One-year outcomes demonstrated that the ASC reduced irritative and voiding symptoms and the prophylactic Burch reduced stress and urge incontinence (10). Similarly, the study authors found that correction of the prolapse with ASC, performed with or without a posterior vaginal wall procedure(s) was associated with significant reductions in l-year post-operative obstructive defecatory and other bowel symptoms (11).

The technique has evolved over the last four decades with varying reports of where on the vagina and sacrum the graft is attached and what type of graft material is used. Minimally invasive approaches for performing abdominal sacrocolpopexy are the most recent developments and appear to offer some clear advantages for the patient. Instead of a single 8-12 cm abdominal incision, surgeons make 4-5 smaller incisions totaling ~ 3-5 cm. The post-operative advantages for the patient are somewhat offset by a range of motion loss of both wrists due to the limitations of laparoscopic surgical instruments and changes in the visual field which is reduced to a two-dimensional image. The addition of robotic assistance results in a three-dimensional image and facilitates instrument technology mimicking the natural motion of the surgeon’s wrists.

When compared to open techniques, robotic procedures are associated with less blood loss, shorter lengths of stay, and longer operative times (12-14). Despite its popularity and likely benefits over open surgery, it is not clear that robotic surgery has any benefit to the patient over laparoscopic surgery and may be associated with greater costs. A recent single-site randomized trial showed longer operating times and more post-operative pain with RASC compared to LASC and similar anatomic outcomes at 1-year (15). One small retrospective series indicates comparable outcomes between RASC and LASC with respect to cure of prolapse and procedural costs (13, 16). No randomized trials have primarily compared cost outcomes of RASC and LASC.

REFERENCES

TIPS AND TRICKS TO IMPROVING ROBOT EFFICIENCY FOR SACROCOLPOPEXY

Catherine A. Matthews, MD, FACOG, FACS

This lecture will focus on the practical steps required to perform three robotic sacrocolpopexies/ supracervical hysterectomy and sacrocervicopexy in a standard 8-hour surgical schedule. The concept of “parallel processing” as opposed to linear functions will be stressed. Specific instructions for anesthesia preparation, patient positioning, and nursing set-up will be described. Appropriate and efficient port-placement and a technique of side-docking, in less than 3 minutes, will be presented. The following steps for supracervical hysterectomy and cervicosacropexy will be described: Retraction of the sigmoid colon, dissection of the retrorectal space and identification of the anterior longitudinal ligament, creation of a retroperitoneal tunnel along the right paracolic gutter, transection of the round and utero-ovarian ligaments, dissection of the vesico- and recto-vaginal spaces, amputation of the corpus, attachment of a y-shaped graft to the anterior and posterior vaginal walls and cervix, and attachment of the graft that is passed through the peritoneal tunnel to the sacrum. Steps for improving efficiency of concomitant procedures such as mid-urethral slings will be described. OR clean-up and turnover, including appropriate packaging and bundling of equipment will be discussed. Video clips of all steps will be included.
Neurosurgical procedures have been used in the management of neurogenic patients for many years. Different procedures have been described including various open and minimally invasive operations such as complete or selective rhizotomies. Most of the techniques focus on treating detrusor overactivity and the accompanying incontinence. However the procedures can be extensive and can have multiple consequences for other functions like bowel movements, erectile functions, lower limb spasms etcetera. All these affects are difficult to compare and to assess in a holistic manner. Therefore the focus is most of the time on the bladder functions and therefore ignoring the other effects, beneficial or deleterious. Various surgical options have been tried in order to control detrusor overactivity in neurogenic patients.

Attempts of sacral root surgery first focused on only destroying the anterior motor sacral roots but this approach did not achieve reliable results. However patients can acquire continence if the reflex arc that supported involuntary bladder contractions is broken by the division of the dorsal (sensory) roots of S2,3,4. Complete de-afferentation of the sacral micturition centre by intradural rhizotomy give good results for abolishing detrusor overactivity and creating a flaccid bladder [1].

Electrostimulation to improve micturition in patients with spinal cord injury was extensively researched but direct stimulation of the detrusor, the spinal cone, the splanchnic and sacral nerves have not produced reliable results. Giles Brindley started to look at the possible use of neuromodulation to aid bladder emptying. He developed a technique for stimulating the ventral sacral roots in order to obtain controlled and complete bladder emptying in cases of spinal cord injury [2]. This led to the development of an implanted stimulator to induce micturition in patients with complete suprasacral spinal cord lesions. The equipment comprises two elements. The energy source and the microprocessor for adjusting the stimulation parameters are not implanted. The transmitter transforms the electric current from the energy source into electromagnetic waves, which are picked up by the implanted receiver and re-transformed into an electric current that circulates to the electrodes in contact with the nerve. Depending on the surgeon’s decision, the implant is placed within the membranes of the dura mater or outside them, so as to stimulate the sacral roots from S2 to S4. Posterior rhizotomy from S2 to S4 is carried out during the procedure in order to abolish detrusor overactivity.

Device-driven micturition is not continuous: the detrusor cannot be stimulated without also stimulating the sphincter as the parasympathetic fibres to the detrusor and the somatic nerves innervating the striated muscle of the urethral sphincter are stimulated together. The response of detrusor smooth muscle fibres leads to a gradual increase in intravesical pressure, which is maintained after stimulation has ceased because of the slow contractile properties of smooth muscle. In contrast, striated muscle exhibits a rapid "on-off" response to stimulation. When stimulation stops, the striated sphincter immediately relaxes, whilst the detrusor continues to contract. Intermittent bursts of stimulation are used to build up pressure within the bladder to the point where voiding can occur in the gaps between stimulation when the sphincter relaxes. The careful selection of stimulation parameters and time intervals between stimulation bursts results in discontinuous, but satisfactory, micturition. This way of voiding is called post stimulus voiding. Attempts at blocking the stimulation of the striated sphincter in order to stimulate straight away have not been reliable.

The Brindley stimulator can also impact on anorectal, erectile function and lower limb spasms. The patient must have a complete spinal cord injury (stimulation is extremely painful in those with incomplete lesions) and an intact conus medullaris. Furthermore, dorsal rhizotomy will abolish reflex erections and ejaculation and can be associated with the development of stress incontinence. The results of the intervention with regard to continence and bladder voiding are good. Failures result from incomplete rhizotomy, where detrusor overactivity persists, or from sphincter insufficiency. In all reported series, mean bladder capacity increased significantly. Micturition was obtained by electrostimulation with a PVR of ≤ 50 ml in 69 to 100% of patients. All series report decreased incidence of urinary infection. It appears that this surgery preserves the upper urinary tract as a result of the posterior sacral rhizotomy controlling detrusor overactivity
and maintaining normal bladder compliance. A further potential benefit of the dorsal rhizotomy that accompanies stimulator implantation is that it may abolish or limit the severity of autonomic dysreflexia [3]. Martens et al. have looked at the effect of the Brindley procedure on a quality of life and were able to demonstrate good outcomes in comparison to a matched population who had been treated using alternative approaches [4].

REFERENCES
While autologous tissues such as rectus fascia and fascia lata have long been considered a standard of care for surgical correction of stress urinary incontinence in women, the use of these tissues is associated with morbidity from fascial harvest. Over the last century, tissue substitutes derived from cadaveric, animal, and polymeric sources have been introduced and have subsequently met with a wide range of outcomes and complications in their attempt to supplant autologous tissue as the gold standard. Biologic grafts (cadaveric allografts and xenografts), in particular, have been particularly unpredictable in their incorporation. While these materials are theoretically attractive for their ability to remodel native tissue, the surgical outcomes have fluctuated widely and some of these materials have met with poor acceptance by native tissues. With the widespread implementation of the synthetic midurethral sling, biologic materials have been further pushed into the role of afterthought for many surgeons.

While the use of polypropylene in midurethral sling surgery has quickly replaced most other procedures for SUI, the use of this material and other synthetics for interposition grafting in pelvic floor repair has been met with greater controversy. While early anatomic outcomes have been encouraging, the positioning of synthetic mesh through a vaginal incision has been accompanied by highly publicized cases of infection, erosion, and extrusion. With their theoretical ability to remodel native tissue, biologic materials may decrease the potential of extrusion and infection seen with synthetic meshes. To date, biologics have been used for interposition grafting for many years and several biologic options may be available for use with commercial prolapse repair kits.

The following are questions to be answered:

1. What is the mechanism of incorporation for each type of biologic material?
2. What are the surgical outcomes after incontinence and prolapse surgery with biologic materials?
3. What is the level of evidence supporting the surgical outcomes?
4. What are the specific complications associated with the implantation of these materials?
5. What advantages (if any) can be conferred by the routine use of these materials in sling and pelvic prolapse surgery?
BACKGROUND AND ORGANIZED UROLOGY RESPONSE

J. Quentin Clemens, MD

In October 2008 the FDA released a warning about complications associated with the use of vaginal mesh for the treatment of pelvic organ prolapse (POP) and stress urinary incontinence (SUI). The announcement can be found here: http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/PublicHealthNotifications/ucm061976.htm

According to the announcement, the FDA had received more than 1,000 reports of complications associated with transvaginal mesh placement in the preceding three years. This was based on data reported to the FDA Manufacturer and User Facility Device Experience (MAUDE) database, which includes reports of adverse events involving medical devices. Manufacturers and user facilities (e.g. hospitals, ambulatory surgical centers) are required to report device-related adverse events to this database, but reports from individual physicians are strictly voluntary.

The 2008 FDA announcement recommended that health care providers should:

- Obtain specialized training for each mesh placement technique, and be aware of the risks of surgical mesh
- Be vigilant for potential adverse events from the mesh, especially erosion and infection.
- Watch for complications associated with the tools used in transvaginal placement, especially bowel, bladder and blood vessel perforations.
- Inform patients that implantation of surgical mesh is permanent, and that some complications associated with the implanted mesh may require additional surgery that may or may not correct the complication.
- Inform patients about the potential for serious complications and their effect on quality of life, including pain during sexual intercourse, scarring, and narrowing of the vaginal wall (in prolapse repair).
- Consider providing patients with a written copy of the patient labeling from the surgical mesh manufacturer, if available.

From 2008 through 2010, an additional 1503 adverse event reports associated with mesh use for POP were reported to the FDA via the MAUDE database. As a result, in July 2011 an updated FDA warning was released which stated that serious complications associated with surgical mesh for transvaginal POP repair are not rare. The updated announcement can be found here: http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm262435.htm

The FDA also conducted a literature review comparing mesh POP surgeries with non-mesh surgeries, and concluded that “it is not clear that transvaginal POP repair with mesh is more effective than traditional non-mesh repair”, and that mesh techniques for POP repair “may expose patients to greater risk”. Importantly, this updated, more serious, FDA warning was limited to mesh use for POP repair.

The 2011 FDA announcement endorsed their 2008 recommendations, and also stated that health care providers should:

- Recognize that in most cases, POP can be treated successfully without mesh thus avoiding the risk of mesh-related complications
- Choose mesh surgery only after weighing the risks and benefits of surgery with mesh versus all surgical and non-surgical alternatives
- Consider these factors before placing surgical mesh:
  - Surgical mesh is a permanent implant that makes future surgical repair more challenging
  - A mesh procedure may put the patient at risk for requiring additional surgery or for the development of new complications
Removal of mesh due to mesh complications may involve multiple surgeries and significantly impair the patient’s quality of life. Complete removal of mesh may not be possible and may not result in complete resolution of complications, including pain.

Mesh placed abdominally for POP repair may result in lower rates of mesh complications compared to transvaginal POP surgery with mesh

- Inform the patient about the benefits and risks of non-surgical options, non-mesh surgery, surgical mesh placed abdominally and the likely success of these alternatives compared to transvaginal surgery with mesh.
- Notify the patient if mesh will be used for her POP surgery and provide the patient with information about the specific product used
- Ensure that the patient understands the postoperative risks and complications of mesh surgery as well as limited long-term outcomes data.

It is worth noting that these announcements were generated and released by the Obstetrics and Gynecology Devices panel of the FDA, and that the Urology branch of the FDA was not involved. Therefore, no urology representation or input was reflected in the announcements.

Following the July 2011 FDA announcement, responses were posted by SUFU and AUGS. The SUFU response can be found at: http://www.sufuorg.com/resources/announcements.aspx. The AUGS response can be found at: http://www.augs.org/p/cm/ld/fid=163

On September 8-9, 2011, an FDA public advisory committee meeting about transvaginal mesh was held in Washington, DC, at which time all interested stakeholders were able to provide public comments to the panel. Representatives from SUFU, the AUA and AUGS gave presentations, all of which reinforced the following points:

- It is critically important to distinguish between mesh used for POP and mesh slings used to treat SUI.
- The use of mesh for SUI surgery (midurethral slings) is an established technique with a favorable risk-benefit ratio, and any reduction or restriction of the use of these techniques will be a disservice to patients.
- Conversely, the risk-benefit ratio for the use of mesh for POP repair is less well defined. However, certain patients may benefit from mesh techniques for POP repair.
- Complications can occur after mesh POP repair, but many of these complications can also occur after non-mesh repair. Furthermore, many women undergo mesh POP repairs without complications.
- We agree with the FDA that a thorough informed consent process is necessary before any of these procedures, that rigorous training is essential, and that surgeons who implant mesh should be able to recognize and manage mesh-related complications.
- Future FDA panels related to urinary incontinence or POP should include urology representation.

Following the FDA public meeting, the AUA issued position statements regarding the use of vaginal mesh for SUI and for POP. These position statements can be found at: http://www.auanet.org/content/aua-policies/position-statements.cfm

Based on the literature review and the input received from the advisory committee meeting, on January 3 2012, the FDA issued post-market surveillance orders to 33 manufacturers of surgical mesh for POP, and to 7 manufacturers of single-incision mini-slings. The FDA also indicated that they are considering reclassifying surgical mesh for POP from Class II to Class III.

In my presentation I will review the above material in more detail, particularly the official SUFU and AUA responses. This will serve as an introduction to the subsequent speakers who will be representing the viewpoints of the FDA, patients, industry, and clinicians in this controversial issue.
FDA PERSPECTIVE
Janine M. Morris
In October 2008, the FDA issued a Public Health Notification (PHN) which included a discussion of adverse events related to urogynecologic use of surgical mesh from 2005 to 2007 and recommendations on how to mitigate risks and how to counsel patients. During this three year period (2005-2007), the FDA received a total of 1,106 Medical Device Reports (MDRs) of injury, death or malfunction: 149 for POP, 835 for SUI and 122 for both POP and SUI. On July 13, 2011, the FDA issued an updated safety communication about serious safety and effectiveness concerns over the use of surgical mesh for the transvaginal repair of POP. A review of adverse events reported to the FDA showed that there were five times as many reports associated with surgical mesh used for POP repair from 2008 - 2010 compared to 2005 – 2007. In response to this growing concern the Agency convened a panel of outside experts on September 8-9, 2011 to discuss the safety and effectiveness of surgical mesh used to treat SUI and POP. In addition, the discussion included a potential change in risk classification of surgical mesh used for transvaginal POP repair from Class II to Class III, which would require manufacturers to submit premarket approval applications, including relevant clinical data and the types of clinical studies necessary to address the risks and benefits of transvaginally placed mesh used to treat POP.

The subject of this presentation will be to review the regulatory framework for medical devices, in particular, surgical mesh under 21 CFR 878.3300. Provide some insight into the process that led to the PHN and other actions under the authority of FDA. Present the major outcomes of the panel meeting and provide a status update on what the Agency’s next steps are with respect to Surgical Mesh for the treatment of POP and SUI.

PATIENT PERSPECTIVE
Colleen H. Kelly and Anna Albrecht
Women’s Health Foundation (WHF) is like no other health organization. There is no other nonprofit devoted to women’s pelvic health that researches, develops and advocates on behalf of women’s pelvic health. As the nation’s most visible and passionate champion of women’s pelvic health issues, WHF is uniquely suited to deliver culturally relevant pelvic health education to women to assist them in accessing care. Driven by the belief that women have a fundamental right to live without shame and limitations, the WHF provides women life-enhancing strategies to achieve pelvic health and wellness across the ages:
• Working to instill in young women an understanding of the role of pelvic structure, function and health to be better prepared for life course experiences.
• Educating women of childbearing age about the effects of pregnancy and childbirth on their bladder, bowel and pelvic health.
• Introducing behavioral approaches to seniors to improve quality of life related to pelvic dysfunction among those who have never received a diagnosis or help with their symptoms.
• Improving quality of life by introducing pelvic health concepts, including behavior modification and treatment options, to senior women, many of whom have never received a diagnosis or help with their symptoms.

While underappreciated, community-based solutions exist to improve bladder control and overall pelvic health. Research shows behavior modification through awareness of nutrition, voiding behavior and muscle exercise is a promising approach to improve pelvic health. WHF has led the field in increasing awareness of women’s pelvic disorders and providing education through our award-winning, evidenced-based, wellness programs Total Control® and Total Control Platinum™ and our related low literacy pelvic health educational materials.

Two primary issues are at the root of under-diagnosed pelvic health disorders, a) lack of understanding by women of normal and abnormal pelvic symptoms; and b) the socially stigmatizing nature of the disorder, making women reluctant to report symptoms. Breaking the silence on pelvic health issues is the key to improving the diagnosis and treatment of pelvic disorders. Women need to feel comfortable learning and talking about conditions such as urinary incontinence, pelvic organ prolapse, and other pelvic disorders which will in turn, empower them to speak to their providers and to make behavioral changes to improve their pelvic health.
WHF has been recognized as a unique force in the field of pelvic health and wellness, focused on empowering women with knowledge and simple behavioral modification approaches to improving their pelvic health, and building a sisterhood of silence into a sisterhood of strength. By utilizing current trends in social media, Women’s Health Foundation has become the voice of the women we serve. This in turn, has helped to establish an environment for comfortable conversations around stigmatized topics, and enabling women and girls to better understand life stage events that may impact their pelvic health.

Female pelvic dysfunction can be conceptualized on a continuum of need; some pelvic disorders are easily managed with behavior modification, while others require access to specialty care such as female urology, urogynecology or pelvic floor physical therapy. WHF is committed to pelvic health education to improve women’s ability to understand and seek care for their conditions as well as raising awareness of when, how, and where to seek care.

Women’s Health Foundation’s public awareness strategy for FDA’s recent warning about the use of mesh in transvaginal surgical treatment included the following activities:

- In July, published several blogs on its popular website: http://womenshealthfoundation.org/blog informing women and patients of the FDA warning.
- Called for women to share their stories of both treatment success and failure on the blog.
- In August, WHF Founder, Missy Lavender was featured on “Real Women on Healthcare” on blog radio to talk with Kelley Connors, Dr. Roger Goldberg and Sherrie Palms about pelvic organ prolapse and the FDA’s recent warnings.
- In September, WHF Board Member Alicia Oberman presented on behalf of the organization at the public FDA hearing addressing the recent warning and the use of mesh in transvaginal pelvic organ prolapse (POP) surgery.

AN INDUSTRY PERSPECTIVE*

Piet Hinoul, MD, PhD

*Not CME accredited

The U.S. Food and Drug Administration (FDA) convened a two-day panel meeting on September 8 and 9, 2011 with the Obstetrics & Gynecology Medical Devices Advisory Committee to discuss the use of transvaginally placed surgical mesh to treat pelvic organ prolapse (POP) and stress urinary incontinence (SUI). Ethicon Women’s Health and Urology worked with other mesh manufacturers as an “Industry Working Group” through the medical device trade association, AdvaMed, to provide an accurate and informed perspective on the discussion topics raised by FDA.

The Industry Working Group presented its scientific assessment of the safety and effectiveness of transvaginal mesh devices and its position that these products should remain as Class II devices subject to the 510(k) requirements. The Industry Working Group proactively proposed additional regulatory controls for transvaginal mesh devices for POP to enhance patient and physician information regarding these devices, and to support the continued collection of clinical evidence.

The majority of panel members agreed with FDA’s position on the reclassification of transvaginal mesh POP devices from Class II to Class III. A reclassification of abdominally-delivered POP mesh devices was not proposed or recommended. With regard to SUI devices, the panel members reached consensus that additional post-market surveillance studies would not be necessary for current retropubic or transobturator slings, due to their well established benefit/risk profile. However, the panel recommended post-market surveillance studies for currently marketed mini-slings.

Ethicon remains committed to working with FDA and the medical community to ensure that surgeons have continued access to safe and effective treatment options that meet the unique needs of their patients. We will continue to collect data to further support the use of our products, and we are prepared to perform both pre-market and post-market clinical studies where needed and appropriate. This is consistent with our long-term commitment to generate clinical evidence.
LITERATURE REVIEW / CLINICAL PERSPECTIVE
Howard B. Goldman, MD

The use of transvaginal mesh for the repair of pelvic organ prolapse was introduced in the hopes of allowing a transvaginal POP repair that had a higher long-term success rate than traditional vaginal POP repairs. Though many have noted the importance of an apical repair together with an anterior or posterior repair, the failure rate with an apical repair can still be significant. Classically the failure rate appears to be greatest for anterior repairs and a number of factors seem to impact the risk of recurrence. Two of these factors are prior recurrence and high stage of prolapse. Selective use of mesh has been shown to significantly lower the rate of objective anatomic recurrence. However, most studies to date have not shown a statistically significant reduction in subjective outcomes. Of importance at one year of follow-up there is a difference in subjective outcomes favoring mesh – just not at a statistically significant level. Many have made the argument that with time this will probably become a significant difference.

There has been much concern regarding the complications associated with transvaginal mesh use. Some of these concerns are valid and some are not. Unfortunately, many surgeons, even experts, who adopted these procedures were not entirely familiar with the appropriate surgical techniques when utilizing transvaginal mesh. The dissection is completely different from the traditional POP repair techniques. Mesh placement at the traditional dissection depth is doomed to cause problems. Many others utilized mesh on patients who probably never needed a repair in the first place. Results from surgeons well trained and facile in the use of mesh are good with few complications.

Any surgical procedure has a risk of complications. In fact on the list of complications that the FDA noted are associated with mesh only one is unique to mesh use and the others can all be seen in native tissue repairs. There is a misconception that when a mesh complication occurs the patient is doomed to be a bladder/vaginal “cripple”. This could not be further from the truth. There have been a handful of studies reporting outcomes after repair of mesh complications. In the vast majority the presenting complaints can be treated successfully. It is important to note that just as every surgeon should not be placing mesh, every surgeon should not be repairing these complications. We have seen a number of cases where the complication’s repair led to worse complications than had been present initially.

The bottom line is that transvaginal mesh can be particularly useful in select patients with select types of POP. The repair technique is very different from the traditional repairs and only those who have been well trained in these techniques should utilize them. When a complication does occur it can usually be successfully treated by someone skilled in this area.

Specific data and examples will be reviewed during the lecture on this topic.
Health providers worldwide are well aware that the treatment of OAB is behavioral modification and antimuscarinic agents with the goal of relieving symptoms and balancing drug treatment efficacy with side effects and costs. Unfortunately for a number of reasons many patients do not reach their treatment goal and suffer from a new disease not yet defined by experts, and in many cases is seldom talked about by patients and health care providers. This disease is called “refractory OAB” and to which I have coined the term “ROAB”, a condition that up to now has been hovering below the radar of many caregivers and industry. Well guess what, things are about to change!

Who has ROAB?
Simply stated- millions do! In fact, I believe that ROAB is more prevalent than OAB that is currently effectively managed by medical therapy. Lets face it, more than 50% of patients with OAB do not respond favorably to the medications we prescribe.

ROAB includes those OAB sufferers who:
- Do not respond to antimuscarinics in spite of trying multiple agents
- Cannot tolerate antimuscarinics
- Cannot afford antimuscarinics
- Have contraindications to taking antimuscarinics
- Do not want to take medication

How do we treat ROAB?
The good news is that there is now a new treatment for ROAB called Urgent® PC. As of January 1, 2011 Urgent® PC, or percutaneous tibial nerve stimulation (PTNS), is now available and reimbursed as an in-office procedure for patients with refractory OAB. Although Urgent® PC is not a panacea, it does benefit many patients with ROAB giving them hope and dignity.

Neuromodulation for the masses
Although sacral nerve stimulation (Interstim®; Medtronic, Inc., Fridley, MN) is an FDA-approved and effective neuromodulation therapy for refractory OAB it simply has not filled the void in treating the millions of patients with ROAB. In spite of its proven effectiveness most urologists do not perform Interstim®, don’t refer to those who do, and the procedure may be perceived as too invasive or expensive, especially in the elderly and in those who are frail or have a number of medical co-morbidities. Botulinum toxin (Botox®) injected directly into the detrusor muscle endoscopically is an effective neuromodulation treatment for refractory OAB but its use in clinical practice is currently limited by its lack of FDA-approval for idiopathic OAB.

Although it may appear harsh, beyond the scope of practice of incontinence experts the routine use of neuromodulation as a treatment of lower urinary tract symptoms has not been available to most patients. In contrast, with the advent of Urgent® PC, I predict that the majority of urologists and uro-gynecologists will now begin offering PTNS to patients with OAB. For this reason I have reflected that Urgent® PC is not just launching in-office neuromodulation, it functionally is launching neuromodulation to the masses of physicians and patients who otherwise are not treating or are not being treated for ROAB, respectively.

Clinical effectiveness of PTNS
The data which supports the efficacy of Urgent® PC will be presented. The robustness of the data is supported by:
- the comparative data to extended-release tolterodine
- the level one evidence demonstrated by the PTNS vs. SHAM study
- the long-term effectiveness of PTNS
**Therapeutic algorithm**

A therapeutic algorithm from a continence center that for many years has utilized sacral nerve stimulation, PTNS, and botulinum toxin will be presented.

The use of PTNS in a variety of patient types will be presented including:

- OAB in the frail elderly
- OAB in patients with mixed incontinence
- OAB in patients with male LUTS
- OAB in patients with neurogenic bladder
- OAB patients with significant nocturia
- OAB who are partial responders to antimuscarinics

**Conclusions**

PTNS offers patients with ROAB a minimally invasive, office-based procedure that is safe, effective, and is an important addition to the therapeutic armamentarium. PTNS raises the bar and you simply cannot deliver the same level of efficacy without it. I believe that in-office neuromodulation is here to stay and that one-day we will look back in time and wonder how we ever practiced without it.
SCIENCE: THE ART OF PROGRAMMING
Lisa Zwiers, PA-C
We implant Interstim devices in a diverse population. These patients vary in age and have different urinary complaints. Although we know the science behind programming, you need confidence and a systematic approach to have a successful, efficient, programming session. I have been programming the Interstim device for the past eleven years and will discuss an approach that will take the worry out of these visits. This course will teach you how to program the Interstim device to achieve optimal symptom control. In addition, we will discuss features of the Medtronic physician programmer that are highly valuable during a programming visit.
This breakout session will focus on older females who have recurrent symptomatic infections and associated varying degrees of pelvic prolapse. New treatment strategies for combating these infections will be reviewed with particular attention to the conservative (and surgical) management of the prolapse. A review of non-antibiotic prophylactic therapies will be discussed including indications and side effects. With the aging patient population there is an increased need to develop effective treatment strategies to prevent UTIs as there occurrence is a cause of frequent hospital admissions and therefore a considerable burden on health care providers. Open discussion during the case presentations will be encouraged to share strategies on various therapies that SUFU members have employed for this vexing problem.
In the Advanced Urodynamics breakout session we will cover several areas related to challenging urodynamics diagnoses and treatment decisions based on urodynamics findings. The entire session will consist of a case presentation format with a presenter, panelists’ commentary and insights from attendees. There will be no didactic component to the session and an understanding of basic urodynamics will be assumed. In addition, participation from the attendees of the session is encouraged and expected. Time will be reserved for questions and presentations of case scenarios from attendees of the session.

Cases will highlight some of the following diagnostic and treatment challenges:

1. Bladder emptying problems in women
   a. Several different scenarios
   b. How important is video?

2. “Complex incontinence” in women

3. Neurogenic voiding dysfunction—difficult treatment decisions based on UDS findings
POST-PROSTATECTOMY INCONTINENCE
Craig V. Comiter, MD

Surgery is the mainstay for treating post-prostatectomy stress urinary incontinence (SUI). While the artificial urinary sphincter (AUS) remains a popular treatment option, a decade worth of innovations have expanded the role of male sling surgery.

AUS surgery has an approximately 80%-85% success rate, regardless of the degree of incontinence. The bone-anchored male sling and transobturator male sling have a similar success rate in men with mild to moderate leakage, but is less efficacious in those with severe incontinence. A new quadratically-fixed sling that achieves a broader area of urethral compression by combining a trans-obturator and supra-pubic approach and two new adjustable pubourethral slings have recently been introduced, with the aim of greater efficacy, while maintaining the low morbidity of sling surgery.

The male sling and AUS are equally efficacious for the treatment of mild to moderate SUI. The sling appears to have a lower risk of infection, erosion, and urethral atrophy. The AUS remains the most efficacious treatment for severe SUI and for radiated patients. Recent changes in male sling surgery may improve efficacy in men with more severe incontinence.

MALE INCONTINENCE
Timothy Boone, MD, PhD

This session will focus on male incontinence with an emphasis on post-prostatectomy incontinence (PPI). Along with risk factors, urodynamic and clinical evaluation of men with PPI we will discuss clinical decision making around complications and pitfalls of surgical intervention.

This session will review the literature on topics including artificial urinary sphincter (AUS) placement in the setting of detrusor underactivity, overactivity and post radiation therapy. Troubleshooting AUS malfunction and revising the AUS in the setting of cuff atrophy and erosion will be discussed. The use of tandem cuffs, cuff downsizing and transcorporal cuff placement will be reviewed and considered in complex revision surgery.
Neurogenic Bladder
Contemporary Management of Neurogenic LUTS
Moderators: J. Christian Winters, MD / Eric S. Rovner, MD
Presenter: Edward J. McGuire, MD
Saturday, March 3, 2012 • 10:00 a.m. – 10:40 a.m.

CONTEMPORARY MANAGEMENT OF THE NEUROGENIC BLADDER
Edward J. McGuire, MD
The Problem
Complications related to neurogenic bladder dysfunction are well known and serious. They include: bacterial infection/colonization, urethral, bladder, ureteral, and renal damage, stone formation, incontinence, and the skin and deep tissue effects of pressure and urinary contact with the skin leading to ulceration, deep tissue loss, and osteomyelitis. Other complications include vesicoureteral reflux, urosepsis, pyelonephritis, renal tissue loss, hypertension, autonomic dysreflexia, and death. Some of these complications are related to the neurogenic bladder condition itself, but others, no less serious, are a consequence of our treatment.

This incomplete list of urologic and other complications has been familiar to urologists and others caring for patients with neurogenic vesical dysfunction for generations. Spinal cord injuries sustained in WWI were fatal. Initial treatment of persons who sustained spinal cord injuries in WWII, Korea, Viet Nam and our more recent conflicts was better in the short term but ultimately the same complications occurred with the same consequences. Though these complications are well known our understanding of the basic mechanisms involved in their development has been, and in some cases still is, quite limited. To be candid, progress in understanding how these things develop has been slow, often based on retrospective data, and is still incomplete.

In neurogenic bladder conditions bacterial colonization is nearly universal. Although this is routinely treated throughout the world with antibiotics, it always recurs, with ever more resistant organisms. Antimicrobial treatment of a serious, symptomatic, urinary infection in a patient with a neurogenic bladder will not solve the functional problem which caused the symptomatic infection; it will recur.

In the recent past we tried to obtain urinary drainage with catheters, or sphincterotomies, and when that did not work, with suprapubic tubes, ileal loop diversions, and or nephrostomy tubes. Incontinence was most often treated with catheters, or with diversion. On the other hand the use of augmentation cystoplasty to treat neurogenic bladder dysfunction associated with sepsis, incontinence, and upper tract disease, lead to some important observations: a low pressure urinary reservoir was as infected as any neurogenic bladder but the complications associated with the latter were not seen in the former. We learned by trial and error that clean intermittent catheterization with out control of detrusor pressure was dangerous and ineffective. Ultimately we learned that the one factor in neurogenic vesical dysfunction we could control was detrusor pressure, and if we measured it and controlled it, we could obviate most of the deadly list of terrible complications these patients suffered. It has been repeatedly demonstrated that radiographic monitoring is a poor to terrible way to follow these patients, and that periodic, simple urodynamics is far superior in identifying condition which can be treated and complications prevented.

We know that all neurogenic vesical dysfunction evolves with time and that this can be expected and identified with urodynamics. We know that a low pressure bladder emptied reasonably often will not cause complications. We know how to achieve a low pressure system with surgery, with combined medications, and with BOTOX. Contemporary manage of the neurogenic bladder is dependent on urodynamic testing, and the use of multimodal therapy which we have developed over the past 20 years. Unfortunately it has been my observation that this still is not universally applied, and expedient methods of management generally lead to disaster. Unfortunately some of these bad situations can not be effectively treated.
ADVANCES IN NEUROUROLOGY
Anne P. Cameron, MD

- Brief review of novel advances in neuourology including botulinum toxin injections and neuromodulation for the indication of neurogenic bladder (NGB).
- Review of the reasons behind slow progress in research in neurogenic bladder.
- Review existing guidelines on bladder management for spinal cord injury, multiple sclerosis and adult survivors of neurogenic bladder.
- Current status of how bladder management is being done in the US in the National Spinal cord injury database and the literature.
- Discuss the complications of various bladder management methods including quality of life from the literature and the NSCIDB including future plans to better evaluate this question.
- Review new advances in medical therapy for NGB and the lack thereof.
- Review of surgical advances in neurourology: augmentation cystoplasty malignancy risk; urinary diversions; simple cystectomy and continent catheterizable stomas.
- Review the current knowledge and guidelines on screening patients for complications who have NGB.

ADVANCES IN THE USE OF BOTULINUM TOXIN FOR NEUROGENIC BLADDERS
Christopher P. Smith, MD, MBA

The minimally invasive use of botulinum toxin (BoNT) in the lower urinary tract has revolutionized the treatment of debilitating bladder, and urethra conditions refractory to conventional therapy. This talk will focus on the practical application of BoNT to the genitourinary tract. It will include a small discussion on the biology, pharmacology, and safety of BoNT in the lower urinary tract. Application of BoNT in the bladder and urethra of patients with neurogenic bladder is then covered in detail, with reviews of the latest clinical series and techniques of BoNT injection in both adults and children. This is a practical lecture that will be of interest to urologists and urogynecologists who are considering the use of BoNT in their patient population.

FUTURE TREATMENT OF NEUROGENIC BLADDER
Timothy B. Boone, MD, PhD

Neurogenic detrusor overactivity (NDO) caused by neurologic injury or disease is common and refractory to many medications in current use for treating incontinence and elevated bladder pressures risking kidney damage. The purpose of this lecture is to review new medicines being developed to better treat NDO, discuss devices to improve management of the NGB and look to future therapies employing tissue engineering to restore and improve bladder function in patients with spinal cord injury or multiple sclerosis.

Medications: Beta-3 Adrenoceptor agonists facilitate bladder storage through smooth muscle relaxation. This new class of drugs will be released in the near future and their use in treating NGB will accelerate as single and combination medications. Purinergic and Vanilloid receptor antagonists offer another potential target for pharmacologic intervention. Afferent pathways markedly change with neurologic disruption to bladder innervation creating other novel approaches to intervene as our understanding of transmitter and receptor physiology advances in the laboratory.

Devices: Improvements in tube drainage can be facilitated by new devices that combat infection and allow better profiles for insertion. Tissue bonding cystostomy tube research will be discussed with future implications for better and safer urine drainage. Future neurostimulation therapy for restoring bladder function provides hope for better control of urine storage and voiding.
Tissue Engineering: Rapid advances in tissue regeneration and engineering have been applied to NGB patients in need of bladder augmentation. Ureteral and urethral replacements have evolved and stem cells harvested from amniotic fluid and adipose tissue have been engineered for application to the damaged sphincter muscle. We will review these novel approaches and their future applications to patients impacted by spinal cord injury and multiple sclerosis.

In conclusion, the future is bright with novel treatments on the horizon for restoring function to men and women with neurologic disorders impacting their bladder function.
POSTER ABSTRACTS
MARK YOUR CALENDARS!

SUFU at the AUA 2012
May 19, 2012
Georgia World Congress Center
Atlanta, GA

SUFU 2013 Annual Meeting
February 26 – March 2, 2013
Caesar’s Palace
Las Vegas, NV

SUFU 2014 Annual Meeting
February 25 – March 1, 2014
Miami, FL
BASIC SCIENCE POSTERS

**Poster #BS1**

**FABRICATION OF A 3-D SCAFFOLD FOR SKELETAL MUSCLE TISSUE ENGINEERING**

Gjanje Smith, MD¹, Jonathan McMichael, BS², Heather-Marie Wilson, PhD², Robert Vernon, PhD², Thomas Kean, PhD², Robert Welikson, PhD², Kathleen Kobashi, MD¹, James Dennis, PhD² and Margaret Allen, MD²

¹Virginia Mason Medical Center, Seattle, WA; ²Benaroya Research Institute, Seattle, WA

(Presented by: Gjanje Smith)

**Introduction:** A 3-D construct seeded with autologous cells on a biodegradable scaffold could serve as tissue replacement in pelvic floor reconstruction. Our goals are to design a scaffold that incorporates suture suitable for implantation and optimizes the conditions for a seeded implant in a 3-D construct by testing various formulations of collagen and hyaluronan.

**Methods:** The C2C12 mouse myoblast cell line was used. Scaffold matrix components included collagen and hyaluronan (Hystem-HP®, Glycosan Biosystems). Constructs were seeded at 3, 4.5, and 6 x10^5 cells/ml and polymerized in a silicone mold. 1:1, 10:1 and 20:1 ratios of collagen:hyaluronan (C:H) were tested. Three scaffold designs were tested: constructs with a suture running through middle, with Nitex mesh at ends only, and with suture and mesh just inside the edges of the matrix. After 21 days, constructs were tested for passive stiffness. They were then stained for dead cells, cell nuclei and filamentous actin, and confocal imaging was performed.

**Results:** All construct conditions resulted in elongated, differentiated muscle cells with filamentous actin that appeared fused and multinucleated. C:H at 1:1 produced a more cellular construct with a greater proportion of elongated cells and fewer dead cells at 3 weeks than the 20:1 and 10:1 (C:H) samples (Figure1). Constructs seeded with 6 x10^5 cells/ml and C:H of 1:1 were 2x stiffer than those seeded at lower densities. The suture-only design (tension-free) resulted in random cell aggregation. Mesh alone also resulted in cell aggregation due to lack of integration of cells into the mesh. Combining suture and mesh allowed cells to integrate into the mesh and promoted rearrangement of the cells and matrix with development of uniaxial tension between suture ends which promoted cell elongation and alignment.

**Conclusions:** Greater cell viability was observed in constructs with an equal ratio of C:H. Combining suture with mesh located inside the matrix promoted the development of uniaxial tension that allowed the cells to align in the direction of tension. A higher seeding density resulted in a stiffer construct. Further testing is needed to determine the viability and functionality of constructs in vivo.

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**Poster #BS2**

WITHDRAWN
ALTERATIONS IN NEUROTRANSMITTER PROCESSING IN RODENTS EXPOSED TO CHRONIC WATER AVOIDANCE STRESS

A. Lenore Ackerman, MD, PhD¹, Una Lee, MD², Rong Zhang, DDS, PhD¹, Ngoc-Bich Le, MD¹, Joanne Leung, MS¹, Sylvie Bradesi, PhD³ and Larissa V. Rodriguez, MD¹

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(Presented by: A. Lenore Ackerman)

**Objective:** Psychological stress can exacerbate functional pain disorders, such as interstitial cystitis/painful bladder syndrome (IC/PBS), a visceral pain disorder of the lower urinary tract thought to result from neuronal dysregulation. Glutamate (Glu) is the primary excitatory neurotransmitter in the central nervous system and functions in the neuroplasticity of nociceptive networks. We sought to examine the role of glutamatergic neurotransmission modulation by spinal astroglia in a model of chronic psychological stress−induced visceral hyperalgesia in female Wistar rats.

**Methods:** Virgin female Wistar rats were subjected to WAS or sham for 1 hour/day for 10 days. Behavioral testing was performed before and after WAS or sham. Referred hyperalgesia and tactile allodynia were tested using von Frey filaments of 0.4, 1, 2, 4, 8, and 15 g (Stoelting) applied to the suprapubic region and plantar region of the hindpaw, respectively. After behavioral testing, animals were sacrificed and spinal cords analyzed by immunocytochemistry and immunoblotting. We assessed the effect of chronic stress on different glial Glu control mechanisms in the spinal cord including glial Glu transporters (GLT1 and GLAST), the Glu conversion enzyme glutamine synthetase (GS), the Glu regenerating enzyme glutaminase, and glial fibrillary acidic protein (GFAP).

**Results:** Rats exposed to WAS demonstrated alterations in voiding behaviors, with increased voiding frequency and decreased voiding intervals. Stressed rats showed increased fecal pellet excretion and anxiety−like behaviors. Animals also demonstrate both visceral hyperalgesia, manifest as suprapubic pain, and global tactile allodynia, assessed as hindpaw allodynia. We observed stress−induced decreased expression of spinal GLT1, GFAP, Glutaminase, and GS, whereas GLAST expression was upregulated. Astrocytes, which play a critical role in glutamate recycling, demonstrated decreased GFAP expression as well as decreased branching and interconnectivity.

**Conclusions:** This rodent WAS model represents a novel tool for studying syndromes characterized by lower urinary tract dysfunction and pain. This repeated psychological stress results in changes in voiding behaviors and increased global pain in response to physiologic stimuli. These changes are associated with alterations in glutamate processing and astrocyte structure in the central nervous system, which may underlie the hypersensitivity of these animals.

Molecular and Protein Identification of PDGFRα+ Cells and Their Functional Role in the Murine Detrusor

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(Presented by: Sang Don Koh)

**Introduction:** Fibroblast-like cells have been characterized in the lamina propria of the bladder with cytological properties of both fibroblast and smooth muscle cells. These cells are possibly activated by ATP and involved in overactive bladder symptoms, inflammation and cancer since they are closely associated with afferent nerves and the urothelium. However, there are no studies examining the functional role of detrusor fibroblasts. Interstitial cells of Cajal were suggested to have a neuromodulatory role in the bladder, similar to that reported in the gastrointestinal tract. PDGFRα+ cells are known to be fibroblast-like cells. In this study, novel approaches were used to characterize the molecular and protein identification of the PDGFRα+ cells and their functional role in the bladder detrusor.

**Methods:** We applied molecular and immunohistochemical techniques to bladder detrusor removed from PDGFRα+ eGFP+ mice (Pdgfra<sup>tm11(EGFP)So</sup>/I mice). These novel mice express bright GFP in the nuclei of cells expressing PDGFRα, thus making them identifiable from a population of enzymatically dispersed cells in the detrusor muscle. We analyzed the qualitative expression of P2Y receptors, M2 and M3 receptors, cKit, tryptase, and TRP channel transcripts in FACS sorted PDGFRα+ cells. Effects of purines in these cells using patch clamp approaches were also examined. Ca<sup>2+</sup>-imaging analysis
was performed with purine application in the detrusor PDGFRα+ cells. Immunohistochemistry was also performed using antibodies raised against PDGFRα, SCFR, and histamine.

**Results:** Qualitative PCR revealed that P2Y1, P2Y2, P2Y4, P2Y6, M2 receptors, Tpsb2, TRPC1, TRPM5, and TRPV2-4 were expressed in FACS sorted PDGFRα+ cells. The transcriptional level and protein expression of cKit and tryptase were revealed similar density suggesting that cKit+ cells could be mast cells in detrusor. In patch clamp experiments, ATP activated inward currents at a holding potential of -80mV. ATP-activated currents reversed at 0mV (EC50=40mV) suggesting activation of non-selective cation currents. CCh also activated inward currents, which had similar properties to ATP-activated currents. In Ca2+-imaging experiments, exogenous purine application increased Ca2+ transients in PDGFRα+ cells.

**Conclusions:** PDGFRα+ cells may have a neuromodulatory function in murine detrusor, particularly in relation to purinergic and cholinergic activation. PDGFRα+ cells may have an important role in pathological conditions such as overactive bladder and urgency.

**Funding:** Supported by NIH P20-RR18751)

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**Poster #BS5**

**POST-PARTUM UPREGULATION OF STEM CELL HOMING CYTOKINES IN LYSYL OXIDASE LIKE-1 KNOCK OUT MODEL OF PELVIC ORGAN PROLAPSE**

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**Introduction and Objectives:** Pregnancy and childbirth are significant risk factors for pelvic organ prolapse (POP). Animal models have shown upregulation of injury–related stem cell homing cytokines after simulated human childbirth, including monocyte chemotactic protein–3 (MCP–3) and stromal derived factor–1 (SDF–1). Our aim was to assess upregulation of the homing cytokines to identify pregnancy and delivery contributions to pelvic tissue injury in lysyl oxidase like–1 knockout (LOXL1 KO) mice, a well–characterized model of POP.

**Methods:** LOXL1 KO mice were bred at 8 weeks old. Bladder, urethra, vagina, and rectum were harvested under isoflurane anesthesia 1 or 12 hours after vaginal or C–section delivery. Sham C–section mice and nulliparous female mice constituted the controls. RT–PCR was used to evaluate the relative expression of MCP–3 and SDF–1 in each organ, normalized to 18S. A Two–way ANOVA with Tukey–Kramer post–hoc test was used to evaluate statistical significance between groups.

**Results Obtained:** In the urethra, MCP–3 was increased compared to controls 1 hour after vaginal delivery and C–section (p<0.001) but was not significantly elevated 12 hours after. In the vagina, MCP–3 was increased 1 hour after vaginal delivery (p<0.001) but not C–section. By 12 hours after vaginal delivery, MCP–3 expression in the vagina was not different from controls. One hour after C–section or sham C–section, MCP–3 was increased in the bladder compared to controls (p=0.008, 0.043), but decreased by 12 hours. No differences were observed in bladders of vaginal delivery mice. Rectum MCP–3 expression did not differ from controls. SDF–1 was underexpressed in the bladder, vagina, and rectum of all delivery groups 12 hours later, although only rectum in vaginal delivery and C–section groups was significantly different (p=0.008, 0.027).

**Conclusions:** MCP–3 is significantly over–expressed in the pelvic organs of LOXL1 KO mice within 1 hour after delivery. This over–expression is not entirely eliminated by C–section, implicating pregnancy–associated factors. Bladder MCP–3 was upregulated after C–section and sham C–section, and may be due to urinary retention causing bladder injury during prolonged anesthesia. SDF–1 was down regulated in the rectum 12 hours after delivery, consistent with previous reports. Novel therapies could utilize systemic stem cell injection and take advantage of these cytokines to direct the stem cells to the sites of injury.

**Funding:** NIH R01HD059859, AUAF
Poster #BS6
DECREASED SMOOTH MUSCLE EXPRESSION FOLLOWING SHORT HAIRPIN MEDIATED KNOCKDOWN OF HOXA11 IN MURINE UTEROSACRAL LIGAMENTS
Alexandra McPencow, MD, Yan Ma, PhD, Marsha K. Guess, MD, MS, Alex M. Hennessey and Kathleen A. Connell, MD
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(Presented by: Alexandra McPencow)

Introduction: Pelvic organ prolapse (POP) is a common, debilitating disorder in women. Hoxa11 is a conserved homeobox gene involved in the differentiation of the genital tract. Previously we showed that Hoxa11 is necessary for the development of the uterosacral ligaments (USLs) in mice and that there is decreased expression of HOXA11 along with decreased cellularity in the smooth muscle (SM) in the USLs of women with POP. Alterations in SM protein expressions have been implicated in the development of POP.

Objective: The aim of this study was to determine if a causal relationship exists between Hoxa11 expression and SM proteins, including α−SMA, transgelin and calponin. We also evaluated the expression of caldesmon, which inhibits SM contraction and has been reportedly increased in USLs in women with POP.

Methods: Twelve week old C57/BL6 mice were injected with 16µg of either empty vector (control (CTL), n=8) or Hoxa11 shRNA plasmid (knockdown (KD), n=9) into the uterus, cervix and peritoneal cavity. USLs were harvested 48 hours after transfection. Messenger RNA levels of Hoxa11, α−SMA, caldesmon, transgelin and calponin were measured via real time−PCR using tubulin as an internal control.

Results: Hoxa11 mRNA levels were significantly decreased in the USLs of KD vs. CTL mice (P=0.004). The expression of α−SMA, transgelin and calponin mRNA expression were all markedly reduced in USLs in KD vs. CTL mice (P=0.04, P=0.04, P=0.02, respectfully). In contrast, caldesmon mRNA expression showed significant upregulation in KD USLs (P=0.04).

Conclusion: Hoxa11 KD in murine USLs leads to decreased expression of smooth muscle contractile apparatus genes and increased expression of a gene regulating inhibition of SM contraction. Thus, HOXA11 mediated pathways may be involved in not only the myogenesis of USLs, but also in maintenance in the inherent property of USLs. Further studies on upstream regulation of the genes involved in SM apparatus and contraction in USLs will provide a greater understanding of the pathogenesis of POP.

Poster #BS7
THE ROLE OF METABOTROPIC GLUTAMATE RECEPTOR SUBTYPE 5 (MGLUR5) IN MICTURITION AND BLADDER PAIN
David Song*, Lara Crock*, Philip Abbosh, MD, PhD, Chang Shen Qiu, MD, PhD, Robert Gereau IV, PhD and H. Henry Lai, MD
Washington University in St. Louis, St. Louis, MO
(Presented by: H. Henry Lai)

Introduction and Objectives: Metabotropic glutamate receptor subtype 5 (mGluR5) has been shown to have a pro−nociceptive role in somatic and colonic pain models. We investigated the roles of mGluR5 in micturition and bladder pain using genetic (mGluR5 knockout mice) and pharmacologic (mGluR5 antagonist) approaches.

Methods: Female mice 9−13 weeks were anesthetized with subcutaneous urethane (1.2g/kg). The dome of the bladder was punctured and filled at 0.04 mL/min during cystometry. The intermicturition intervals (IMI) were compared between mGluR5 knockout and wildtype littermates. IMI were also compared before and after intraperitoneal fenobam (mGluR5 antagonist) or DMSO (vehicle) administration. Distention evoked bladder pain was quantified by abdominal visceromotor response (VMR). VMR was measured by placing silver electrodes in the external oblique muscle to allow differential amplification of EMG activity during distention. Distention evoked bladder pain (20 to 80 mmHg, 20 s) was compared between mGluR5 knockout and wildtype littermates. Inflammatory bladder pain after chronic cyclophosphamide administration before and after intraperitoneal fenobam administration (mGluR5 antagonist) was also compared.
Results: mGluR5 knockout mice had a significantly increased IMI compared to wildtype littermates during cystometry (468±28 versus 204±25 s, p=0.0007, t test). Inhibition of mGluR5 activity with fenobam increased the IMI from 182±9 to 481±80 s (p=0.031, t test). There was no change in IMI after DMSO (vehicle) administration. mGluR5 knockout mice showed significant decrease in distention evoked VMR compared to wildtype littermates (p<0.05, 2-way ANOVA). Distention evoked VMR in the cyclophosphamide inflammatory model was significantly decreased after mGluR5 inhibition (with fenobam, p<0.05, 2-way ANOVA) but not after vehicle (DMSO) administration.

Conclusion: mGluR5 modulates micturition and both inflammatory and non-inflammatory bladder pain in mice. These data suggest a therapeutic potential for mGluR5 antagonists in the alleviation of bladder pain and bladder dysfunctions.

Disclosure: No conflict of interest

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*Note: Song and Crock made equal contribution and share the first authorship.

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Poster #BS8

BLADDER DYSFUNCTION AFTER TRAUMATIC BRAIN INJURY IN RATS

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(Presented by: Hai-Hong Jiang)

Introduction and Objectives: Traumatic Brain Injury (TBI) is a common cause of death and disability. Although injury to the brain is often an acute event, the chronic consequences of TBI affect multiple organ systems and may initiate or accelerate other disease processes including urinary dysfunction, which may further cause kidney damage. Voiding dysfunction after TBI is not well characterized. The goal of this study was to characterize lower urinary tract function in a rat model of TBI.

Methods: Twenty-three female Sprague-Dawley rats underwent TBI (n=10), sham TBI (n=7) or were nonmanipulated controls (naïve, n=6). The effects of TBI on bladder and urethra function were characterized by repeated urodynamic studies in rats. Fluid-percussion injury after craniotomy was used to create an animal model with moderate TBI. Sham TBI consisted of craniotomy only. All rats underwent filling cystometry (5ml/h) while bladder pressure and external urethral sphincter electromyograms (EMG) were simultaneously recorded 1 day, 1 week, 2 weeks, and 1 month after injury. Quantitative assessments of pressure and EMG results were utilized to compare bladder function between the three groups. The bladder was harvested after the last urodynamic timepoint and weighed before qualitative histological evaluation.

Results Observed: One day after injury, 70% of the animals in the TBI group and 29% of the animals in the sham TBI group showed no bursting activity during urination. Compared to naïve rats, bladder function was significantly altered 1 day and 1 week after sham TBI, suggesting that craniotomy temporarily affected bladder function. Bladder function in the TBI group went from atonic 1 day after TBI to overactive 1 month after TBI, suggesting that TBI significantly affected bladder function. Compared to sham TBI, bladder weight (p=0.058) and collagen content in the bladder wall were both increased 1 month after TBI.

Conclusion: Lower urinary tract function could be a useful measure to evaluate the recovery process and efficacy of treatment after TBI. Early appropriate intervention for bladder function after TBI could potentially alleviate further irreversible bladder dysfunction. Further research is needed to determine the mechanism of bladder dysfunction after TBI.

Funding: NIH R01NS 069765, AUAF, and Cleveland Clinic
**Introduction and Objectives:** Caveolae are considered critical membrane microdomains for integrating and modulating various signal transduction processes, given that many receptors and signaling molecules are enriched in these structures. Caveolins (Cav), the constitutive proteins of caveolae, serve as scaffolds for interacting proteins and function as signal transduction regulators. Thus the specific location and combination of Cav isoforms may contribute to the diversity of caveolae-dependent signaling and partly determine cell phenotype. Three caveolin isoforms are expressed in bladder smooth muscle (BSM); however, the spatial distribution of these isoforms and their molecular relationships have not been investigated.

**Methods:** Rat bladders were divided in three portions corresponding to base, body and dome. RNA and protein were extracted from each portion and Cav−1, Cav−2 and Cav−3 expression was determined by real-time PCR and western blot. To evaluate the regional distribution of caveolins, bladder sections from the base to dome were processed for confocal microscopy. The interactions between Cav−1, Cav−2 and Cav−3 were determined by co-immunoprecipitation.

**Results:** All three Cav isoforms were expressed throughout the bladder wall, with lowest regional expression in the bladder base relative to body and dome. Although Cav−1 was the most homogenously distributed, a progressive increase in immunoreactivity (IR) was detected transversely from submucosa to serosa in each region. The distribution of Cav−2 IR generally paralleled Cav−1, but progressively decreased from submucosa to serosa in each region. Cav−3 expression predominated in the mid-transverse region of BSM increasing progressively from base to dome, but was poorly expressed in the sub-serosal region particularly in the dome. Cav−1 co-precipitated extensively and reciprocally with both Cav−2 and Cav−3. Co-precipitation between Cav−3 and Cav−2 was also detected, albeit to a lesser extent.

**Conclusion:** The isoform-specific spatial distribution and distinct molecular interactions among caveolins in BSM may contribute to the contractile heterogeneity of BSM cells and facilitate differential modulation of responses to local stimuli. Since BSM caveolins regulate several signaling processes, altered expression of any of these proteins may generate a regional imbalance in contraction/relaxation responses, thus leading to bladder dysfunction.

Department of Veterans Affairs, Research Service, Washington, DC

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**Poster #BS10**

**EFFECT OF LIPOSOME ENCAPSULATION ON THE PHARMACOKINETICS OF TACROLIMUS AFTER INTRAVESICAL ADMINISTRATION**

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(Presented by: Jayabalan Nirmal)

*Not CME accredited*

**Introduction and Objectives:** The potent immunosuppressive effect of systemic tacrolimus to achieve an anti-inflammatory effect is limited by the high incidence of severe adverse effects including nephrotoxicity and hypertension. However, intravesical application of tacrolimus to achieve a local anti-inflammatory effect for treating radiation and hemorrhagic cystitis is hindered by the poor aqueous solubility of tacrolimus and justifies the search for novel delivery platforms like liposomes. In the present study, we compared the single dose pharmacokinetics of liposome encapsulated tacrolimus formulation after intravesical administration with plain tacrolimus formulation administered systemically and locally in the rat bladder.
Methods: The dose of tacrolimus was kept constant in all formulations at 200 microgram/mL. A single dose of liposome encapsulated tacrolimus (lipo–tacrolimus) was instilled into the rat bladder under anesthesia, whereas tacrolimus alone (tacrolimus) was either instilled or i.p. injected into rats. At different time intervals blood, urine and bladder samples were collected and stored at −80°C until analysis. Levels of tacrolimus in the different samples were analyzed using Microparticle Enzyme Immunoassay (MEIA II) for tacrolimus (Abbott Laboratories, Abbott Park, IL, USA).

Results: Area under the curve (AUC) calculation for serum levels of tacrolimus revealed that AUC(0–24) of lipo–tacrolimus was significantly less as compared to instillation or injection of tacrolimus. Concentration vs time curve showed a concurrent Tmax of tacrolimus reached serum and urine at 1 and 2 h for both lipo–tacrolimus and tacrolimus rats after single intravesical administration. AUC(0–24) of lipo–tacrolimus and tacrolimus in urine after intravesical administration was significantly (p<0.05) higher than i.p. injected group. Bladder tissue distribution AUC(0–24) of tacrolimus did not differ significantly between all groups.

Conclusions: Single dose pharmacokinetic data demonstrates that bladder instillation of a liposomal formulation of tacrolimus is an efficient approach for achieving intravesical immune suppression as it significantly reduces the systemic exposure of instilled tacrolimus and its resultant toxicity. Intravesical tacrolimus formulated in liposomes may hold promise for bladder inflammatory conditions including the rare condition of hemorrhagic cystitis induced by radiation and chemotherapeutics.

Poster #BS11
INFLUENCE OF TIME COURSE AND PH IN BIOFILM FORMATION
Chih-Ho Lai, Leah Gandee, Vanessa Sperandio, Cristiano Moreira, J.T. Hsieh and Philippe Zimmern, MD
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(Presented by: Benjamin Dillon)

Introduction and Objectives: Once intra bacterial colonies have developed inside the urothelium, they manufacture a biofilm that protects them from outside influences, including antibiotic therapy. We studied the evolution of a biofilm from 2 established E.Coli strains [1] and evaluated the impact of time and pH to determine potential approaches to deter biofilm formation.

Methods: Two established bacterial strains of enteropathogenic E.Coli (EPEC) known to produce robust biofilms, one wild-type bundle-forming pili (bfp−), the other with green fluorescent protein (GFP), were grown in Luria–Bertani (LB) broth at pH7.4 for biofilm formation assay using crystal violet staining. Bacterial suspensions were diluted 1:100 in 24−well plates containing LB broth with 1% glucose (Sigma−Aldrich, St. Louis, MO). The plates were incubated at 37°C with agitated shaking (100 rpm) for 24–h or incubated in LB broth with different pH environments (pH5–) for 24–h. The attached bacterial biofilm was stained with 0.4% of crystal violet (Sigma−Aldrich) for 5 min at room temperature. The OD550 was determined by spectrophotometry.

Results: Tables 1 and 2 indicate a progressive development of the biofilm over 48h, with stabilization afterwards to 72 hours. Low pH slowed down the expansion of the biofilm in 2 bacterial strains known to produce very strong biofilms. Differences between pH 5 vs. pH 8 were significant (p=0.026).

Conclusion: Incubation for 48h appears to be optimal to attain a reproducible biofilm formation. Interventions to halt biofilm growth may be more successful when conducted at an early stage and in an acidic environment. These findings are clinically relevant in the management of urinary tract infections in women.

Citation: [1] C. Moreira et al., Journal of Bacteriology, 188:3952–3961, 2006
**Poster #BS12**

**EVOKE ELEKTROMYOGRAPHIC ACTIVITY IN THE EXTERNAL ANAL SPHINETER MUSCLE OF NON-HUMAN PRIMATES DIFFERS FROM CORRESPONDING PATTERNS IN HUMANS**

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(Presented by: Una Lee)

**Introduction:** Concentric needle electromyography (EMG) of the external anal sphincter (EAS) muscle is useful in our understanding of fecal continence and pelvic floor disorders. Rodent studies of the anal sphincter complex with EMG have been described, and demonstrate quiescence at baseline. Concentric needle EMG of the external anal sphincter in humans demonstrates an active interference pattern at baseline, associated with fecal continence, decreased amplitude after deinnervation injury, and EMG silence during defecation. Detailed anal sphincter EMG firing activity in the non-human primate model is unknown. In the present study, we aimed to develop a method to assess electromyographic activity for the external anal sphincter muscle in non-human primates.

**Methods:** Electromyography (EMG) of the EAS muscle was performed in neurologically intact adult female rhesus macaque (Macaca mulatta) monkeys (n=4 subjects). A pair of EMG electrodes was inserted into the EAS bilaterally. EAS recordings (Biopac systems, Goleta, CA) were obtained using ketamine/dexmedetomidine or propofol anesthesia. Baseline EMG recordings were obtained, and EMG activity was induced by inserting a glass probe (10mm, 13mm, 16 mm, or 20 mm in diameter) into the rectum for a period of 5 seconds.

**Results:** All baseline EMG recordings showed a pattern of quiescence with absence of any tonic or continuous EMG activity. Introduction of glass probes of increasing size produced a brief period of stretching of the EAS muscle which induced burst-like EMG activity during the insertion and removal of the probe. After the probe removal, the EAS muscle showed continued EMG activity, which gradually declined in amplitude and frequency over the subsequent 10–30 seconds. The evoked response depended in part on the probe size with individual subjects showing a stimulus-response relationship to probes of increasing diameter. Repeated evoked responses were consistent and similar in pattern and duration. Evoked EMG activations were followed by baseline electromyographic silence.

**Conclusion:** The above pattern of EAS EMG activity in non-human primates is different from the corresponding pattern of continued EMG activity during rest and EMG silence during defecation in humans.

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**Poster #BS13**

**ANIMAL MODEL OF PELVIC FLOOR DYSTONIA AND CYSTOMETRIC EFFECTS ON URINARY DYSFUNCTION**

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(Presented by: Sara Spettel)

**Introduction:** While the relationship between pelvic floor muscle dystonia and urinary dysfunction is described in clinical literature, the mechanism and pathways remain elusive. One of the barriers is the lack of an effective animal model. We sought to develop an animal model of pelvic floor dystonia and evaluate the resultant change during cystometric (CMG) and electromyography (EMG) testing.

**Methods:** Seventeen adult female rabbits were evaluated with simultaneous CMG and EMG recordings under ketamine/xylazine sedation. Four rabbits served as control with no pelvic muscle stimulation. In 13 rabbits we inserted and stimulated a pubococcygeus EMG electrode to approximate pelvic floor dystonia (4 trains at 15mA 0.1ms 50Hz, with 10 seconds between trains) with the resulting micturition cycles recorded. We preformed S3 rhizotomies on two rabbits to evaluate potential interference of field stimulation.
**Results:** The control (4), rhizotomy (2) and stimulation (11) groups’ baseline CMGs were not significantly different from each other. No rabbit had unproductive contractions during baseline CMG. The control group’s amplitude, duration and intervals of all three micturition CMGs were within 20% of each rabbit’s baseline. There were no unproductive contractions in the control group. The two rabbits that underwent rhizotomy did not have a detrusor contraction after the dorsal roots were severed. The results for rabbits with stimulation could be divided into 3 groups based on their micturition pattern after stimulation. Two rabbits (Resilient Group) were relatively unchanged overall in their micturition cycles after stimulation with only new-onset of post-stimulation of unproductive contractions. Two rabbits (Overactive Group) exhibited an overactive voiding pattern with lower capacity (mean −27ml +/- 9ml), a shortened interval between contractions (0.16 +/- 0.13), shorter duration of contraction (0.56 +/-0.43) and lower PVR. The majority (7) of the rabbits (Dysfunctional Group) exhibited a dysfunctional voiding pattern with larger capacity (17ml +/- 22ml), longer interval (2.27 +/- 2.01) and longer duration of contractions (1.63 +/- 0.53).

**Conclusion:** Using electrical stimulation of rabbit pelvic floor muscles, we were able to describe both CMG and EMG changes in an animal model of pelvic floor dystonia. These changes were suggestive of the clinical presentations we observe in humans with voiding dysfunction related to pelvic floor dysfunction.

**Poster #BS14**

**A NEW METHOD FOR OBJECTIVE ANALYSES OF DETRUSOR RHYTHMIC CONTRACTION**

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(Presented by: Michael D. Byrne)

**Introduction and Objectives:** Evidence from ambulatory urodynamics indicates that the normal bladder undergoes spontaneous rhythmic contraction (SRC) during the filling phase, and that SRC is increased in patients with overactive bladder. Moreover, strips of detrusor smooth muscle (DSM) isolated from patients with overactive bladder exhibit greater SRC than controls. However, SRC in man and other mammals often consists of waves with amplitudes that vary with time and that consist of apparently disparate frequencies, and while qualitative changes may be visually obvious, assessing quantitative differences has been challenging. Techniques used in our laboratory and elsewhere to analyze SRC include manual counting and computer programs that simulate counting. However, these techniques are limited by biasing and setting of arbitrary tension threshold sensitivities. We propose a new mathematical approach to analyze SRC that focuses on concepts drawn from signal analysis.

**Methods:** Strips of DSM dissected from fresh bladders obtained from rabbits were placed between two clips in a water-jacketed muscle bath; one clip was attached to a micrometer for length adjustments, the other to an isometric tension transducer for DSM tone analyses. Tissues were stretched from 0.8-fold a reference muscle length (Lref) to 1.2-fold Lref in 0.1-fold Lref increments and allowed to rhythm spontaneously for 20 min at each muscle length. SRC at each length was analyzed using Fourier transforms which allow the data to be represented on a frequency rather than a time spectrum.

**Results Obtained:** Based on Fourier transform plots represented by signal peaks within specific frequency ranges, rabbit SRC can be divided into 3 component waveforms defined as A0+A1B1+A2B2. A0 = length–dependent baseline tone that increases ~exponentially. A1B1 = a fast wave with a length–dependent specific amplitude (A1) and length–independent constant frequency (B1) of ~0.2 Hz, and A2B2 = a slow wave with a length–dependent amplitude (A2) and frequency (B2).

**Conclusions:** Use of Fourier transform revealed, for the 1st time, that rabbit SRC consists of 2 frequencies, one that is, and one that is not, dependent on muscle length. Each component of bladder SRC likely reflects a biochemical mechanism that determines a physiologically relevant biomechanical function during bladder filling. This method has potential clinical utility in the study of therapies designed to treat urgency occurring during the filling phase.
LENGTH-DEPENDENT REGULATION OF DETRUSOR SMOOTH MUSCLE MYOSIN LIGHT CHAIN PHOSPHORYLATION AND TONE DURING BLADDER FILLING

Jordan B. Southern, BS¹, Jasmine R. Frazier¹, Amy S. Minor, BA¹, Michael D. Byrne, MD², Ashley B. King, MD², John E. Speich, PhD³, Adam P. Klausner, MD² and Paul H. Ratz, PhD¹
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(Presented by: Paul H. Ratz)

Introduction and Objectives: The causes of overactive bladder (OAB) remain unknown. However, isolated strips of mammalian bladder display low amplitude, rhythmic contractions that are independent of nervous input, and muscle strips isolated from patients with OAB display enhanced rhythmic contraction. The bulk of stretch-sensitive afferent nerves within the bladder wall behave as tension receptors in-series with detrusor smooth muscle (DSM), and afferents display burst activity associated with rhythmic contraction. We previously showed that both rhythmic and micturition contractions induce a crossbridge-dependent preload during bladder filling. DSM tone during filling is the sum of crossbridge-dependent preload plus rhythmic contraction. We propose that DSM tone is regulated to adjust the degree of crossbridge overlap and afferent nerve activity during bladder filling. Smooth muscle contraction is dependent on crossbridge activation as assessed by myosin light chain (MLC) phosphorylation (MLCp). In arterial smooth muscle, MLCp is not muscle length-dependent. The goal of this work was to determine whether MLCp and tone are muscle length-dependent in rabbit bladder.

Methods: Strips of DSM dissected from fresh bladders obtained from male rabbits were placed between two clips in a water-jacketed muscle bath; one clip was attached to a micrometer for length adjustments, the other to an isometric tension transducer for DSM tone analyses.

Results Obtained: Stretching DSM strips from 0.8-fold of an optimum length for muscle contraction (Lref) to 1.2-fold Lref caused an ~2.5-fold increase in the area under the DSM tone curve. The general cyclooxygenase inhibitor ibuprofen abolished this increase. Thus, stretch either increased prostaglandin release or sensitized DSM to the action of prostaglandins. In the presence of ibuprofen, addition of PGE2 increased tone, and stretch from 0.8-fold Lref to 1.2-fold Lref increased PGE2-induced tone by ~2.5-fold. The level of MLCp at 1.2-fold Lref was ~5-fold that at 0.8-fold Lref, but when stretched further to 1.3-fold Lref then released back to 1.2-fold Lref, MLCp was only ~3-fold that at 0.8-fold Lref.

Conclusions: These data indicate that muscle length regulates the biochemical activation of DSM, and thus, the degree of DSM tone during bladder filling. Pathological increases in the sensitivity of this mechano-biochemical transduction mechanism may accentuate bladder tone during filling, and thus, may be a cause of OAB.

LENGTH ADAPTATION VIA AUTONOMOUS CONTRACTION (AC) IN RABBIT DETRUSOR AND VOLUME ADAPTATION IN MOUSE BLADDER

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(Presented by: John E. Speich)

Introduction and Objectives: In skeletal muscle, there is a static length-active tension (L-Ta) curve, and stretching a strip of muscle to a known length and inducing a maximal isometric contraction will achieve a predictable tension which lies along the established curve. In contrast, we have previously shown that the L-Ta curve for strips of rabbit detrusor smooth muscle (DSM) is dynamic (undergoes short-term length adaptation) as a function of strain and activation history. Autonomous contraction (AC) which has been observed in all mammalian bladders may be involved in the
regulation of length-adaptation and may underlie disorders of bladder contractility and overactivity. Therefore, the objectives of this study were to determine 1) whether length adaptation exists in strips of detrusor from a different animal species (mouse as opposed to rabbit), 2) whether length adaptation (measured as volume adaptation) exists in whole bladder specimens in mouse bladders, and 3) whether AC induced by prostaglandin–E2 (PGE2) produces length adaptation in rabbit DSM.

**Methods:** L-Ta curves were measured for New Zealand White rabbit DSM and C57BL/J mouse bladder strips. Active pressure–volume (P–V) curves were measured for whole mouse bladders. Three contractions were induced at a length or volume on the descending limbs of the L-Ta and P–V curves. AC was induced with PGE2 or inhibited with SC–560 (COX–1 inhibitor) for 24 min after and before KCl–induced contractions at a length on the ascending limb.

**Results Obtained:** In mouse bladder strips, the 3rd KCl– or carbachol–induced contraction produced greater Ta than the 1st contraction on the descending limb, revealing that short–term length adaptation (n=4, p<0.05) exists in mouse detrusor strips. In whole mouse bladders, the 3rd KCl–induced contraction produced greater pressure than the 1st contraction on the descending limb, revealing volume adaptation (n=3) in a whole bladder model. KCl–induced Ta was elevated following PGE2–induced AC (and not elevated in when AC was inhibited by SC–560), revealing that AC produces length adaptation in rabbit DSM (n=5).

**Conclusions:** These data identify a potential physiological role for AC in bladder adaptation and motivate the investigation of a potential link between short–term volume adaptation and disorders of both contractility and overactivity.

**Poster #BS17**

**EVIDENCE OF CENTRAL MODULATION OF BLADDER COMPLIANCE DURING FILLING PHASE**

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¹University of Connecticut Health Center, Farmington, CT; ²Center on Aging, University of Connecticut Health Center, Farmington CT

(Presented by: Phillip Smith)

**Introduction and Objectives:** Bladder compliance is one expression of the pressure and volume relationship as the bladder fills. In addition to passive elements, autonomous micromotional detrusor activity contributes to this relationship. In the mouse cystometric model, compliance pressure contributes to voiding expulsive pressure. During attempts to isolate the detrusor contractile component of this filling pressurization, we found that compliance reversibly diminishes under conditions which remove central control from the micturition cycle.

**Methods:** Ten mature female mice underwent constant infusion pressure/flow cystometry under urethane anesthesia, and five awake mature female mice underwent constant infusion pressure cystometry. Following baseline cystometry, all mice were anesthetized with isoflurane to abolish the micturition reflex, and cystometry conducted with manual emptying of the bladders. Animals were then allowed to recover from isoflurane to re-establish the micturition reflex, and cystometry again conducted. The urethane group was also studied immediately postmortem. Repeated measures comparisons of cystometric parameters were made across conditions.

**Results:** Compliance reversibly decreased in all mice with the abolishment of micturition responses by isoflurane anesthesia. A similar decrease was observed immediately post–mortem in the urethanated mice. Bladder filling and voiding were not different between the intact micturition segments of the testing.

**Conclusions:** Enhanced compliance in mice with intact micturition responses suggests that autonomous micromotional activity is suppressed by central processes during normal filling. Afferent activity during filling is a function of bladder pressure and volume, therefore bladder volume mechanotransduction is related to compliance. Central modulation of compliance may thus constitute a reflected feedback afferent signal conditioning mechanism. Confirmation of this effect in humans would contribute to understanding relationships of urinary function and measures of global function such as mobility and cognition.

**Funding:** Dennis A. Jahnigen Scholars CDA, American Geriatrics Society (PPS); NIH R01AG028657 (GAK)
Introduction and Objectives: In a large series of human bladders from organ transplant donors, the potency of carbachol to induce contraction varies nearly 100 fold with no correlation to M2 or M3 muscarinic receptor density. The aim of this study is to investigate the role of internalization of M2 or M3 receptors on the contractile response.

Methods: Cell surface and total cellular receptors were determined with radioligand binding and subtype selective immunoprecipitation. Surface receptors were labeled with the quaternary ammonium ligand N−methyl scopolamine and total receptors were labeled with the lipophilic ligand quinuclidinyl benzilate. Detrusor muscle strips were pre−exposed to 100 µM carbachol for 10 min, allowed to recover for various times, then the potency of carbachol and the M3 selective antagonist darifenacin were determined.

Results Obtained: Carbachol pre−exposure with 40 minute recovery reduced the maximal contractile response to carbachol by 38% (4.5 – 2.8 g) which recovered by 80 minutes. The table below shows that it also reduced the potency of both carbachol and darifenacin. Surface M3 receptor density was unchanged but M2 surface receptors increased from 78% to 93% by carbachol pre−exposure.

Conclusions: These studies show that pre−exposure to carbachol desensitizes the contractile response of human detrusor. This is accompanied by reduced M3 selective antagonist potency and an increased surface M2 receptors. Similar effects may occur in−vivo with endogenous acetylcholine released from urothelial, muscle as well as neuronal sources. Alterations in receptor internalization pathways may lead to bladder dysfunction.

Funding: Supported by DK052620 and a competitive grant from Pfizer

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**Poster #BS19**

**TRANSMISSION ELECTRON MICROSCOPY ULTRASTRUCTURAL STUDY OF LIPOSOME DRUG DELIVERY UPTAKE BY UROTHELIUM**

Jayabalan Nirmal, PhD¹, Loan Dang, BS², Pradeep Tyagi, PhD¹ and Michael Chancellor, MD¹

¹Oakland University William Beaumont School of Medicine; ²Oakland University

(Presented by: Jayabalan Nirmal)

**Introduction and Objectives:** Intravesical liposomes (artificial phospholipid membrane vesicles) have been used as a drug delivery platform and more recently, empty liposomes has shown promise as a treatment of interstitial cystitis in patients. The exact mechanism for liposome uptake in bladder cells remains to be investigated and in the present study, we investigated the role of endocytosis in uptake of liposomes by urothelial cells.

**Methods:** Urothelial cell line (UROtsa) were left to adhere and grow for 48h in 100mm petridishes using Dulbecco’s modified Eagle’s medium (DMEM) containing 5% v/v fetal bovine serum with incubation at 37°C in a 5% CO2:95% air atmosphere. Liposomes encapsulating colloidal gold particles size 10nm were prepared by thin film hydration method and were incubated with serum free UROtsa cells for 2h either at 37°C or at 4°C. The morphology of liposome–cell interactions at two temperatures was assessed by transmission electron microscopy.

**Results:** Transmission Electron Microscopy (TEM) images located endocytic vesicles containing liposomes inside the UROtsa cells incubated at 37°C and only extracellular binding was noticed in cells incubated at 4°C. Thin section electron micrographs show gold−containing liposomes bound to coated pits, in intracellular coated and uncoated vesicles, and in secondary lysosomes, including dense bodies of cells incubated at 37°C with colloidal gold liposomes.

**Conclusions:** Based on these morphologic observations, we propose that the main route of entry of liposomes into urothelium cells is by endocytosis and provide evidence for a possible mechanism by which liposomes act as drug delivery platform. These findings support the usefulness of liposomes in intravesical drug delivery.

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**Poster #BS20**

**EFFECT OF EARLY LIFE STRESS (ELS) ON BLADDER FUNCTION: A NEW MODEL FOR UNDERSTANDING THE PATHOGENESIS OF IC/BPS**

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¹CWRU, Cleveland, OH; ²University Hospitals of Cleveland; ³Ohio State University

(Presented by: Elias Veizi)

**Background:** IC/PBS could be one manifestation of a “central sensitivity syndrome (CSS).” Recent clinical and experimental evidence has identified sensitization of both the peripheral and central nervous systems in patients with IC/BPS. Individuals with CSS appear to be generally hyper–responsive to sensory stimuli, and unusually vulnerable for development of chronic pain syndromes. We hypothesize that early life stress (ELS) results in development of CSS, which in turn causes an overreaction of the bladder to environmental insults. The aim of the present study was to generate an animal model of ELS to determine if it could affect bladder function, which could implicate ELS in the development of visceral hyperalgesia.

**Methods:** We used C57BL/6J pregnant mice and their female offspring to adapt an existing mouse of early life stress. ELS was initiated on postnatal day 2 ( P2). Control dams (n=2 per group) and pups (n=3 per group) were placed in cages on a raised aluminum mesh with standard amounts of bedding, whereas ELS dam and pups (n=4) were placed on a raised mesh with ½ of the control amount of nesting material. The ELS period lasted from P2−P10, after which both groups were housed under identical, standard conditions. Mice were tested as adults 9–12 weeks later using the elevated plus maze test, open field test, tail flick test and frequency/volume chart (FVC).

**Results:** No differences between ELS and control mice were found in spatial learning and memory using the elevated plus maze, or in anxiety–like behavior as indicated by open field 8.3±2.7 ELS vs. 10.5±2.6 control (% of time spend in the center). Tail flick latency was significantly reduced in ELS when compared to control animals [ELS 6.1±0.4 vs. control 9.4±0.4 sec (*p<0.005)]. FVC analysis indicated a daily voided volume of 7±2.7 mL, daily frequency of 55±8 voids, and volume per void of 0.14±0.06 (n=4) in ELS animals vs. 17.9± 0.8 mL per day (t test p<0.001), daily frequency of 57± 8 voids, and volume per void of 0.32±0.02 (p<0.002).
Conclusion: Despite the similarities in behavioral testing results there appeared to be an increased frequency of voiding at 2.5 fold smaller volumes in ELS mice. This could be indication of ELS phenotype impacting LUT by enhancing bladder sensitivity. While this study is limited by the small number of experimental animals, it is the first evidence to our knowledge of bladder hypersensitivity as a result of ELS in the absence of a provocative stimulus.

Poster #BS21
SUCCESSFUL INDUCTION OF STRESS URINARY INCONTINENCE BY VAGINAL DISTENSION IN MICE DOES NOT DEPEND ON THE ESTROUS CYCLE
Yexiang Huang, MD, Firouz Daneshgari, MD and Guiming Liu
Department of Urology, Case Western Reserve University, Cleveland, OH
(Presented by: Guiming Liu)

Objectives: Vaginal delivery is a risk factor for stress urinary incontinence (SUI). We created a mouse SUI model by simulated birth trauma–vaginal distension (VD) before. As we known, the female reproductive tract including vagina undergoes numerous sequential morphological changes over the course of estrous cycle. In addition, the estrous cycle was reported to affect the urination patterns in mice. In this study, we aimed to examine if performance of VD in different estrous cycles affects the successful induction of SUI in mice. Leak point pressure (LPP, the bladder pressure at which the urine leaks from the urethra) was used to evaluate the urethral competence.

Methods: One hundred and twenty-eight female virgin C57BL/6 mice (aged 10 weeks) were equally distributed into 4 groups according to their estrous cycle: pro–estrus (P), estrous (E), metestrus (M) and diestrous (D). Each group was divided into four subgroups of eight mice for measurement of LPP at 4 or 20 days after VD or sham VD. Twenty four–hour urinary habit was measured. Under anesthesia, the vagina was accommodated using different size of urethral dilators. VD was induced by injection of 0.35 ml water into the balloon of a modified 6–Fr Foley catheter inserted in the vagina for 1 h. LPP was measured with an open abdomen method. A 24–gauge angiocatheter was inserted into the bladder dome and connected to a pressure transducer. Room temperature saline was infused at 1 ml/hour. Gentle pressure with two fingers was applied to the mouse’s bladder at half bladder capacity. The pressure difference between the peak pressure and basal pressure was used to represent LPP. At least five LPP were obtained on each animal and the mean LPP was calculated. Urethra and vagina were harvested for histological examination.

Results: We found no differences in LPP among the four different stages either in the sham or VD group (figure). Consistent with our previous report, we found LPP was decreased 4 days but not at 20 days after VD compared with the corresponding sham group. Twenty four–hour urinary habit and histological changes support the above results.

Conclusions: VD causes reversible SUI in mice. Successful induction of SUI in mice is not dependent on the estrous cycle.
PLATEFORM SWIM STRESS RESULTS IN AN ALTERED VOIDING PHENOTYPE IN MALE MICE
Ariana Smith, MD¹, Erin McGonagle², Stephan Butler², Joanna Sliwoski², Rita Valentino, PhD², Douglas Canning, MD² and Stephen Zderic, MD²
¹University of Pennsylvania, Philadelphia, PA; ²Children's Hospital of Philadelphia, Philadelphia, PA
(Presented by: Ariana Smith)

Introduction and Objectives: We set out to characterize the voiding phenotypes of male mice subjected to a platform swim stress protocol and compare the molecular changes with male mice subjected to surgically induced partial bladder outlet obstruction.

Methods: 6 week old male Swiss Webster mice housed with sibling littermates were individually placed on a platform centered in the middle of a water filled basin for 1 hour daily for 4 weeks. A non stressed cohort of sibling littermates served as controls. Measured end points included voiding frequency, voided volume, bladder mass, and in vivo cystometry. Molecular end points included Myosin Heavy Chain (MHC) isoform distribution by PCR, and nuclear translocation of Hypoxia Inducible Factor (HIF1α) and the Nuclear Factor of Activated T−cells (NFAT) by gel shift assay. These molecular endpoints were compared with samples from male mice undergoing anatomic partial bladder outlet obstruction (pBOO).

Results Obtained: Platform swim stress resulted in increased average voided volumes and bladder mass, and a decrease in voiding frequency (P<0.05). The slower MHC A isoform was only expressed in the pBOO group that developed severe hypertrophy. Gel shift assays revealed substantial increases in HIF1−α nuclear translocation in the group subjected to pBOO that developed severe hypertrophy but minimal changes in the pBOO group that developed minimal hypertrophy and the swim stress groups.

Conclusions: The platform swim stress model induces moderate bladder wall hypertrophy in the absence of any surgical manipulation.

PUDEveal NERVE STRETCH REDUCES EXTERNAL URETHRAL SPHINCTER ACTIVITY IN RATS
Kamran Sajadi, MD¹, Dan Lin, MD², James Steward, BS³, Brian Balog, BS³, Charuspong Dissaranan, MD³, Bradley Gill, BSE³, Hai-Hong Jiang, MD³, James Kerns, PhD⁴ and Margot Damaser, PhD²
¹Oregon Health and Science University, Portland, OR; ²Cleveland Clinic and Cleveland VAMC, Cleveland, OH; ³Cleveland Clinic, Cleveland, OH; ⁴Rush University Medical Center, Chicago, IL
(Presented by: Kamran Sajadi)

Introduction and Objective: Vaginal childbirth is a major risk factor for stress urinary incontinence (SUI). Rat models that emulate childbirth injury via vaginal distension (VD), pudendal nerve crush (PNC), or combination recover, but do not account for significant peripheral nerve stretch known to occur during human childbirth. We hypothesize that PNS produces reversible SUI and dysfunction of the external urethral sphincter (EUS).

Methods: Female virgin Sprague−Dawley rats were anesthetized with urethane and the urethra and pudendal nerves were exposed bilaterally. Leak point pressure (LPP) and EUS electromyography (EMG) were performed during bladder filling. Bilateral PNS or sham injury was performed for five minutes. EUS EMG and LPP were repeated immediately following and then at ten, 30, 60, and 120 minutes after bilateral stretch, and compared to pre−stretch values and to sham−injured animals. The pudendal nerves underwent neuromorphometric analysis, and Onuf’s nucleus was evaluated by immunohistochemistry and PCR for β−APP and c−Fos expression.

Results Observed: Fourteen rats underwent bilateral PNS (N=9) or sham injury (N=5). Baseline EMG amplitude was similar between PNS and sham−injured animals. EMG amplitude (Mean ± SEM) decreased immediately following PNS compared to baseline (27.3±3.6µV to 12.1±4.5µV) and to sham injury (27.3±3.6µV to 32.1±3.0µV) following PNS (p = 0.003) and recovered by 30 min after the stretch. There was no significant change in LPP at any time point. The pudendal nerve was stretched 74±18% on the left and 63±13% on the right, but this did not correlate with extent of EMG amplitude decrease (p = 0.25). Two hours after injury, histology showed rare neuronal degeneration. β−APP and c−Fos protein and mRNA expression were similar between the two groups.
Conclusions: Acute PNS injury shows reversible electrophysiologic dysfunction, but without impairment in LPP. PNS shows promise in modeling injury, and should be tested along with VD and PNC as a multi–injury chronic physiologic model of human maternal vaginal childbirth injury.

Funding: Cleveland Clinic

Poster #BS24
DIFFERENTIAL GENE EXPRESSION IN CELLS SLOUGHED IN THE URINE OF INTERSTITIAL CYSTITIS SUBJECTS
Kevin Benson, MD, MS¹, Michael Fiegen, MD, MS², Keith Hansen, MD² and Kathleen Eyster, PhD³
¹University of South Dakota School of Medicine; ²University of South Dakota School of Medicine Sanford Health, Sioux Falls, South Dakota; ³University of South Dakota School of Medicine Department of Basic Biomedical Sciences, Vermillion, South Dakota
(Presented by: Kevin Benson)

Introduction: Most studies to diagnose IC have utilized bladder biopsy specimens. Urine specimens have been used to examine actual proteins; however gene expression in cells found in urine samples has not been studied to our knowledge.

Hypothesis/Specific Aims: To determine whether intact RNA could be extracted from cells found in urine specimens. To confirm differential gene expression between non–affected controls and IC subjects.

Study Methods: This is a prospective cohort case–controlled pilot study. Test subjects were seeking care for IC type symptoms, control subjects were undergoing midurethral sling surgery for stress incontinence and were negative for IC symptoms. IC diagnosis was based on cystoscopy. 18 test and 10 control subjects were enrolled. Catheterized urine samples were studied. RT–PCR was performed on a group of 8 subjects to confirm the presence of extractable, intact RNA before DNA microarray analysis. DNA microarrays were then performed on 28 subjects (18 test, 10 control).

Statistical Analysis: Gene Spring 7.0 software (Agilent) was used for statistical analysis of the DNA microarrays; (P < 0.05). Multiple testing correction used the Benjamini and Hochberg false discovery rate. With use of this test, approximately 5% of identified genes would be expected to pass this restriction by chance.

Results: Intact RNA from cells sloughed in the urine was confirmed by evaluating actin gene expression with RT–PCR. Subsequent DNA microarray analysis revealed 115 named genes with a significant difference (p < 0.05). Of these genes, 21 named genes showed greater than a 2 fold difference. The most overexpressed were signal transduction, transcriptional regulation, cell adhesion and genes coding for cellular DNA architecture.

Conclusions: Viable RNA can be obtained from cells in a urine specimen. Gene expression in uroepithelial cells from subjects with IC varies from that of control subjects, but the differences are not dramatic. This may be due to cellular systems dismantling as cells are shed.

Poster #BS25
WITHDRAWN
**Poster #BS26**

**INHIBITION OF TNF-α IMPROVES THE BLADDER DYSFUNCTION THAT IS ASSOCIATED WITH TYPE 2 DIABETES IN MICE**

Zongwei Wang, PhD¹, Zhiyong Cheng, PhD², Vivian Cristofaro, PhD³, Pablo Gomez, MD⁴, Maryrose Sullivan, PhD³, Rosalyn Adam, PhD² and Aria Olumi, MD¹

¹Massachusetts General Hospital; ²Howard Hughes Medical Institute, Division of Endocrinology, Children’s Hospital Boston; ³VA Boston Healthcare System; ⁴Children’s Hospital, Boston (Presented by: Zongwei Wang)

**Introduction and Objectives:** Diabetic bladder dysfunction (DBD) is common and affects 80% of diabetic patients. However, the molecular mechanisms underlying DBD remain elusive due to lack of appropriate animal models. Here we demonstrate bladder dysfunction in a mouse model that harbors hepatic insulin receptor substrate 1 and 2 deletion (double knockout: DKO) which develops type 2 diabetes. We demonstrate that TNF-α is significantly upregulated during the excitatory phase of diabetic cystopathy.

**Methods:** Bladders from 6, 12, 16 and 20 week old DKO/control mice were harvested and functional alterations were evaluated by muscle strip experiment ex vivo, urodynamic and Voiding Stain on Paper (VSOP) experiment in vivo. Cultured rat Bladder Smooth Muscle Cell (BSMC) contraction in vitro was assayed by collagen gel retraction. The presence of macrophages, the expression of specific proteins was assessed with IHC and western blot respectively.

**Results:** Bladders of DKO animals exhibited detrusor overactivity at an early stage: increased frequency of non-voiding contractions during bladder filling, decreased voided volume, and dispersed urine spot pattern. In contrast, older animals with diabetes exhibited detrusor hypo-activity. TNF-α was upregulated in serum and in bladder smooth muscle tissue. TNF-α augmented the contraction of primary cultured bladder smooth muscle cells through upregulating Rho kinase activity and phosphorylating Myosin Light Chain (pMLC). Systemic treatment of DKO animals with soluble TNF receptor 1 (TNFRI) prevented upregulation of RhoA signaling and reversed the bladder dysfunction without affecting hyperglycemia. TNFRI combined with the anti-diabetic agent, metformin, improved DBD beyond that achieved with metformin alone, suggesting that therapies targeting TNF-α may have utility in reversing the secondary urologic complications of type 2 diabetes.

**Conclusions:** Our findings demonstrate that hyperactive bladder dysfunction occurs in early/middle aged animals whereas the bladder is hypoactive in older animals. Targeted inhibition of the TNF-α pathway may have a role in treating DBD and reducing the burden of the secondary complications of DM2.

**Funding:** NIH/NIDDK grant (Animal Models of Diabetic Complications Pilot & Feasibility Project, 09MCG72) and the American Urological Association/Pfizer Pharmaceutical Company competitive grants to AFO.

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**Poster #BS27**

**PUEDUAL NERVE ELECTRICAL STIMULATION IMPROVES URINARY CONTINENCE AFTER SIMULATED CHILDBIRTH INJURY IN RATS**

Hai-Hong Jiang, MD, PhD, Raul Juarez, MS, Yolanda Cruz, PhD and Margot Damaser, PhD

Cleveland Clinic, Cleveland, OH (Presented by: Hai-Hong Jiang)

**Introduction and Objectives:** Both the urethra and pudendal nerve can be injured during childbirth, which is associated with the development of stress urinary incontinence (SUI). We have previously demonstrated that electrical stimulation of the pudendal nerve after simulated childbirth upregulates brain derived neurotrophic factor (BDNF) expression in Onuf’s nucleus. The current study investigates the effects of pudendal nerve electrical stimulation on recovery of urinary continence following simulated childbirth, a dual injury animal model of vaginal distension (VD) and pudendal nerve crush (PNC).
Methods: Twenty-four Sprague-Dawley female rats were divided into 3 groups of dual injury plus electrical stimulation (DE, n=8), dual injury plus sham electrical stimulation (DS, n=8), and sham dual injury plus sham electrical stimulation (SS, n=8). Rats in the DE and DS groups underwent 4 hours of VD followed by bilateral PNC. Those in DE received 1 hour of bilateral electrical stimulation (20 Hz, 0.3mA, 0.1 ms duration) of the pudendal nerve proximal to the crush site immediately after PNC and 2 times per week for 2 weeks, when urethral function was assessed via leak point pressure (LPP) and simultaneous external urethral sphincter (EUS) electromyography (EMG) using a transurethral catheter and needle wire electrodes. DS received VD and PNC followed by sham stimulation immediately and 2 times per week. SS received the same procedures but without balloon distension, nerve crush, or electrical stimulation. A 2 way ANOVA was used to analyze the results, with the 2 factors of dual injury and electrical stimulation. P<0.05 indicated a significant difference between groups.

Results Observed: Two weeks after injury, dual injury significantly decreased both LPP and amplitude of EUS EMG (p<0.05) while electrical stimulation significantly increased LPP and amplitude of EUS EMG (p<0.05). Dual injury significantly decreased EUS EMG frequency but electrical stimulation did not significantly improve it.

Conclusion: The results suggest that bilateral electrical stimulation immediately facilitates recovery of continence after simulated childbirth injury. Based, in part on our previous work, we suggest it does so by increasing expression of neurotrophins, particularly BDNF, in Onuf’s nucleus. We conclude that electrical stimulation has potential as a preventative paradigm for SUI to facilitate recovery of continence after childbirth.

Poster #BS28
RAT BONE MARROW DERIVED MESENCHYMAL STEM CELL THERAPY IN A PARKINSONIAN ANIMAL MODEL OF DETRUSOR OVERACTIVITY
Lysanne Campeau, MDCM¹, Roberto Soler, MD², Masanori Nomiya, MD¹ and Karl Erik Andersson, MD, PhD¹
¹Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC; ²Division of Urology, Federal University of Sao Paulo, Sao Paulo, Brazil
(Presented by: Lysanne Campeau)

Introduction: Parkinson’s disease (PD) patients commonly develop lower urinary tract symptoms (LUTS) as their disease severity progresses. Stem−cell based therapies have been investigated in animal and clinical human studies for the treatment of PD−related motor dysfunction, but have yet extended their application in the treatment of LUTS. We developed an animal model of detrusor overactivity by inducing a unilateral medial forebrain (MFB) lesion with 6−hydroxydopamine (6−OHDA) in female rats. Our goal is to test the hypothesis that transplantation of rat bone marrow mesenchymal stem cells (BMSC) in substantia nigra (SN) in this model can produce lasting improvements of cystometric bladder dysfunction.

Methods: Female Sprague−Dawley rats underwent a unilateral stereotactic injection of 8µg of 6−OHDA in the right MFB. Two weeks following the lesion, we performed a treatment injection in the ipsilateral SN of vehicle (4 µl of PBS) in twenty animals, or 100,000 rat BMSC (GFP positive) suspended in 4 µl of PBS in forty animals. Animals in both groups were evaluated by cystometry at four different time points after treatment: 7 days, 14 days, 28 days, and 42 days. Urodynamic parameters were compared using t−test at each time point, and a two−way ANOVA.

Results: Urodynamic parameters at 7 and 14 days were not significantly different between both groups. At 28 days, the vehicle−treated animals had higher threshold pressure (TP) (45.5 vs 25.7, p<0.05) and basal pressure (BP) (28.4 vs 13.4, p<0.05) than the cell−treated animals respectively. These differences were again demonstrated at 42 days between the vehicle−treated animals and the cell−treated animals respectively (TP: 32.3 vs 16.8, p<0.05; BP:17.7 vs 7.9, p<0.05). At 42 days, the intermicturition pressure (IP) and spontaneous activity (SA) were statistically significantly higher in vehicle−treated animals than in cell−treated animals respectively (IP: 36.1 vs 12.3, p<0.01; SA: 18.4 vs 4.4, p<0.05). ANOVA confirmed the differences in IP and SA at 42 days and the differences in BP at 28 days.

Conclusion: We confirmed persistent urodynamic effect of the 6−OHDA lesion 42 days after vehicle injection. Rat BMSC injection in the SN lowered the TP and BP at 28 and 42 days after treatment. Cell therapy also decreased the IP and SA 42 days after treatment. Immunohistochemical studies and Western Blot assays are undertaken to clarify the cells’ role in the improvement of the cystometric parameters in this model.
Poster #BS29
RECOVERY OF BLADDER EMPTYING FOLLOWING REINNERVATION IN A CANINE MODEL
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(Presented by: Sandra Gomez)

Introduction and Objective: Our previous studies showed that after bladder, urethra and anal sphincter denervation, bladder reinnervation could be achieved by transfer of the genitofemoral nerve to the vesical branch of the pelvic nerve and urethral reinnervation could be achieved with femoral nerve transfer to the pudendal nerve. The goal of this investigation was to determine whether bladder emptying function could be regained by these reinnervation procedures.

Methods: In 5 female canines bladder denervation was performed by transection of 2 bilateral lumbosacral nerve roots inducing bladder contractions and reinnervation was performed by bilateral transfer of the genitofemoral (GF) nerve to the vesicle branches of the pelvic nerves. Nerve cuff electrodes interfaced to radiofrequency (RF) micro stimulators were placed on the transferred GF nerves. Bladder emptying during the 6 months of recovery was accomplished by an abdominal vesicostomy. After reversing the vesicostomy and allowing 5–7 days of recovery with bladder catheterization, the catheter was removed and the animal observed twice daily for 2 weeks during which the bladder was emptied using the Credé maneuver, if necessary.

Results: The Credé maneuver expressed urine in only 2 of the 5 GF nerve transfer animals on only 2 and 3 post operative days. Palpation of the lower abdomen indicated an empty bladder in the other 3 GF nerve transfer animals every day following catheter removal after vesicostomy reversal. Activation of the implanted RF micro stimulators induced increase bladder pressures in 2 of the 5 GF nerve transfer dogs.

Conclusion: Genitofemoral to pelvic nerve transfer results in recovery of bladder emptying function in this canine model.

Poster #BS30
BONE MARROW MESENCHYMAL STROMAL CELL THERAPY FOR RESTORATION OF BLADDER WALL DEFECTS
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(Presented by: Jacques Corcos)

Introduction: Bladder tissue engineering seems to be a promising avenue for tissue replacement in neurourology and oncology. Our aim is to evaluate the process of bladder regeneration after implantation of bladder acellular matrices (BAMs) seeded with bone marrow derived–mesenchymal stem cells (MSCs) in experimentally damaged bladders.

Materials and Methods: 72 Sprague–Dawley rats were divided as follows: 6 for harvesting MSCs, 22 for harvesting bladders, and 44 subdivided into 8 subgroups: normal, sham control, partial cystectomy (PC), augmentation with BAMs only and augmentation with MSCs seeded BAMs. At 1 and 6 months, rats underwent cystometrograms before sacrifice, histological analysis and immunohistochemistry after sacrifice with H&E and Masson’s trichrome. Urothelial cells were identified by anti–pancytokeratins AE1/AE3 while smooth muscle cells were identified by alpha smooth muscle actin (α–SMA).

Results: PC group had only 45% of their native bladder capacity at 1 and 6 months. The non–seeded group increased their mean bladder capacities (MBCs) by 55% compared to pre–operative values at 1 month and 65% at 6 months. MSCs–seeded BAMs bladders reached MBCs of 75% and 99% in comparison to original pre–cystectomy volume at 1 and 6 months, respectively. In the MSC–seeded group, organized muscle bundles were present in the grafted patches at 1 month, yet their thickness was attenuated in comparison to normal control bladders. At 6 months, muscle bundles were more prominent with increased thickness. Strong and diffuse α–SMA expression was observed. In non–seeded BAMs, smooth muscles were identified, but in disorganized arrangements and attenuated thickness compared to seeded groups. Multi–layered urothelial regeneration was observed in all groups (anti–pancytokeratins positive).
**Conclusions:** Seeding MSCs onto BAMs is feasible and produce a viable tissue for bladder augmentation. Bladders grafted with MSCs–seeded BAMs showed a more significant increase in capacity and satisfactory muscularis propria development when compared to bladder augmented with BAMs only. Functionality of this new type of biomaterial is still to be proven.

**Poster #BS31**

**BLADDER SENSORY SIGNALS ARE POSITIVELY MODULATED BY UROTHELIAL P2X3 AND P2X2/3 PURINERGIC RECEPTORS IN SPINAL CORD INJURED RATS**

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(Presented by: Alvaro Munoz)

*Not CME accredited

**Objective:** Evaluate the role of urothelial P2X3 and P2X2/3 purinergic receptors in modulating the activity of lumbosacral neurons and urinary bladder contractions in normal (NL) rats or spinal cord injured (SCI) rats with bladder hyperactivity.

**Methods:** SCI was induced in female rats by complete transection at T8–T9 and experiments performed four weeks later, when bladder overactivity developed. Non–transected rats were used as controls. Neural activity was recorded in the dorsal horn of the spinal cord. Laminectomy was performed at the L1–L2 levels and field potentials were acquired with tungsten microelectrodes in response to intravesical pressure step of 60 cm/w via a suprapubic catheter. Field potentials were recorded under control conditions, after stimulation of urothelial purinergic receptors with 1mM ATP and following systemic application of the P2X3/P2X2/3 purinergic antagonist AF–353 (10 mg/kg and 20 mg/kg). Cystometry was performed in urethane–anesthetized rats intravesically infused with saline. AF–353 (10 mg/kg and 20mg/kg) was systemically applied after baseline recordings. Changes in the frequency of voiding (VC) and non–voiding (NVC) contractions were evaluated.

**Results:** SCI rats showed significant higher frequencies of field potentials and NVC following noxious pressure stimulation. Intravesical ATP increased field potential frequency in controls but not in SCI rats, while systemic AF–353 significantly reduced this parameter in both groups. AF–353 reduced the frequency of VC in controls but not SCI rats; however, the frequency of NVC in SCI animals was significantly decreased.

**Conclusions:** These results suggest that urothelial P2X3/P2X2/3 purinergic receptors positively regulate C–fiber mediated sensory nerve activity and the development of non–voiding contractions in rats with bladder hyperactivity.

**Funding and Support:** National Institutes of Health; VA Medical Center; the Neurourology Fund and the Methodist Hospital Foundation.

**Poster #BS32**

**REACTIVE OXYGEN SPECIES IN THE SACRAL SPINAL CORD CONTRIBUTE TO NEUROGENIC BLADDER DYSFUNCTION IN SUPRASACRAL CHRONIC SPINAL CORD INJURY**

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(Presented by: Matthew O. Fraser)

**Introduction:** We hypothesized that spinal cord neurons involved in detrusor hyperreflexia experience changes and conditions consistent with central sensitization, including exposure to reactive oxygen species (ROS). We sought to determine whether scavenging ROS at the sacral cord will favorably affect post–SCI neurogenic bladder. To this end, continuous cystometry (CMG) was performed in long term post–SCI rats before and after local sacral spinal cord delivery of the ROS scavenger phenyl–N–tert–butylnitroxide (PBN).
Methods: Eighteen female Sprague Dawley rats (225−250 g BW) underwent laminectomy at T10 and had complete spinal cord transections. At ≥4 weeks, the chronic SCI rats received an intrathecal catheter inserted at T10, with the tip positioned at the L6 sacral cord region. The bladders of the rats were catheterized at the dome via a midline laparotomy, and the rats’ wounds were closed with suture. The rats were positioned in Ballman restraint cages and allowed 30–60 minutes of recovery prior to CMG evaluation. The rats underwent control CMG at a flow rate of 0.3 ml/min for a minimum of 30 minutes to achieve a steady baseline of filling and voiding. Following the control period, rats were given 3 sequential doses of vehicle alone at 20–30 minute intervals prior to a single dose of 1 mg PBN via intrathecal catheter in 50 ul artificial cerebrospinal fluid (aCSF) followed by 10 ul of aCSF to clear dead space. Any vehicle effects were stable by the third vehicle administration, thus data following the third vehicle were taken as control.

Cystometric measurements included intermicturition interval (IMI), minimum intravesical pressure (Min IVP), voided volume (VV), number of non−voiding contractions per voiding cycle (NVC#), and compliance (Comp). Post−PBN data were compared by paired t−test from the control.

Results: The Table shows that intrathecal PBN resulted in a dramatic (3X) increase in IMI, which may be explained by a greater than 2X increase in VV together with a decreased Min IVP, both of which suggest an increase in voiding efficiency, together with an increase in Comp. Moreover, NVC# decreased dramatically (to 26% of control values).

Conclusion: Acute ROS inhibition produces a favorable response in chronic SCI rats, reducing many hallmark indices of neurogenic hyperreflexia. These results suggest an ongoing activation of ROS production, likely due to central sensitization following suprasacral SCI, contributes significantly to detrusor hyperreflexia associated with neurogenic bladder.

Poster #BS33

SACRAL NEUROMODULATION AND MRI SAFETY: AN EX VIVO INVESTIGATION OF MRI-INDUCED HEATING OF THE INTERSTIM DURING HEAD IMAGING AT 1.5- AND 3-TELA

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(Presented by: Leise R. Knoepp)

Introduction: Using standardized protocols, previous ex vivo testing of MRI−related safety of the InterStim (Medtronic, Inc.) sacral neuromodulation system by our group was most concerning for significant heating of the device. These studies were analogous to lumbar MRI exams. However, due to the high volume of head/brain MRI scans performed clinically, the objective of this study was to perform ex vivo studies assessing heat−related safety of the InterStim for this scan type.

Materials and Methods: InterStim I and II implantable pulse generators (IPG’s) were studied connected to a standard lead. Standardized MRI testing techniques were used to evaluate device heating for 2 configurations previously determined to invoke “worst−case” heating. Devices were placed within the “torso” of a “head/torso” gelled−saline−filled phantom, with temperature probes attached to the IPG and lead tip. MRI scans of the phantom “head” were performed using the transmit/receive radio frequency (RF) head coil or the transmit−body RF coil, in effort to minimize device heating, at 1.5− and 3−Tesla (whole body averaged Specific Absorption Rate (SAR) 0.2 W/kg, peak SAR 6.6 W/kg, coil SAR 2.6 W/kg).

Results: The maximum temperature elevation achieved by either device was +0.2°C, exhibited by the InterStim I at 1.5−T in “half−bent”formation with the transmit−body RF coil. Importantly, no temperature changes were considered to be physiologically consequential for a human subject.

Conclusions: Performing head/brain MRI with transmit RF body and transmit/receive coils appears to produce inconsequential heating of the InterStim. These findings suggest some conditionality of device MRI safety, but further clinical testing is needed.

Funding: American Urogynecologic Society Thomas Benson Award in Sacral Neuromodulation.
**Poster #BS34**

**INTRAVENOUS MESENCHYMAL STEM CELLS FACILITATE PUDENDAL NERVE RECOVERY VIA PARACRINE FACTORS AFTER SIMULATED CHILDBIRTH INJURY**

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(Presented by: Charuspong Dissaranan)

**Introduction and Objectives:** The pudendal nerve innervates the external urethral sphincter (EUS) and can be injured during vaginal delivery, resulting in stress urinary incontinence. Recovery from this injury remains poor even 5 years later. Bone marrow–derived stem cells can improve growth and myelination of regenerating axons potentially via the release of trophic factors. This study was designed to investigate if intravenously (IV) injected mesenchymal stem cells (MSC) home to the affected tissues and facilitate functional recovery via secretion of paracrine factors after pudendal nerve crush (PNC).

**Methods:** Age–matched virgin female rats were utilized in 3 experiments: 1) The functional study utilizing MSC had 3 groups: PNC receiving IV phosphate buffered saline (PBS; N=6); PNC receiving 2 million GFP–labeled MSC IV (N=6); and sham PNC receiving IV saline (N=6). 2) The functional study utilizing media that had been conditioned by MSC and then concentrated (CCM) had 3 groups: PNC receiving CCM by local injection to the crush site of the pudendal nerve (N=6); PNC receiving a local control media injection (N=6); and sham PNC receiving a local control media injection (N=6). 3) The homing study had 2 groups: PNC receiving IV MSC (N=11) and sham PNC receiving IV MSC (N=11). Urethral function was tested 10 days after injury by simultaneous leak point pressure (LPP) and EUS electromyography (EMG). Mean frequency and amplitude of EUS EMG at rest and during LPP were calculated. The pudendal nerve, urethra, vagina, bladder, rectum and spleen were harvested and imaged ex–vivo for GFP 2 and 4 days after injection.

**Results Observed:** LPP was significantly reduced in rats with PNC treated with PBS or control media compared to sham PNC but not in those given IV MSC or CCM. Similarly, EUS EMG frequency and amplitude were significantly decreased in rats with PNC treated with PBS or control media compared to sham PNC but not in PNC rats treated with IV MSC or CCM. Ex vivo imaging showed significantly increased fluorescence, indicating more MSC, in the pudendal nerve and spleen of PNC rats receiving IV MSC.

**Conclusions:** IV infused MSC home to the pudendal nerve and spleen and facilitate recovery of the pudendal nerve and continence after simulated childbirth injury. CCM injection gave similar results suggesting the mechanism of action leading to restored continence is through paracrine factors secreted by MSC.

**Funding:** National Center for Regenerative Medicine

**Poster #BS35**

**INDUCED REGENERATIVE ELASTIC MATRIC REPAIR IN LOXL1 KNOCKOUT MICE: POTENTIAL THERAPY FOR PELVIC ORGAN PROLAPSE**

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(Presented by: Andrew Lenis)

**Introduction and Objectives:** No non–surgical methods exist to arrest or regress female pelvic floor disorders (FPFD), including pelvic organ prolapse (POP), which affect nearly 50% of elderly women. Impairment of elastic matrix remodeling occurs in reproductive tissues after vaginal delivery and has been linked to development of POP. Elastin determines soft tissue mechanics and cell–signaling, so regenerative repair of elastic matrix in pelvic floor tissues has the potential to prevent or alleviate POP symptoms. We have identified novel elastogenic factors (EFs), including hyaluronan oligomers (HA−o) and transforming growth factor beta (TGF−β1), that significantly enhance tropoelastin synthesis, elastic fiber assembly and crosslinking by smooth muscle cells (SMCs), both healthy and diseased.
The goal of this study was to ascertain if these factors improve the quantity and quality of elastic matrix deposition by vaginal SMCs (vSMCs) isolated from an animal model of FPFD, knockout (KO) mice deficient in lysyl oxidase like−1 protein (LOXL1), whose absence is linked to both impaired elastic matrix remodeling post parturition and POP development.

Methods: Cells isolated from vaginal tissue biopsies of age−matched LOXL1 KO mice (n=3; parity 3, stage 3 prolapse), cultured in DMEM/F12 with 10% serum were identified as SMCs by their expression of a−actin, SM22, caldesmon, smoothelin & tropomyosin. P2 vSMCs (3×10^4/10cm^2) were cultured for 21d with EFs (n=6/case). Cell layers and spent medium aliquots were assessed for elastin content and quality.

Results Obtained: EF treated vSMCs proliferated at a similar rate to untreated control vSMCs but synthesized more alkali−soluble (3.4±1.1−fold; p = 0.001 vs. control) and alkali−insoluble (heavily crosslinked) matrix elastin (1.8±0.4−fold; p=0.027), and tropoelastin (1.5±0.2−fold; p=0.032). There was greater elastic matrix deposition as well as increased LOX and fibrillin−2 content in EF−treated vSMCs compared to controls. The elastic matrix was significantly denser in EF−treated cultures, which was composed of fully−formed, mature elastic fibers that were absent in controls.

Conclusions: The results support the feasibility of a therapy to enhance regenerative elastic matrix repair in post−partum FPFD−susceptible female pelvic floor tissues, and suggest that in LOXL1 KO mice, this may occur through a compensatory mechanism involving enhanced production and activity of LOX.

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Post #BS36
THE EFFECT OF VAGINAL DISTENTION ON THE CONNECTIVE TISSUE AND SMOOTH MUSCLE PROTEINS OF THE MOUSE URETHRA
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(Presented by: Madeline A. Dick-Biascoechea)

Introduction: Stress urinary incontinence (SUI), one of the most common forms of incontinence, has been consistently linked to vaginal delivery. Vaginal distention (VD) is a proposed mechanism of injury during delivery leading to SUI. VD consists of stretching and displacement of vaginal muscles and surrounding tissues, including the urethra. VD has been associated with decreased leak point pressure (LPP) in the mouse urethra.

Objectives: To evaluate alterations in urethral tissue protein expression in the mouse urethra after VD compared to non−distended controls over time.

Methods: 66 female C57BL/6 mice were ovariectomized and supplemented with estradiol for 3 days. 35 mice had VD via transvaginal balloon catheter inflation while 31 mice received sham treatment. Mice were sacrificed at 0, 2, 3, 4, 7, 20 and 28 days after VD. Protein lysates were prepared and used for Western Blots (WB). Smooth muscle proteins alpha actin, calponin, smoothelin and SM22, and connective tissue proteins, collagens 1 and 3 and tropoelastin were analyzed with GAPDH as a loading control. WB were analyzed by densitometry with Image J and compared in Excel using Student's t−test. P<0.05 was statistically significant.

Results: All smooth muscle proteins showed a transient decrease in expression either immediately after VD or at day 2. Expression then increased as compared to the control group. These differences achieved significance in smoothelin on day 2 and calponin and SM22 on day 28. The connective tissue proteins collagen 1 and collagen 3 were both increased at all time points after VD compared to controls, achieving significance on day 0 and 28. Tropoelastin was more variable and no overall trend was observed.

Conclusions: Significant changes were observed in urethral smooth muscle and connective tissue proteins after VD. This suggests that urethral tissue remodeling occurs after VD to restore tissue properties and function to the pre−distended state. Aberrant or incomplete remodeling could contribute to decreased LPP and potentially, to the development of SUI.

Funding: NIH UL1RR024139 and RWJF Harold Amos Faculty Development Award
**Poster #BS37**

**ENHANCED MMP-1 TRANSCRIPTION: ROLE IN THE DEVELOPMENT OF SUI AND POP**

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(Presented by: Tristan Keys)

**Introduction and Objectives:** Stress urinary incontinence (SUI) and pelvic organ prolapse (POP) impact millions of American women. It has been proposed that decreased collagen content may weaken pelvic floor support, culminating in SUI and/or POP. One possible etiology is elevated activity of extracellular matrix collagen degrading enzymes such as Matrix Metalloprotinase−1 (MMP−1). Increased MMP−1 activity may decrease pelvic floor integrity by decreasing collagen concentration, and we suspect that a genetic etiology may be implicated. The MMP−1 promoter contains a single nucleotide polymorphism (SNP) consisting of an extra guanine (G) base pair inserted 1607 bases upstream of the MMP−1 transcriptional start site (termed “2G”). This alteration serves as a transcription−factor binding site known to up−regulate MMP−1 expression. Increased MMP−1 activity in women with SUI/POP may be linked to this 2G allele. The aim of this study is to determine whether the 2G allele is more prevalent in women with SUI and/or POP.

**Methods:** Adult Caucasian females with SUI and/or surgically corrected POP comprised the study group and were recruited in the Department of Urology. A group of genetic controls was obtained via the Department of Obstetrics and Gynecology to estimate local MMP−1 −1607 allele frequencies among Caucasian women. After blood samples (10ml) were obtained, red blood cells were lysed and DNA was isolated. The promoter region spanning the −1607 GG/ G− allele site was sequenced and the genotypes were analyzed. Tests of association were computed for the overall genotypic test of association (no model) and 3 genetic models (additive, dominant, and recessive).

**Results:** Seventy study patients and 72 control patients were recruited. The GG allele was present in 54 of the 70 study patients (77%) compared to 45 of 72 controls (63%). The additive model was appropriate and demonstrated that the GG allele was significantly more prevalent in women with SUI and/or POP than in genetic controls (Odds ratio: 1.62, 95% CI: 1.05−2.52, p−value: 0.0292). There were no significant associations assuming no genetic model (p=0.0924) or either the dominant (p=0.0576) or recessive (p=0.0761) genetic models.

**Conclusion:** There is a significant positive association between the 2G promoter variant of MMP−1 and the presence of SUI and/or POP. This suggests that enhanced MMP−1 transcription may play an important role in the development of SUI and POP.

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**Poster #BS38**

**REGULATION OF TREK-1 CHANNEL BY ESTROGEN INJECTION FOLLOWING OVARIECTOMIZED STAGES**

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(Presented by: Sang Don Koh)

**Introduction:** The benefits of hormone replacement therapy (HRT) to treat overactive bladder in postmenopausal women are highly controversial. Several reports suggest estrogen treatment can partially alleviate bladder overactivity (OAB) and that loss of estrogen receptors (ERs) and reduction in plasma estrogens may underlie OAB. However, other studies have revealed that estrogen treatment can actually aggravate OAB. In contrast, in postmenopausal animal models, such as ovariectomized (OVX) mice, it is accepted that uncoordinated OAB can be rectified by treatment with estradiol. We propose that the time period between the onset of postmenopause and actual commencement of treatment is the critical factor underlying the success of HRT.

**Methods:** OVX mice after 2wks surgery were used. Mice were sacrificed and detrusor muscles were collected at 1, 3 and 5 months following OVX surgery. Sham−operated mice were age−matched controls. E2 was injected for 2 weeks to OVX animals after 1, 3 and 5 following OVX surgery. Expression of TREK−1, TREK−2, ERα and ERβ in these three groups using qPCR, western blot and immunohistochemistry. Cystometry was performed to define the link between alterations in estrogen with expression of transcripts.
Results: Transcriptional analysis revealed that TREK−1 and ERα expression were down−regulated in OVX compared to control. E2 injection in OVX (OVX−E2) mice up to 3 months rescued the expression of TREK−1 transcript with recovery of ERα expression. However, 5 months in OVX and OVX−E2 were negligible. This data suggests that long−term exposure to estrogen depletion decreased the expression of ERα and thus E2 application could not rescue TREK−1 expression. ERαKO showed the down−regulation of TREK−1 transcript. Immunohistochemistry also supports that ERα immunoreactivity was down−regulated in OVX (3Mo) compared to sham−operated bladder. Cystometry (OVX 5 months) revealed an increase in the steepness of the slope during the filling phase, threshold for voiding contraction and residual pressure. E2−injection in this group did not rescue to normal bladder function.

Conclusions: This investigation confirmed the molecular mechanism of estrogen regulation of TREK−1 channels with estrogen receptor expression. In conclusion, we clarified the effectiveness of estrogen treatment following various periods of time after OVX to explain the controversial effectiveness of HRT between human and animals.

Funding: NIH P20−RR18751

Poster #BS39
BLADDER FUNCTION IMPROVES WITH SPINAL CORD REGENERATION AFTER A COMPLETE SPINAL CORD TRANSECTION IN RATS
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(Presented by: Hai-Hong Jiang)

Introduction and Objectives: Relatively few studies have focused on central neuronal regeneration with the goal of fostering recovery of efficient micturition. The effects of peripheral nerve grafts (PNG) and acidic fibroblast growth factor (aFGF) combined with ChondroitinaseABC (ChABC) on bladder reflexes after complete spinal cord transection (ST) at T8 in adult rats were studied.

Methods: Adult female Sprague−Dawley rats were divided randomly into six groups: Sham control (laminectomy only), ST only, ST+aFGF+ChABC, ST+PNG+aFGF, and ST+PNG+aFGF+ChABC. Two injections of ChABC were made near the rostral and caudal stumps of the spinal cord. Urodynamics and external urethral sphincter electromyogram (EMG) activity were recorded six months after injury. Anterograde tracing was used to evaluate axonal regeneration.

Results Observed: Urodynamical data in the ST+PNG+aFGF+ChABC animals was markedly improved beyond that in the other four injury groups. The ST+PNG+aFGF+ChABC group also had a significantly shorter time to void and significantly improved patterns of high frequency bladder pressure oscillations during voiding than the other four injury groups. This indicates that the ST+PNG+aFGF+ChABC group did not need to store large volumes of urine (less bladder incontinence and distention) to void and developed better coordination between detrusor and sphincter activity, which is closer to a normal pattern. The ST+PNG+aFGF+ChABC group also displayed higher amplitudes and bursting rates of sphincter EMG activity than the other injured animals. The improvement in urodynamics and EMG disappeared after spinal cord re−transection in the ST+PNG+aFGF+ChABC group, suggesting that supraspinal regeneration is critical for recovery. Anterograde tracing studies revealed more regenerated fibers in the distal end of the spinal cord in the ST+PNG+aFGF+ChABC group.

Conclusion: The improvements in bladder reflexes might have been due to newly formed supraspinal control via nerve regeneration.

Funding: NIH R01NS 069765, AUAF, and the Cleveland Clinic
**Introduction and Objectives:** This study compares the microstructural and mechanical properties of two surgical meshes currently used for vaginal prolapse repair. Surgical meshes differ in dimension and tightness of weave, which may influence clinical outcome risks such as tissue ingrowth, infection and mesh exposure.

**Methods:** Two FDA approved polypropylene (PP) meshes, Uphold™ (Boston Scientific) and Marlex (C. R. Bard), were tested: 1. Chemical polymer composition was analyzed by surface reflection spectroscopy of selected microscopic areas by Fourier transform infrared spectrometry (FTIR) and RAMAN. 2. Meshes were tested on an electromechanical load tester up to the failure limit. Stress was tested in triplicate from orthogonal directions in relation to waft and weave. 3. Surface scanning electron microscopy (SEM) was obtained before and after stress, and before and after dry freezing in liquid N2 and after 15 minutes in water, followed by drying.

**Results:** IR spectra matched PP library data and commercial PP sheet with peak and intensity matches of 85% to 95% (Figures 1 and 2). Spectra did not vary significantly before and after stress. Unstressed or elastic stressed PP showed slight differences vs. samples stressed to plastic deformation. Both meshes have square knits (~8 openings/cm.) Uphold has a tighter grid with pores of ~0.5 mm, vs. <0.025 mm for Marlex. SEM showed striations, enhanced with freezing, on Uphold fibers but none on Marlex (Figure 3). Fiber overlays in Uphold were fused as though compressed. Figure 4 shows load slopes. Both meshes had roughly the same Young’s modulus in initial loading (0–3 Newtons [N] with 100% deformation), but different strain patterns. PP sheet had elastic deformation of 2.5% up to 33 N, with plastic deformation at ~30 N until failure at 650%. In contrast the meshes had complex deformations with much smaller forces (3 N to 6 N). The curves have a series of drops, which may indicate slippage and tightening of the knit.

**Conclusion:** The two meshes had very similar polymer composition but showed significantly different mechanical and microstructural qualities, which may impact their clinical performance.

**FIGURES** (for Mesh 1 = Marlex and Mesh 2 = Uphold)
**Poster #BS41**

**PROSTANOID PROFILING USING ION-SPRAY TANDEM MASS SPECTROPHOTOMETRY: A POTENTIAL NEW MODALITY FOR OVERACTIVE BLADDER DIAGNOSIS AND SUB-TYING**

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(Presented by: Ashley B. King)

**Introduction and Objectives:** It is well-established that prostaglandins can influence bladder contractility. However, the role of these agents in the pathophysiology of overactive bladder (OAB) remains poorly understood. The purpose of this study was to investigate prostanoid profiles produced by detrusor smooth muscle in animals and humans using the new technology of ion-spray tandem mass spectrophotometry (TMS).

**Methods:** Five strips of detrusor smooth muscle, with or without urothelium, were harvested from New Zealand White rabbits and Wistar rats (N=2, each). Strips were incubated in 500µL of warmed, aerated phosphate-buffered saline (NPSS), and medium was aspirated after one hour for measurement of baseline prostanoid production. Fresh medium was replaced containing an equal volume of NPSS (control), or NPSS with vehicle (DMSO), ibuprofen (non-selective COX inhibitor), NS-398 (COX-2 inhibitor), or SC-560 (COX-1 inhibitor). Medium was aspirated after one additional hour of incubation and TMS was used to quantify an array of prostanoids in the baseline and post-treatment media. Strips were weighed and total protein was determined using Bradford Assays. Values (µg/µg protein) were normalized to baseline prostanoid production to determine the percentage change. Urine specimens from women with (N=7) or without (N=2) urinary urge incontinence based on validated questionnaires (UDI-6 and ICIq-OAB) were similarly analyzed to demonstrate proof-of-concept in humans.

**Results Obtained:** In all cases, prostanoids were simultaneously quantified using ion-spray tandem mass spectrophotometry. PGE2 production was decreased by more than 50% after treatment with COX inhibitors with no decreases seen after treatment with control (NPSS) or vehicle (DMSO). Similar changes were seen with PGD2, PGF2α, 6-keto PGF1α. COX inhibitors did not affect production of HETEs (5–HETE, 11–HETE, 12HETE, and 15HETE), which were run as non-prostanoid controls. Prostanoid production was quantifiable in the urine of women with or without OAB, demonstrating the potential for use of this modality in the diagnosis and sub-typing of incontinence.

**Conclusions:** This study demonstrates the feasibility of quantifying an array of prostanoids in detrusor tissue or urine from animals and humans. The effects of non-selective and selective COX inhibitors were readily observable and highlight TMS as a potential novel modality for improved diagnosis, sub-typing, and drug testing on patients with OAB.

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**Poster #BS42**

**MONITORING OF DETRUSOR DYSFUNCTION IN PATIENTS WITH SPINAL CORD INJURY USING SIMULTANEOUS URODYNAMIC EVALUATION AND NEAR INFRARED SPECTROSCOPY**

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(Presented by: Babak Shadgan)

**Introduction:** Management of bladder dysfunction in patients with spinal cord injury (SCI) requires precise diagnosis and regular monitoring of bladder function during the treatment and recovery periods. Currently, the method used for evaluation of bladder dysfunction is invasive urodynamic study (UDS). Near infrared spectroscopy (NIRS) is a non-invasive optical method to study tissue oxygenation, hemodynamics and function by monitoring changes in the chromophore concentrations of oxygenated (O2Hb), deoxygenated (HHb) and total hemoglobin (THb).

**Objective:** The objective of this study was to confirm the feasibility of NIRS for monitoring detrusor oxygenation and hemodynamics during UDS filling and emptying of the bladder in patients with SCI and to investigate the correlations of NIRS measures with simultaneous UDS parameters.
Methods: 20 adult paraplegic patients with neurogenic bladder dysfunction who were referred for regular UDS were recruited. Changes in O2Hb, HHb and tHb along with tissue saturation index (TSI%) of detrusor were monitored by a wireless NIRS system during the UDS. Time points of urgency and urinary leakage were marked and pattern of changes in NIRS measures were compared to standard UDS pressure tracings.

Results: A similar pattern of changes in NIRS measures was observed during each phase of bladder filling and emptying across the subjects (Figure 1). During bladder filling a gradual increase in tHb and O2Hb with minimal changes in HHb was observed. Strong consistency between changes in tHb and intravesical pressure was observed during filling. By recording a sudden fall in TSI%, NIRS was able to successfully predict the time-point of urgency and bladder failure in patients with urinary leakage.

Conclusions: NIRS monitoring of detrusor is a feasible method in SCI patients with bladder dysfunction. Our preliminary data are suggesting a relationship between noninvasive NIRS measures and urodynamics parameters during bladder filling in SCI patients. Detrusor TSI% was observed to fluctuate during filling in neurogenic individuals providing observation of possible neurovascular alterations in these cases. Further studies are required to confirm these qualitative findings and measure them quantitatively.

Poster #BS43
FEASIBILITY OF POST-OPERATIVE ADJUSTABILITY OF A NOVEL SINGLE-INCISION SLING: AN ANIMAL STUDY
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(Presented by: Ervin Kocjancic, MD)

Introduction: The latest trend in single incision slings is the ability to adjust the sling intra-operatively after the anchors have been placed. However, oftentimes post-operative adjustment is desirable. In this study, we compare the force required to adjust the mesh tension at the time of insertion and at various post-operative points to determine if post-operative adjustability is feasible.
Methods: The Coloplast Altis single-incision trans-obturator sling was used for this study. It is comprised of three components: a fixed anchor, a dynamic anchor, and a tensioning suture through the dynamic anchor that allows adjustment of mesh tension. Four slings were implanted into the obturator internis muscle of four 6-month old New Zealand white rabbits. Three of the four meshes in each animal were used for force measurements; the fourth mesh was used in a separate study. The force required to adjust the tension of the mesh was measured in Newtons (N) with a commercial force gauge by applying steady force to the mesh perpendicular to the plane of the muscle at the time of implantation (day 0), as well as 1, 7, 14, and 21 days after implantation.

Results: Average forces required to adjust the mesh tension for each time point are presented in the graph. The average force needed to adjust the mesh tension amongst days 0, 1, and 7 were similar (3.6N, 7.6N, 5.7N respectively). The mean force required was significantly higher for days 14 and 21; specifically >23N, at which point the mesh broke. The percent increase in mean force required to adjust the mesh tension compared to day 0 were as follows: 111% at day 1, 58% at day 7, and greater than 500% for days 14 and 21.

Conclusion: Days 1 and 7 required similar forces to day 0 to adjust the mesh tension. Days 14 and 21 required much higher forces causing the mesh to fail before the tension was adjusted. It appears that the optimal time to adjust the sling post-operatively would be approximately 0 to 7 days after implantation, beyond this time, re-tensioning is not possible. These findings leave open the possibility to adjust the tension of the sling up to a week after surgery. Further investigation may help extrapolate these findings to human subjects.
Poster #BS44
ASSOCIATION OF INFLAMMAGING (INFLAMMATION + AGING) WITH HIGHER PREVALENCE OF OAB IN ELDERLY POPULATION
Jayabalan Nirmal, PhD¹, Michael Chancellor, MD¹, Vikas Tyagi, PhD¹, Xianggui Qu, PhD¹, Hann-Chorng Kuo, MD³, Hsin-Tzu Lin, PhD³, Yao-Chi Chuang, MD⁴ and Pradeep Tyagi, PhD¹
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(Presented by: Jayabalan Nirmal)

Introduction and Objectives: Although, epidemiology studies consistently report increased prevalence of overactive bladder (OAB) with age, an accurate deciphering of causative links between the two remains elusive. Studies on aged rodent bladder have yielded contradictory results on age associated changes in muscarinic receptors and highlighted the challenge from species differences in OAB pathology. We hypothesized that age related biochemical changes in bladder resulting in altered bladder function will be reflected in altered urinary proteome of elderly OAB patients.

Methods: Single time point urine specimens were obtained from 140 OAB patients in the age range of (25−90 years) of either sex coming routinely to the urology clinics. Eight chemokines in urine were measured by MILLIPLEX® MAP Human Cytokine/Chemokine multiplex immunoassay and ELISA. Multivariate and univariate statistical analysis was done to determine association of age with urinary chemokines and OAB symptoms.

Results: In agreement with age dependent higher prevalence of OAB, the logistic regression analysis in our study also highlighted the significant association of OAB symptoms with age (odds ratio [OR]:1.12; 95% CI,(1.072, 1.187), p=0.0001. Univariate analysis of 8 urinary proteins revealed age associated elevation of NGF (nerve growth factor) in 137 out of 140 OAB patients (Pearson r= 0.274; 95%CI[0.112 − 0.422]; p= 0.001). Chemokines like MCP−1 (monocyte chemoattractant protein−1) were detected in 115 OAB patients and the remaining chemokines were only detected in one−third of OAB patients.

Conclusions: Based on our findings, we postulate that age associated biochemical changes in the bladder are revealed by changes in urinary proteome. NGF elevation may be a homeostatic response to counter the senescence of bladder nerves and arrest the progression of OAB into overactive hypocontractile bladder and elevation of MCP−1 may be related to decreased muscle mass and increased fat in bladder of old OAB patients. Urinary NGF and MCP−1 can be surrogate markers for monitoring age associated biochemical changes and the effect of therapeutic interventions in OAB patients.

Poster #BS45
HISTOLOGIC CHANGES AFTER IMPLANTATION OF A NOVEL SINGLE-INCISION SLING: AN ANIMAL STUDY
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(Presented by: Ervin Kocjancic, MD)

Introduction: Patient convalescence is an important factor when determining which mid−urethral sling to utilize. There are now several single−incision slings that promise a quicker return to daily activity, however, very few studies look at the histology at different time points after mesh implantation in order to support their claims. In this study, we track the evolution of cellular response after insertion of a novel single−incision sling and correlate these findings to phases of wound healing.

Methods: The Coloplast Altis single−incision trans−obturator sling was used for this study. It is comprised of three components: a fixed anchor, a dynamic anchor, and a tensioning suture through the dynamic anchor that allows adjustment of mesh tension at the time of surgery. Four slings were implanted into the obturator internis muscle of four 6−month old New Zealand white rabbits. One of the four meshes in each animal was sent for pathology, the remaining 3 meshes were used in a separate study. Hematoxylin and eosin (H&E) slides were prepared and examined by a pathologist for several markers of inflammation and wound healing including: granulation tissue, vascularity, edema, heterophils (rabbit equivalent of human neutrophils), giant cells, fibrin deposition, fibrosis, mononuclear cells and myofibroblasts.
Results: The cellular changes noted in the histology slides correlated well with the phases of wound healing. Of particular interest was the increase in fibrosis, decrease in edema and fibroblasts, as well as the appearance of myofibroblasts at day 14, all of which herald the beginning of the maturation phase of wound healing. At day 21, we see the appearance of late granulation tissue that converts to collagen and continued fibrosis.

Conclusion: By day 14 the maturation phase of wound healing has begun. This data suggests that there may be sufficient ingrowth of the mesh for urethral stabilization two weeks post-operatively. Patients being implanted with this novel sling may be able to resume normal activity sooner than the 4–6 weeks often advised with other single-incision slings. Further investigation may help extrapolate these findings to human subjects.

Poster #BS46
TARGETED MOLECULAR ASSESSMENT OF PUDENDAL NERVE NEUROREGENERATIVE RESPONSE
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(Presented by: Bradley Gill)

Introduction and Objectives: The aim of this project was to validate an improved method for quantifying mRNA upregulation in small, isolated tissue samples using laser capture microdissection (LMD) and quantitative real-time PCR (Q–PCR). We investigated Betall-tubulin upregulation in Onuf’s nucleus as a measure of the pudendal nerve (PN) neuroregenerative response to simulated childbirth injury. We validated the new method by comparing it to previously published results obtained using in situ hybridization with radioisotopes.

Methods: Four virgin Sprague-Dawley rats weighing 225–250g received a unilateral PN crush injury. Intracardiac perfusion of heparinized saline and lumbo-sacral laminectomy were conducted 1 week later, after which the spinal cord was frozen in situ with liquid nitrogen and the L4–S2 segment was removed en bloc and stored in a cryotube kept in liquid nitrogen. Onuf’s nucleus, containing the PN cell bodies, is at approximately the L6 spinal cord level in female rats and was identified anatomically on serial 10um sections via cryostat. Samples were collected on LMD slides and stored at −80C until used. After thionin staining and fixation, 5 Onuf’s nuclei from the injured and contralateral uninjured sides were isolated from serial sections in each rat and collected with like-samples in cell lysis solution prior to being frozen on dry ice. Samples were then processed with an RNA isolation kit and subject to DNA digestion. Reverse transcription was performed followed by a non–biasing PCR cDNA pre-amplification targeting Betall-tubulin (gene: TUBB2C). Q–PCR was conducted using ribosomal 18s RNA (gene: 18s) as an endogenous control.

Results Obtained: The LMD–PCR method indicated Betall–tubulin was expressed 2.29 +/- 0.44 times higher in injured compared to uninjured PN cell bodies. Prior in situ hybridization methods showed a 2.49 +/- 0.32 fold greater expression after the same simulated childbirth injury compared to uninjured control rats.
Conclusions: The LMD–PCR method reproduced previous in situ hybridization findings but without radioactive reagents. Results were obtained in 8–9 hours with LMD–PCR rather than 4 weeks with in situ hybridization. This technique may be useful in preclinical studies to assess the neuroregenerative response to therapeutic agents.

Funding: NIH Grant R01 HD038679, Cleveland Clinic, VA

Poster #BS47
CHARACTERIZATION OF NEUROMODULATION FOR BLADDER CONTROL IN A RAT CYSTITIS MODEL
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Neuromodulation, Medtronic Inc.
(Presented by: Angela Nickles)

*Not CME accredited

This study was to determine the urodynamic effects of spinal nerve (SN) stimulation in a rat cystitis model. Rats were anesthetized with urethane and two wire electrodes were placed bilaterally under each of the L−6 SN for current stimulation. Urodynamic functions were evaluated in saline induced isovolumetric recording of the bladder rhythmic contraction (BRC) and cystometry performed with room−temperature saline or 0.3% acetic acid saline. SN stimulation at motor threshold intensity, 10 Hz for 10 min reduced the frequency of the BRC to 29±14% of controls (mean ± se, n=11, v.s. control, n=23, p<0.05, two−way ANOVA). Stimulation did not alter the bladder contraction amplitude. Four cystometry parameters were assessed including micturition pressure (MP), threshold pressure (TP), void volume (VV) and intercontraction interval (ICI). Significant decreases in TP (3.15±0.36 mm Hg v.s. 7.68±1.92 mm Hg, control), VV (0.19±0.02 ml v.s. 0.44±0.07 ml) and ICI (3.48±0.28 min v.s. 7.99±1.30 min) were observed following acetic acid irritation (P<0.05, two−way ANOVA). One hour of SN stimulation largely increased TP, VV and ICI. The maximal percentage increases in TP as compared with the pretreatment value in saline, and acetic acid−treated rats were 277±54% (P=0.01, Mann−Whitney test) and 204±47% (P=0.04) of controls, respectively. SN stimulation increased the VV to 206±74% (P=0.20) and 383±139% (P=0.03) and ICI to 226±77% (P=0.04) and 367±141% (P=0.01), respectively. The percentage increases in the acetic acid−treated group were not significantly higher than those in saline−treated group (P>0.05, Mann−Whitney test). SN stimulation did not change MP in any group. SN stimulation attenuates the frequency but not amplitude of the BRC. The inhibitory effect appears as a consequence of increased functional bladder capacity since stimulation increases TP, VV and ICI from the cystometry model. Furthermore, the disrupted storage functions in acetic acid induced cystitis rats are improved by SN stimulation. The study prompts further urodynamic evaluation of neuromodulation and its correlation with subjective improvement in patients with an overactive bladder.

Funding: Supported by Medtronic Inc.

Poster #BS48
CITRATE SYNTHASE, SACROPLASMIC RETICULAR CALCIUM ATPASE, AND CHOLINE ACETYLTRANSFERASE ACTIVITIES OF SPECIFIC PELVIC FLOOR MUSCLES OF THE RABBIT
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(Presented by: Sara Spettel)

Introduction: An emerging body of research supports a relationship between the pelvic floor muscles and urinary systems manifested as urgency, frequency, incontinence, pelvic pain and bowel complaints.

Improved understanding of the relation between the pelvic floor muscles and urinary tissues is clinically relevant in tailoring the treatment of these patients. This study compares three important cellular enzymes in pelvic floor muscles, bladder muscle (body and base) and bladder mucosa. These enzymes were chosen because of their relationship with intracellular calcium uptake and release, mitochondrial energy production, and muscarinic neurotransmission; which have significant implications regarding contractile function.
Methods: Adult female WNZ rabbits were euthanized and the following muscle were excised: pubococcygeus (PC), ischiocavernosus (IC), bladder body muscle and mucosa, and bladder base muscle. The citrate synthase (CS) (mitochondrial biomarker enzyme), sarcoplasmic reticular calcium ATPase (SERCA) (sarcoplasmic reticular biomarker enzyme), and choline acetyltransferase (ChAT) (biomarker for muscarinic neurotransmission) were quantitated and compared.

Results: The CS and SERCA activities of the bladder body mucosa were significantly higher than that of the bladder body or base muscle. The CS, SERCA, and ChAT activities of the PC pelvic floor muscle were significantly higher than the IC pelvic floor muscle. Thus, specific pelvic floor muscles do not have the same metabolic properties, the PC pelvic floor muscle should have significantly greater capacity to contract than the IC muscle. Interestingly, the bladder body and base muscles have significantly higher ChAT activities than both pelvic floor muscles.

Conclusions: There are significant differences between specific pelvic floor muscles for the three important intracellular enzymes CS, SERCA, and ChAT.

Posters

Poster #BS49
SYNCHRONIZED VIDEO AND MULTICHANNEL WIRELESS EMG CAN BE USED TO STUDY PELVIC FLOOR MUSCLE RESPONSE TO MOVEMENT
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(Presented by: Cara-Louise Fox)

Objective: To demonstrate the usefulness of wireless video synchronized emg in the analysis of pelvic floor muscle response to different movements.

Methods: A 55 year old female subject performed three different jump rope exercises; skipping rope (alternating single foot hop jump), jumping rope (jumping with both feet at the same time), running rope (alternating single foot jump). Pelvic floor, gluteal, lower extremity adductors, and Transversus abdominis muscles were monitored using surface emg electrodes with wireless sensors (Noraxon Inc., Scottsdale AZ). Several seconds of each movement were monitored and average mean amplitude (µV) and average mean area (µV) were measured for each of the three jump rope exercises. Multiples of baseline emg was used to compare average mean amplitude for the three different jump rope exercises.

Results: Baseline amplitude was measured at 9.7 µV. Skipping rope (MOB = 10.1) and running rope (MOB = 9.5) were found to induce a greater degree of pelvic floor muscular activity than jumping rope (MOB=3.9) in this subject. In this subject we found skipping rope and running rope to produce 61% and 59% greater average mean amplitude than jumping rope.

Conclusions: Wireless Video Synchronized EMG can be used to interpret the effects of movement on pelvic floor muscular activity. This tool may be useful in the creation of novel programs of pelvic floor muscle exercise as well as the effects of pathological states on pelvic floor muscular response to movement.
**Poster #M1**

**EXTERNAL AND INTERNAL STIMULI RELATED TO URINARY URGENCY AND URGENCY INCONTINENCE**

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Teachers College Columbia University

(Presented by: Kathleen A. O’Connell)

Introduction and Objectives: Latchkey incontinence (leakage as one arrives home), a frequent complaint of those with overactive bladder syndrome (OAB), may be an example of responding to a conditioned stimulus. The objective of this study was to investigate whether other external (environmental) or internal (interoceptive) cues may serve as conditioned stimuli in OAB.

Methods: A questionnaire containing 21 external, 5 internal, and 3 unlikely cues was administered to 306 subjects randomly drawn from a panel of respondents maintained by Zoomerang, Inc. such that approximately half (150) had self-reported diagnoses of OAB and half did not. The sample was 66% female, with average age of 53 in the diagnosed group (DX) and 54 in the undiagnosed group (UNDX). DX and UNDX groups were compared on the mean number of cues rated as “often” or “always” associated with leakage and with urgency. Within-subjects analyses compared mean responses of the three unlikely cues with means of the other cues.

Results Obtained: Substantial portions of both groups reported urgency and leakage once per year or more: DX: 97% urgency and 87% leakage; UNDX: 84% urgency and 69% leakage. DX and UNDX showed significant differences in the mean number of cues associated with leakage (external: DX = 5.27 cues, NONDX = 2.67 cues, p < .001; internal: DX = 1.46 cues, UNDX = 0.76 cues, p < .001). Similarly, those with OAB reported significantly more cues associated with urinary urgency (external: DX = 5.61 cues, UNDX = 3.41 cues, p < .001; internal: DX = 1.97 cues, UNDX = 1.5 cues, p = .001). Within cues, DX were significantly more likely than UNDX to associate 17 of the 21 external cues and all 5 of the internal cues with both leakage and urgency. Within subjects, responding to cues unlikely to be associated with urination was significantly lower than responding to likely cues.

Conclusions: External cues associated with urgency and urgency incontinence were frequently reported in this sample, suggesting that Pavlovian conditioning of bladder responses may be widespread. However, responding to cues was significantly more frequent among those who had been diagnosed with OAB. Comparisons of likely cues with unlikely ones indicated that respondents were not simply responding to all cues in the questionnaire. These findings suggest that behavioral strategies incorporating extinction of conditioned cues should be tested as an approach to treatment of persons with OAB.
Poster #M2
A SURPRISINGLY LOW PREVALENCE OF DEMONSTRABLE STRESS URINARY INCONTINENCE IN WOMEN WITH MULTIPLE SCLEROSIS FOLLOWED AT A TERTIARY NEUROUROLOGY CLINIC
Benjamin Dillon, MD, Casey Seideman, MD, Michelle Van Kuiken, Dominic Lee, MD, Elliot Frohman, MD and Gary Lemack, MD
University of Texas Southwestern, Dallas, Texas
(Presented by: Benjamin Dillon)

Introduction: Multiple Sclerosis (MS) is a demyelinating disorder in which 80% patients will seek urologic care due to bothersome lower urinary tract symptoms. Although urgency and urge incontinence are most frequently reported, the age demographic affected by MS suggests that stress urinary incontinence would be common as well. We report on the prevalence of stress urinary incontinence (SUI) in a large cohort of MS patients referred to a tertiary neurogenic bladder (NGB) clinic.

Materials and Methods: An IRB−approved neurogenic bladder database of MS patients followed over a 10 year period was queried for urodynamic (UD) and demographic data. Demographic information included MS classification, age at initial visit, BMI and parity. Clinical SUI was defined as the presence of urodynamic stress incontinence using provocative testing (USI) and/or incontinence on supine stress test performed with a comfortably full bladder. Urogenital Distress Inventory Short form (UDI−6) responses were also obtained at the initial visit.

Results: Between 1/2000−7/2011, 280 women with MS were referred to the tertiary care NGB clinic. Their mean and median age was 50, and mean duration of MS was 13 years (median 2). Relapse remitting MS (RRMS) was noted in 40%, followed by Secondary Progressive MS in 36% and Primary Progressive in 7%. SUI was demonstrated in 39 (14%) of patients. Women with SUI had a higher average Qmax (15 ml/sec vs. 9 ml/sec, p<0.001), higher voided volumes (272 cc vs. 194cc, p=0.02) and a higher BMI (30 vs. 25, p<0.001). There was no difference in age, parity or MS duration when comparing those with and without SUI. When looking at MS classification, patients with RRMS were more likely to have SUI compared to patients with PMS (21 vs. 10, p=0.02). Among women with SUI, total UDI−6 score was higher (6 vs. 3.6, p<0.01), including higher scores on question 3(p<0.001) and 4 (p=0.03).

Discussion: Higher voided volumes and flow rates in those with SUI indicate improved emptying and diminished outlet resistance, as has been reported in non−neurogenic SUI populations. The 14% prevalence of demonstrable SUI in women with MS is markedly lower than published historical data of an age matched cohort without MS. The surprisingly low prevalence of SUI among women with MS may be attributable to diminished activity level, neurogenically enhanced strength of the vesicourethral unit, or other functional or anatomic etiologies which merit further study.
**IMPACT OF URETHRAL CATHETER SIZE DURING VOIDING IN WOMEN: OBSTRUCTIVE OR NOT?**

Pierre Nelson¹, Francoise Valentini¹ and Philippe Zimmern, MD²

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(Presented by: Philippe Zimmern)

**Introduction and Objectives:** Pressure flow studies in women are controversial, possibly due to the presence and size of the urethral catheter [1]. We used the VBN mathematical micturition model [2] to analyze the parameters most likely to influence the voiding phase of a urodynamic study in women.

**Methods:** The VBN model was used to investigate the effect of catheter size during voiding and to tease out its role against other influential parameters of voiding in women, such as volume voided and degree of detrusor contractility (k parameter). Simulations were made for a range of catheter sizes frequently utilized during UDS: 3.5, 5, 6, 7 and 8 Fr. Other studied parameters included bladder volumes (from 100 to 600 mL), detrusor contractility, and a compressive urethral obstruction (a value of 15 cm H2O was arbitrarily chosen). Comparisons were made between the computed maximum flow (Qmax) in these various conditions.

**Results Obtained:** The geometrical obstruction due to a catheter was almost negligible compared with the volume effect (Fig 1: k=1 with normal urethra). The highest decrease in Qmax resulted from a decrease of detrusor contractility (Fig 2: k=0.3 with normal urethra) or from the equivalent of a urethral compression independent of catheter size. Concomitant changes such as decrease in detrusor contractility and urethral compression increased the apparent obstructive effect and decreased the volume effect (Fig3: k= 0.3, urethral compression = 15 cm H2O).

**Conclusions:** Based on the VBN model, the main reason for a decrease in Qmax during an intubated flow is related to a decrease in detrusor contractility or to a urethral compression effect whereas the geometrical obstructive effect of the catheter is less contributive.

**Citation:** [1] Urol Int 2005; 75: 21−5; [2] NAU 2000; 19: 153−76
Poster #M4

PUBOVAGINAL SLING IN THE TREATMENT OF CONCOMITANT FEMALE URETHRAL DIVERTICULA AND STRESS URINARY INCONTINENCE

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(Presented by: Ekene Enemchukwu)

Introduction: Female urethral diverticulum is a rare condition with nonspecific symptoms. Consequently, diagnosis is often delayed. There is a paucity of data on the management and outcomes. Surgical management of female urethral diverticula and concomitant stress urinary incontinence (SUI) with pubovaginal sling (PVS) has been shown to be safe and effective in small series. We present our experience with concomitant repair.

Methods: Retrospective chart review from 2006 to 2009 identified 22 women undergoing concomitant diverticulectomy and autologous fascia PVS. Demographics, symptoms, urodynamics (UDS), prior treatments, concomitant procedures, pads per day (PPD), outcomes and complications were evaluated.

Results: Mean age was 50.2. Mean duration of symptoms was 71.2 months. Follow up was 307 days. Magnetic resonance imaging was utilized in 19 patients and 3 were evaluated with voiding cystourethrogram. Seven patients presented with recurrent diverticula status post >1 repairs. All women had demonstrable SUI on exam or UDS. Two patients experienced post–operative retention, one requiring short term intermittent catheterization. Pre and post–operative PPD were 2.6 and 0, respectively. 60% patients reported mixed urinary symptoms prior to repair. Of these, 8 had complete resolution while 5 had significant improvement. Overall, 16 (73%) patients reported cure, while 5 (22%) were improved. One patient experienced recurrence of her urethral diverticulum with SUI after 23 months. No de novo detrusor overactivity, perioperative complications, including hemorrhage, vaginal erosion, fistula or hernias were observed.

Conclusions: To our knowledge, this represents the largest series of concomitant repair of SUI and urethral diverticulum. In this series, autologous fascia PVS is a safe and effective in women undergoing primary as well as repeat diverticulectomy. In addition to treatment of SUI symptoms, placement of a PVS may provide tissue interposition to reduce erosion, fistula, and additional post–operative complications. Future directions include determining the prevalence of SUI in those with recurrent urethral diverticula, as this population may be at higher risk and require more preoperative evaluation.
REPEATED INTRA-DETRUSOR INJECTION OF ONABOTULINUM TOXIN-A IN PATIENTS WITH NEUROGENIC BLADDER
Matthew Fine, MD¹, Prashanth Kanagarajah, MD¹, Chris Gomez, MD² and Angelo Gousse, MD¹
¹Florida International University, Miami, FL; ²University of Miami Miller School of Medicine, Miami, FL
(Presented by: Matthew Fine)

Purpose: To evaluate clinical outcomes with repeated intra-detrusor onabotulinum toxin-A (BTX-A) injections in patients with neurogenic detrusor overactivity (NDO) and incontinence.

Methods: We reviewed bladder BTX-A treatments for 20 consecutive neurogenic bladder (NGB) patients. All patients underwent baseline history and physical, seven-day bladder diary, and urodynamics (UDS). Inclusion criteria included NDO on UDS and incontinence. Six weeks after the first injection with BTX-A patients completed a seven-day bladder diary and underwent repeat UDS. Patients completed a seven-day voiding diary for all subsequent BTX-A injections. We evaluated clinical outcomes with respect to age, gender, etiology of NGB, presence of diabetes and obesity, pre and post-BTX-A cystometric capacity, pre and post-BTX-A incontinence episodes per week, and the number of times injected until non-response. We defined intra-detrusor BTX-A injection success as a greater than 50% reduction in incontinence episodes per week according to seven-day bladder diary.

Results: Of the 20 patients with NGB, 16 patients had spinal cord injury (SCI) and four had multiple sclerosis (MS). The average patient age was 46.6 ± 15.6 years, including 12 men and eight women. A total of 59 total injections were given with an average of 2.95 injections per patient (1–7). Seventeen patients (85%) continue to have successful responses. Three patients were non-responsive (15%). Two patients never responded (one SCI and one MS). Only one patient received multiple injections with initial success and later became non-responsive. Using statistical analysis, age, gender, obesity, diabetes, etiology, pre-BTX-A incontinence episodes per week and pre-BTX-A cystometric capacity did not portend an increased risk of non-response (Table 1). BTX-A responders were noted to have a significantly increased cystometric capacity and significantly decreased incontinence episodes per seven-day voiding diary.

Conclusions: Intra-detrusor BTX-A injection is an effective and important treatment for NDO and incontinence. Only one patient of twenty initially responded to BTX-A and later became non-responsive indicating that repeated BTX-A injection response is durable.
Introduction and Objectives: Urinary incontinence after repair of vesicovaginal fistula (VVF) poses a unique challenge. Unlike in the U.S., VVF in sub-Saharan Africa are most commonly due to obstetric fistulae, the result of prolonged obstructed labor. The objective is to report preliminary observations and challenges on women with stress urinary incontinence (SUI) after successful juxta urethral obstetrical VVF repair at Mbarara Regional Referral Hospital (MRRH) in Mbarara, Uganda.

Methods: This is an observational study of women who underwent surgical VVF repair at MRRH, between Jan 2008 and Dec 2010. In March 2011, in response to radio, women with prior VVF repair presented to MRRH, and were evaluated by history, physical exam (PE), and retrograde methylene blue dye test.

Results: 77 women underwent surgical repair of VVF at MRRH during the study period. Of the 60 (77.9%) women who had successful closure of their fistulae, 13 (21.7%) had residual SUI as determined by history and PE. In March 2011, 7 of these women with prior VVF repair presented with urine leakage and dye test confirmed no recurrent VVF. 1 woman had predominantly urge incontinence and was counseled accordingly. 6 of these women were evaluated to have severe SUI. 1 had had her VVF repair within the previous 3 months and treatment was delayed. The remaining 5 women with bothersome severe SUI were all noted to have a history of medium (1.5–3cm) to large (>3cm) juxta–urethral fistulae (type IIb fistulae, circumferential fistulae, and/or repeat VVF repair). On PE, the urethrae were non–hypermobile, with significant scarring periurethrally. Each was counseled on the risks benefits and alternatives of retropubic sling placement. Surgical dissection was challenging. Foley catheters were left to open drainage, and all voided after removal. All 5 patients reported improvement prior to being discharged. At 2 month follow up, all were continent and without complaint. Long term follow–up will be conducted.

Conclusions: In sub-Saharan Africa, SUI after successful juxta urethral VVF repair poses a complicated management dilemma with limited treatment options. The history of damage to the urethra and urethral–vesical junction, history of surgical reconstruction, as well as the severity of SUI requires a feasible, durable, and effective treatment with an acceptably low complication rate. Retropubic mid–urethral mesh sling placement after successful VVF repair is one alternative that is being evaluated with long term follow–up needed.
Results: 20 women with symptoms of UI (n=16) or POP (n=4) were enrolled. The mean age of participants was 60.5 years (range 31–87), and the majority were Caucasian (n=15) with college experience (n=14). TOFHLA scores indicated high levels of health literacy with an average score of 93 (range 84–100). Overall, themes extracted during data analysis fell into two main categories: patient fears were largely allayed after their initial physician visit (Figure 1A), and patients tended to focus on treatment, despite continued difficulty understanding their diagnosis (Figure 1B).

Conclusions: Our findings demonstrate that the initial encounter with a specialist has a significant impact on a patient’s understanding of her pelvic floor disorder. Though our data demonstrates a continued difficulty recalling diagnosis, patients had improved understanding of treatment plans after the specialist visit. This study also supports the benefit of grounded theory methodology in understanding patient concerns as well as addressing their perceived needs.

Funding: NIDDK Patient–Oriented Career Development Award (1 K23 DK080227 JTA) and an American Recovery and Reinvestment Act (ARRA) Supplement (5K23DK080227).

Poster #M8
COMPLICATION RATES OF SINGLE INCISION SLINGS—META-ANALYSIS OF THE WORLD LITERATURE
Crystal Dover, MD, Glenn Levenson and Sarah McAchran, MD
Madison, WI
(Presented by: Crystal Dover)

Objectives: Single-incision slings are touted to provide equal efficacy with less morbidity than the traditional mid-urethral slings. This study was designed to review the available data regarding the complication rates of single-incision slings placed for stress urinary incontinence, notably the TVT–Secur by Ethicon and Mini–Arc by AMS.

Methods: A PubMed search using the terms “mini sling or TVT Secur or Mini Arc” was performed. 64 articles were identified. 38 of these provided some information regarding complications. Case reports and studies which had less than 3 months average follow-up were excluded. This left 27 studied with 2,549 patients for review. The following complications were recorded: de novo urgency and urge incontinence, urinary tract infection (UTI), urinary retention, vaginal mesh extrusion, urethral erosion, bleeding, bladder perforation, vaginal wall perforation, urethral laceration, pain, and dyspareunia. Using SAS software, complication rates were calculated as were minimum and maximum values.

Results: 2,549 patients were included representing 1,628 TVT–Secur procedures and 921 Mini–Arc procedures. The average follow-up was 11.8 months. The most common reported complication was de novo urgency, frequency and urge incontinence with a rate of 7.7% (0–32.9%). The rate of UTI was 2.0% (0–11.9%). The rate of urinary retention was 2.9% (0–9.6%), with 0.5% of the patients requiring operative urethrolysis. The rate of vaginal extrusion was 2.0% (0–12.5%). The rate of urethral erosion was 0.03% (0–1.1%). The rate of bleeding complications was 0.66% (0–2.5%). The percentage of patients requiring re-operation for bleeding was 0.03%. The rates of bladder perforation, urethral perforation, vaginal wall perforation, and urethral laceration were all less than 1%. Patients reported post-operative pain at a rate of 2.0% (0–26%) and dyspareunia at 0.2% (0–2.1%).
Conclusions: Based on the early data, with the exception of bladder perforation rates which are consistently higher with retropubic midurethral slings, the single incision slings appear to have similar complication rates to those published for the more traditional retropubic and transobturator midurethral slings. Long term studies and prospective comparisons are needed.

Poster #M9
NEUROPATHIC PAIN AND URGE URINARY INCONTINENCE
Holly Langmuir, MD, MPH, Heidi Harvie, MD, MBA and Lily Arya, MD
Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania
(Presented by: Holly Langmuir)

Aim: Translational studies have reported biomarkers associated with neural inflammation in the urine of women with urgency urinary incontinence (UUI). However, clinical evidence of neural inflammation in women with UUI is lacking. The aim of the present study is to determine the association between urgency urinary incontinence and neuropathic pain.

Methods: A cross-sectional study was performed in 233 consecutive women with urgency predominant urinary incontinence (UUI) reporting to a urogynecology clinic for their initial evaluation. UUI was diagnosed using the validated questionnaire “Questionnaire Based Voiding Diary.” All women completed a visual analogue score of their average pain intensity over the previous four weeks. Women with UUI and pain (VAS > 3) were compared to women with UUI and no pain. All women completed a validated questionnaire, PainDETECT, to measure neuropathic pain, as well as validated questionnaires to measure the urinary symptoms (Urogenital Distress Inventory–short form), irritable bowel symptoms (Birmingham Bowel Scale), and quality of life (Uriney Impact Questionnaire).

Results: The prevalence of pain (VAS >3) in women with UUI was 27%. We compared 63 women with UUI and pain to 160 women with UUI and no pain. Mean age (55 ± 14 vs. 57 ± 15 years), BMI (28 ± 6 vs. 27.7 ± 6.5) and parity were similar in women with UUI and pain and women with UUI and no pain. Women with UUI and pain were significantly more likely to complain of difficulty emptying the bladder (3.2 ± 1) than women with UUI and no pain (2.4 ± 1, p<.001). The mean total quality of life score of women with UUI and pain (42.4 ± 33) was significantly worse than that of women with UUI and no pain (20.5 ± 21, p<.001). Women with UUI and pain were significantly more likely to report all the characteristics of neuropathic pain (burning, tingling, pain with light touch, pain attacks, numbness, sensitivity to temperature, and pain with light pressure or allodynia) than women with UUI and no pain. Women with UUI and pain were also significantly more likely to have a higher constipation score (4.9 ± 4 vs. 3 ± 3.3) and higher diarrhea score (5 ± 4.2 vs. 3.7 ± 4.3, p<.001) than women with UUI and no pain.

Conclusions: Women with urge urinary incontinence and pain are more likely to report pain with neuropathic characteristics and bowel symptoms than women with UUI and no pain. These findings support the presence of an underlying neuropathic mechanism in women with UUI.

Poster #M10
EVALUATING PATIENTS SYMPTOMS OF OVERACTIVE BLADDER BY QUESTIONNAIRE: THE ROLE OF URGENCY ON URINARY FREQUENCY
Benjamin Brucker, MD, Daniella Kaefer, MD, Maragrita Aponte, MD, Duane Hickling, MD, Christopher Kelly, MD, Nirit Rosenblum, MD and Victor Nitti, MD
New York University, NY, NY
(Presented by: Benjamin Brucker)

Introduction: The hallmark symptom of overactive bladder (OAB) is urinary urgency (urgency), yet many patients complain of urinary frequency (frequency) as their most bothersome symptom, with some not even reporting the symptom of urgency. It is not clear however what factors drive frequency in patients with OAB. In this study, we aim to explain what role urgency has on frequency.
Methods: We prospectively enrolled 102 patients with OAB. Patients were assessed with an OAB-q symptom bother scale (OABqbs) and completed a questionnaire asking them to identify the most bothersome symptom (BS) (using the ICS definitions for frequency, urgency, urgency incontinence and nocturia). Patients that noted that their most BS was “void/urinate too often by day” (ICS definition of frequency) were then asked why they voided frequently. One of the responses was “a sudden compelling desire to pass urine that is difficult to defer” (ICS definition of urgency). Other responses included: fear of leakage of urine, sensation of something in the bladder, learned behavior.

Results: 85.3% (87) female and 14.7% (15) male with a mean age of 67.4 years were enrolled. 45.1% (46/102) were currently on an anticholinergic (ACH) and 43.1% (44/102) had not been on ACH for > 4 weeks. The median OABqbs was 52.5 (10–100). Overall, the most BS was identified as follows: frequency 24.5%, urgency 23.5%, incontinence 24.5%, nocturia 27.5%. When analyzed according to ACH, those not on ACH noted that frequency and nocturia were the most common bother (34% each), vs. those currently on ACH noted that urgency was the most common BS (33%) with frequency being the most bothersome in only 15%. Of all patients most bothered by frequency, 52% selected the ICS definition of urgency as the underlying reason for their frequency. The other underlying reasons for frequency were: sensation in the bladder 32%, fear of leakage 12% and behavioral 4%.

Conclusions: The reason some patients with OAB void frequently has not been well described. This pilot study confirms that urgency is a large factor underlying the drive to void frequently, even when patients do not admit to urgency as the most bothersome. We confirm that urgency is the keystone in defining OAB in that 75.5% of patients were most bothered by urgency, either as a primary complaint or as the driving symptoms behind frequency. In this study, patients on ACH had a lower rate of reporting frequency as the most BS.

Poster #M10.5*
CENTRAL NERVOUS SYSTEM PENETRATION AND EFFECT ON MEMORY: COMPARISON OF TROSPUIM CHLORIDE AND OXYBUTYIN IN PATIENTS WITH OVERACTIVE BLADDER AND AGE-ASSOCIATED MEMORY IMPAIRMENT
David Staskin, MD¹, Gary Kay, MD², Howard B. Goldman, MD³, Cara Tannenbaum, MD, MSc⁴, Warren Tong, PharmD, MS⁵, Rina K. Patel, MS, CCRA⁵ and Michael G. Oefelein, MD⁵
¹Division of Urology, Caritas St. Elizabeth’s Medical Center, Tufts University School of Medicine, Boston, MA; ²Neurophysiology Division, Department of Neurology, Georgetown University School of Medicine, Washington, DC; ³Glickman Urologic and Kidney Institute, The Cleveland Clinic, Cleveland, OH; ⁴Department of Geriatric Medicine, Institut Universitaire de Gériatrie de Montreal, Montreal, Quebec, Canada; ⁵Allergan, Inc., Irvine, CA
(Presented by: David Staskin)

*Not CME accredited

Introduction: Anticholinergic (AC) agents are implicated in effects on memory due to central nervous system (CNS) penetration, which allows for muscarinic receptor binding in the brain—a particular concern in overactive bladder (OAB) treatment, due to high prevalence of OAB and utilization of AC agents in the elderly. Patients with age-associated memory impairment (AAMI) may be especially vulnerable to cognitive impairment associated with CNS-active ACs. AC agents most likely to cross the blood-brain barrier (BBB) are the lipophilic tertiary amines (eg, oxybutynin). Quaternary amines are far less lipophilic and are not thought to cross the BBB. This randomized trial is the first to compare cerebrospinal fluid (CSF) permeation and memory effects of a quaternary (trospium) and tertiary (oxybutynin) amine in older OAB patients with AAMI.

Methods: In SMART II, a blinded, active-comparator, placebo-controlled, biodistribution and memory study, patients ≥60 years with OAB and AAMI were randomized to extended-release (XR) trospium 60 mg once daily for 10 days (n=6), or immediate release (IR) oxybutynin 5 mg 3-times daily for 2 days (n=10). Primary endpoints were plasma and CSF steady-state (SS) pharmacokinetic parameters. Secondary endpoints, memory testing at baseline (BL) and post-dose SS, used validated memory scales—the Hopkins Verbal Learning Test–Revised (HVLT–R) for total (T) and delayed (D) recall.

Results Obtained: At SS, oxybutynin (oxy) and its metabolite desethyl oxybutynin (deoxy), were detected in the CSF, whereas trospium was not detected in CSF (Table). Increased memory impairment vs. baseline was seen with oxybutynin IR (trend towards significance in reduction in HVLT–R (T) and significant reduction in HVLT–R (D) [P=.028]). Trospium XR had no deleterious effect on memory.
Conclusions: In older patients with OAB and AAMI, oxy and deoxy, but not trospium, were detected in the CSF at steady state. Memory test scores decreased in those receiving oxybutynin IR, but not trospium XR. AC induced memory impairment in vulnerable older adult AAMI patients is avoided with the quaternary amine trospium chloride XR.

Funding: Allergan, Inc.

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<tr>
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<th>Tropium XR</th>
<th>Oxybutynin IR</th>
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<tr>
<td>Mean AUC (ng·hr/mL)</td>
<td>25.1†</td>
<td>21.0†</td>
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<tr>
<td>Plasma</td>
<td></td>
<td></td>
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<tr>
<td>CSF</td>
<td>0.204†</td>
<td>1.68†</td>
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<tr>
<td>ΔHVLT-R scores BL to SS:</td>
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<td></td>
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<tr>
<td>Total recall</td>
<td>-0.3</td>
<td>-3.3</td>
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<tr>
<td>Delayed recall</td>
<td>-1.2</td>
<td>-1.3†</td>
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</table>
| BLQ = below lower limit of quantification (<40 pg/mL); †AUC0-24, †AUC0-144; †P=0.03 vs BL

Poster #M11
DOES SUBJECTIVE VALSALVA VOIDING PREDICT ITS PRESENCE ON URODYNAMIC TESTING?
Amul Shah, MD, R. Corey O'Connor, MD, Dan Eastwood, MS and Michael Guralnick, MD, FRCSC
Medical College of Wisconsin, Milwaukee, WI
(Presented by: Amul Shah)

Introduction: Valsalva voiding (VV), or straining to urinate, has been identified as a potential risk factor for complications following anti-incontinence surgery. Subjective VV is a symptom measured by the American Urological Association Symptom Index (AUASI). Subjective urinary symptoms, however, do not necessarily correlate with objective measures of voiding function. The purpose of this study is to determine if subjective VV based on AUASI predicts its objective presence on urodynamic studies (UDS).

Methods: A retrospective chart review was performed on patients undergoing video UDS for a variety of indications, who had also completed an AUASI. An AUASI of >3 for the symptom of VV (have to push or strain to begin urination half or more of the time) was used as a cut-off to identify subjective VV. The pressure-flow studies of the UDS were analyzed for the presence or absence of any VV, defined as a rise of at least 10 cm H2O in abdominal pressure during voiding (with or without a concomitant detrusor contraction, DC). These were then compared with the AUASI results for VV. Exclusions included: neurogenic patients with abnormal sensation, inability to void on UDS, a study that was subjectively not representative of typical voiding, or undocumented AUASI. Statistical analysis was performed using 2x2 tables, binomial proportions, and Fisher’s test.

Results: Forty-nine female patients have been analyzed to date with data collection ongoing. Subjective VV was reported on AUASI in 13/49 (27%). A component of VV was noted on UDS in 26/49 (53%) of patients: 10/26 (38%) had pure VV, 16/26 (62%) had VV + DC. 10/13 (77%) patients with subjective VV had a component of VV on UDS (3/10 had pure VV, 7/10 had VV + DC). 16/36 (44%) with subjective non-VV were noted to have a component of VV on UDS (7/16 had pure VV, 9/16 had VV + DC). For predicting a component of VV on UDS, subjective VV had a sensitivity of 38.5% (95% CI 20.2%, 59.4%), a specificity of 87.0% (95% CI 66.4%, 97.2%), a positive predictive value of 76.9% (46.2%, 95.0%), and a negative predictive value of 55.6% (38.1%, 72.1%)

Conclusions: Overall the subjective impression of VV is not a strong predictor of the presence of VV on UDS. While patients reporting subjective VV may be more likely than not to have this confirmed on UDS, the converse is not true: many patients who deny subjective VV may be found to have at least a component of it on UDS.
DIFFERENCES IN URODYNAMIC STUDY VARIABLES IN ADULT PATIENTS WITH NEUROGENIC BLADDER AND MYELOMENINGOCELE BEFORE AND AFTER AUGMENTATION ENTEROCYSTOPLASTY

Michael Vainrib, MD and David A. Ginsberg, MD
University of Southern California, Los Angeles, California
(Presented by: Michael Vainrib)

Introduction: The majority of literature evaluating neurogenic bladder (NGB) in the myelomeningocele (MMC) patients focuses on pediatric patients. Adult MMC patients with NGB underwent urodynamic studies (UDS) during their follow up (F/U) or work-up before augmentation. Our aim was to compare UDS parameters between patients with native bladders and those after augmentation as well as to check the longevity of UDS variables after surgery.

Methods: A retrospective review of MMC patients with UDS was performed. Comparative variables were analyzed using either student’s t test or Fisher exact test.

Results: 113 patients with MMC and NGB were identified with annual follow up. 58/118 (49.1%) had their UDS been done in our clinic: UDS after reconstruction − 18/58 (31%) (AUGMENT group) and UDS during annual follow-up (NoSx group) − rest 40/58 (69%). There were no significant differences in age (AUGMENT/NoSx=33.3/36.8 years, p=0.16) or gender distribution (AUGMENT/NoSx=61/55% male, p=0.778) between the two study groups ( ). 10/40 (25%) from NoSx were operated soon after UDS was performed: augmentation (9) and cystectomy (1). The following table describes the UDS variables in both study groups:

<table>
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<tr>
<th></th>
<th>NoSx</th>
<th>AUGMENT</th>
<th>p</th>
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<tbody>
<tr>
<td><strong>Pdet@Qmax (cmH2O)</strong></td>
<td>31.1(1−95)</td>
<td>39.6(1−60)</td>
<td>0.0081</td>
</tr>
<tr>
<td><strong>Mean Cystometric Capacity (ml)</strong></td>
<td>407.5(32−800)</td>
<td>495.9(245−970)</td>
<td>0.086</td>
</tr>
<tr>
<td><strong>Detrusor Overactivity (no. of pts)</strong></td>
<td>18</td>
<td>3</td>
<td>0.0443</td>
</tr>
<tr>
<td><strong>Loss of Compliance (no. of pts)</strong></td>
<td>21</td>
<td>3</td>
<td>0.0197</td>
</tr>
<tr>
<td><strong>Incompetent Sphincter (no. of pts)</strong></td>
<td>13</td>
<td>5</td>
<td>0.769</td>
</tr>
<tr>
<td><strong>ALPP(cmH2O)</strong></td>
<td>51.0(17−78)</td>
<td>39.6(20−110)</td>
<td>0.567</td>
</tr>
</tbody>
</table>

Mean time from the surgery to UDS was 10.4 years (1–16). There was no significant difference in period of time between surgery and UDS for patients who had been operated and stayed with normal compliance and those patients with loss of compliance in UDS (p=0.128).

Conclusions: Patients with MMC and NGB after augmentation have significantly lower Pdet@Qmax, lower frequency of DO and leakage episodes and higher frequency of normal compliance bladder than those patients that did not operated. Close long-term follow up should be maintained, especially in those patients that have not had prior augmentation. Residual urinary incontinence may be secondary to poor sphincteric function in patients with/without prior augmentation. Moreover, we should continue to follow patients after reconstruction as elevated detrusor pressures can still be seen. As a result of a longer survival of patients with MMC, strict follow up after lower urinary tract dysfunction continues to be important.

URODYNAMIC FINDINGS IN FEMALE PATIENTS WITH DIABETES MELLITUS

Charles Chang, MD¹, Anastasia Osipova, MD², Natasha O’Gorman, PA-C², Kyungmin Kang², and Doreen Chung, MD²
¹Section of Urology, Department of Surgery, The University of Chicago Medical Center, Pritzker School of Medicine, Chicago, IL; ²Department of Urology, Mount Sinai Hospital, Chicago, IL
(Presented by: Charles Chang)

Introduction and Objective: Diabetic cystopathy has been described as decreased sensation, increased capacity, impaired contractility, and an elevated post void residual (PVR). Data are conflicting and few studies exist regarding urodynamic (UDS) findings in patients with diabetes mellitus (DM). We wanted to characterize UDS findings in females with DM and lower urinary tract symptoms (LUTS) from a contemporary database.

Methods: A single center UDS database from 2010 to 2011 was searched for females with DM and retrospectively reviewed. All studies were performed according to International Continence Society standards.
Results Obtained: Among 35 patients identified, 8 had insulin dependent DM (IDDM) and 27 had non-insulin dependent DM (NIDDM). Mean age was 58.6±11.1 years. UDS parameters are shown in the table. The most frequent presenting complaints were stress urinary incontinence (SUI) in 27 (77.1%) patients, urge urinary incontinence (UUI) in 26 (74.3%), and urgency in 23 (65.7%). Based on UDS findings, the most common diagnoses in both groups were SUI in 20 patients (57.1%), large capacity bladder (LCB) in 15 (42.9%), detrusor overactivity (DO), DO incontinence (DOI), and detrusor underactivity (DU) in 12 (34.3%) each. In IDDM patients, the most common diagnoses were SUI (n=6, 75%), LCB (n=5, 62.5%), and DU (n=4, 50%). In NIDDM patients, SUI (n=14, 51.9%), DO, DOI, and LCB (each with n=10, 37%) were the most common diagnoses. 2 (25%) women with IDDM and 7 (26%) with NIDDM had incomplete emptying. There were no significant differences in maximum detrusor pressure, PVR, and volume at first sensation between the two groups; however, there was a significant difference in capacity (p=0.035).

Conclusions: In this series, the most common UDS diagnosis and presenting complaint was SUI. Other common diagnoses are LCB, DO, DOI, and DU. Women with IDDM had significantly larger bladder capacities than those with NIDDM. Our findings suggest that although women with DM do not present with symptoms of “diabetic cystopathy” some exhibit certain classical findings on UDS as well as the usual common findings of SUI, DO, and DOI. This reinforces the need for UDS as part of the workup in diabetics presenting with LUTS.

| Table: Urodynamic findings in 35 female diabetic patients |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
|                                | Bladder capacity (mL) | Volume of First sensation (mL) | Max Pdet (cm H2O) | PVR (mL) |
| All patients                   | 557 (±369)         | 187 (±180)       | 34 (±19)         | 66 (±117) |
| IDDM                           | 792 (±486)         | 219 (±188)       | 30 (±17)         | 101 (±192) |
| NIDDM                          | 488 (±304)         | 179 (±181)       | 35 (±20)         | 54 (±81)  |

Poster #M14
DECREASE OF MAXIMUM FLOW RATE DURING INTUBATED FLOW IN WOMEN: TOWARDS IMPLICATION OF A URETHRAL REFLEX
Françoise Valentini, MD, PhD, Gilberte Robain, MD, PhD, Dorothée Hennebelle, MD and Pierre Nelson, PhD
ER6-Université Pierre et Marie Curie – Hôpital Rothschild Paris, France
(Presented by: Françoise Valentini)

Aims: To analyze, using the VBN mathematical micturition model [1], the potential obstructive effect of the transurethral catheter on the voiding process during intubated flow (IF) with the hypothesis of an incomplete sphincter relaxation leading to a residual sphincter pressure.

Methods: We reviewed a 2 years urodynamic database of women referred for the evaluation of lower urinary tract dysfunction. Criteria of exclusion were a neurological disease or a grade ≥2 prolapse. Included filed comprised a free uroflow (FF1) before cystometry and IF (7F urethral catheter), and a second FF (FF2) at the end of the session. Analysis of FF and IF was made using the VBN model (requirements: voided volumes ≥100 ml and continuous flow curves). Criteria for acceptable result: same value of the mechanical parameters during the session and fitting between recorded and computed curves with a quadratic error less than 5%.

Results: Among 472 women, 157 met the criteria for inclusion. Effect of the urethral catheter was only a geometrical one in 60 (38.2%) files with QmaxIF=QmaxFF1. An additional effect of urethral catheter identified as an incomplete sphincter relaxation was observed in 97 (61.9%) files with QmaxIF<1.5*QmaxFF1 (Fig). Among these last files, the same remaining sphincter excitation was found for 30 (30.97%) in FF2 (Fig b).
Conclusions: The decrease in Qmax observed during IF when compared with that during FF does not result from the mechanical effect of the catheter. It must be related to an incomplete sphincter relaxation during voiding and could involve, in addition to the anxiety of the patient, a urethral reflex. These findings underline the necessity to perform a FF before the IF during a urodynamic session in order to increase the reliability of the conclusions of the urodynamic investigation.

Citation: [1] NAU 2000; 19: 153−76

Poster #M15
RENAL TRACT ULTRASONOGRAPHY FOR ROUTINE SURVEILLANCE IN SPINAL CORD INJURY PATIENTS
Leonard Edokpolo, BS and Harris Foster Jr., MD
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(Presented by: Leonard Edokpolo)

Introduction and Objectives: To evaluate the efficacy of annual ultrasonography rather than regular urodynamic testing for upper tract surveillance in spinal cord injury (SCI) patients managed with long-term intermittent catheterization.

Methods: Data was gathered retrospectively from the records of 48 SCI patients (40 males and 8 females) included in the study. After establishing a safe system with initial urodynamics, renal tract surveillance was done with annual ultrasonography. Urodynamics were repeated only when patients presented with new symptoms. The primary endpoint was the presence/absence of ultrasound abnormalities at last follow-up. Findings of dilation, calculi, scarring and reflux were noted.

Results: Mean follow-up was 6.8 years. By final follow-up 7 (15%) subjects had moderate/minimal hydronephrosis. 3 cases were stable and 4 (8%) cases were new compared to initial assessment. No severe cases of hydronephrosis were noted. 5 (10%) subjects had renal/ureteral calculi; one case of calculi was stable compared to the initial exam. No new cases of renal cortical scarring/thinning were noted. 1 (2%) subject had high grade reflux secondary to a double J stent.

Conclusions: Data relating to the efficacy of sequential ultrasonography or urodynamics in SCI patients are scarce thus there is great variability in the urologic management of these patients. Upper tract abnormalities detected in our patients were early consequences of acute obstructive processes rather than late manifestations of detrusor changes and thus could not have been prevented with more regular urodynamic testing. These results support the regular use of ultrasonography rather than urodynamics for urinary tract surveillance in SCI patients.

Acknowledgements: This work was completed with support from the Yale Medical Student Research Fellowship Award/James G. Hirsch Medical Student Research Award.
**Introduction and Objectives:** Up to 40% of men with post-prostatectomy urinary incontinence also have bladder dysfunction. In men undergoing artificial urinary sphincter (AUS), detrusor overactivity and impaired contractility have been previously shown to adversely affect AUS outcomes. Less is known about predictive findings on UDS for transobturator male sling (TOS). The objective of this study was to evaluate the association of preoperative urodynamic parameters on functional outcomes after transobturator male sling placement for stress urinary incontinence (SUI).

**Methods:** Forty nine male patients with stress urinary incontinence (SUI) after radical prostatectomy or transurethral treatment of benign prostatic hyperplasia (BPH) underwent TOS placement from December 2008 through June 2011 (AdvVance, AMS Minnetonka, MN; Virtue, Coloplast, Humblbaek, Denmark). A non–funded retrospective review of a prospective database was reviewed for those patients who underwent preoperative urodynamics and had at least 6 weeks of follow up. In total 38 patients were identified. There were 28 patients considered a success, defined as cured (no or one dry "security" pad) or greatly improvement (1–2 pads or pad reduction ≥50%), and 10 patients considered a failure (pad reduction <50%, unchanged, or worse SUI). We then evaluated the preoperative urodynamic parameters between these two groups to identify potential adverse parameters.

**Results:** Overall success rate was 74% (28/38) with an average follow up of 3 months. Comparing the success and failure groups there was no difference between the age, BMI, pre–operative pad usage, rate of mixed urinary incontinence, pre and post–operative Qmax, pre and post–operative post void residual, or length of follow up, Table 1. On preoperative urodynamics, only bladder capacity was found to be significantly lower in those who failed TOS, (p = 0.047), Table 1. Abdominal leak point pressure (ALPP), max detrusor pressure at peak flow, the presence of valsalva voiding, and detrusor overactivity had no impact, Table 1. Complication rates were similar between the groups.

**Conclusions:** Low bladder capacity may be a predictor for failure in male patients undergoing TOS.

<table>
<thead>
<tr>
<th>Table 1 – Patient Demographics and Urodynamic Parameters</th>
</tr>
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<tbody>
<tr>
<td><strong>Success (No. 28)</strong></td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>BMI</td>
</tr>
<tr>
<td>Pads per day</td>
</tr>
<tr>
<td>Mixed incontinence</td>
</tr>
<tr>
<td>Pre-op Qmax (mL/s)</td>
</tr>
<tr>
<td>Pre-op PVR (mL)</td>
</tr>
<tr>
<td>Abdominal LPP (cm H2O)</td>
</tr>
<tr>
<td>PdetQmax cm H2O</td>
</tr>
<tr>
<td>Valsalva voiding</td>
</tr>
<tr>
<td>Detrusor Overactivity</td>
</tr>
<tr>
<td>Bladder Capacity (mL)</td>
</tr>
</tbody>
</table>

*10 patients in the success group did not have ALPP seen on UDS, and 1 in the failure group.
**Introduction:** Radical prostatectomy (RP) is an effective treatment for localized prostate cancer, but can result in long term complications such as stress urinary incontinence and erectile dysfunction. Climacturia is a poorly characterized consequence of RP that can have adverse quality of life implications and has been cited to affect up to 93% of post RP patients. The aim of this study is to determine the impact of male urethral sling placement on post-prostatectomy climacturia.

**Methods:** A retrospective review of all men who underwent urethral sling placement between 2007 and 2011 was generated. All patients were queried by telephone questionnaire that examined aspects of climacturia, including frequency, amount of urine loss, bother score of patient and partner, and coping mechanisms (Lee, et al), both before and after urethral sling placement.

**Results:** Thirty-three patients were eligible for analysis. Twenty patients answered the full questionnaire and comprise the study cohort. Mean follow-up was 18 months (range 3.1–37.8). Sixteen of 20 men (80%) were pad-free or minimally spotting on chart review at last follow-up. Fifteen of 20 men were not sexually active prior to sling placement. Eight were impotent, 1 was celibate and 6 were potent, but avoided sexual activity due to incontinence during intercourse. In total, there were 11 potent men, of which 10 acknowledged climacturia. All of the men and their partners (100%) found climacturia to be bothersome to varying degrees (see Figure). After sling placement, 9 of 10 men (90%) had improvement in bother score for climacturia (p<0.05). Six of 10 men (60%) had completely resolved climacturia, including 3 who avoided sexual activity due to leakage before sling placement. In three of the 4 patients who still had climacturia, it rarely occurred and the amount of urine loss was quantified as a few drops.

**Conclusions:** Male urethral sling placement for post-prostatectomy climacturia has a positive effect, with 90% of the study group showing a benefit. Climacturia should be discussed as a potential consequence of RP and should be specifically inquired about in the post-prostatectomy period.
**Poster #M18**

**PRESENTING SYMPTOMS IN PATIENTS WITH ARTIFICIAL URINARY SPHINCTER CUFF EROSION**

Ekene Enemchukwu, MD, MPH, Melissa Kaufman, MD, PhD and Doug Milam, MD
Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN
(Presented by: Ekene Enemchukwu)

**Introduction:** Erosion of the urethral cuff of the artificial urinary sphincter (AUS, American Medical Systems, Inc. Minnetonka, Minnesota) is an important cause of sphincter loss. Signs of cuff erosion can be subtle in many cases. Early recognition of device erosion may prevent circumferential erosion and further complications such as urethral stricture. This study examined the presenting features of sphincter cuff erosion along with other risk factors such as radiation treatment, bladder neck contracture, and pre-erosion placement of a urethral catheter.

**Patients and Methods:** Records of all patients who underwent AUS explantation at our center between 1/2002 and 6/2011 were retrospectively examined. Patients undergoing revision due to fluid loss or bulbar atrophy were excluded. Data collected included patient demographics, comorbidities, previous radiation and complications. All patients had cystoscopic and/or intraoperatively confirmed cuff erosion.

**Results:** Forty men underwent device explantation for cuff erosion. 83 percent of men were post prostatectomy. 32.5% had undergone radiotherapy for prostate cancer. 20% had diabetes mellitus. Mean time to diagnosis of device erosion was 48 months. 30% presented with recurrent urinary incontinence (ISD). 32.5% demonstrated new signs of obstruction, ranging from weak stream to urinary retention. 27.5% had signs of infection, including swelling, pain, erythema, fever and malaise, while only 15% presented with hematuria.

**Conclusions:** Presenting symptoms can be subtle. A minority of patients presented with infection or hematuria. Most interestingly, most men presented with symptoms of obstruction or incontinence. This study suggests that changes in voiding symptoms should prompt suspicion of urethral cuff erosion and further evaluation should be undertaken without delay. Future studies will be needed to determine whether presenting symptoms correlate with degree of urethral erosion and ultimate outcomes.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Mean (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (yrs)</td>
<td>68 (19-93)</td>
</tr>
<tr>
<td>Mean time to erosion (mos)</td>
<td>48 (1-181)</td>
</tr>
<tr>
<td>Post prostatectomy</td>
<td>35 (97.5%)</td>
</tr>
<tr>
<td>History of radiation</td>
<td>13 (32.5%)</td>
</tr>
<tr>
<td>Previous SUI surgery</td>
<td>21 (53%)</td>
</tr>
<tr>
<td>History of AUS revision</td>
<td>16 (40%)</td>
</tr>
<tr>
<td>History of tandem cuff</td>
<td>8 (20%)</td>
</tr>
<tr>
<td>History of Urolex</td>
<td>2 (2.5%)</td>
</tr>
<tr>
<td>History of CIC</td>
<td>3 (7.5%)</td>
</tr>
<tr>
<td>Foley catheterization prior to GU evaluation</td>
<td>6 (15%)</td>
</tr>
</tbody>
</table>

**Poster #M19**

**INDICATIONS FOR REVISION OF ARTIFICIAL URINARY SPHINCTER AND MODIFYING RISK FACTORS FOR DEVICE-RELATED MORBIDITY**

Ifeanyi Anusionwu, MD and E. James Wright, MD
Johns Hopkins Medical Institution, Baltimore, MD
(Presented by: Ifeanyi Anusionwu)

**Introduction and Objectives:** The aim of our study is to evaluate the causes for failure of artificial urinary sphincter (AUS), and to detect modifiable risk factors for device-related morbidity. We also report our outcome after AUS revision.

**Methods:** We retrospectively reviewed the medical records of consecutive patients who underwent revision of AUS at our institution by a single surgeon over the last 5 years (2006 to 2011). No financial funding was received for this study.
Results Obtained: There were 53 AUS revisions performed on 34 patients. Median age of the population was 69 years. The indications for AUS revision are shown in Table 1. Urethral atrophy was the most common indication for AUS revision. Fourteen patients (41%) underwent more than one revision. Table 2 shows the number of revisions undergone by patients. Forty–three percent of those who underwent multiple revisions had a history of radiation therapy, as opposed to 25% of those who underwent one revision, but the difference was not statistically significant (P=0.45). Seven patients had urethral catheterization in the setting of an activated AUS while admitted to a non–urologic service; all of these patients developed cuff erosion with or without infection. Fifty four percent of urethral erosions were associated with such traumatic catheterizations. After revision, 80% patients with an AUS in place were continent at mean follow up 27 months (median 20 months).

Conclusions: Urethral atrophy remains the most common reason for AUS revision. Forty–one percent of patients undergoing AUS revision will have repeated revisions. More than half of all urethral erosions are secondary to urethral catheterization in the setting of an activated sphincter, suggesting that some of the risk of device–related morbidity may be modifiable.

<table>
<thead>
<tr>
<th>Indication for Revision</th>
<th>Number of revisions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urethral atrophy</td>
<td>31 (56%)</td>
</tr>
<tr>
<td>Erosion</td>
<td>13 (25%)</td>
</tr>
<tr>
<td>Infection</td>
<td>2 (4%)</td>
</tr>
<tr>
<td>Mechanical failure</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Patient discomfort</td>
<td>5 (9%)</td>
</tr>
<tr>
<td>Need for transurethral procedure</td>
<td>1 (2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of revisions</th>
<th>Number of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 revision</td>
<td>20 (88%)</td>
</tr>
<tr>
<td>2 revisions</td>
<td>11 (32%)</td>
</tr>
<tr>
<td>3 revisions</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>4 revisions</td>
<td>2 (6%)</td>
</tr>
</tbody>
</table>

Poster #M20
WITHDRAWN

Poster #M20.5
FULGURATION OF HUNNER’S ULCERS: LONG-TERM CLINICAL OUTCOMES
Joel Hillelsohn, BA, Zhamshid Okhunov, MD and Robert Moldwin, MD
The Arthur Smith Institute for Urology Hofstra North Shore – LIJ Hofstra School of Medicine, New Hyde Park, NY
(Presented by: Joel Hillelsohn)

Introduction: Fulguration of Hunner's ulcer (HU) recommended by AUA guidelines may dramatically and rapidly ameliorate patient symptoms; however HU recurrence along with symptoms is common, often necessitating further intervention. We retrospectively reviewed long–term outcomes after bladder fulguration with a focus upon the need to repeat this procedure to maintain symptom relief.

Methods: Fifty nine cases (32 patients) of fulguration of HU were evaluated. Intra–operative and , follow up parameters as well as treatment modalities were recorded and analyzed.

Results: There were 7 males and 25 females with the mean age of 68 (range 26–92). The mean duration of symptoms was 8 years (range 2–35). All 32 patients prior to fulguration, in addition to medication, were treated with intravesical anesthetics. Two patients (6%) received an Interstim® device, 4 patients (12%) received DMSO therapy, 2 patients (6%) had hydrodistention performed, and 4 patients (13%) received physical therapy.
Follow up after initial fulguration was available for 30 patients. Mean follow up time was 32 months (Range 1−76) since first fulguration procedure. Fifteen patients (50%) reported improved or stable symptoms, 10 (33%) patients reported continuous or deterioration of symptoms, 3 (10%) were deceased and 1 (3%) underwent cystectomy. Of the 32 patients 16(50%) underwent only one fulguration procedure while 16 (50%) underwent multiple procedures with a mean number of procedures 3 (range 2−6). In the multiple procedure group (n=27) average time between procedures was 16 months (SD 11). A comparison of patients receiving one fulguration procedure versus multiple is summarized on table 1.

**Conclusion:** Fulguration of HU is effective treatment for patients’ refractory to less invasive therapies. In 28%, a single treatment was able to improve or stabilize their symptoms. In patients’ with multiple fulgurations, there is potential for improvement even after multiple treatments. There does not appear to be any clinical data differentiating between patients that require multiple fulgurations and those whom require a single fulguration.

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**Poster #M21**

**READMISSION AND REOPERATION FOLLOWING LAPAROSCOPIC SACROCOLPOPEXY**

William Warner, MD¹, Eric Hurtado, MD², Sonali Vora, MD³, Jeffrey Welgoss, MD², Nicolette Horbach, MD² and Walter von Pechmann, MD²

¹Walter Reed National Military Medical Center, Bethesda, MD; ²Inova Fairfax Hospital, Falls Church, VA; ³George Washington University School of Medicine, Washington, DC

(Presented by: William Warner)

**Objective:** Laparoscopic sacrocolpopexy (LSC) is gaining popularity as alternative to open abdominal sacrocolpopexy (ASC). The risks and complications in ASC are well known, but not as well described for LSC. The objectives of this study were to characterize and quantify the complications that resulted in readmission and reoperation following LSC.

**Methods:** The medical records of 390 patients who underwent LSC between January 2006 and August 2010 were retrospectively reviewed for intraoperative and postoperative complications.

**Results:** The mean age was 59 ± 9.5 years and the mean BMI was 26.6 ± 4.4. The average hospital stay was 1.7 days (median 2 days). Seven (1.8%) patients stayed longer than four days. Median follow−up time was 26 weeks (3−210). 43.6% were discharged on the first postoperative day and 49.0% on day two. Of these patients, 14 (3.6%) were readmitted, seven of them requiring reoperation. Of the 29 (7.4%) patients staying beyond two days, one required reoperation. 71% of readmissions and 100% of reoperations were for gastrointestinal (GI) or mesh−related complications. Additional causes of readmission were DVT, fever, abscess, and hematuria.

Seven patients had functional GI complications including one ileus, three SBOs, and three cases of prolonged nausea/emesis. The combined rate for ileus and SBO was 1.0% and the rate of prolonged nausea/emesis was 0.8%. Patients with functional GI complications were more likely to have undergone prior abdominal surgery (100% vs. 61.4%, p=0.048). There were no significant differences between the two groups with respect to age, BMI, EBL, or OR time. There were three small bowel injuries and two rectal injuries for a bowel injury rate of 1.3%. Small bowel injury was not associated with prior abdominal surgery (20.0% vs. 62.6%, p=0.071), nor was it associated with age, BMI, EBL, or OR time. There were four (1.0%) cystotomies. The rectal and bladder injuries all occurred in cases where the dissection and mesh attachment were done laparoscopically.

Ten (2.6%) mesh exposures were found resulting in four reoperations. Mesh exposure was more common in cases where the vaginal cuff was opened (4.4% vs. 0.5%, p=0.022).
Conclusions: The complication rates following LSC are low. GI and mesh–related complications account for the majority of readmissions and reoperations. This information should assist surgeons with preoperative patient counseling.

Poster #M22
THE PESSARY PROCESS: SPANISH-SPEAKING LATINAS’ EXPERIENCE
Alexandriah Alas, MD¹, Cecilia Wieslander, MD², Claudia Sevilla, BS³, Aqsa Khan, MD³, Brita Mittal, BS³, Sally Maliski, PHD, RN⁴ and Jennifer Anger, MD⁵
¹Department of Obstetrics and Gynecology, Cedars-Sinai Medical Center, Los Angeles, CA; ²Department of Obstetrics and Gynecology, Olive View Medical Center, Sylmar, CA; ³Department of Urology, UCLA David Geffen School of Medicine, Los Angeles, CA; ⁴UCLA School of Nursing, Los Angeles, CA; ⁵Department of Urology, Cedars-Sinai Medical Center, Los Angeles, CA
(Presented by: Alexandriah Alas)

Objective: To evaluate the experience of Spanish–speaking women using a pessary as treatment for pelvic organ prolapse.

Methods: Spanish–speaking women from a urogynecologic pessary clinic were recruited for this study. Personal interviews were conducted and the women were asked about their experience using a pessary including questions involving symptom relief, pessary management, and quality of life. All interview transcripts were analyzed using the qualitative methods of Grounded Theory.

Results: Sixteen Spanish–speaking women who had been using a pessary for at least one month were enrolled in this study. The mean age was 67.6 (range 47–85 years) and the majority of women had an education level of less than high school or had no schooling at all. Grounded theory methodology yielded several preliminary themes, in which three main concepts emerged as a pessary adjustment process. In this process the patients had to first decide to use a pessary, either because of physician’s recommendations or out of personal choice. Second, the patients entered an adjustment period in which their fears about using a pessary were relieved, and they learned to adapt to using the pessary. Lastly, if the patients properly adjusted to wearing a pessary they experienced relief. During this last stage, they experienced resolution of symptoms and could return to their normal daily lives.

Conclusion: Our findings demonstrate that Spanish–speaking women go through a process in order to adjust to a pessary. Fear of using a pessary, as well as choosing a pessary because of fear of surgery are factors that heavily influence a Spanish–speaking woman’s treatment decisions. Secondly, our findings demonstrate that the physician has a major role in not only determining a woman’s decision to use a pessary, but also whether she can adjust to wearing the pessary. By properly showing a patient how to change and clean the pessary, the patient can then attempt to manage the pessary independently and obtain relief from her prolapse and/or urinary symptoms.

Funding: NIDDK (1 K23 DK080227, JTA) and an American Recovery and Reinvestment Act (ARRA) Supplement.
ANTERIOR COLPORRAPHY USING POLYPROPYLENE SUTURES: OUR TWO-YEAR EXPERIENCE
Ngoc-Bich Le, MD¹, Forrest Jellison, MD¹, A. Lenore Ackerman, MD, PhD², Lisa Rogo-Gupta, MD¹, Denise Chow, MD¹, Z. Chad Baxter, MD², Eric Treat, MD¹, Tamara G. Hartshorn, MD¹, Ja-Hong Kim, MD¹, Larissa V. Rodriguez, MD¹ and Shlomo Raz, MD¹
¹UCLA, Los Angeles, CA; ²North Shore–Long Island Jewish Healthcare, New Hyde Park, NY
(Presented by: Ngoc-Bich Le)

Introduction: Due to the complications associated with mesh, our institution has reverted to meshless techniques of prolapse repair. We repair cystoceles with central and lateral defects with the previously-described CRISP (Cystocele Repair with Interlocking Sutures of Polypropylene), and central-only defects with the anterior colporraphy, but using polypropylene sutures, which are non-absorbable and cause less infection/granulation than braided suture. We reviewed anatomic and functional outcomes, and tracked recurrence rates to compare to the traditional anterior colporraphy (30–60% at 1 year).

Methods: Evaluation included examination using the Baden–Walker (BW) Grading system (0–4), validated questionnaires, VUDS, cystoscopy, and dynamic pelvic MRI. Postoperative evaluation occurred at 4–6, 10–12, 22–24 months, and then annually.

Description of Procedure: All indicated incontinence and prolapse procedures were performed concomitantly. After exposure, the perivesical fascia is plicated with 4 2-0 polypropylene mattress sutures. The suture line is covered with a rotational flap of vaginal wall.

Results: Between 1/09 and 1/11, we performed 171 meshless cystocele repairs (107 Central, 64 Central–Lateral). The patient population was complex, as 38% had prior cystocele repair and 56% had prior prolapse surgeries. At the time of the COP, 60% had sling placement and 74% had additional prolapse repairs. There were statistically significant anatomic and symptomatic improvements. Anterior compartment BW grade decreased from 2.27, to 0.15 (4–6 mo), and 0.25 at (10–12 mo) (p<0.001). The total UDI–6 score decreased from 11.3 to 6.8 (4–6 mo, p<0.001), and 6.58 (10–12 mo, p=0.04). The POPDI–6 score, which reflects prolapse bother, also decreased (preop=11.5, 4–6mo=5, 10–12mo=3.29, p<0.001). The PFDI–20 vaginal bulge score improved from 2.53 to 0.70 (4–6mo, p<0.001) and 0.14 (10–12 mo, p<0.001).

The complication rate was 8.4% (9/107). Seven patients had an extruded suture removed in clinic (Dindo I). One patient was treated for ureteral obstruction (III) and another had a reoperation for bleeding (III). No recurrences to date.

Conclusion: The anterior colporraphy using polypropylene sutures is an alternative to mesh repair. Preliminary data shows significant anatomic and symptomatic improvement with minimal complications. At 1 year, the failure rate compares favorably to that of the traditional colporraphy. Continued follow-up is needed to assess durability.

DOUBLE BALLOON URETHROGRAPHY FOR THE DIAGNOSIS OF URETHRAL DIVERTICULA IN WOMEN—IS IT STILL RELEVANT IN THE 21ST CENTURY?
Jacob Golomb, MD¹, Noam D. Kitrey, MD¹, Tomer Erlich, MD¹, Orit Portnoy, MD², Yoram Mor, MD¹ and Jacob Ramon, MD¹
¹Department of Urology, Chaim Sheba Medical Center, Tel Hashomer, Israel; ²Department of Diagnostic Imaging, Chaim Sheba Medical Center, Tel Hashomer, Israel
(Presented by: Jacob Golomb)

Introduction and Objectives: The diagnosis of a urethral diverticulum (UD) in women is based on detailed history, physical examination, and imaging. Imaging studies are required for proper delineation of the diverticulum, and supply the surgeon with anatomical data which are considered vital prior to embarking on surgery. The imaging studies in clinical practice today include Voiding Cystourethrography (VCU), Double Balloon Urethrography (DBU) and Magnetic Resonance Imaging (MRI) of the urethra. The purpose of this study is to review our experience with DBU in the diagnosis of UD in women.
Materials and Methods: Women with a clinical suspicion for a UD underwent an ambulatory DBU study, utilizing a Davis–model catheter (C.R. Bard, Inc.). The collected data included the presence of UD, as well as its location, number, configuration and complexity, relation to the bladder neck region and connection to the urethra.

Results: Between 2001 and 2011, 37 women, aged 38±13 years (range 20–82), with a clinically suspected UD, underwent DBU at our institution. In 15 women (40.5%) no UD was visualized. In 22 patients, a total of 29 UD were demonstrated. 16 patients (72.7%) had 1 UD, 5 (22.7%) had 2 UD and 1 (4.6%) had 3 UD. A single round diverticulum was demonstrated in 9/22 studies (40.9%) while in 13/22 patients (59.1%) a complex UD was diagnosed. 11/29 of the diverticula (38%) were located in the proximal urethra, 9/29 (31%) in the mid–urethra and 9/29 (31%) in the distal urethra. The connection of the UD to the urethra was demonstrated in 12/22 patients (54.5%).

Conclusions: DBU is a highly accurate imaging study in the diagnosis of UD in women. It provides vital and detailed anatomical data regarding the structure of the UD, and thus it may decrease the chance of incomplete excision of the diverticula and improve the surgical success rate. In addition, DBU is a simple and inexpensive study, and in our hands it is well tolerated by most patients, with minimal discomfort. We therefore conclude that DBU should be still considered as a viable option in the diagnostic process of a UD in women.

Funding: None

Poster #M24
COMPARATIVE OUTCOMES OF ROBOTIC ASSISTED SACROCLOPOPEXY AND SACROCLOPOPERINEOPEXY: A COHORT STUDY
Salim Wehbe, MD, Dominique El Khawand, MD, Howard Goldstein, MD, Kristene Whitmore, MD and Babak Vakili, MD
Drexel University College of Medicine
(Presented by: Salim Wehbe)

Objective: To compare the short-term outcomes of robotic sacrocolpopexy (RALSCP) to sacrocolpoperineopexy (RALSCPP) for the repair of pelvic organ prolapse (POP).

Methods: This is a retrospective cohort study comparing these 2 approaches. RALSCPP was performed by introducing the polypropylene Y-shaped mesh through a perineal vaginal incision, attaching it to the perineal body, and passing it through the rectovaginal space into the posterior cul-de-sac. The mesh was then retrieved and the procedure completed laparoscopically. The primary outcome was vaginal vault support as measured by postoperative POP quantification (POP−Q). Secondary outcomes were vaginal mesh exposure and blood loss.

Results: The analysis included 84 patients (56 RALSCP=Group I and 28 RALSCPP=Group II). There were no differences in demographics and performance of concomitant sling and/or hysterectomy. Mean follow up was 140 days (+/- 110) for group I and 151 days (+/- 109) for group II. Apical support cure rates defined as (C<−1) was similar between both groups; 95 % (53/56) for group I (Median −8) and 100 % (28/28) for group II (Median −7) (p=0.55). Anatomical cure rates for the anterior vaginal wall (Ba<−1) were higher in Group I 96 % (54/56) (Median −2) compared to 82 % (23/28) (Median −2) for Group II (p=0.04). Cure rates for the posterior vaginal wall (Bp<−1) were 100 % (56/56) for group I (Median −3) and 96 % (1/28) for group II (Median −3) (p=0.33). Vaginal mesh exposure rate was 23% (13/56) for group I and 7 % (2/28) for group II (p=0.08). Incidental vaginotomy during dissection was similar between Group I and Group II (12/56 vs. 5/28; p=0.56). In analyzing the whole cohort, subjects with incidental anterior vaginotomy have a higher risk of developing vaginal mesh exposure (RR=5.5), compared to those without vaginotomy (p= 0.05). There was a significantly higher blood loss in the RALSCPP group (Median 50 ml vs. 125 ml; p= 0.02).

Conclusions: This study suggests that RALSCPP has a similar short-term anatomical outcomes compared to RALSCP for apical prolapse. There was a slightly better support for the anterior vaginal wall in the RALSCP group. RALSCPP had a higher blood loss compared to RALSCP. The lower risk of mesh exposure in the RALSCPP compared to RALSCP did not reach statistical significance. Long-term data are needed to assess the durability of RALSCPP especially to evaluate its full benefit regarding a concomitant distal rectocele/perineocele.
Poster M25
PATTERNS OF PESSARY CARE AMONG MEDICARE BENEFICIARIES WITH PELVIC ORGAN PROLAPSE
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(Presented by: Aqsa Khan)

*Not CME accredited

Objective: Few guidelines on pessary management exist. We sought to assess patterns of pessary care, including rates of complications and pessary failure requiring surgery for prolapse repair.
Methods: Data was obtained from the Public Use Files from the Centers for Medicare and Medicaid Services for a 5% national random sample of beneficiaries for which a pessary was placed in the years 1999–2000. ICD–9 diagnosis codes and CPT–4 procedure codes were used to identify women with pelvic organ prolapse who had pessary placement. Subjects longitudinally tracked for 9 years. The rate of follow up, complications, and surgery for POP were assessed.
Results: Of 34,782 women who carried a diagnosis of prolapse, 4,019 women were fitted with a pessary, making up 11.6% of the cohort. By 2009, 69% of patients had followed up with the same provider who placed the pessary. A total of 120 patients (3%) were identified with vesicovaginal or rectovaginal fistulas, and 5% had a mechanical genitourinary device complication. 12% of women underwent definitive prolapse surgery by one year and 24% underwent definitive surgery by nine years. There was a 30.4% mortality rate by 9 years.
Conclusions: Pessaries for POP are under-utilized in women aged 65 years and older. No clear guidelines for pessary fitting, follow-up, or management exist to date, possibly leading to a high rate of vaginal fistula formation which is likely a sequelae of being lost to follow-up. Large prospective trials are warranted to further examine outcomes of pessary use.
Funding: NIDDK Patient–Oriented Career Development Award (1 K23 DK080227, JTA) and an American Recovery and Reinvestment Act Supplement.
Introduction and Objectives: Rapid shifts in the surgical treatment of stress urinary incontinence (SUI) occurred in the new millennium, despite a relative lack of level I data to support such trends. We sought to similarly evaluate patterns of care for prolapse management from 1999–2009.

Methods: Public use file data were obtained from the Centers for Medicare and Medicaid Services (CMS) for a 5% national random sample of female Medicare beneficiaries age 65 and over. Subjects were identified by ICD−9 diagnosis codes for pelvic prolapse. From this cohort, surgical treatments, pessary placement, and mesh use were identified by appropriate CPT−4 and ICD−9 procedure codes. Treatments for cohorts in each year were compared.

Results: In 1999, 21,245 women carried a diagnosis of prolapse, of whom 11.3% were fitted for a pessary, and 15.3% had surgical treatment for prolapse. The most frequently performed operation was a combined anterior, posterior, and apical repair. This was followed in frequency by combined anterior and posterior repairs. The frequency of different prolapse component repairs remained largely unchanged through 2009. However, mesh insertion, as defined by CPT−4 procedure code 57267, rose significantly such that by year 2009 it was used in 41% of prolapse repairs.

Conclusions: Though specific component prolapse repairs remained relatively unchanged over the 10−year period analyzed, the new millennium has witnessed a significant increase in the use of mesh for prolapse. Like surgery for SUI, this trend as occurred despite a relative lack of level I data supporting mesh use. Despite the growing evidence that apical support improves outcomes of anterior repair, the rise in popularity of laparoscopic− and robotic−−assisted sacrocolpopexy and evidence of long−term efficacy of sacrocolpopexy, unfortunately the proportion of apical and anterior repairs being performed has not changed significantly over the last decade.

Funding: Funded by an NIDDK Patient−Oriented Career Development Award (1 K23 DK080227, JTA) and an American Recovery and Reinvestment Act Supplement.
**Poster #M27**

**ECONOMIC BURDEN OF PELVIC ORGAN PROLAPSE IN THE UNITED STATES: INPATIENT SURGICAL CARE**

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(Presented by: Tatiana Sanses)

**Objectives:** The objectives of this study were to describe the population of women undergoing inpatient surgical procedures for Pelvic Organ Prolapse (POP) by demographics, insurance status, and comorbidities, and also to estimate hospital charges, length of stay, and inpatient mortality nationwide in this patient population.

**Methods:** We used data from the 2008 National Inpatient Sample (NIS), which includes a 20% national representative sample of inpatient admissions in the U.S. The POP-related procedures were identified by using the relevant procedure codes in International Classification of Diseases, 9th revision, Clinical Modification. We conducted descriptive analysis to characterize the study population and to assess the economic burden. We calculated the total hospital charges associated with POP-related procedures by multiplying the mean total charges per admission by the estimated total number of inpatient admissions. Given the nature of the data, which was obtained via stratified probability sampling, we incorporated sample weights in all of our analyses.

**Results:** The total number of inpatient admissions related to surgical treatment of POP was estimated to be 162,463, representing 0.4% of all inpatient admissions nationwide. Women underwent a total of 231,235 procedures, including apical (34.8%), anterior (18.9%), posterior (10.6%), anterior–posterior (33.1%), and obliteratorative (2.6%) vaginal repairs. More than one surgical procedure was performed in 36.7% of participants.

The mean age of study subjects was 57.3 years, 95% CI (56.8–57.8); 81% of women were Caucasian, 4.4% African–American, and 9.5% were Hispanic. Nearly 33% and 5.2% of admissions were to Medicare and Medicaid beneficiaries respectively, and 57% to privately insured women. With respect to comorbidities, 41% of women presented with none, 31%, 18%, and 11% with 1, 2, and ≥3 comorbid conditions respectively. Inpatient mortality was 0.05%.

The average length of hospital stay was 2.12 days, 95% CI (2.05–2.18). The mean total charges per admission were $24,433, 95% CI ($23,275–$25,635), thus amounting to nearly $3.89 billion in 2008 alone.

**Conclusions:** Our findings revealed that the economic burden related to POP surgery in inpatient population is considerable and, given the aging of population, is likely to increase. Further economic analyses are necessary to predict the demand in Female Pelvic Medicine and Reconstructive Surgery.

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**Poster #M28**

**PATTERNS OF CARE FOR URETHRAL TRAUMA IN PATIENTS WITH PELvic FRACTURE**

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(Presented by: A. Lenore Ackerman)

**Objectives:** We sought to examine the national incidence and patterns of care for trauma patients with urethral injuries associated with pelvic fractures.

**Methods:** Using the National Trauma Database, we examined demographic and treatment data for 599 patients with documented pelvic fractures and urethral injury, ranging from contusion to complete avulsion, between 2002 and 2006. We examined the associations of treatment patterns with gender, ethnicity, time to OR, and type of injury.
Results: The majority of urethral injuries (90.2%) were sustained in association with motor vehicle accidents, with 51.9%, 19.2%, and 15.5% involving cars/trucks, motorcycles, and pedestrians, respectively. There were no changes in injury type or severity over the 5-year time course. The majority of urethral injuries occurred in Caucasian patients (67.3%), with fewer Blacks (15.5%) and Hispanics (10.8%) affected. Caucasians were less likely to sustain severe (defined as full-thickness injury or avulsion) injuries [odds ratio (OR) 0.70 (95% CI 0.88–0.52)] than other ethnicities. 89% of injuries were in males, with 11% in females. Males were more likely than females to suffer severe urethral injury (1.70 OR, 95% CI 1.99–1.43).

Only 52.1% of all patients (68.8% of patients with urethral avulsion) had a documented procedure (including catheter placement) related to urethral injury, including 67.4% cystotomies (primarily suprapubic catheter placements), 14.6% urethral catheter placements, and 12.2% repair/realignment. While interventions typically occurred in the first 6 hours of presentation (67.4%), 20.9% underwent procedures after 24 hours. Patients undergoing later intervention (>24 hr) were more likely to undergo attempted urethral repair/realignment (ICD−9 codes 58.41, .46, .49, .6: suture of laceration, dilation, repair, or reconstruction of the urethra) than patients treated during the first 6 hours (OR 2.51, 95% CI 2.85–2.17).

Conclusions: There was little change in incidence of pelvic fractures with associated urethral injuries from 2002 to 2005. The relatively low intervention rate for severe urethral injuries (69%) may be due to deficient reporting or the need for patient stabilization. Although delayed primary realignment of the urethra following urethral distraction can either avoid or facilitate later urethroplasty, relatively few patients receive such procedures.

Poster #M29
DORSAL VAGINAL GRAFT URETHROPLASTY FOR FEMALE URETHRAL STRICTURE DISEASE
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(Presented by: Alexandra Rogers)

Introduction and Objectives: Female urethral stricture disease represents a challenging problem with few high volume studies and no gold standard for treatment. We aim to review the technique and outcomes of utilizing a dorsal vaginal graft to perform urethroplasty for the treatment of urethral strictures in a female population.

Methods: A retrospective chart review of nine female patients who were treated with a dorsal vaginal graft urethroplasty by a single surgeon was conducted. All women underwent pre-operative evaluation that included history, physical examination, fluoro urodynamics and urethral calibration. Post surgical interviews, physical examinations, uroflow and postvoid residuals were obtained.

Results Obtained: Nine women who had undergone dorsal vaginal graft urethroplasty were identified for review. Average age was 60.2 years (range 39–76). Mean follow up was 18.2 months (range 3–36.5). There were no cases of new onset stress or urge urinary incontinence. Average pre-procedure and post-procedure residuals were 185.3 cc’s and 90.4 cc’s respectively (p= 0.012). Average pre procedure and post procedure uroflows were 6.8 cc’s/sec and 22.7 cc’s/second, respectively (p=0.008). No patient has required repeat post operative therapy. Self reporting satisfaction scores using the Patient Global Impression of Improvement (PGI−I) revealed that 5 patients scored 1 (very much better), 1 patient scored 2 (much better), 2 patients scored 3 (a little better), and 1 scored 4 (no change). No patient felt they were worse.

Conclusions: No consensus exists for the surgical treatment of female urethral stricture disease, which represents a challenging problem. The success of this exploratory series is very competitive to other approaches. Dorsal graft urethroplasty with vaginal mucosa should be considered as a first–line option for definitive management of female urethral stricture disease. Our series shows significant improvements in objective measures of success including post-operative improvements in uroflow coupled with decreased post void residual values as well as improvements in standardized clinical evaluations.
OBJECTIVES: To assess factors in the physician–patient encounter contribute to disease understanding in Spanish−speaking women with pelvic floor disorders (PFD).

METHODS: Spanish−speaking women with referrals suggestive of urinary incontinence (UI)and/or pelvic organ prolapse (POP) were recruited from urogynecology clinics. Patients participated in the Spanish−validated Short Test of Functional Health Literacy for Adults (STOFHLA) assessment and an interview after their physician encounter. All interviews and physician−patient encounters were audio−recorded, transcribed, and analyzed using Grounded Theory qualitative methods.

RESULTS: A total of 27 women with PFDs including POP (N=6), UI (N=11), and POP/UI (N=10) were enrolled. The mean age was 55.5 (range 41−71 years) and STOFHLA scores indicated inadequate to marginal levels of health literacy. Qualitative analysis revealed several elements in the encounter that might affect patient understanding. Three significant variables were present for each encounter: level of training of the physician (resident vs. general gyn vs. urogynecologist), Spanish proficiency of the physician (with and without a translator), and number of conditions diagnosed. Different themes emerged regarding patient understanding of PFDs. The level of training (resident or attending) had little influence on disease understanding. Also, patients had difficulty understanding their diagnosis regardless of how extensive the explanation. Although adequate Spanish proficiency alleviated language barriers, it had no effect on helping patients understand their disease. Lastly, we discovered that the most influential factor affecting disease understanding was the number of diagnoses presented simultaneously. We noted a correlation between a lower number of diagnoses and enhanced disease understanding.

CONCLUSIONS: Our findings demonstrate that, although the training level and Spanish proficiency of the physician may be important in the physician−patient encounter, a more significant factor in disease understanding is the amount of information presented to patient at one encounter. When a patient is presented with a new diagnosis, the ability to process this information is compromised if excessive information is given at one time. Furthermore, this ability to process information is further complicated by inadequate health literacy.

FUNDING: K23 award from the NIDDK (JTA) and an American Recovery and Reinvestment Act supplement
Poster #NM1

CYCLE OF MISUNDERSTANDING: COMMUNICATION BETWEEN PHYSICIANS AND SPANISH-SPEAKING LATINAS WITH PELVIC FLOOR DISORDERS

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(Presented by: Alexandriah Alas)

Objectives: To assess the effect of initial visit with a specialist on disease understanding in Spanish-speaking women with pelvic floor disorders.

Methods: Spanish-speaking women with referrals or chief complaints suggestive of UI and/or POP were recruited from a Los Angeles County-based urogynecology clinic. Patients participated in a Spanish-validated Short Test of Functional Health Literacy in Adults (STOFHLA) and scripted interview session before and after physician encounter. All interviews were audio recorded and transcribed. Interview transcripts were analyzed using Grounded Theory qualitative methods.

Results: Twenty-seven women with POP (N=6), UI (N=11), and POP/UI (N=10) were recruited and enrolled in this study. The mean age was 55.5 (range 41–71 years) and the majority of women were Mexican with less than a high school education level. STOFHLA scores indicated inadequate to marginal levels of health literacy. From our grounded theory analysis, three important concepts emerged. First, was that patients had poor understanding of their diagnosis before and after the encounter regardless of how extensive the physician’s explanation or the level of Spanish-proficiency. Secondly, patients did have temporary relief when discovering that their condition was not life-threatening, but ended up feeling overwhelmed with the amount of information being given to them. The more conditions a patient had, the less she was able to retain. Lastly, we found that patients ultimately put their complete trust in the physician, relying on them for treatment recommendations.

Conclusions: Our findings emphasize how difficult it is for Spanish-speaking patients with low health literacy to understand and retain information regarding pelvic floor disorders. This finding holds even more significance in patients that have multiple diagnoses. In this specific population, the physician has a major impact in influencing a patient’s treatment options and helping the patient overcome any fears she might have about her pelvic floor disorder.

Funding: Funded by the NIDDK (1 K23 DK080227, JTA) and an American Recovery and Reinvestment Act (ARRA) Supplement
Poster #NM2
IS COMPLETE CURE NECESSARY FOR SATISFACTION IN PATIENTS UNDERGOING CONCURRENT ANTI-INCONTINENCE AND PROLAPSE SURGERY?
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(Presented by: Jeffrey Wolters)

Introduction: Simultaneous repair of SUI and prolapse has become increasingly common. In these cases, determinants of patient satisfaction are further complicated given the fact that complete surgical success may be achieved in one component but not the other. The study focus was to determine if patients report satisfaction if success is only achieved with respect to a single surgical outcome when concurrent surgeries are performed.

Materials and Methods: We performed a retrospective review of post-operative results on 92 consecutive women undergoing variety of AI procedures and/or prolapse repair. Multiple validated outcome measures were used to evaluate success following AI surgery (ICIQ-FLUTS, SUI item, pad use, subjective SUI cure) and prolapse (ICIQ-VS, POPQ stage). Multiple statistical analyses (Pearson’s correlation, Mann-Whitney test, and Fischer’s exact test) were performed to assess for association between outcome measures and patient satisfaction.

Results: Eighty women (87%) reported satisfaction following surgery with mean follow-up of 12 months. Cure of both prolapse (POPQ stage <2) and SUI (subjective cure) was associated with satisfaction (p<0.05). Satisfaction rates among these dual cure patients were comparable to satisfaction rates in women who had cure of only one entity (prolapse OR incontinence). ICIQ-VS improvement correlated with overall post-op satisfaction (p<0.05) while the other examined measures did not demonstrate statistically significant correlation with post-op satisfaction.

Conclusions: Not surprisingly, cure of both incontinence and prolapse in the setting of a concomitant procedure was associated with statistically significant satisfaction. Interestingly, these satisfaction rates do not differ greatly from those in patients who reported cure of only one problem.

Poster #NM3
THE USE OF A CADAVER LABORATORY AS A TEACHING TOOL IN THE FEMALE UROLOGY AND MALE RECONSTRUCTION CURRICULUM
Adam Mellis, MD and Gennady Slobodov, MD
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(Presented by: Adam Mellis)

Introduction: The Department of Urology at the University of Oklahoma has for the past 2 years utilized a cadaver lab, sponsored by American Medical Systems (AMS), as an adjunct tool for urology residents as part of the female urology and male reconstruction curriculum. In this lab, residents, under faculty guidance, practice surgical technique for various urologic procedures, including mid urethral slings, inflatable penile prosthesis, and the artificial urinary sphincter. The goal of our study is to determine whether this lab would prove beneficial in the education of residents in female and reconstructive urology and to determine how our experience can be improved.

Methods: 16 residents participated in the cadaver lab in a 4 hour training session. Objectives included review of the AUA guidelines for SUI, indications for surgery, and discussion of clinical outcomes. The first 2 hours consisted of presentations on the anatomical landmarks for TOT, suprapubic, and mid-urethral slings, along with an update on FDA controversies concerning transvaginal mesh. Mesh kits for POP and the discussion of sacrospinous ligament suspension were explained. The next two hours consisted of practicing with various urologic kits, using 4 cadavers. A variety of AMS products, including SPARC®, Mini–Arc®, Monarc®, and Advance® slings, along with AMS 700® and 800® systems, were discussed. Residents were then given a 16 question survey on whether objectives were met along with free response questions on whether the lab was beneficial and how it could be improved.
Results: Overall, 70% (11/16) of residents agreed or strongly agreed that the workshop objectives were met. 80% (7/9) of junior residents (defined as PGY1−PGY3) commented on the hands-on nature of the lab and saw the lab as an attempt to practice surgical technique without the consequences of complications. The major criticism of the laboratory was the quality of cadavers that were used (6/16, 38%). Moreover, residents thought more cadavers and smaller groups could have been beneficial.

Conclusions: Despite the bias that may be associated with an industry-based cadaver lab, residents viewed this laboratory as a positive instrument as part of their female and reconstructive urology experience. The cadaver based lab may be beneficial in a residency program to expose junior residents to the field of, and possible career in, female and male reconstructive urology and serve as a reinforcement tool for senior residents.

Poster #NM4
CONTEMPORARY MANAGEMENT OF PRIMARY URETHRAL MELANOMA
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(Presented by: Jonathan Warner)

Introduction: Surgical treatment of urethral melanoma is not well defined. The adoption of current melanoma principles to the treatment of urethral melanoma has not been described.

Materials and Methods: To identify the incidence of female urethral melanoma, a review of tumor registries at all three clinic locations was performed from 1961 to 2011. All urethral malignancies and all female urethral melanomas were identified.

Results: From June 1961 through August 2011 we identified 315 urethral tumors. Of these 77 were female patients, and 8 were primary melanoma. The incidence of female urethral melanoma amongst all female urethral tumors was 10.4%. Surgical treatment of the urethral melanomas ranged from anterior exoneration to local excision. We present two recent cases with a primary distal urethral melanoma. Case 1 is a 62 year old female diagnosed through excision biopsy with positive margins at an outpatient center, and was referred for definitive management. Pathology revealed an ulcerated 3.5 mm melanoma with a mitotic rate of >6/mm2 and no angiolymphatic invasion. Case 2 is an 88 year old female who presented to the emergency room with hematuria, and was found to have a large urethral mass. Excisional biopsy demonstrated an ulcerated 7 mm melanoma, mitotic rate of 4/mm2 and no angiolymphatic invasion with a focal positive deep margin.

Sentinel lymphoscintography with SPECT CT was performed by injecting Tc 99 filtered sulfur colloid around the melanoma site in the urethra. Dynamic images were taken to identify the sentinel lymph (SLN) nodes. Both cases demonstrated drainage to the left and right inguinal lymph nodes. Intra-operative gamma probes were used to identify the lymph nodes with the highest radioactivity in each inguinal lymph node basin. Wide local excision with a 1 cm margin was then performed around the biopsy site. Final pathology for case 1 revealed a 2mm focus of residual melanoma with negative margins, left inguinal SLN 0/2+ and right inguinal SLN 1/1+. She then went on to undergo a complete right inguinal lymph node dissection with 0/7 LN+ and robotic assisted right pelvic lymph node dissection 0/9+. Final pathology for case 2 demonstrated no residual tumor in the operative bed on repeat excision, left inguinal SLN 0/1+, and right inguinal SLN 0/1+.

Conclusion: We present a contemporary series of management for urethral melanoma using lymphoscintography with SPECT CT with sentinel lymph node biopsy, and urethral sparing techniques.
## COMPLICATIONS OF MESH-AUGMENTED PELVIC ORGAN PROLAPSE AND INCONTINENCE REPAIRS: CASE SERIES OF 319 PROCEDURES

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UCLA Los Angeles, CA

(Presented by: Lisa Rogo-Gupta)

**Purpose:** We report our experience with surgical removal of mesh used in pelvic reconstruction in a tertiary referral center from 2005–2011.

**Materials and Methods:** We performed a retrospective study of all consecutive patients who underwent surgical mesh removal between July 2005 and July 2011 for treatment of mesh complications. Symptoms were determined by patient self-assessment including validated questionnaires.

**Results:** Two hundred and thirty six patients underwent 319 mesh excision procedures during the study period. Mean age was 59 years old (range 25–88, median 58), mean parity 3 (range 0–10, median 2), mean BMI 27 (range 11–44, median 26). Seventy five percent were post-menopausal, 18% reported prior tobacco use and 78% had prior hysterectomy, 44% with concomitant mesh placement.

Sixty four patients (28%) had prior mesh revision. One hundred and thirty six (58%) had pelvic organ prolapse (POP) mesh and 208 (86%) had sling mesh. POP mesh was located in multiple compartments in 63 patients, 46% of whom presented with exposure or erosion, and a single compartment in 60 patients, 38% of whom presented with exposure or erosion. Mean time from mesh placement to removal was 3 years (range <1–22).

The most common indications for surgery were mesh exposure or erosion (58%), pain or dyspareunia (34%) and de novo urgency, frequency, or incontinence (38%). One hundred and one patients had multiple indications for surgery. Of 28 patients with POP mesh only, 75% presented with erosion, 50% with pain or dyspareunia. Of 108 patients with both POP mesh and sling, 62% presented with erosion, 31% with pain or dyspareunia, and 33% with de novo urgency, frequency, or incontinence.

One hundred and eighty two patients (77%) underwent a single mesh excision, 13% underwent two, 8% underwent three, and 1% underwent four or more to achieve significant symptom improvement. Initial excision procedure involved removal of only sling mesh in 61 patients with erosion and 43 with pain, only POP mesh in 75 patients, 73% with erosion and 53% with pain, and both POP mesh and sling in 30 patients, 67% with erosion and 52% with pain.

**Conclusions:** Mesh complications are an increasingly common indication for referral to tertiary care centers. Pain and dyspareunia are the most common symptoms necessitating mesh removal in patients without mesh exposure and many patients present with multiple symptoms. Patients may require multiple procedures to achieve resolution of their symptoms.

## SINGLE-DOSE ORAL CIPROFLOXACIN VERSUS INTRAVENOUS CEFAZOLIN PROPHYLAXIS IN WOMEN UNDERGOING MIDURETHRAL SLING SURGERY

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(Presented by: Alex Gomelsky)

**Introduction and Objectives:** Antimicrobial prophylaxis is one of several measures thought to reduce surgical site infections. RCTs regarding antimicrobial prophylaxis for vaginal urologic surgery are rare, and both cephalosporin (CS; antimicrobial of choice) and fluoroquinolone (FQ; alternate) are listed as options for prophylaxis in the AUA Best Practice Policy Statement on Urologic Surgery Antimicrobial Prophylaxis. We evaluate postoperative urinary tract infections (UTIs) after these prophylactic regimens in women undergoing midurethral slings (MUS).
Methods: Women who underwent MUS only at two affiliated institutions were evaluated retrospectively. Women who had an allergy to either antibiotic or were preoperatively treated for a microorganism resistant to the antibiotic were excluded from analysis. At site #1, women received 500mg oral ciprofloxacin (FQ) 1 hour before surgery while at site #2 women received 1g IV cefazolin (CS). Electronic health records were reviewed for demographic information, and incidence characterization of preoperative and postoperative (within 30 days) UTIs. Statistical evaluation was conducted.

Results: 63 women received FQ and 145 received CS. The groups were not statistically different demographically. In the FQ group, 17.5% were treated for a preoperative UTI. The most common organisms were E. coli, Enterococcus, and other gram negatives. Four of 63 women (6.3%) had a postoperative UTI. Two grew out a FQ-resistant organism and 2 were FQ-sensitive. In the CS group, 17.9% were treated for a preoperative UTI. The most common organisms were E. coli, Enterococcus, Group B Streptococcus, and other gram negatives. Thirteen out of 145 women (9.0%) had a postoperative UTI. Two grew out a CS-resistant organism and 11 were CS sensitive. Women treated for preoperative UTI in either group did not have significantly higher rate of postoperative UTI. The patient charge for a single dose of FQ and CS was $23 and $207, respectively.

Conclusions: Prophylactic single-dose FQ before uncomplicated MUS is not associated with an increased risk of postoperative UTI when compared with IV CS and the implementation of this regimen may represent a significant cost savings in the future. The recent emergence of FQ-resistant bacteria should be considered, and institutional antibiograms should be consulted prior to initiating a prophylactic protocol.

Poster #NM7
REPEATED INTRA-DETRUSOR INJECTION OF ONABOTULINUM TOXIN-A IN PATIENTS WITH IDIOPATHIC OVERACTIVE BLADDER
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(Presented by: Matthew Fine)

Purpose: To evaluate clinical outcomes with repeated intra-detrusor onabotulinum toxin-A (BTX-A) injections in patients with idiopathic overactive bladder (OAB) with or without detrusor overactivity (DO) and/or incontinence.

Methods: We reviewed 60 consecutive refractory OAB patients who underwent intra-detrusor BTX-A injection for clinical symptoms. Each patient underwent evaluation using history and physical examination, UDI-6 and VAS questionnaires, and urodynamics (UDS) at baseline. Six weeks after the initial and all subsequent intra-detrusor injections with either 100 or 150 units of BTX-A, all patients completed the UDI-6 and VAS questionnaires. To meet inclusion, all patients had OAB and had either failed anti-muscarinics or could not tolerate them due to side effects. We evaluated clinical outcomes with respect to age, gender, presence of incontinence, presence of DO on pre-BTX-A UDS, and pre and post BTX-A UDI-6 and VAS scores. We evaluated the number of times injected until non-response which we defined as a less than 50% reduction in either UDI-6 or VAS questionnaire.

Results: Of the 60 patients with OAB, the average patient age was 56.5 ± 15.7 years, including 9 men and 51 women. A total of 156 total injections were given with an average of 2.6 injections per patient (1–6). Of the 60 patients who started, 36 underwent a second injection (26 responders and 10 non-responders), 23 underwent a third injection (19 responders and 4 non-responders), 17 underwent a fourth injection (15 responders and 2 non-responders), 12 underwent a fifth injection (10 responders and 2 non-responders) and 9 patients received a sixth injection (8 responders and 1 non-responder). Using statistical analysis, age, gender, presence of incontinence, and UDI-6 and VAS scores pre-BTX-A did not portend an increased risk of non-response. When using the VAS questionnaire, BTX-A responders were noted to have a significantly decreased rate of pre-BTX-A DO, but when using the UDI-6 questionnaire this only trended towards significance [p = 0.002453 (0.01462 – 0.492) 95% CI and p = 0.089 (0.1056 – 1.167) 95% CI respectively].

Conclusions: Intra-detrusor BTX-A injection is an effective and important treatment for OAB with or without DO or incontinence. Further studies are needed to elucidate predictive factors for long-term success of repeated intra-detrusor BTX-A injections for patients with OAB.
**Poster #NM8**  
**IMPAIRED DETRUSOR CONTRACTILITY AND THE TREATMENT OF FEMALE STRESS INCONTINENCE**  
Rose Khavari, MD¹, Kumaran Sathyamoorthy, MD², Ricardo Gonzalez, MD³ and Sophie Fletcher, MD¹  
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(Presented by: Judy Choi, MD)

**Introduction and Objectives:** Little conclusive data exists regarding urodynamic (UD) variables predictive for voiding dysfunction after synthetic midurethral sling (MUS). Previous studies report impaired detrusor contractility (IDC) or valsala voiding (VV) to be associated with urinary retention, need for clean intermittent catheterization (CIC), or de novo lower urinary tract symptoms after pubovaginal sling. Our aim with this study was to evaluate outcomes of MUS in female patients with IDC, VV, or both. We proposed that there would be no direct relationship between these variables and a specific outcome measure: urinary retention requiring CIC or reoperation at 6 wk follow-up.

**Methods:** Retrospective chart review was performed for all MUS procedures at a single institution, 1/2010 – present. Subjects with complete preoperative UD records and ≥6–wk follow up were included. Bladder contractility was determined using the bladder contractility index (BCI = PdetQmax+5*Qmax). IDC was defined as BCI < 100. VV was defined as ΔPabd > 10 cm/H2O during voiding. The primary outcome measure was urinary retention requiring CIC or reoperation at 6–wk follow up. Categorical analysis using the Chi square statistic calculated the relative risk (RR) regarding the primary outcome in relation to BCI < 100, presence of VV, and both.

**Results:** 236 patients underwent MUS from January 2010 to present. 196 subjects had complete UD and ≥ 6 wk follow up data. Average patient age was 54 yrs (32–87 yrs). Sling procedures were: TOT (134), SPARC (23), TVT (12), and MiniArc (25). Preop UD identified 66 (33.7%) IDC subjects. At 6–wk follow up, no subjects in this group required CIC or reoperation. No subjects without IDC (BCI >100) required CIC or reoperation for urinary retention; however there were 2 reoperations in this group: persistent stress incontinence (1) and vaginal extrusion (1). Preop UD identified 62 (31.6%) VV subjects. One patient in this group required reoperation; however sling removal was for vaginal extrusion, not urinary retention. In the group with both IDC and VV (n=27) no subjects required reoperation.

**Conclusion:** Neither IDC nor VV appear to be risk factors for postop urinary retention or reoperation after MUS. The small study size is a limiting factor, and a larger investigation is planned. However, this study suggests that IDC and VV will join the ranks of other UD variables that have little predictive value for outcomes after MUS.

**Poster #NM9**  
**COMPLEX RECTOVAGINAL FISTULAS AFTER POSTERIOR COMPARTMENT REPAIR WITH SYNTHETIC MESH: IDENTIFICATION AND MANAGEMENT OF THIS DEVASTATING COMPLICATION**  
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(Presented by: Judy Choi, MD)

**Objectives:** To present a single–institution series of complex rectovaginal fistulas (RVF) after synthetic mesh–augmented pelvic organ prolapse (POP) repair.

**Methods:** IRB approval was obtained for this retrospective study. Data was collected on all consecutive patients referred for complex RVF from 2006–2009.

**Results:** Thirty seven patients were referred for complex RVF repair to our multidisciplinary center for restorative pelvic medicine from 2006 – 2009. Etiologies of RVF were: childbirth (n=14), synthetic mesh procedure (n=9), and a variety of inflammatory, vaginal, or colorectal procedures (n=14). Etiologies for patients with RVF associated with synthetic mesh included: robotic sacrocolpopexy (n=1), lap sacrocolpopexy (n=1), and transvaginal POP repair with mesh (n=7). Of the 7 patients with RVF after transvaginal POP repair, median age was 52 yrs (range 33–66). Time to presentation was 9 to 960 days after prolapse repair. Presenting symptoms included: drainage of stool in the vagina (4), rectal bleeding (2), dyspareunia (2), vaginal bleeding (1), rectal pain (1), dyschezia (1), and mesh protruding from anus (1). Mesh was palpated in the rectum in 5 patients. There were only 2 patients with negative palpable rectal defect and negative colonoscopy. Patients required a median 3 (range 1–5) procedures for definitive RVF repair. Diverting ileostomy was necessary in 4 of 7 patients; one patient refused.
Repairs included advancement flap (3), transperineal repair with levator flaps (2), closure with gracilis flap, (1), low anterior resection with primary anastomosis (1). Median follow up was 13 mo. (range 6–46). Two patients have persistent fistulas on follow up; one is still diverted and long-term colostomy is planned. Of those with successful repairs, persistent pain (3) and vaginal mesh extrusion (1) still complicate RVF repair.

**Conclusion:** This series highlights the significant impact of synthetic mesh complications in the posterior compartment. Rectal complications can occur after any posterior POP repair, but those involving mesh are especially disastrous. These complications should be cautious for synthetic graft use by those with limited experience or with alternative choice of traditional repair. Whenever symptoms of RVF present, a colon and rectal specialist should be involved as soon as possible to minimize repeated attempts at repair and prolonged morbidity.

**Poster #NM10**

**LONG-TERM DURABILITY OF THE DISTAL URETHRAL POLYPROPYLENE SLING PROCEDURE FOR STRESS URINARY INCONTINENCE: MINIMUM 10-YEAR FOLLOW-UP**

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(Presented by: Lisa Rogo-Gupta)

**Purpose:** We report on the long-term outcomes of the distal urethral polypropylene sling (DUPS) for stress urinary incontinence (SUI).

**Materials and Methods:** We performed a prospective study of all consecutive patients who underwent a DUPS procedure between November of 1999 and April of 2000 for treatment of SUI. One and five year outcomes for this particular patient cohort have been previously reported. This cohort was followed prospectively and at a minimum of 10-yr follow-up, outcome was determined by patient self-assessment including validated symptom and bother questionnaires (Incontinence Symptom Score and Urogenital Distress Inventory).

**Results:** There were 69 patients followed prospectively. Mean age at the time of surgery was 62 years (range 29–86). Mean age at follow-up was 73 years (range 40–97 years). At a minimum follow-up of 10 years, patient determined subjective success rate was 69%. Patients reported an overall mean improvement in symptoms of 63%, with 46% of patients reporting ≥90% improvement. This compared to a success rate of 88% and an overall mean improvement of symptoms of 81% at 5 years.

More than 10 years after surgery, 82% of patients reported SUI occurred never or less than once per week. 80% of patients reported never or slightly being bothered by SUI. This compared to 93% and 84% of patients who reported SUI occurred never or less than once per week, and 93% and 86% who reported never or slightly being bothered by SUI, at 5 years and 1 year, respectively.

Of patients age ≤48 years at the time of surgery, 100% were able to respond at the time of long-term follow-up, compared to 71% of patients age 49–74, and 44% of patients age ≥75. The remaining patients were unable to respond due to cognitive limitations or were deceased within the follow-up period.

**Conclusions:** The DUPS procedure has excellent long-term durability in treating patients with SUI, in addition to the low morbidity and low cost previously described. Ten years after their procedure the majority of patients report symptom improvement. Nevertheless, a significant number of older patients undergoing surgery for SUI are unable to follow up 10 years after surgery due to cognitive limitations or death. When choosing an anti-incontinence procedure, effectiveness and durability need to be considered in light of patient age given the theoretical advantages of long term durability are limited by cognitive decline and mortality.
Poster #NM11
REDUCING RADIATION EXPOSURE DURING UROLOGIC RADIOGRAPHIC STUDIES
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(Presented by: Jonathan Warner)

Objectives: Studies have shown that ionizing radiation from radiographic imaging studies have potential for long term harmful effects. We aimed to reduce the radiation exposure to our staff with simple measures during our office radiographic studies.

Materials and Methods: Radiographic studies performed in our office include RUGs, cystograms, nephrostograms, loopograms, and VCUGs (± video urodynamics). In an effort to reduce radiation exposure and improve radiation safety, several changes were implemented. Default radiation dose was decreased from 15 frames/second to 3–4 frames/second. Radiology technicians were instructed to stop using fluoroscopy to position patients. For video urodynamics (VUDS), RUGs, and loopograms the majority of saved images were fluoroscopic images rather than digital spots. Digital spots were only used for one final image in RUGs and loopograms. Patients rather than the staff were instructed to hold the speculum in place to reduce vaginal prolapse during VUDS. The staff was educated to stop capturing images to demonstrate incontinence during stress maneuvers. Average whole body radiation was examined amongst four staff members. This was compared before and after the radiation safety measures were implemented. Radiation data was collected from radiation badges.

Results: There was no significant difference in the number of studies performed before and after the radiation safety changes were made. Badge readings were reported every 2 months by the radiation safety office. Average badge readings prior to the implementation of the radiation safety changes were taken between January and September 2009. Average whole body radiation per person was 263 mrem/period (2 months) during this time. The average badge readings after the implementation were taken between July 2010 and March 2011. The average whole body radiation per person was 45 mrem/period (2 months). There was no difference in quality or quantity of the studies between the two periods.

Conclusions: Making simple changes such as decreasing radiation dose, limiting scout films, and limiting the number of films taken/study have made marked improvements in whole body radiation exposure. This was an important measure that was taken in our department to improve radiation safety amongst the staff.

Poster #NM12
DATA FOR “FREE”: CAN AN ELECTRONIC MEDICAL RECORD PROVIDE OUTCOME DATA AFTER INCONTINENCE/PROLAPSE REPAIR PROCEDURES?
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(Presented by: Philippe Zimmern)

Introduction and Objectives: A prior study based on a survey of the SUFU membership identified a core list of outcome measures (OM) that the majority of survey respondents used in their real life practice [1]. However, how to implement OM data acquisition in a busy practice without added burden remains challenging. We developed a custom computer program using the language C# for the search of progress notes in an electronic medical record and tested its yield to extract and analyze key OM against a traditional data recording system.

Methods: Following IRB approval, we compared the extraction rate of 2 datasets for a pre-specified list of OMs. The first dataset (D1) came from a Microsoft Access database for an ongoing prospective study of women undergoing incontinence and/or prolapse surgery maintained by a data entry specialist. The second dataset (D2) originated from progress notes contained in an electronic medical record (Epic). These notes were extracted from the EMR using Epic’s Clarity application. A custom program was written in C# to extract the same sets of OM contained in D1 from the progress notes. To facilitate data extraction, a list of rules, called regular expressions, allowed for the automated searching of the Epic progress notes for words and values of interest. Extracted OMs were transferred into an Excel spreadsheet for statistical analysis in which D1 was considered the “gold standard.”
Results: From June 2007 to July 2011, 757 patient visits were matched by date and medical record number with a 94.9% overlap between D1 and D2. Extraction rates for fixed data points like BMI, age, ethnicity, parity, menopausal status, prior hysterectomy, hormonal intake, were high, nearing 100%. Variable data points had a much lower extraction rate averaging 53% including questionnaire scores (UDI−6 [62%], IIQ−7 [48%], QoL [45%]) and selected POP−Q points (Aa [61%], Ap [49%], C/D[53%], TVL [53%]). However, after excluding data missing in D2, thus comparing similarity between D1 and D2 datapoints, an average accuracy rate of 93% was achieved (UDI−6 [97%], IIQ−7 [97%], QoL [81%], Aa [93%], Ap [91%], C/D[95%], TVL [70%]).

Conclusions: By comparing data retrieval from D1 and D2 for the same set of patients, we found an acceptable yield and high accuracy for rapid retrospective data collection or for random sampling. Optimal data retrieval will require a more elaborate template design in Epic.


Poster #NM13
ANTERIOR TRANSVAGINAL MESH—HOW “SERIOUS” ARE THE COMPLICATIONS AND ARE THEY REVERSIBLE?
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(Presented by: Philippe Zimmern)

Introduction and Objectives: Following two FDA warnings on the use of trans–vaginal mesh in women with pelvic organ prolapse, we reviewed our series of patients referred with anterior mesh related complications.

Methods: Following IRB approval, a retrospective analysis of pooled data from 2 tertiary institutions managing complications of anterior transvaginal mesh (ATM) from 2006 to March 2011 was conducted. Data recorded included mesh type, symptoms leading to surgical removal, and clinical outcome. Minimal follow–up was 6 months.

Results: Fifty–eight women underwent anterior vaginal wall mesh removal. Mean age was 54.6 years (range: 32–80) and duration of follow–up 13.3 months (range: 6–67.3). Time from original surgery to mesh excision was 20.9 months (range: 2.2−59.8). Overall, 44 patients had removal of ATM mesh only, while 31 of 44 had mid urethral sling (MUS) takedown as well. Fourteen patients had ATM removal combined with apical and/or posterior mesh removal and of these, 9 also had MUS takedown. ProliftTM was the predominant mesh kit material (28), followed by PerigeeTM (14), AvaultaTM (10) and various others (8). Nineteen of 58 patients (32.7%) had prior mesh removal attempts. Vaginal mesh extrusion (75%), dyspareunia (73%) and pelvic pain (41%) were the commonest presenting complaint, in addition to one case of vesico–vaginal fistula. Three cases required an abdominal approach. Seventy–four surgeries were required for maximal anterior mesh excision. Thirteen additional procedures were required for recurrent cystocele (4) and secondary stress urinary incontinence (9). Forty–two of 58 were women remained sexually active (73%) postoperatively and reported improvement in dyspareunia with 18 having no pain (42.8%), 12 mild pain (28.6%) and 3 moderate pain (7.1%). Chronic pelvic pain was improved in most patients with 7 women reporting no pain (30.4%), 9 mild pain (39.1%) and 5 moderate pain (21.7%). Two patients had mesh erosion recurrence, and 1 intra–operative ureteric injury was successfully repaired primarily on mesh removal.

Conclusion: In this combined series, ATM removal provided symptom relief in over 75% of women. Residual issues of dyspareunia, chronic pelvic pain, prolapse recurrence, and recurrent mesh extrusion remain in a substantial minority. Some ATM complications are life–altering and intervention “may or may not correct the complication” [FDA October 2008].
**Poster #NM14**

**EFFICACY OF TRIGONITIS FULGURATION IN THE MANAGEMENT OF RECURRENT URINARY TRACT INFECTIONS IN WOMEN**

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**Introduction and Objectives:** Non-neurogenic women with history of recurrent urinary tract infections (rUTI’s) are challenging because antibiotic therapy is limited by drug allergies and bacterial resistance. Trigonitis, defined as areas of infection with pus–appearing pockets over >50% of the trigone on cystoscopy, may be a reservoir for chronic infection. We report on our mid and long-term follow-up experience on cystoscopy with fulguration of trigonitis (CFT) for eradicating bladder sites of presumed bacterial niches.

**Methods:** Following IRB approval, the prospective, third-party updated, Access database of fulgurated patients for rUTI’s with a minimum 12 months follow-up was reviewed. rUTI was defined as at least 3 episodes of uncomplicated infection documented by urine culture in the past year with clinical symptoms. Primary outcome was cure rate as defined by complete resolution of trigonitis based on follow-up office cystoscopy at 6 months. Secondary outcome was number of UTI’s based on number of antibiotic courses prescribed since CFT as documented in the patient’s electronic record at our institution.

**Results Obtained:** Of 84 consecutive patients between 2004–September 2010, 9 were lost to follow-up and 75 had ongoing follow-up. Group 1 (n=29) had 6–24 months follow-up (mean 8.2 month) whereas group 2 (n=46) had longer follow-up (> 24 months) (mean 33.9 month, range 24–71). The majority were Caucasian, with mean age 60 (29–85) for group 1 and 66 (35–90) for group 2. Cystoscopic resolution of trigonitis was noted in 26/29 in G1, and 31/46 in G2. In G1, 3 women underwent 1 antibiotic course each afterwards, compared to 18 in G2, including 10 needing only 1 antibiotic course. Among the 18 “cystoscopic failures” from G1 and G2, a much higher tendency for recurrent UTI’s was observed. Repeat CFT was performed in 4/18 patients followed by a short antibiotic course which resulted in cystoscopic cure. Several patients in this failure group defaulted to low dose chronic antibiotic suppression to avoid symptom recurrence.

**Conclusion:** When CFT is technically successful with complete resolution of trigonitis 6 months later, many patients with rUTI’s experienced a significant reduction in their UTI’s rate, although over time a subgroup still had a few UTI’s occasionally. Persistent trigonitis or new onset lesions outside the trigone at 6 months after CFT portend a worse prognosis.

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**Poster #NM15**

**SHORT AND LONG TERM DURABILITY OUTCOMES FOR FEMALE STRESS URINARY INCONTINENCE: A SYSTEMATIC REVIEW AND META ANALYSIS OF POLYDIMETHYLSILOXANE INJECTION**

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(Presented by: Gamal Ghoniem)

**Introduction and Objective:** Stress urinary incontinence (SUI) is a debilitating condition affecting millions of women worldwide. There are several treatment options for SUI ranging from behavior modification to surgical repair. Urethral bulking agents (UBA) have been widely used with minimal invasiveness, however long term durability varies between products, as resorption, allergic reactions, and migration can occur in some UBAs. The objective of this study is to review the scientific literature for safety and efficacy of the urethral bulking agent (UBA) Polydimethylsiloxane (Macroplastique) in the treatment of adult females diagnosed with SUI due to intrinsic sphincter deficiency (ISD).

**Methods:** Ovid MEDLINE, PubMed and the Cochrane Library were used to conduct a systematic review of studies from 1990 to 2010, using PRISMA guidelines. Articles in the meta analysis included only those studies from randomized control trials, prospective, observational and cohort studies. Publications with the same cohort sample were excluded. Eight–two publications were retrieved from the searches with 19 patient cohorts from 20 published articles used in this systematic review.
Random-effects models were used to estimate the improvement and cure rates following treatment with Macroplastique at three follow-up periods: short-term (<6 months), mid-term (6–18 months), and long-term (>18 months). Meta-regression assessed the effect of reinjection on successful treatment outcomes. Adverse event rates were aggregated and reported.

**Results Obtained:** A total of 817 patients from 19 cohorts were analyzed. Improvement rates were 74% (67–%) in the short-term, 71% (58–%) in the mid-term, and 64% (57–%) long-term. Cure rates (dry) were 45% (34–%), 38% (27–%), and 38% (28–%) over the same respective follow-up periods. Samples with higher reinjection rates had greater improvement in SUI symptoms across all time periods, but cure rates were unaffected. No serious adverse events were reported.

**Conclusions:** Results of this quantitative review support Macroplastique as a durable and safe treatment option for the improvement of female SUI symptoms. Meta-analytic evidence suggests that among those with initial success, long-term therapeutic benefit is frequently maintained with some patients requiring a “booster” injection.

**Poster #NM16**

**SUCCESS OF MIDURETHRAL SLINGS IN OBESE PATIENTS**

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(Presented by: Gjanje Smith)

**Introduction:** Obesity is a risk factor for urinary incontinence [1]. Retropubic (RP) and transobturator (TO) midurethral slings (MUSs) have been shown to be efficacious for treatment of female stress urinary incontinence. We examined the effect of obesity on the success of RP and TO MUSs.

**Materials and Methods:** A prospective database of all patients undergoing RP or TO MUS placement from October 2001 to April 2010 was reviewed. Each patient was mailed validated questionnaires annually to assess outcomes. Outcomes were compared in patients with a minimum of 12 months follow-up. Success was defined as <1 incontinence episode/week or ≥70% patient–reported improvement. Obesity was defined as BMI ≥ 30 kg/m2.

**Results:** Data were available on 201 and 188 patients who underwent RP (Group A) and TO (Group B) MUS placement, respectively. 69 patients in each group met the criteria for obesity. Overall success in Group A was 80.3%. Obese patients in Group A had a similar valsalva leak point pressure (VLPP), but lower success than the non-obese patients (71.6% vs. 82.9%, p=0.04). Overall success in Group B was 82.3%. Obese patients in Group B had a higher VLPP, and similar success to the non-obese patients (81.1% vs. 82.1%, p=0.513). There was no difference in age and rate of prior anti-incontinence procedures between the obese and non-obese patients in each group. There was also no significant difference in success of obese patients in Group A vs. Group B (p=0.13), or that of non-obese patients in Group A vs. Group B (p=0.85). VLPP was lower in the obese patients in Group A vs. Group B (p=0.01), and similar in non-obese patients in each group (p=0.06). There was no difference in success of patients with VLPP<60 in Group A (n=25) vs. Group B (n=5), (76% vs. 80%, p=0.67).

**Conclusion:** The RP MUS has a lower success rate in obese patients, while the success of the TO MUS is similar in obese and non-obese patients. We found no difference in the success of RP vs. TOS MUS in obese patients. Further investigation is needed to determine the most effective MUS for use in the obese patient population.

**Poster #NM17**

**EFFICACY OF DEXTRANOMER IN STABILIZED HYALURONIC ACID (SOLESTA®) FOR TREATMENT OF FECAL INCONTINENCE SECONDARY TO OBSTETRIC TRAUMA**

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(Presented by: Cedric Olivera)

**Introduction and Objectives:** Solesta® (non–animal stabilized hyaluronic acid dextranomer [NASHA™ Dx]), a biocompatible injectable bulking agent, is approved in the EU and the US for the treatment of fecal incontinence (FI). Our objective was to evaluate the efficacy of Solesta® as an injectable bulking agent in the treatment of FI secondary to obstetric trauma (OT).

**Methods:** In a subject and evaluator blinded, multicenter study, 206 subjects with FI were randomized 2:1 to either transanal submucosal injections of Solesta® or sham injections. Efficacy analyses at 6 months post procedure were based on number of patient–reported FI episodes, patient–reported number of days without incontinence episodes, and FI quality of life questionnaire (FIQL) scores [1].

**Results Obtained:** Of the 206 subjects, 56 women with FI secondary to OT were treated with Solesta® and 26 were sham treated. For the total study population, a ≥50% reduction in FI episodes (primary efficacy end point) was noted in 71/136 (52.2%) subjects in the treatment group and 22/70 (31.4%) in the sham group (P=0.0089). Median increase in number of incontinence–free days was 3.1 and 1.0 in the treatment and sham groups, respectively (P=0.016), and median decrease in the number of FI episodes was 6.0 and 3.0 in the treatment and sham groups, respectively (P=NS). Median changes in FIQL coping/behavior scores of 0.3 and 0.0 in the treatment and control groups, respectively, differed significantly (P=0.001). For subjects with FI secondary to OT, a ≥50% reduction in FI episodes was noted in 30/56 (54.0%) subjects in the treatment group and 7/26 (27.0%) in the sham group (P=NS). Median increase in number of incontinence–free days was 3.0 and 1.0 in the treatment and sham groups, respectively (P=NS), and median decrease in number of FI episodes was 6.8 and 3.0 in the treatment and sham groups, respectively (P=NS). Median changes in FIQL coping/behavior scores of 14.6 and 0.0 in the treatment and control groups, respectively, differed significantly (P=0.023), as well as median changes in FIQL lifestyle scores of 6.1 and 0.0 (P=0.05).

**Conclusions:** FI due to OT is a major problem for many women following childbirth. This post hoc analysis indicates that women with FI due to OT had improved quality of life in the coping/behavior subscale, and lifestyle subscale of the FIQL when treated with Solesta®.

**Funding:** Supported by funding from Oceana Therapeutics, Inc.


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**Poster #NM18**

**OUTCOMES OF SALVAGE PROCEDURES FOR BLADDER OUTLET OBSTRUCTION SECONDARY TO PRIOR SUI**

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(Presented by: Ahmed El-Zawahry)

**Introduction and Objectives:** The optimal intervention for failed or complicated anti–incontinence surgery (AIS) resulting in bladder outlet obstruction in women is ill–defined in the modern era of female anti–incontinence surgery. These patients often have a complicated problem and surgical treatment may end up with unwanted results. We retrospectively reviewed patient outcomes for those who had undergone salvage procedures for BOO secondary to previous AIS and report the outcomes.

**Methods:** Patients undergoing salvage procedures for BOO after AIS procedures between 2004–2009 were identified. Preoperative assessment included history, physical exam, diary, pad test, cystoscopy, and video urodynamics (VUDS). BOO was defined by a combination of clinical parameters, VUDS and cystoscopy. Salvage procedures included either transvaginal sling incision (TVSI) with or without formal urethrolysis, with or without concomitant autologous rectus fascial sling (AFS) based on patient preference. Outcome was assessed by patients’ symptomatology reported prior to, and following the salvage procedure using the Blaivas–Groutz (B–G) score. Success was defined as cure, good or fair based on the B–G score.
Results: A total of 45 patients were identified. Mean age was 61 years old and mean follow-up period was 18.2 months. Mean time from initial procedure to salvage procedure was 42.8 months. Procedures included: 15 TVSI, 12 urethrolysis, and 18 TVSI/urethrolysis with AFS. Preoperative and postoperative symptoms are reported respectively as follows; stress urinary incontinence (47% vs. 11%, p=0.0001), urgency (93% vs. 47%, p=0.00003), pelvic pain (33% vs. 13%, p=0.02), infection (44% vs. 22%, p=0.02), extrusion (4% vs. 2%, p=0.6), frequency (89% vs. 42%, p=0.00001), incomplete emptying (89% vs. 24%, p=0.00004) and good urinary stream (11% vs. 73%). The B-G score was reported to be successful in only 67% of patients.

Conclusions: Patients who present for salvage procedures after AIS have an array of complicated symptoms. Salvage procedures for BOO after previous AIS are a viable option. Although patients’ symptoms showed statistically significant improvement with salvage procedures, the composite success rate based on B-G score was only 67%. Proper patient counseling prior to salvage procedures is paramount in order to temper patient expectations.

Poster #NM19

EFFECT OF AN ANTICHOLINERGIC MEDICATION ON COGNITIVE FUNCTION IN POSTMENOPAUSAL WOMEN

Elizabeth Geller, MD, Andrea Crane, MD, Ellen Wells, MD, Barbara Robinson, MD, Mary Jannelli, MD, Christine Khandelwal, DO, Anna Marie Connolly, MD, Brent Parnell, MD, Catherine Matthews, MD, Julie Dumond, PharmD and Jan Busby-Whitehead, MD

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(Presented by: Andrea Crane)

Introduction and Objectives: Overactive bladder (OAB) is a common condition with a prevalence of 35% in our aging population. The mainstay of treatment for OAB is pharmacologic therapy using anticholinergic medications. Cognitive effects have been reported with anticholinergic use. Our objective was to investigate the effect of one anticholinergic medication on cognitive function in postmenopausal women.

Methods: Women 55 or older seeking treatment for OAB underwent baseline cognitive function assessment via Mini–Cog, Hopkins Verbal Learning Test (and its seven subscales) and the Orientation, Memory & Concentration (OMC) Test. Trospium chloride was initiated and cognitive function was reassessed at Day 1 and Weeks 1, 4 and 12. OAB improvement was assessed with validated condition-specific questionnaires.

Results Obtained: Of 50 women enrolled, 35 completed the assessment. Average age was 70.4 years and 77.1% had previously taken anticholinergic medication for OAB. At enrollment 65.7% had severe overactive bladder symptoms and 71.4% had severe urge incontinence. Cognitive function showed an initial decline on Day 1 in the Hopkins total score (p=0.037), Hopkins Delayed Recognition subscale (p=0.011) and Hopkins Recognition Bias subscale (p=0.01). At Week 1 the Hopkins Learning subscale declined from baseline (p=0.029). All Hopkins scores normalized by Week 4. OMC remained stable throughout. The Mini–Cog nadired at a 90.9% pass rate at Week 4. OAB symptoms improved at Week 4 based on questionnaire scores (p<0.05).

Conclusions: Cognitive function exhibited early changes after initiation of anticholinergic medication but normalized within four weeks. These changes occurred weeks prior to the improvement seen in OAB symptoms.

Poster #NM20

THE ROLE OF THREE-DIMENSIONAL ENDOVAGINAL ULTRASOUND (3D EVUS) IN THE ASSESSMENT OF PERIURETHRAL DISTRIBUTION OF MACROPLASTIQUE AND ITS ASSOCIATION WITH SUBJECTIVE SUCCESS

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(Presented by: Aparna Hegde)
Introduction: Currently no reliable parameters have been found to be associated with subjective success following macroplastique injection.

Objectives: To determine the role of 3D endovaginal ultrasound (3D EVUS) in assessment of the periurethral distribution of macroplastique and its association with subjective success.

Methods: Ultrasound parameters in 100 treatment naïve patients from April 2009 to January 2011 in whom 3D EVUS was performed post transurethral instillation of macroplastique was retrospectively analyzed. 360 degree 3D EVUS was performed with BK 2502 transducer. The location, volumes and distance of the hyperechoic densities from the urethrovesical junction were assessed. The urethra was divided into four quadrants in a clockwise fashion: left upper, left lower, right lower and right upper and the percentage of each quadrant filled with macroplastique was assessed. Based on the subjective outcomes, the patients were divided into two groups: Group A (n=72): patients who were cured or improved following treatment and Group B (n=28): patients who were not improved or worsened.

Results: The two groups were similar with respect to their demographic data, prior anti-incontinence procedures, the amount of macroplastique injected and the median weeks of follow-up (p > 0.05). On 3-D EVUS, the two groups were not significantly different in the volumes instilled, mean distance of the hyperechoic densities from urethrovesical junction and the % of each quadrant filled with macroplastique when assessed separately (p > 0.05). However the results were significantly different when the quadrants were considered together as seen in table 1. The odds of finding symmetric distribution as defined in Table 1 in Group A was 13.62 times the odds in Group B (95% CI: 5.12 –56.95).

Conclusion: Patients with subjective success following macroplastique injection have higher odds of having symmetric distribution of macroplastique on 3D EVUS as compared to patients with subjective failure. 3D EVUS immediately following instillation can potentially suggest the need to repeat the injection in a different quadrant to improve subjective outcomes.

<table>
<thead>
<tr>
<th>Quadrants filled</th>
<th>Group A (n=72)</th>
<th>Group B (n=28)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYMMETRIC DISTRIBUTION*</td>
<td>59 (79.10%)</td>
<td>7 (25%)</td>
<td>0.00</td>
</tr>
<tr>
<td>ASYMMETRIC DISTRIBUTION*</td>
<td>13 (18.50%)</td>
<td>21 (71%)</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* More than 50% of three consecutive quadrants or all four quadrants filled

* Less than 50% of three consecutive quadrants or only 2 or 1 quadrant filled

Poster #NM21
IS PERSONALITY A RISK FACTOR FOR SEXUAL DYSFUNCTION?
Catrina Crisp, MD¹, Apurva Pancholy, MD², Angela Fellner, PhD³, Steven Kleeman, MD¹ and Rachel Pauls, MD¹
¹Good Samaritan Hospital, Cincinnati, OH; ²Baylor School of Medicine; ³Hatton Institute, Cincinnati, OH
(Presented by: Catrina Crisp)

Introduction: Sexual disorders affect up to 43% of females in the US. There is a paucity of data investigating the relationship between sexual dysfunction and psychological variables (ie personality traits, coping mechanisms).

Aim: Examine personality domains and coping strategies in women with sexual dysfunction.

Methods: Patients from an academic urogynecology practice specializing in sexual medicine were identified using ICD-9 codes. They were sent a study packet including informed consent, Female Sexual Function Index (FSFI), Female Sexual Distress Scale–Revised (FSDS–R), Ten Item Personality Index (TIPI), and Brief COPE.

Main Outcome Measure: Correlations among FSFI, FSDS–R, TIPI, and Brief COPE.

Results: Of the 79 patients meeting inclusion criteria, 50 (63.2%) returned completed questionnaire packets. FSFI (M=18.9) and FSDS–R (M=35.5) total scores confirmed sexual dysfunction in all respondents. When evaluating the TIPI, overall personality scores did not differ from normative data. FSDS–R total scores correlated negatively with openness (r=-.305, p=0.037), and approached significance with extraversion (r=-.258, p=0.08). No significant correlations were seen between the FSFI and personality scores.
With respect to the brief COPE, patients used positive coping mechanisms (emotional support, instrumental support, active coping, planning, positive reframing) more often than negative strategies (self blame, denial, self distraction, behavioral disengagement). Frequent use of behavioral disengagement correlated with lower FSFI total scores (r=.329, p=0.04), and the use of emotional support correlated with higher FSFI satisfaction (r=.331, p=0.03). With respect to personality and coping, patients scoring higher on conscientiousness, extraversion, and openness more often used positive coping strategies (p=0.013−0.034), suggesting that use of coping mechanisms may be influenced by personality.

**Conclusion:** The relationship between sexual function, personality, and coping has not previously been assessed. Although limited by small sample size, we identify trends between these factors in our group of subjects. These findings suggest a need to consider psychological variables when evaluating women presenting with these common quality of life complaints.

**Poster #NM22**

**VALIDATION OF THE FEMALE SEXUAL FUNCTION INDEX (FSFI) FOR WEB-BASED ADMINISTRATION**

Catrina Crisp, MD¹, Maria Estanol, MD¹, Angela Fellner, PhD², Steven Kleeman, MD¹ and Rachel Pauls, MD¹

¹Good Samaritan Hospital, Cincinnati, OH; ²Hatton Research Institute

(Presented by: Catrina Crisp)

**Introduction:** With increasing access to the Internet, online questionnaires are becoming valuable tools for clinical research. Therefore, it is necessary to validate gold-standard questionnaires for web-based administration.

**Methods:** Four hundred forty-three women who voluntarily responded to an email regarding women’s health issues were invited to participate in a validation study. Those consenting to the study completed both the web-based and the paper-based version of the FSFI. Demographic data was collected for all participants.

**Results:** One hundred fifty-one subjects or 34% (151/443) agreed to participate in the validation study. Participants were excluded if there was greater than 6 weeks between completion of the two questionnaires. FSFI scores and demographic data did not differ significantly between groups. Total FSFI scores between versions were not significantly different, M=20.31 and M=20.29 (p=0.931). The six domains or subscales of the FSFI were also not significantly different (Table 1). Additionally, both total and subscale scores showed a high degree of correlation.

**Conclusion:** Web-based administration of the FSFI is a reliable alternative measure to assess female sexual function.

**Table 1**

<table>
<thead>
<tr>
<th></th>
<th>Web-based Mean</th>
<th>Paper-based Mean</th>
<th>Mean difference</th>
<th>P value*</th>
<th>Interclass Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total FSFI</strong></td>
<td>20.32±1.4</td>
<td>20.57±3.8</td>
<td>0.254 (−0.34−0.84)</td>
<td>0.393</td>
<td>0.870</td>
</tr>
<tr>
<td><strong>Desire</strong></td>
<td>2.89±1.4</td>
<td>3.01±1.4</td>
<td>0.148 (−0.03−0.32)</td>
<td>0.100</td>
<td>0.838</td>
</tr>
<tr>
<td><strong>Arousal</strong></td>
<td>4.03±1.5</td>
<td>3.94±1.5</td>
<td>−0.095 (−0.27−0.09)</td>
<td>0.297</td>
<td>0.890</td>
</tr>
<tr>
<td><strong>Lubrication</strong></td>
<td>3.30±0.5</td>
<td>3.39±0.4</td>
<td>0.096 (−0.03−0.22)</td>
<td>0.135</td>
<td>0.422</td>
</tr>
<tr>
<td><strong>Orgasm</strong></td>
<td>3.68±0.7</td>
<td>3.71±0.7</td>
<td>0.028 (−0.13−0.19)</td>
<td>0.725</td>
<td>0.637</td>
</tr>
<tr>
<td><strong>Satisfaction</strong></td>
<td>3.97±1.6</td>
<td>4.02±1.5</td>
<td>0.050 (−0.18−0.28)</td>
<td>0.671</td>
<td>0.848</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>2.24±1.5</td>
<td>2.32±1.4</td>
<td>0.088 (−0.14−0.31)</td>
<td>0.436</td>
<td>0.851</td>
</tr>
</tbody>
</table>
**Poster #NM23**

ASSOCIATION OF BLADDER SENSATION MEASURES AND BLADDER DIARY IN PATIENTS WITH URINARY INCONTINENCE

Ashley King, Jeffrey Wolters, MD¹, Adam Klausner, MD¹ and David Rapp, MD²

¹Virginia Commonwealth University, Richmond, VA; ²Virginia Urology Center for Incontinence and Pelvic Floor Reconstruction, Richmond, VA

(Presented by: Ashley King)

**Introduction and Objectives:** Investigation suggests the involvement of afferent actions in the pathophysiology of urinary incontinence. Current diagnostic modalities do not allow for the accurate identification of sensory dysfunction. We previously reported urodynamic derivatives that may be useful in assessing bladder sensation. This study further investigated these derivatives by assessing for a relationship with 3-day bladder diary.

**Methods:** We performed a retrospective review of 120 women evaluated for urinary incontinence. Statistical analysis assessed for a relationship between bladder diary parameters and two previously reported urodynamic derivatives (First Sensation Ratio (FSR)(FS/Capacity), Bladder Urgency Velocity (BUV)(Capacity−FS)). Subset analysis was performed in patients without stress urinary incontinence (SUI) to isolate patients with urgency symptoms. Analysis was also performed to identify a possible relationship between these derivatives and the presence/absence of detrusor overactivity (DO).

**Results Obtained:** No association was demonstrated between bladder diary parameters and FSR/BUV. However, subset analysis demonstrated an association between DO and BUV, with a lower BUV identified in patients without DO (p<0.05). Subset analysis of patients without SUI demonstrated a weak association between voiding frequency and FSR (r=−0.39) and between daily incontinence episodes and BUV (r=−0.35). However, these failed to demonstrate statistical significance.

**Conclusions:** No association between bladder diary and FSR/BUV was seen. This is not unexpected since bladder diary may reflect numerous pathologies including not only sensory dysfunction but also SUI and DO. However, weak associations identified in patients without SUI suggest that further investigation is needed to assess the utility of FSR/BUV in characterizing sensory dysfunction in patients with urge–predominant symptoms.

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**Poster #NM24**

TOPIX DISCUSSION BOARD: A QUALITATIVE INSIGHT INTO THE LIVES OF WOMEN AFFECTED BY TAPE COMPLICATIONS

Mio Yanagisawa and Philippe Zimmern MD

UT Southwestern Medical Center, Dallas, Texas

(Presented by: Philippe Zimmern)

**Introduction:** To gain insight into the lives of women affected by tape complications and the various uses of the Internet as a source of information communication and social networking, an active online discussion board on Topix.com was surveyed.

**Methods:** Every public post on the specific Topix discussion forum titled “lawsuit filed Gynecare TVT bladder suspension tape” from its beginning to now was reviewed. Extracted data included the number of unique individuals who made comments on the forum about their unsuccessful surgical experience, the time lapse between date of surgery and date of first comment, surgical complications mentioned, and number of corrective surgeries needed.

**Results:** From the first post in August of 2007 to June of 2011, over 2030 comments were made in the forum from at least 239 individual women. Only 4 women reported a successful surgery, while the remaining 235 described the details of their surgeries and subsequent complications. Complications mentioned included dyspareunia, urinary issues such as retention or incontinence, pain, and/or erosion; 65% of women reported having multiple complications. Post surgical problems were so severe that 119 women discussed the need for corrective surgeries. The number of reoperations ranged from 1–15 (mean 2). Looking at the dates of the forum entries and date of surgery when mentioned, it was noted that 35% of women searched the Internet and were driven to comment on the forum within several months of their surgery while 71% commented within 2 years. Furthermore, the rising number of reported post–operative complications per year rose from 2001–2008, a possible trend related to the increase in the practice of synthetic sub–urethral tape procedures (Fig. 1). The number of forum entries remained relatively steady each year. Thus the activity within the forum remained high. Legal recourse was often discussed.
Conclusion: By this internet networking, women affected by surgical complications of TVT were able to find each other, form social networks, and unite together to pursue legal change. Physicians should be aware of these patient−driven initiatives.

Poster #NM25
CLINICAL AND URODYNAMIC CORRELATION AMONG PATIENTS WITH OVERACTIVE BLADDER-DRY
Adam Stewart, MD, Wesley White, MD, Fred Klein, MD and Ragi Doggweiler, MD
University of Tennessee Graduate School of Medicine, Knoxville, TN
(Presented by: Adam Stewart)

Introduction and Objectives: The International Continence Society defines overactive bladder (OAB) as the presence of urgency, with (OAB−wet) or without (OAB−dry) urge incontinence, usually associated with frequency and nocturia, in the absence of other pathological disorders. The majority of patients with OAB−wet demonstrate objective evidence of detrusor overactivity (DO) or detrusor instability (DI) when subjected to urodynamic testing. However, patients with OAB−dry often manifest variable outcomes during urodynamic testing. We present our series of patients with clinical symptoms of OAB−dry that underwent urodynamic testing and describe how our results may impact its current definition.

Methods: A longitudinal, observational study was performed to better correlate clinical and urodynamic outcomes among patients with OAB−dry. Patients with clinical symptoms of OAB as defined by the ICS were included in the study. Patients with incontinence, pelvic pain, and retention were excluded. All patients underwent a history and physical examination including a complete neurologic exam. A 3 day voiding log was obtained on all patients. Patients with OAB−dry based on clinical symptoms and voiding log results were invited to undergo UDS. Multi−channel urodynamics was performed including urethral profilometry.

Results: Between July 2007 and July 2010, a total of 418 patients with clinical symptoms of OAB−dry underwent UDS testing. Of this cohort, 177 patients manifested urgency and frequency without associated pain or retention. All patients reported complaints of increased daytime frequency with voiding volumes of less 200mL. Urodynamics revealed bladder capacities of between 90 and 750mL. Sixty−six patients had a maximum urodynamic capacity of less than 300mL without signs of overactive detrusor contractions. Only 2 patients demonstrated overactive detrusor contractions. In 58 patients, the urethral sphincter pressure was > 100cm H2O (range 100 –200cm H2O). In addition, 73 patients reported pain (> 5/10) during introduction or adjustment of the catheter.
Conclusion: Based on our experience, many patients who are classified as OAB–dry demonstrate evidence of bladder and/or urethral hypersensitivity or a low cystometric bladder capacity. We contend that our current definition of OAB–dry may therefore be misleading and a re-examination of our current nomenclature is warranted.

Poster #NM26
INCIDENCE AND TIME TRENDS IN THE SURGICAL MANAGEMENT OF STRESS URINARY INCONTINENCE
Michele Jonsson Funk, PhD¹, Pamela Levin, MD² and Jennifer Wu, MD, MPH²
¹University of North Carolina, Chapel Hill, NC; ²Duke University, Durham, NC
(Presented by: Pamela Levin)

Introduction and Objectives: A major limitation of existing data on trends in stress urinary incontinence (SUI) surgeries is the use of non-specific International Classification of Diseases, 9th Revision (ICD–9) procedure codes in the majority of databases. For example, the most common procedure reported is ICD9 59.79, which represents “other repair of SUI.” The objective of this study is to use a large healthcare claims database to estimate the incidence rates of SUI surgery from 2000–2009, by type of procedure based on Current Procedural Terminology (CPT) codes and to evaluate region-specific trends.

Methods: We utilized the 2000–2009 Thomas Reuters Marketscan® Commercial Claims and Encounters database which contains healthcare claims data from employer-based plans. All SUI procedures were identified using CPT codes. We evaluated women aged 18–64 years, as those 65+ are covered by Medicare and are not uniformly captured by this database. The overall incidence rates (IR) per 100,000 person-years (100Kpy) and 95% confidence intervals (95%CI) were calculated for each type of procedure for each year from 2000 to 2009. We also compared the overall IR by region of the country.

Results: We evaluated 32.9 million women aged 18–64 years with over 74 million person-years of follow-up. The total number of SUI procedures performed was 191,254, corresponding to a total IR of 258.4 per 100Kpy (95%CI: 257.3, 259.6). The most common SUI surgery was sling (IR=205.8, 95%CI: 204.8, 206.9) followed by Burch procedure (IR=28.5, 95%CI 28.1, 28.8). Other types of SUI surgeries had significantly lower rates. From 2000–2009, there was a dramatic increase in slings with a decrease in Burch procedures (Figures 1 and 2). Although these trends were demonstrated across all regions of the U.S, the Northeast had the lowest overall IR of any SUI surgery, while rates in the South, Midwest and West were 2.1, 1.8 and 1.4 times higher, respectively.

Conclusions: In women aged 18–64 years, slings were the primary procedure for stress urinary incontinence, representing a dramatic shift over the last decade. Although this trend was seen in all regions of the U.S., significant variability exists in the rate of SUI surgery by region.
Poster #NM27
TREATMENT OF RECURRENT STRESS URINARY INCONTINENCE AFTER MID URETHRAL SYNTHETIC SLING WITH A PUBOVAGINAL SLING, A SINGLE INSTITUTION EXPERIENCE
Jennifer Rothschild, MD, MPH¹, Ekene Enemchukwu, MD, MPH¹, Lorraine Alexis, BS¹, W. Stuart Reynolds, MD, MPH¹, Harriette Scarpero, MD², Melissa Kaufman, MD, PhD¹ and Roger Dmochowski, MD¹
¹Vanderbilt University Medical Center, Nashville, TN; ²Associated Urologists, Nashville, TN
(Presented by: Jennifer Rothschild)

Introduction: Although mid urethral synthetic slings (MUSS) have been favorably used in the past for the surgical treatment of SUI, they are currently under scrutiny due to synthetic mesh complications. Most published data on MUSS report a cure rate of 77% to 88% with a standard failure rate quoted at 10−20%. Therefore, a significant amount of women undergoing MUSS will not have successful outcomes and will have recurrent SUI. Although there are many treatment options for recurrent SUI, there are no specific studies on the role of autologous pubovaginal sling (PVS) in women with a prior failed MUSS. We present our experience of the efficacy and complications of PVS in patients with recurrent stress urinary incontinence after failed mid urethral synthetic sling.

Methods: Retrospective review of 114 patients with stress urinary incontinence following mid urethral sling surgery who underwent subsequent pubovaginal sling placement from 2006 through 2010 were evaluated for demographics, history, symptoms, subjective outcomes, and complications.

Results: Of the 114 patients reviewed, 22 patients had recurrent SUI following MUSS surgery. Although all women reported SUI, 14 (64%) had additional symptoms: frequency (14%); mixed incontinence (5%); frequency, urge and mixed incontinence (45%); and dysuria (24%). In addition to prior MUSS, 8 patients had between 2−4 additional surgeries: prior MUSS (5), urethral bulking (5), and prior PVS (3). At the time of the PVS surgery, 13 (59%) underwent concurrent urethrolysis. All 22 patients received autologous abdominal rectus fascia. At a mean follow−up of 10 months, 15 (68%) of the PVS procedures were considered successful with no SUI and no additional SUI surgery. Complications included 7 (32%) women who developed urinary retention and they were treated with an indwelling catheter (1), intermittent catheterization (5) or suprapubic tube (1). Of the 22 patients, 11 (50%) reported no urinary urgency while 9 reported continued or worsening symptoms of urgency. Prior surgeries was not associated with successful outcomes, Fisher’s exact test, p = 0.268.

Conclusions: Pubovaginal sling is a reasonable option to offer patients who have recurrent SUI after failed mid urethral synthetic sling surgery. In our series, 68% of women were successfully treated with PVS, although post−op urgency and retention rates remained high. Additional analyses are needed to identify other predictive variables.

Poster #NM28
CORRELATION OF PRE-OPERATIVE ABDOMINAL LEAK POINT PRESSURE WITH POST-OPERATIVE STRESS URINARY INCONTINENCE AFTER CYSTOCELE REPAIR AND SLING
Sam Kuykendall, MD, Sharron Mee, MD and Gary Leach, MD
Tower Urology, Los Angeles, CA
(Presented by: Sam Kuykendall)

Introduction: It is unknown if the severity of stress urinary incontinence (SUI) on pre−operative urodynamic studies correlates with a patient’s likelihood of persistent SUI after cystocele repair with sling. No previous studies have evaluated the correlation of pre−operative abdominal leak point pressures (ALPP) with incidence and severity of SUI after cystocele repair with sling placement.

Methods: A retrospective review was performed examining 420 patients who underwent cystocele repair with simultaneous suburethral sling. All patients had both pre−operative urodynamic studies (UDS) and follow−up with a validated incontinence questionnaire. UDS were performed in all patients with and without reduction of the cystocele. All patients underwent sling placement regardless of pre−operative UDS findings. Sling types included transobturator sling, single incision sling and cadaveric fascial sling. Presence and severity of patient SUI was self−reported in a validated questionnaire post−operatively.

Results: Of 424 patients analyzed who underwent cystocele repair and sling, 185 demonstrated SUI on pre−operative urodynamic studies. The remaining 239 patients did not show SUI during preop UDS.
Table 1
Incidence and Severity of Self–Reported SUI after Cystocele Repair Based on Pre–op ALPP

<table>
<thead>
<tr>
<th></th>
<th>Preop ALPP &lt;50 (75 patients)</th>
<th>Preop ALPP 50–80 (70 patients)</th>
<th>Preop ALPP &gt;80 (40 patients)</th>
<th>PreOp ALPP of Infinity (DRY) (239 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Post–op SUI</td>
<td>46 (61%)</td>
<td>42 (60%)</td>
<td>32 (80%)</td>
<td>218 (91%)</td>
</tr>
<tr>
<td>Mild SUI</td>
<td>19 (25%)</td>
<td>19 (27%)</td>
<td>6 (15%)</td>
<td>14 (6%)</td>
</tr>
<tr>
<td>Moderate SUI</td>
<td>7 (9%)</td>
<td>8 (11%)</td>
<td>1 (3%)</td>
<td>6 (3%)</td>
</tr>
<tr>
<td>Severe SUI</td>
<td>3 (4%)</td>
<td>1 (1%)</td>
<td>1 (3%)</td>
<td>1 (&lt;1%)</td>
</tr>
</tbody>
</table>

There was no detectable difference in the proportion of patients with or without post–operative SUI in any of the three groups with pre–op SUI based on pre–operative ALPP (p=1 for LO v MID; p=.036 for HI v MID; p=0.059 for LO v HI). We estimated the 95% confidence interval for the difference to be ± 20% for all three. There was no statistically significant difference between the three groups when compared to the 239 patients who were dry pre–operatively as well. Additionally, ALPP did not correlate with post–operative SUI based on sling type.

**Conclusions:** Despite suburethral sling placement at the time of cystocele repair, some patients experience post–operative SUI which is usually reported as mild. There is no evidence for a direct correlation between ALPP on pre–operative urodynamics and the likelihood of continued SUI after cystocele repair with sling placement.

Poster #NM29
OUTCOMES OF URETHRAL TRANSECTION FOR RECONSTRUCTION OF THE DORSAL OR CIRCUMFERENTIAL URETHRAL DIVERTICULUM
Ahmed El-Zawahry, MD¹, Ross Rames, MD² and Eric Rovner, MD²
¹Urology Department, MUSC, Charleston, SC; ²MUSC, Charleston, SC
(Presented by: Ahmed El-Zawahry)

**Introduction:** Reconstruction of urethral diverticulum (UD) can be technically demanding. It is not uncommon to face with a circumferential UD extending dorsally or anteriorly around the urethra. Excision of UD may leave a large gap in the urethra which can be challenging. In these cases we use a technique in which we transect the urethra to be able to remove the entire UD then reconstruct the urethra. We present our experience with the reconstruction of these complex UDs.

**Methods:** A retrospective review of patients who underwent urethral diverticulectomy at the Medical University of South Carolina in the period of 2004 to 2008 was performed. A total of 27 UD surgeries were performed of which six patients underwent surgical reconstruction with complete division of the urethra to access the dorsal wall of the UD. Urethral continuity was established by end–to–end urethroplasty.

Initial diagnosis was confirmed with voiding cystourethrography (VCUG). Presenting symptoms were reviewed and compared to post–operative results. Martius flap and pubovaginal sling was used as needed. Postoperatively VCUG was performed in all patients to document absence of the UD.

**Results:** Presenting symptoms included stress urinary incontinence (SUI) in all 6 patients. Urgency was present in 3 patients, pelvic pain and/ or dyspareunia in all 6, recurrent urinary tract infections in 3, and vaginal mass in 2 patients. Tender anterior vaginal wall was present in 3 patients. Two patients presented with dysuria and one patient has bladder outlet obstruction and high post void residual secondary to previous sling surgery.

Mean age of the patients was 47.5 years. Mean and range of follow-up was 18 month (range 1 to 71 months). Pubovaginal fascial sling was performed in 5 patients and Martius flap in 3. All patients reported subjective improvement of symptoms. Five patients did not report postoperative SUI. One patient had recurrent urinary tract infections that required chronic suppressive therapy. One patient had recurrent pelvic pain and was found to have a recurrent UD after 18 months and required another surgery after which she reported improvement.

**Conclusions:** Circumferential UD is an unusual problem. SUI seems to be commonly associated with these patients at presentation. Urethral transection and end–to–end anastomosis is a feasible approach. Pubovaginal sling should be considered when indicated in these patients. We conclude that this approach can result in excellent clinical outcomes.
**Poster #NM30**

**PREVALENCE OF STRESS URINARY INCONTINENCE IN WOMEN WITH MULTIPLE SCLEROSIS**

Alana Murphy, MD, Francois Bethoux, MD, Darlene Stough, RN, MSCN, CCRP and Howard Goldman, MD
Cleveland Clinic, Cleveland, OH
(Presented by: Alana Murphy)

**Introduction and Objective:** The purpose of this study was to determine the prevalence of SUI in women with multiple sclerosis and to what degree these women are bothered by their SUI, since the nature of SUI has been largely ignored in this unique population of women.

**Methods:** We conducted a prospective IRB approved study to determine the prevalence of SUI in women with MS. Women scheduled for outpatient follow-up appointments at a dedicated MS center were asked to complete a questionnaire regarding urinary incontinence. UUI and SUI were defined as an answer of slightly, moderately or greatly to UDI question #2 and question #3, respectively. Impact of SUI on physical activity was determined by IIQ question #2.

**Results:** A total of 55.9% women had SUI, 70.6% women had UUI, and 44.8% women had mixed urinary incontinence. The mean age was 45.8 years old (range 20−72). Women with SUI were significantly older (mean 47.2 vs. 41.9, p=0.023) and there was a trend towards a greater BMI (mean 29.3 vs 26.5, p=0.057). Women with SUI had significantly higher IIQ−7 scores compared to women without SUI (p<0.001). Impact of urinary incontinence on physical activity was also found to be significantly greater in women with SUI (mean IIQ question #2 0.96 vs. 0.35, p<0.001).

**Conclusions:** The prevalence of SUI in women with MS is 55.9% and the presence of SUI has a significant impact on their quality of life. A comprehensive urologic evaluation of a woman with MS should include assessment of SUI.

**Poster #NM31**

**SURGICAL PRACTICE PATTERNS FOR MALE URINARY INCONTINENCE AMONG CERTIFYING AMERICAN UROLOGISTS**

Stephen Poon, MD¹, Jonathan Silberstein, MD¹, Will Lowrance, MD, MPH², Caroline Savage, MS¹, Alexandra Maschino, MS¹ and Jaspreet Sandhu, MD¹
¹Memorial Sloan-Kettering Cancer Center, NY, NY; ²University of Utah, Salt Lake City, UT
(Presented by: Jaspreet Sandhu)

**Introduction and Objectives:** Several treatment options exist for the surgical correction of male stress urinary incontinence, including endoscopic injection of periurethral bulking agents, the artificial urinary sphincter (AUS), and the recently introduced male urethral sling. We sought to investigate contemporary trends in the utilization of these procedures.

**Materials and Methods:** Annualized case log data for incontinence surgeries from certifying and re-certifying American urologists were obtained from the American Board of Urology, ranging from 2004 to 2010. Chi-squared tests and logistic regression models were used to evaluate the association between surgeon characteristics (type of certification, annual volume, practice type, and practice location) and the use of incontinence procedures.

**Results:** Among the 2036 non−pediatric urologist case logs examined, the number of incontinence treatments being reported for certification has steadily increased over time (p=0.008). The rate of endoscopic procedures has decreased from 80% of all procedures in 2004 to 60% in 2010 but remains the exclusive incontinence procedure performed by 49% of urologists. Male slings have gained in popularity with nearly one−fifth of urologists reporting performing at least one sling. AUS usage remains stable accounting for 12% of procedures. Increased usage of endoscopic treatments is associated with decrease utilization of sling (OR: 0.5, p<0.0005).

**Conclusions:** Incontinence procedure utilization is on the rise. Urethral slings have been widely adopted by surgeons, but endoscopic treatments may continue to be over used. AUS are performed by a select group of urologists. Further research is required to understand the urologist’s decision process in the treatment of stress urinary incontinence with respect to treatment modality.
Poster #NM32

TRANSURETHRAL RESECTION OF THE PROSTATE IN NEUROGENIC PATIENTS
Casey Seideman, MD, Benjamin Dillon, MD, Dominic Lee, MD, Claus Roehrborn, MD, Philippe Zimmern, MD, and Gary Lemack, MD
University of Texas Southwestern, Dallas, Texas
(Presented by: Benjamin Dillon)

**Introduction:** Transurethral resection of the Prostate (TURP) is the gold standard treatment for men with bladder outlet obstruction (BOO). Often, TURP is not recommended in neurologically compromised patients for concerns of post-operative incontinence and/or inability to improve symptoms. We report on the outcomes of TURP in neurogenic patients in a large cohort of patients referred to a tertiary neurogenic bladder (NGB) clinic, to determine if we can predict those patients who will have favorable outcomes from a TURP.

**Materials and Methods:** Patient data was obtained from an IRB-approved neurogenic bladder database. Demographic information included neurologic condition, age at initial visit, pre and post-operative AUA Symptom Index (AUASI). Patients were categorized into group 1 if their post-operative AUASI was ≤19 or group 2 if >20. Preoperative urodynamics (UD) were performed in all patients.

**Results:** Between 1/2000–7/2010, 25 men with underlying neurologic conditions underwent TURP for UD proven BOO. The mean and median age at time of TURP was 66. Pre-Op AUASI was available for 16 (64%) of subjects with the mean and median score 20. The most common neurologic condition was Parkinson’s Disease in 12 (48%), followed by Multiple Sclerosis in 8 (32%) and the remaining 5 patients had other assorted neurologic conditions. Post operatively, 14 patients were categorized into group 1, while the remaining 11 patients in group 2. Mean duration of follow-up after TURP was 2.3 years (median 1.5) with mean post-op AUASI 13 (median 11). There were no pre-op UD data that were predictors of TURP failure, however, differential PvesQmax was higher in group 1 (70 cmH2O vs. 50cmH2O), a value which trended toward significance (p=0.08). Post-operative PVR was significantly lower in group 1 (110cc vs. 284cc, p=0.02). Similarly, 93% of patients in group 1 were able to void post-op compared to 45% of patients in group 2 (p=0.03). There was no difference in neurologic condition between the two groups.

**Discussion:** The neurogenic patient with BOO poses a clinical dilemma to urologists. We were not able to identify any pre-operative demographic data to help determine which patients will have a successful outcome from a TURP, though more severe UD obstruction may portend a greater improvement in symptom score. Larger multi-center studies may be required to determine if specific UD values can help identify neurogenic patients likely to do best following TURP.

Poster #NM33

THE USE OF THE ARTIFICIAL URINARY SPHINCTER AND CLEAN INTERMITTENT CATHETERIZATION TO ACHIEVE CONTINENCE IN PATIENTS WITH DYSTROPHIC PROSTATIC CALCIFICATIONS AFTER RADIATION THERAPY FOR PROSTATE CANCER
Adam Mellis, MD and Gennady Slobodov, MD
University of Oklahoma HSC, Oklahoma City, OK
(Presented by: Adam Mellis)

**Introduction:** Management of post radiation and brachytherapy urinary retention can be very challenging as rates of retention have been reported from 5 to 12.7 %. Transurethral resection or incision of the prostate can be performed for urinary retention, as 30 % of patients undergoing brachytherapy will develop BOO within 2 years. However, there is a high risk of incontinence (range: 0–83%) and other complications, including dystrophic calcifications. Limited data have demonstrated the efficacious use of urethral stent and artificial urinary sphincter (AUS) in patients’ post-radiation with dystrophic calcification. The goal of our current study is to report our management of severe intrinsic sphincter deficiency and SUI in patients with recurrent dystrophic calcifications after radiation therapy and brachytherapy.

**Methods:** A retrospective chart review of one surgeon’s (GS) initial experience reveals 4 patients who presented with incontinence (mean: 5 diapers daily) after treatment for prostate cancer. Treatment included prostatectomy with radiation, brachytherapy, radiation therapy, or a combination of radiation and brachytherapy.
All four patients presented with dystrophic calcifications with one patient also presenting with concomitant urethral stricture disease. All patients were treated for their prostatic calcifications with subsequent recurrence. Three patients had undergone prior male sling placement since the sling allowed for easier access to the prostate for treatment of dystrophic calcifications. All four patients then underwent placement of AUS with daily CIC regimen initiated.

**Results:** All three patients who underwent male sling placement failed treatment. Three of four patients (75%) were continent with zero pad usage after the placement of AUS and daily CIC (mean follow up time: 12.3 months). The fourth patient had urethral erosion requiring removal of the AUS. Moreover, these patients have been compliant with their CIC regimen, leading to urinary continence. Only one patient has had a recurrence of dystrophic calcifications, requiring laser lithotripsy of the stone.

**Conclusions:** The use of AUS with daily CIC in patients with dystrophic calcifications after radiation therapy may be a viable option for the treatment of urinary incontinence. However, longer further follow-up with our current patient cohort may help predict long term clinical outcomes. Moreover, further analysis is required in a larger study population.

**Poster #NM34**

WITHDRAWN

**Poster #NM35**

**PATIENT PERCEPTION OF THE ARTIFICIAL URINARY SPHINCTER PUMP**

Michelle Koski, MD¹, Austin Lutz, MD², Benjamin Whittam, MD³, Melissa Kaufman, MD³, Ryan Krlin, MD⁴, Douglas Milam, MD² and J. Christian Winters, MD²

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(Presented by: Michelle Koski)

**Purpose:** The artificial urinary sphincter (AUS) is the gold standard treatment for male stress urinary incontinence, particularly for higher volume leakage. Physicians and patients alike may express concern about the presence of a foreign device, particularly the scrotal pump. Although prior studies have documented high overall patient satisfaction with the device, none have examined the issues of cosmesis, functionality, bother and overall perception of the AUS in implanted patients.

**Methods:** IRB approved questionnaire study of patients undergoing AUS from 1/2000 to 1/2011 at two academic institutions was performed. A validated instrument developed by the Veterans Administration Prosthetics Research Study (PEQ) to assess patient satisfaction and perception of prosthetic limbs was adapted to AUS pump appropriate questions, annotated on a continuous numerical variable (visual analogue scale) measured from 0 to 100 with higher numbers corresponding to a more positive response. Applicable questions were utilized covering 6 of the 9 PEQ domains: appearance, frustration, perceived response, social burden, utility and well-being. Questionnaires were mailed to patients agreeing to participate and responses recorded and correlated clinically.

**Results:** 162 patients with AUS were identified, 93 were accessible by telephone and consented, and 66 returned questionnaires (71% response). 50% had reported using no pads or a pad for confidence and 40.7% described themselves as significantly improved, using 1 pad per day (PPD). Reported pad usage decreased from an average of 6.6 to 1.0 PPD.

The overall majority of men expressed little to no bother, cosmetic, social, or functional concerns regarding the AUS, particularly the scrotal pump. Mean scores for each domain were: 81.0 (appearance), 79.5 (frustration), 83.1 (perceived response), 82.2 (social burden), 79.8 (utility) and 81.9 (well being). Non–painful scrotal sensation was reported by 37.9% (81.5 mean bother score, with score of 100 = extremely mild) and scrotal pain in 33.3% (77.4 mean bother score).

**Conclusions:** Average scores reflecting sphincter pump utility and appearance, patient frustration, perceived response, social burden and well being revealed minimal negative impact on quality of life. We believe this information can be useful to more accurately counsel men choosing between AUS and the male sling as surgical treatment for male stress incontinence.
Objectives: To examine the outcomes of male patients who have undergone artificial urinary sphincter (AUS), AMS−800 (American Medical Systems, Minnetonka, MN) placement for treatment of iatrogenic stress urinary incontinence (SUI) after radical cystectomy (RC) and orthotopic neobladder (ONB) diversion in a single institution.

Methods: From 2002 − 2009, patients were prospectively randomized to undergo RC and Studer vs. T−pouch neobladder reconstruction. We received IRB−approval to retrospectively review charts of patients who subsequently underwent AUS placement for symptoms of SUI. Patients were mailed two validated questionnaires: International Continence Society Male−Short Form (ICSmaleSF) and the Incontinence Symptom Severity Index (ISS) and a pad questionnaire.

Results: Twelve male patients were identified. Average age at time of AUS placement was 73.8 years (range 52 to 82). Mean time between RC/ONB and AUS placement is 1.53 years (1 to 4 years). Mean follow−up time after initial AUS placement is 21.7 months (12 to 72 months). All patients (100%) responded to the pad questionnaire. Ten patients (10/12; 83.3%) returned the validated questionnaires. The mean score on the ICSmaleSF was 11.1 and the mean score for ISS was 9.5. In comparing pre−AUS continence to their post−AUS continence, all 10 patients reported improvement in continence. Three patients deactivate their AUS during the day and activate it at night. One patient had infection of both his penile prosthesis and AUS (1/12; 8.3%) and underwent removal of both devices. He subsequently underwent reimplantation of the AUS with improvement in continence. Three patients underwent AUS cuff downsizing due to persistent SUI, which resulted in improved continence. Neither erosions (0%) nor any mechanical malfunction of the device (0%) were reported in our study group. There were no complications or injuries to the ONB during placement of the AUS components.

Conclusions: AUS is a safe, effective continence procedure for patients with ONB and SUI. Complication rate, urinary symptoms, and quality of life these patients experience as determined by validated questionnaires is acceptable.
Poster #NM37
HANDLING MAJOR TRANSURETHRAL PROCEDURES IN PATIENTS WITH ARTIFICIAL URINARY SPHINCTER BY CUFF UNSNAPPING
Ifeanyi Anusionwu, MD and E. James Wright, MD
Johns Hopkins Medical Institution, Baltimore, MD
(Presented by: Ifeanyi Anusionwu)

Introduction and Objectives: Patients with an artificial urinary sphincter (AUS) undergoing transurethral procedures that require rigid instrumentation are at risk for device erosion. We report our management strategy to minimize urethral injury or compromise to AUS.

Methods: We reviewed the medical records of three patients with artificial urinary sphincter who underwent transurethral procedure after unsnapping the AUS cuff through a perineal incision. The capsule of the cuff was incised and the cuff unsnapped. The wound was packed with moist gauze, then the transurethral procedure performed. At the conclusion of the transurethral procedure, the AUS cuff was fastened, and the capsule closed. The wound was then closed in two layers. There was no financial funding for this study.

Results Obtained: The three patients (age 73, 75 and 65) underwent transurethral resection of a bladder tumor, transurethral resection of necrotic obstructive prostate with cystolithopaxy, and transurethral incision of bladder neck contracture. All transurethral procedures were performed using a sheath greater than 20 french in size. One patient was followed for 20 months, including cystoscopy at 12 months post procedure, and there was no evidence of AUS erosion, infection or malfunction during follow up. The second patient was followed for two months, at which point he underwent cystectomy, urinary diversion and explantation of AUS for invasive urothelial cancer. As of the two month follow up, the sphincter was functional without evidence of erosion or infection. The third patient was followed for 11 months and as of last follow up AUS was functional with mild urge and stress incontinence requiring one pad per day.

Conclusion: AUS cuff unsnapping prior to extensive transurethral procedure is feasible and not associated with device infection or erosion.

Poster #NM38
PRESENTATION AND MANAGEMENT OF COMPLICATIONS OF MALE PERINEAL SLINGS: ARE COMPLICATIONS UNDER-REPORTED?
Jessica DeLong, MD, William Jaffe, MD¹ and Arthur Mourtzinos, MD²
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(Presented by: Jessica DeLong)

Introduction: The AdVance and Virtue male slings have become viable treatment options for post−prostatectomy incontinence (PPI), with the goal of improving urinary continence with low associated morbidity. While improving quality of life, it is prudent to evaluate for potential significant complications. The purpose of this study was to report the presentation and treatment of complications from this minimally invasive treatment to two tertiary referral practices and to highlight complications reported in the food and drug administration (FDA) device failure database.

Materials and Methods: From January 2008 through July 2011, we reviewed all cases of AdVance and Virtue sling complications that presented to our institutions. The FDA manufacturer and user facility device experience (MAUDE) database was queried for self−reported complications with both slings over the same time period.

Results: A total of 5 patients were referred to the Lahey Clinic and Penn Presbyterian Medical Center with complications following the AdVance or Virtue male sling over the study period. Treatments required a combination of surgical exploration, drainage and irrigation with antibiotics, mesh excision, and further surgery to treat the incontinence. The MAUDE database contained a total of 86 reported complications, 78 (91%) of which required intervention or resulted in disability. There were more major complications reported in MAUDE than in published literature.

Conclusions: Although rare, significant complications of male perineal slings are more common than they appear in the literature. Many of these cases may require additional reconstructive surgery and subsequent procedures for treatment of underlying incontinence. This information may be useful when counseling patients and creating treatment plans.
Poster #NM39
MALE STRESS URINARY INCONTINENCE: A COMPARISON OF THE COST OF CONSERVATIVE VERSUS SURGICAL MANAGEMENT
Jessica Delong, MD and Arthur Mourtzinos, MD
Lahey Clinic Medical Center, Burlington, MA
(Presented by: Jessica Delong)

Objectives: Postprostatectomy incontinence (PPI) is initially treated with pantiliners, pads, or undergarments. Patients with persistent leakage are typically treated with a male perineal sling (MPS) or an artificial urinary sphincter (AUS). The purpose of this study was to compare the direct costs of each treatment at our institution over 10 years.

Methods: The Lahey Clinic finance department provided the Medicare charges for patients undergoing both a MPS and an AUS during December 2010. Two local grocery stores and three pharmacies provided the current price of all pads and undergarments.

Results: The following pantiliners and pads were the least expensive on average at the local grocery stores and pharmacies: Poise ultra thin pantiliners and Poise maximum absorbency pads at $0.21 and $0.34 each, respectively. The average cost of Depends undergarments was $0.63 each. The cost of wearing 5 of the least expensive pads per day for 10 years is $3833. The average Medicare total cost for an MPS is $10,408. The average Medicare total cost for AUS placement is $20,366. When our current 22% reoperation rate for an AUS is factored in, the average Medicare cost for AUS placement is $24,846.

Conclusions: MPS and AUS placement is significantly more expensive than conservative management for almost all patients except the rare patient wearing greater than 10 pads or undergarments per day. If the psychosocial benefits of urinary continence are considered, a MPS or AUS becomes more desirable.

Poster #NM40
POST-OPERATIVE URODYNAMICS IN OPEN VERSUS ROBOTIC RADICAL PROSTATECTOMY PATIENTS WITH STRESS URINARY INCONTINENCE
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Eastern Virginia Medical School, Norfolk, VA
(Presented by: Jack Zuckerman)

Introduction: Radical prostatectomies are routinely performed in the United States for localized prostate cancer. The difference in post–operative urodynamic parameters between open and robotic–assisted approaches is not well defined.

Methods: We retrospectively reviewed the charts of patients referred to our practice for post–prostatectomy incontinence. Using this cohort we compared the urodynamic findings of patients having undergone an open versus robotic assisted radical prostatectomy. We collected data on detrusor overactivity (DO), valsalva leak–point pressure (VLPP), peak flow rate, bladder compliance and post–void residual (PVR).

Results: Our data set was comprised of 114 post–prostatectomy patients, including 68 patients following robotic assisted and 46 following open radical prostatectomies. There were no differences between the open or robotic groups in terms of age at prostatectomy, race or body mass index. Univariate analysis revealed similar post–op urodynamics regardless of surgical approach in terms of DO (26% robotic versus 35% open, p=NS), mean VLPP (59.7 cmH2O robotic, 59.1 cmH2O open, p=NS), PVR (12.8 ml robotic, 17.5 ml open, p=NS) and normal bladder compliance (94% robotic, 98% open, p=NS). A trend towards improved peak flow was seen in the robotic compared to the open group with flow rates of 20.5 ml/s and 16.5 ml/s, respectively (p=0.07). Stratifying out patients with PVR’s greater than 50ml showed a higher rate in the open group at 22% compared with 7% in the robotic group (p=0.03).

Conclusion: The difference in urodynamic parameters seen in post–prostatectomy incontinence patients following open and robotic–assisted radical prostatectomies are minimal and of questionable clinical significance.
VOIDING DYSFUNCTION IN PATIENTS WITH DYSAUTONOMIA

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(Presented by: R. Corey O'Connor)

Introduction: Dysautonomia is a primary neurologic condition resulting from failure of the sympathetic/parasympathetic nervous systems. The disorder has a myriad of clinical presentations including dysregulation of body temperature, blood pressure and gut motility. Urologically, while sexual dysfunction has been recognized as part of the autonomic dysfunction spectrum, voiding symptoms have been inadequately characterized. We present the chief urologic complaints, results of urodynamic studies and treatments of patients with dysautonomia.

Methods: Retrospective chart review was performed on dysautonomia patients referred to our neuro-urology clinic for voiding dysfunction. All patients underwent focused history/physical examination and video urodynamic studies. Upper tract imaging by ultrasound or computerized tomography was performed on select patients. Treatment modalities that subjectively/objectively improved symptoms were recorded. Objective improvements were measured via post void residual bladder volume, uroflowmetry and/or urodynamic studies.

Results: Of 694 dysautonomia patients, 62 (9%) were referred for urologic evaluation. Mean age was 45 years (range 12 – 83) and 53/62 (85%) patients were female. Chief complaint was urgency +/- incontinence, hesitancy or incomplete bladder emptying sensation in 39 (63%), 13 (21%) and 10 (16%) patients, respectively. Corresponding videourodynamic findings are listed in table 1. No (0/37) hydronephrosis was noted. Successful objective/subjective treatment modalities included anticholinergics (48%), pelvic floor physical therapy (21%), sacral neuromodulation (16%), alpha blockers (15%), intermittent catheterization (11%), intradetrusor botulinum toxin injections (10%) and bladder augmentation (2%).

Conclusion: A minority (9%) of dysautonomia patients displayed voiding symptoms requiring neuro-urologic referral. Presenting symptoms did not reliably coincide with urodynamic findings. Urodynamically, most patients exhibited either detrusor overactivity or detrusor sphincter dyssynergia. The majority of patients were successfully managed with conservative therapies.
**Poster #NM42**

**TRANSITIONING CARE IN ADULTS WITH MYELOMENINGOCELE—LESSONS LEARNED FROM A TERTIARY NEUROGENIC BLADDER CLINIC**

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(Presented by: Benjamin Dillon)

**Introduction:** Myelomeningocele (MMC) is diagnosed typically in–utero or in infancy, but can have profound lifelong effects. Bladder dysfunction most frequently results from MMC, and the initial care is intended to optimize voiding, while reducing the risk for renal damage over time. Transferring care when patients reach the age of 18 to adult urologists with an expertise in this area poses challenges. We report on a series of MMC patients referred to an adult neurogenic bladder (NGB) tertiary clinic.

**Materials and Methods:** An IRB–approved neurogenic bladder database was surveyed for patients referred with MMC, who reported closure at birth. Demographic and urodynamic (UD) parameters were captured. Urodynamics were carried out per ICS guidelines. Upper tracts were surveyed by ultrasound at the time of initial evaluation.

**Results:** Over the period 1/2005–7/2011, 36 (19 Female, 17 Male) adults with MMC were referred to the tertiary care NGB clinic. Their mean age was 57 (median 30), and 57% (20/35) were previously treated by adult urologists prior to presentation at our center. Referring providers were most often adult (36%), or pediatric urologists (28%), or other physicians (16%). In 44% of cases, patients were referred for a current urological problem (most commonly incontinence, recurrent infection, fistula, bladder pain), and only 9 of patients were referred for routine follow–up. Seventeen (47%) of patients had prior urological surgeries. One patient was noted to chronic renal insufficiency. Upper tract imaging revealed abnormalities in 11 of 28 patients (6 with hydronephrosis, 1 with nephrolithiasis, 4 with atrophy of one or both kidneys). 22 % of patients have required further urological surgeries. Reduced compliance was noted in 47% of patients, detrusor overactivity in 29%, urge incontinence in 24% patients and PVR >100 in 35% of those undergoing UD.

**Discussion:** Despite dissemination of information locally about the need for ongoing care for MMC patients and a very active local specialty MMC hospital, transition to adult urologists familiar with the care of MMC patients remains inadequate. In most cases, patients are referred with specific problems rather than for routine care. Significant urodynamic abnormalities are present in a substantial number of patients. These findings support the development of a transition clinic to reduce morbidity related to urologic disease in adults with MMC.

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**Poster #NM43**

**RELATIONSHIP BETWEEN PHYSICAL EXAMINATION, DYNAMIC MRI, AND INTRA-OPERATIVE FINDINGS IN THE TREATMENT OF PELVIC ORGAN PROLAPSE**

Forrest Jellison, MD, Ngoc-Bich Le, MD, A. Lenore Ackerman, MD, MPH, Lisa Rogo-Gupta, MD, Denise Chow, MD, Karim Chamie, MD, MSHS, Tamara G. Hartshorn, MD, Steven Raman, MD, Larissa V. Rodriguez, MD and Shlomo Raz, MD
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(Presented by: Forrest Jellison)

**Objective:** The purpose of this study is to determine the relationship between physical examination (PE), dynamic MRI, and operative findings in the surgical repair of pelvic organ prolapse (POP).

**Methods:** A cohort of 71 consecutive patients who underwent surgical repair for anterior compartment prolapse between 2009 and 2011 were selected for a retrospective analysis. Clinical symptoms were determined by validated questionnaires. Preoperative PE and dynamic MRI findings were compared with the intraoperative findings of the anterior, apical and posterior compartments. Dynamic MRI employed a previously described limited T2 weighted Haste sequence.

**Results:** A total of 71 patients with a mean age of 64 (range of 33–99, and median 65) were included. The median parity was 2 (range 0–). The mean score of the PFDI–20 and PFIQ–8 were 125 and 269, respectively. Anterior compartment repair was performed for the entire cohort with concomitant surgical repairs in 89%—% had apical compartment repair and 74% had repair of the posterior compartment.
When dynamic MRI was compared to intraoperative findings, detection of apical compartment prolapse (uterine or vault) had a sensitivity of (100%, 100%), specificity (70%, 95%), and ROC (0.85, 0.97). In contrast, when PE was compared to intraoperative findings of apical compartment prolapse (uterine or vault), detection rate had a sensitivity of (42%, 33%), specificity (86%, 93%), and ROC (0.64, 0.63), respectively.

In evaluation of the posterior compartment, dynamic MRI and PE had a sensitivity (76%, 85%), specificity (16%, 63%), and ROC (0.16, 0.74) when compared to intraoperative findings.

Anterior compartment prolapse detection rates of (93%, 96%) were similar when dynamic MRI and PE were compared to intraoperative findings.

Dynamic MRI had additional anatomical findings in 34% of the patients (simple and complex ovarian cysts, nabothian cyst, uterine fibroids, sacral cysts, umbilical and inguinal hernias, ureteral stone, bladder thickening, and hydronephrosis of the kidney).

**Conclusion:** Dynamic MRI was able to predict prolapse for all compartments, but is moderately less reliable for posterior compartment when compared with intraoperative findings. PE was able to predict anterior compartment prolapse but is less reliable for apical and posterior compartments when compared with intraoperative findings. MRI predicted apical prolapse better than PE. Further investigation in evaluation of posterior compartment is warranted.

**Poster #NM44**

ANATOMICAL, FUNCTIONAL, AND QUALITY OF LIFE OUTCOMES OF TRANSVAGINAL SACRUTERINE LIGAMENT SUSPENSION FOR VAGINAL VAULT PROLAPSE

A. Lenore Ackerman, MD, PhD, Ngoc-Bich Le, MD, Forrest Jellison, MD, Lisa Rogo-Gupta, MD, Denise Chow, MD, Tamara G. Hartshorn, MD, Larissa V. Rodriguez, MD and Shlomo Raz, MD

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(Presented by: A. Lenore Ackerman)

**Introduction:** We sought to evaluate the safety and intermediate efficacy of sacrouterine ligament vault suspension, a cost–effective, mesh–free vaginal approach to apical prolapse repair.

**Methods:** After opening the cul de sac, bilateral 1–0 polyglactin 910 (Ethicon, Somerville, NJ) suspension sutures are placed through the posterolateral vaginal wall, 3 cm from the apex, into the sacrouterine ligament origin ~15 cm from the introitus, distal to the sacrospinous ligament, lateral to the sacrum, and posterolateral to the rectum. Sutures are brought through the vagina 1–2 cm from the original entrance. Two purse–string sutures including prerectal fascia, sacrouterine ligament, and pubocervical fascia close the peritoneum. After cuff closure, suspension sutures are tied to provide depth and support to the vaginal cuff.

Fifty patients with Baden–Walker (BW) grade 3–4 apical prolapse underwent sacrouterine ligament vault suspension from January to July 2009. We retrospectively analyzed data from physical exams and self–reported questionnaires [OAB–Q bother scale, Pelvic Floor Impact Questionnaire (PFIQ), and Pelvic Floor Distress Index (PFDI)] acquired preoperatively and 6 and 12 months postoperatively.

**Results:** This procedure was done with concomitant sling, cystocele repair, and rectocele repair in 69%, 89%, and 83% of patients, respectively. With a mean follow–up of 21.7 months, patients demonstrated improvements in prolapse grade (3.23±0.58 pre– vs. 0.14±0.55 post–operatively, p<0.001), which were stable over time, with no differences between 6 and 12 months. We observed significant percent improvements in all quality of life measures [PFDI (76.7%, p<0.001), PFIQ (68.8%, p<0.01), and OAB–q bother score (62.7%, p<0.001)]. Depth did not change significantly, with total vaginal length averaging 9.12 cm 6 months postoperatively. Complications were few, with only one grade III complication; all but one patient reported resolution of preoperative pain.

**Conclusions:** Sacrouterine ligament vault suspension is effective and safe without using vaginal mesh and provides a more physiological position to the vaginal apex when compared to sacrocolpopexy. The procedure can be done as an outpatient without special equipment at lower cost than abdominal approaches. Providing great symptom and quality of life improvement, this method is an attractive option for mesh–free transvaginal vault suspension. Further studies will be necessary to determine long–term performance.
Objective: To determine the efficiency of key procedural steps of robotic sacrocolpopexy (RSCP) with and without concomitant hysterectomy.

Methods: Prospective data were collected for women undergoing RSCP with or without hysterectomy from September 2008 through December 2010. All elements of the cases were recorded, including time in room, total incision time, total robot docked time, as well as each step of the RSCP and hysterectomy. Concomitant procedures were also recorded. To assess the learning curve, times were compared between the first 20 cases and all later cases.

Results: During the study period 181 cases were performed. A urogynecology attending and fellow staffed all procedures. Sixty subjects (33%) underwent concomitant hysterectomy (55 total and 5 supracervical), 37 had a mid–urethral sling, and 7 subjects had a concomitant colporrhaphy. Total operating room time was 279 ± 124 minutes, total incision time was 218 ± 117 minutes and total robot docked time was 155 ± 50 minutes. When comparing the first 20 cases to the remaining cases, there was a significant decrease in estimated blood loss (176 v 76mL, p=.02), time of cuff closure (p=.036), sacral dissection (p=.004), anterior mesh attachment (p=0.006), posterior mesh attachment (p=0.003), sacral mesh attachment (p=0.003), peritoneal closure (p<0.001), total docked time (187.5 v 150.6 min, p=0.016), total incision time (245.1 v 189.4 min, p<0.001) and total room time (326.9 v 248.8 min, p=0.002). We then wanted to see if the learning curve occurred earlier, by comparing just the first 10 cases to the remaining cases, and found a significant decrease in time of sacral dissection (p=0.038), anterior mesh attachment (p=0.001), sacral mesh attachment (p=0.006), peritoneal closure (p<0.001), total colpopexy (121 v 77 min, p<0.001), total docked time (197 v 152 min, p=0.14), total incision time (257 v 193 min, p=0.003) and total room time (341 v 255 min, p<0.001).

Conclusions: Robotic–assisted surgical efficiency improves significantly over a short learning period, with the greatest differences seen in steps involving intra–corporeal suturing and overall times. Understanding which steps are more time–consuming may aid surgeons and learners in focusing their efforts in order to improve overall efficiency and to establish benchmarks for performance.

Poster #NM46
MESH–RELATED COMPLICATIONS AFTER PROLAPSE REPAIR; HOW COMMON IS IT, AND WHAT IS THE BEST MANAGEMENT STRATEGY
Ifeanyi Anusionwu, MD, Stacy Loeb, MD, Stephen Juraschek, Lynda Mettee, PAC and E. James Wright, MD
Johns Hopkins Medical Institution, Baltimore, MD
(Presented by: Ifeanyi Anusionwu)

Introduction and Objectives: Although polypropelene mesh is increasingly used for surgical repair of pelvic organ prolapse, there are ongoing concerns regarding mesh extrusion through vaginal wall and possible erosion into pelvic viscera. Our objective was to review the frequency, risk factors, and management of vaginal mesh exposure from our series of vaginal mesh repair (VMR).

Methods: In a single–surgeon series of VMR (2005–2010), we retrospectively identified all cases of mesh–related complications. Specifically, we examined the sequelae and management of mesh–related complications. Multivariable logistic regression was also used to examine predictors of mesh–related complications. No financial funding was received for this study.

Results Obtained: In our VMR series (n=71), there were eight (11%) mesh exposures in the vagina at a median follow–up of 6 months. There were no cases with active ongoing infection or erosion of mesh into pelvic organs. On multivariable analysis, only age was significantly associated with the risk of mesh extrusion. Three patients with sub–centimeter extrusions were managed conservatively with vaginal estrogen cream, with one patient having complete resolution. Five patients with larger defects elected surgical excision of the exposed mesh with re–approximation of the vaginal epithelium.
Conclusions: One in ten women undergoing vaginal mesh repair for pelvic organ prolapse experience vaginal mesh extrusion; however, there were no instances of erosion into pelvic viscera. Age was the only significant risk factor for mesh extrusion. Sub-centimeter extrusions can be managed conservatively, but larger defects may require surgical excision and re-closure.

Poster #NM47
COMPREHENSIVE EVALUATION OF ANTERIOR ELEVATE SYSTEM IN THE TREATMENT OF ANTERIOR AND APICAL PELVIC FLOOR DESCENT: 1 YEAR FOLLOW-UP
Jeffrey Wolters, MD, MPH¹, Ashley King, MD², Bruce Rowe, MD²,³ and David Rapp, MD²,³
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(Presented by: Jeffrey Wolters)

Purpose: The Anterior Elevate prolapse repair system (AE) comprises a polypropylene mesh anchored through sacrospinous ligament and obturator fascia fixation points. We present a comprehensive evaluation of AE through 1-year comprising focus on safety, operative characteristics, anatomic, subjective, and quality of life outcomes.

Materials and Methods: Thirty women underwent AE repair of ≥stage II anterior/apical compartment prolapse. Anatomic outcomes were assessed using POPQ staging. Subjective and quality of life outcomes were assessed validated ICIQ–VS, ICIQ–FLUTS, and IIQ–7 questionnaires. Additional outcomes comprised 3-day bladder diary and cough test, with outcomes assessed at pre-operative, 6-week, and 1-year time points.

Results: Mean blood loss and operative time was 61.2 cc (±23.6) and 80.7 minutes (±43.5), respectively. POPQ points Aa, Ab, and C improved from 0.8, 1.0, and −1.8 to −2.4, −4.7, and −6.5 cm, respectively in comparison of pre-operative and 1-year evaluations (p<0.05, all comparisons). Two patients experienced anatomic recurrence, with one associated with symptomatic recurrence via ICIQ–VS assessment. Statistically significant improvements in ICIQ–VS, ICIQ–FLUTS, and IIQ–7 were seen at both follow-up points. Adverse events comprised urinary retention, vaginal exposure, and leg pain in patients 5, 2, and 1, respectively.

Conclusions: The AE is associated with good anatomic restoration and significant improvements in validated symptom and quality of life indices through 1-year assessment. Our experience suggests the AE to be a safe and reproducible surgical procedure. Further follow-up is ongoing to assess durability and safety of AE.

Poster #NM48
SAME DAY DISCHARGE FOR VAGINAL PELVIC ORGAN PROLAPSE REPAIR: ARE THERE PREDICTORS FOR RETENTION, ADMISSION, OR SHORT TERM COMPLICATIONS?
Bhavin Patel, MD¹, Wai Lee, MD², Alvaro Lucioni, MD¹ and Kathleen Kobashi, MD¹
¹Virginia Mason Medical Center, Seattle WA; ²Stony Brook, NY
(Presented by: Bhavin Patel)

Purpose: To study our practice of same day discharge for patients having pelvic organ prolapse repair with or without an anti-incontinence procedure. We reviewed predictors for peri-operative retention, admission, and short term complications.

Methods: Our prospective database of over 2,700 patients was reviewed and all procedures involving pelvic organ prolapse repair by a single surgeon, after excluding patients with concomitant hysterectomy or abdominal procedure, were identified. Cases after 2008, when the transition to outpatient surgery was made, were selected. This identified 59 patients.

Results: Of the 59 patients reviewed, 17 (29%) were admitted. 7 (41%) of the admissions were due to anesthesia reasons (nausea, vomiting, pain, respiratory monitoring, and unresolved spinal), while 9 (53 %) were admitted due to surgical reasons (retention, bleeding, hypotension). 1 (6%) of the admissions was due to patient preference. The only statistically significant predictor of admission was the presence of diabetes mellitus (p < 0.05). Of the admissions 88% were < 24 hour stays, while the remainders were discharged on post-operative day 2.
A total of 8 (14%) patients went into retention post-operatively. The group that went into retention was significantly older. Of the 8 patients that went into retention, 7 were identified in the PACU and one had delayed presentation. 3 total patients had short-term (less than 6 weeks) delayed complications (persistent retention, delayed hematoma, candidal vaginitis).

Conclusions: With a regimented post-operative plan, same day discharge after pelvic organ prolapse repair is feasible and safe. Risk factors for retention and hospital admission are advanced age and presence of diabetes respectively.

Poster #NM49
SURGEON IMPACT ON PROLAPSE SURGERY OUTCOMES
Karyn Eilber, MD¹, Aqsa Khan, MD², Marianna Alperin, MD, MS³, J. Quentin Clemens, MD, MSCI⁴, Ning Wu, PhD⁵, Chris Pashos, PhD⁵ and Jennifer Anger, MD, MPH¹
¹Cedars-Sinai Medical Center, Los Angeles, CA; ²UCLA Department of Urology; ³Department of Obstetrics and Gynecology, Kaiser Permanente, West Los Angeles, CA; ⁴Department of Urology, University of Michigan, Ann Arbor, MI; ⁵United Biosource Corporation, Lexington, MA

Introduction: The recent FDA warning about mesh-related complications has shed light on a quality problem in the area of prolapse surgery. We used a national dataset to determine whether surgeon volume and provider specialty have an impact on prolapse outcomes.

Methods: Data was obtained from the Public Use Files for a 5% national random sample of female Medicare beneficiaries age 65 and over. To determine long-term outcomes, patients who underwent anterior and apical prolapse surgery (presumably without mesh) during 1999 were followed through 2009. Long-term outcomes were compared by surgeon specialty and volume. To assess short-term mesh-related complications, patients were further identified by prolapse surgery with a mesh insertion code during 2007-2008. Data was analyzed by surgeon volume and specialty.

Results: Long-Term Outcomes (no mesh): In 1999, 43% of anterior repairs were performed by gynecologists and 47% by urologists. 72% of apical repairs were performed by gynecologists and 8% by urologists. The majority of prolapse cases were performed by low-volume providers (one prolapse surgery performed annually). There was no significant difference in long-term reoperation rates by surgeon specialty or volume.

Short-Term Outcomes (mesh): During 2007-2008, gynecologists performed 1,159 prolapse repairs with a mesh code and urologists performed 438. 881 surgeries with mesh were performed by low volume providers (one case per year) and 776 were performed by surgeons who performed two or more prolapse cases per year. Low volume providers had higher reoperation rates for prolapse at one year than surgeons who performed two or more procedures annually (6% vs. 3%, p <0.003). Patients who had surgery by an urologist had more postoperative coding for bleeding, UTI, pain and urinary retention.

Conclusions: Urologists and gynecologists both perform a significant amount of surgery for cystocele, but gynecologists perform the majority of apical repairs. Urologists had more complications reported, but it is not discernible from claims-based data whether or not this is because they were more likely to code for certain diagnoses. The fact that the vast majority of providers performed only one procedure annually suggests that a great deal of prolapse surgery with mesh is performed by generalists with minimal experience.

Funding: NIDDK K23 award (JTA) and an ARRA supplement
**Poster #NM50**

**OUTCOMES AND PREDICTORS OF OUTCOME AFTER VAGINAL MESH REPAIR FOR PELVIC ORGAN PROLAPSE**

Ifeanyi Anusionwu, MD¹, Stacy Loeb, MD², Stephen Juraschek¹, Lynda Mettee, PAC¹ and E. James Wright, MD¹

¹Johns Hopkins Medical Institution, Baltimore, MD; ²Johns Hopkins Hospital

(Presented by: Ifeanyi Anusionwu)

**Introduction and Objective:** To report outcomes and predictors of outcome from a single institution series of vaginal mesh repair for pelvic organ prolapse.

**Methods:** We performed retrospective chart review of vaginal mesh repair performed by a single surgeon from 2005 to 2010. We evaluated rates and predictors of complications and success.

**Results Obtained:** Vaginal mesh repair was performed in 71 patients with median postoperative hospitalization of one day. At mean follow up of eight and half months, success rate was 91% (97% for anterior repair, 100% for posterior repair and 80% for combined repair). Recurrence was significantly higher with higher preoperative stage (P=0.049) and combined repair (P=0.019). Complications occurred in 12 patients (17%), including vaginal hematoma, pelvic pain, urinary retention, dyspareunia and vaginal mesh exposure (but not mesh erosion or perforation into adjacent organ). Complications were only associated with younger age (P=0.016).

**Conclusions:** Vaginal mesh repair is effective in managing pelvic organ prolapse. Higher preoperative pelvic organ prolapsed quantification (POP–Q) stage and combined repair predict failure while younger age is associated with higher rate of complication.

**Funding:** No financial funding was obtained for this study

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**Poster #NM51**

**THE INCIDENCE AND RISK FACTORS OF POST-OPERATIVE URINARY TRACT INFECTION AFTER UTEROSACRAL LIGAMENT SUSPENSION**

Christopher Chung, MD, Sheena Harris, Madeline McBride, Thomas Kuehl, PhD, Wilma Larsen, MD, Paul Yandell, MD and Bob Shull, MD

Scott and White Healthcare, Texas A&M Health Science Center College of Medicine, Temple, TX

(Presented by: Christopher Chung)

**Objective:** To assess the incidence and risk factors of developing urinary tract infection (UTI) after uterosacral ligament suspension (USLS).

**Method:** Retrospective analysis of patients undergoing USLS in 2008–9. Post–operative UTI was defined as a positive urine culture within one month of surgery. Factors analyzed were patient age, body mass index, parity, surgeon, history of UTI before surgery, passing voiding trial, discharge with Foley catheter or intermittent self–catheterization, antibiotics at discharge, and history of diabetes or renal disease.

**Result:** Surgical records from 169 patients were reviewed. Twenty–three patients (14%) developed UTI. There were no differences in pre–operative factors between patients who developed UTI and those who did not. Subgroup analysis revealed those patients who went home with Foley catheter and did not receive antibiotics had the highest proportion of UTI.

**Conclusion:** Patients requiring Foley catheter at discharge following vaginal prolapse repair are at risk highest for UTI and require prophylactic antibiotics.
Poster #NM52
LIGHTWEIGHT POLYPROPYLENE MESH SYSTEM WITH APICAL SUPPORT FOR PELVIC ORGAN PROLAPSE REPAIR
Keith Xavier
(Presented by: Keith Xavier)

Introduction: Outcome of anterior repair of pelvic organ prolapse (POP) is sometimes complicated by inadequate support of the apex. This abstract reports on a lightweight polypropylene mesh system (Exair®, Coloplast Corp.) with apical support for the treatment of POP.

Objectives: Report initial objective and subjective results of the Exair System for treatment of anterior POP repair.

Methods: A retrospective chart review was conducted on all patients receiving treatment with the Exair system at a single site. Patients included in this analysis had ≥ 6 month follow-up from implant, a Baden–Walker grade at baseline and follow-up and completed the Patient Global Impression of Improvement (PGI–I) questionnaire.

Results: 26 patients met criteria, with a mean age at implant of 66.4 years (SD 9.7, range 45.3–82.1). Mean follow-up was 9.7 months (SD 2.6, range 6–14). Baseline characteristics are summarized in Table 1. Objective results show 26 patients (100%) with a follow-up Baden–Walker grade of ≤ 1. Subjective results indicate 12 patients (46.2%) reporting “very much better”, 11 patients (42.3%) “much better,” and 3 patients (11.5%) “a little better” (2 of which had urge incontinence unrelated to POP repair and 1 that had a previous anterior repair), as reported via the PGI–I Questionnaire. No patients reported their condition as unchanged or worsened. Complications of POP repair were apical failure in 1 patient (3.8%) requiring a hysterectomy, and mild dyspareunia in 1 patient (3.8%). Additional clinical findings included future posterior compartment repair in one patient. No patients had apical or anterior recurrence. No erosions, exposures, or complications to solid structures occurred.

Conclusions: Results in this small population indicate that the Exair system is safe and efficacious for anterior prolapse repair. Continued study of this device for longer-term results is ongoing.

The author has a relevant financial relationship with Coloplast Corp.

<table>
<thead>
<tr>
<th>Characteristic</th>
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<tr>
<td>Previous anterior prolapse treatment</td>
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<tr>
<td>Previous SUI treatment</td>
<td>4 (15.4)</td>
</tr>
<tr>
<td>Concomitant SUI sling treatment</td>
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<td>Hysterectomy (% Yes)</td>
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<td>Sexually active (% Yes)</td>
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**Poster #NM53**

**TREATMENT OF FEMALE URETHRAL STRICTURE DISEASE: A SYSTEMATIC REVIEW OF THE LITERATURE**

Cynthia Fok, MD¹, Elizabeth Mueller, MD, MSME¹, Rezoana Rashid, BS² and Jennifer Anger, MD, MPH²

¹Departments of Urology and Obstetrics & Gynecology, Loyola University Medical Center, Maywood IL; ²Department of Urology, Cedars-Sinai, Los Angeles, CA

(Presented by: Cynthia Fok)

**Introduction and Objectives:** Female urethral stricture disease is uncommon. As compared to men, women are far less likely to undergo urethroplasty for urethral stricture disease. The aim of this study was to systematically review the literature on urethroplasty as management of female urethral stricture disease.

**Methods:** Using Meta-analysis Of Observational Studies in Epidemiology (M.O.O.S.E.) criteria, we searched Cochrane, Pubmed and OVID databases for articles published before September 22, 2011 using the terms “female urethroplasty,” “urethroplasty girl,” “female AND urethroplasty,” “girl AND urethroplasty,” “female urethral stricture,” and “female AND urethral AND stricture.” Two reviewers (CF, JA) independently reviewed the titles, subsequent abstracts and articles. We excluded articles that were based on animal models, congenital abnormalities, transgender surgery, obstetrical trauma, cancer, urinary incontinence procedures, primary fistula repairs, acute traumatic distractions, or non-urethroplasty management of female urethral strictures. References from articles were also obtained and included in the analysis.

**Results:** We identified 983 articles from the database query. Articles were then systematically excluded by title, abstract, or review of the article itself. Five hundred sixty four articles were excluded based on title, leaving 419 abstracts or articles to be reviewed. From the references of the articles obtained, we also reviewed any relevant abstracts or articles. All non-English articles were translated into English. From the articles reviewed it is clear that female urethral stricture disease is a rare occurrence and there is no clear consensus on its optimal treatment. The literature discusses multiple different approaches to female urethroplasty for stricture disease from meatoplasty to tissue flaps and tissue grafts. This available literature, however, is limited by the variable postoperative assessment and generally limited follow up.

**Conclusions:** There is a paucity of high-quality data in the literature on urethroplasty for the management of female urethral stricture disease. As a result, some procedures on women, such as circumferential buccal mucosa grafts for distal meatal stricture disease, are unnecessarily morbid. Vaginal flap-based urethroplasty appears to have the least morbidity with good efficacy. Standardization of management by specialty societies is needed.

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**Poster #NM54**

**NEUROGENIC BLADDER: A HETEROGENEOUS POPULATION WITH COMMON UROLOGIC NEEDS**

Mohammad Ramadan, MD, Jonathan Heinlen, MD and Gennady Slobodov, MD

University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma

(Presented by: Mohammad Ramadan)

**Introduction:** Patients with malfunction of the urinary bladder due to neurologic dysfunction are grouped under the diagnosis of Neurogenic Bladder (NGB). This patient population, with its broad spectrum of underlying disease processes and comorbidities, presents significant challenges to practicing urologists.

**Objectives:** The NGB patient population is often overlooked due to their presumed complexities related to individual pathology, leading to increased costs of medical care and diminished quality of life. Although the underlying causes and symptoms of NGB are widely varied, first line management techniques are common amongst them and can be implemented to decrease adverse events and improve outcomes.

**Methods:** At the University of Oklahoma Health Sciences Center (OUHSC), a urologic specialty clinic for NGB patients was instituted two years ago. For this study, 101 patients were identified with NGB and a retrospective analysis of documented urinary tract infections (UTI) with resistance patterns, incidence of urolithiasis, and hospital admissions for a urologic cause were identified over a ten-year period (January 2000 –August 2011) at OUHSC.

**Results:** Patients were categorized by sex, etiology of neurologic lesion, and level of neurologic lesion. Each subset was then analyzed to identify differences in rates of UTI, urolithiasis and urologic hospital admissions. Males and females were noted to have a significant difference in etiology of lesion ($\chi^2(2) = 11.6, p <0.005$) as well as level of lesion ($\chi^2(4) = 10.4, p <0.05$). Despite this variance, there was no difference in rates of UTI, urolithiasis, or hospital admissions for urologic cause between the groups.
Conclusions: Although the etiology of Neurogenic Bladder is highly variable, these patients exhibit similar rates of UTIs, urolithiasis, and urologic related admissions, regardless of sex, etiology of NGB, or anatomic level of neurologic dysfunction. Therefore, basic initial management can be similar for the entire group, regardless of underlying pathology, and can potentially decrease complications as well as associated costs of care.

Disclosure: No financial funding or affiliations are currently associated with this research.

Poster #NM55

RESIDENT AND FELLOW BENCHMARKS FOR ROBOTIC PERFORMANCE TIMES
Andrea Crane, MD, Elizabeth Geller, MD and Catherine Matthews, MD
University of North Carolina at Chapel Hill
(Presented by: Andrea Crane)

Introduction and Objectives: Robotic surgery plays a significant role in pelvic floor reconstruction. In adopting this technology, residency and fellowship programs may be challenged with how to incorporate trainee participation. The objective of this study was to establish performance time benchmarks for resident and fellow involvement in robotic surgical cases using trainee operative times and proportion of case time that trainees spent as he console surgeon.

Methods: This was a retrospective analysis of all robotic hysterectomies and sacrocolpopexies performed in one academic Urogynecology Division between September 2008 and August 2011. All elements of robotic surgical cases were recorded. Performance times are recorded in real time on a standardized paper form housed in the operating rooms. The operative times and the proportions of the case done by trainees were obtained to assess trends in trainee performances times by year of training and establish benchmarks for trainee involvement in robotic cases.

Results Obtained: In the three−year time period, there were 106 cases that had designated trainee performance times. The average performance time for a robotic hysterectomy and sacrocolpopexy were 69 minutes and 74 minutes, respectively. The mean proportion of total performance time spent on each step of the hysterectomy by a trainee was: right side (30%), left side (30.2%), bladder flap (13.6%), colpotomy (20.3%), and cuff closure (29.2%). The mean proportion of total performance time spent on each step of the sacrocolpopexy by a trainee was: sacral and peritoneal dissection (18.6%), anterior cuff dissection (12.8%), posterior cuff dissection (9.3%), anterior mesh attachment (20.6%), posterior mesh attachment (24.7%), sacral mesh attachment (16.1%), and peritoneal closure (11.6%) Breakdown of sacrocolpopexy mean performance times by level of training is shown in Table 1.

Conclusions: Using historic operative times, we have established benchmarks for resident and fellow participation in robotic surgery at an academic center. This information may be useful for residency and fellowship training programs with robotic capabilities for both skill development and performance assessment.
Introduction and Objectives: Cytoreductive surgery (CRS) plus hyperthermic intraperitoneal chemotherapy (HIPEC) is becoming accepted as the treatment of choice for peritoneal surface malignancy. In many cases, invasion or inadvertent injury to the urinary tract requires urologic reconstruction. There is very little data in the literature concerning associated urologic complications and procedures in CRS and HIPEC. In this study, we report the urologic complications and methods of urologic reconstruction in the largest single center series of patients.

Methods: Data were extracted from a prospective database of patients undergoing CRS with HIPEC for peritoneal surface malignancy at our hospital. The preoperative performance status, prior surgical score (PSS), ureteral stenting, urologic intervention or complications during or after surgery, and their management were assessed. Pearson Chi-Square, Wilcoxon rank-sum test, Fisher exact test, and multiple logistic regressions were used as appropriate to determine predictors of a urologic intervention and subsequent urologic complications.

Results: From 1991 to 2011, 867 patients underwent 934 CRS with HIPEC. 594 (63.6%) were stented preoperatively. 67 (7.2%) patients had planned or unplanned urologic interventions including 1 adrenalectomy, 7 nephrectomies, 1 partial nephrectomy, 1 autotransplant, 7 ureteral resections, 4 ureterorraphies, 2 ureteroureterostomies, 4 ureteral reimplantations, 2 JJ stents, 1 Boari flap, 13 cystorrhaphies, 29 partial cystectomies, 3 radical cystectomies and one partial prostatectomy. Postoperatively, 9 (0.96%) patients developed urinary fistulas, 7 after urologic repair, and 2 after unrecognized ureteral injury.

Preoperative stent placement (possibly confounded by patient selection) and PSS (OR 2.89 if PSS ≥2, 95% CI 1.19–6.99) were associated with increased risk of urologic intervention. Factors statistically significant in development of urologic complications were female gender (p= 0.04) and presence of malnutrition (p=0.04).

Conclusions: Urologic reconstructions are infrequently needed in CRS and HIPEC cases (7.2%), more commonly in patients with higher PSS and in stented patients. Malnutrition and female sex predicted urologic complications. We conclude that possible urologic complications can safely managed with proper reconstruction by urologists, and proximity or involvement of urologic organs should not preclude CRS and HIPEC.

Purpose: We evaluated complications and patient satisfaction following supravesical urinary diversion for non–bladder cancer indications.

Materials and Methods: This IRB approved retrospective study was performed in 26 females and 10 males who underwent ileal loop diversion for a non–bladder cancer indication by a single surgeon between 1999 and 2010. Patients were contacted to assess outcomes, complications and satisfaction following surgery.

Results: Of the 36 patients, indications for urinary diversion were: neurogenic bladder (18), radiation cystitis (11), prostatic brachytherapy complications (3), refractory incontinence (3) and recurrent urinary tract infection (1). All patients were left with their native bladders. Complications occurred in 18 patients (50%) including: UTI (25%), ureteral stenosis (19%), stomal hernia (14%), pyocystis (8%), bowel leak, (6%), and nephrolithiasis (6%). Fourteen patients were deceased at time of our review (mean 27 months after surgery). Nineteen of the surviving 22 patients (86%) were interviewed.
Their mean age was 62 years and mean time from surgery was 39 months. Patients had a mean overall satisfaction score of 8.63 ± 1.83 on a scale from 0−10 (10 = highest). When asked if they would repeat the surgery 14 (74%) said yes, 2 (11%) said no, and 3 (16%) said they were unsure.

**Conclusions:** In selected patients, ileal loop diversion can be used to manage recalcitrant lower urinary tract complications. Despite a relatively high complication rate, long-term patient satisfaction remains high. The bladder may be left in place, given the low pyocystis rate.

**Poster #NM58**

**UROLOGIC COMPLICATIONS AFTER ROBOTIC HYSTERECTOMY**

Allen Haraway, MD¹, Gary Faerber, MD², Quentin Clemens, MD, MPH², Humphrey Atiemo, MD³ and Anne Pelletier-Cameron, MD²

¹University of Michigan; ²Ann Arbor, MI; ³Detroit, MI

(Presented by: Allen Haraway)

**Introduction:** There is a learning curve when first performing any robotic procedure, and a robotic hysterectomy is no exception. Over the last year, eight patients have been referred to our facility with multiple urological complications secondary to robotic assisted hysterectomy.

**Methods:** From February 2010 to February 2011, eight patients were referred to the University of Michigan with multiple complications following a robotic assisted hysterectomy. IRB approval was obtained. All operative reports were obtained and reviewed.

**Results:** Among these eight patients, indications for hysterectomy included fibroids (50%), dysfunctional bleeding (37.5%), and cervical adenocarcinoma (12.5%). In five out of the eight (62.5%) patients, the urologic injuries were not recognized intraoperatively. Presentations included continuous incontinence, flank pain and one patient was anuric 24 hours after her operation. There were three patients with bilateral ureteral injuries and concomitant bladder injury. All three had ureteral obstruction postoperatively and then represented with a vesicovaginal fistula. Two patients had unilateral ureteral injuries, one of which presented with a ureterovaginal fistula. One patient had bilateral ureteral injuries and two patients had bladder injuries alone presenting as vesicovaginal fistulas. All patients required multiple operations to correct these urological complications including stent placement, ureteral reimplant with Boari flap, vesicovaginal fistula repair both abdominal and vaginal approaches, pubovaginal sling, and sacroenuromodulation for refractory urge incontinence. One patient required a nephrectomy for a nonfunctioning kidney after long term obstruction. The total number of subsequent operations totaled 17 with each patient undergoing at least two operations (2, 2−6).

**Conclusion:** We have noted a rise in serious urologic injuries referred to our center after hysterectomy coinciding with a rise in robotic assisted hysterectomies. When called to the operating room to assess urological injuries in the setting of a robotic hysterectomy, it is important to assess and rule out the possibility of multiple injuries.

**Poster #NM59**

**THE WEST AFRICA FISTULA FOUNDATION (WAFF) STAGING SYSTEM OF VESICO VAGINAL FISTULAS (VVF) TO PROVIDE EVIDENCE BASED OUTCOMES AND IMPROVE MANAGEMENT IN DEVELOPING COUNTIRES**

Alexandra Rogers, MD¹ and Darius Maggi, MD²

¹Department of Urology, Mayo Clinic Florida, Jacksonville, Florida; ²West Africa Fistula Foundation, Bo, Sierra Leone

(Presented by: Alexandra Rogers)

**Introduction and Objectives:** WAFF has developed and implemented a simple staging system for VVF. Creating a simple staging system has improved the management during all care phases for our patients. The common language of the staging system is understood by all WAFF care providers, which optimizes the treatment process. Most importantly, the staging system helps predict postoperative outcomes which is critical for both the providers and patients. Minimal data exists regarding a classification system for VVF, which could be used by care givers in developing countries to maximize VVF repair success rates.
Methods: Multiple factors beyond sheer size need to be accounted for when assessing a patient. Obviously, the urethral integrity is very vital to urinary continence once the fistula tract has been closed. The WAFF staging system involves the following: Stage 1 patients have an intact urethra, Stage 2 patients have proximal urethral damage and a urethra longer than 2.5 cm, Stage 3 patients have a urethra less than 2.5 cm or circumferential urethral destruction, and Stage 4 patients have total destruction of urethra or complete vaginal stenosis or severe scarring. Stage IV fistulas require urinary diversion. Over a three year period, a total of 155 women with stage 1, 2 and 3 VVF were prospectively followed during their transvaginal fistula repairs, which were performed by a single surgeon in Bo, Sierra Leone. A successful outcome was defined as being continent 1 month after surgery.

Results Obtained: Stage 1 repairs (N=26) were successful 100% of the time. Stage 2 repairs (N=49) were successful 96% of the time. Stage 3 repairs (N=80) were successful 84% of the time. As expected, our data suggests that stage 1 and 2 fistula repairs have a higher continence rate while stage 3 fistulas present more of a challenge.

Conclusions: The WAFF staging system could be adopted by all hospitals that perform fistula repairs in resource poor countries. This staging system would help less experienced surgeons define their limits and improve patient care by referring to a high volume fistula center since the first attempt at repair will always be the best. Our sizeable prospective review provides unique insight about VVF staging which would be very helpful for improving care abroad for a tragic epidemic.

Poster #NM60
CAHPS SURGICAL CARE SURVEY
Allen Haraway, MD¹, Anne Pelletier-Cameron, MD², Humphrey Atiemo, MD³, Anne Oldendorf, MD², Jerilyn Latini, MD² and Quentin Clemens, MD, MPH²
¹University of Michigan; ²Ann Arbor, MI; ³Detroit, MI
(Presented by: Allen Haraway)

Introduction: The Consumer Assessments of Healthcare Providers and Systems (CAHPS®) hospital survey was designed to enable patients, physicians, and payers to compare quality among hospitals and to facilitate quality improvement in hospitals. The CAHPS® survey has been extensively studied in the primary care setting, but there is a paucity of data in the literature on the Surgical CAHPS® survey. We administered this survey to our patients in an attempt to do a feasibility study as well as improve patient care.

Materials and Methods: After IRB approval, the Surgical CAHPS® survey was mailed to patients who underwent surgery in the division of neurourology and pelvic floor reconstruction in the Department of Urology. Four surgeons in this division participated in the study. The patients who received the survey were patients who underwent outpatient surgical procedures or surgical procedures that required a 23 hour observation. These procedures included urethroplasty, midurethral sling, pubovaginal sling, sacroneuromodulation, male sling, artificial urinary sphincter, cystoscopy with hydrodistention, cystolithalopaxy and prolapse repair. The survey was mailed to the patient one week after their surgical procedure. There are a total of 45 questions in the survey that address 4 domains including, “Before Surgery”11 items (range of scores 11−29) “Your Surgery”3 items (range of scores 3−9), “Anesthesiology”7 items (range of scores 7−18), and “After Your Surgery”items (range of scores 9−26). There were also two items where the patient is asked to rate both the anesthesiologist and the surgeon on a scale of 0−10 with 10 being the best anesthesiologist/surgeon possible.

Results: 256 CAHPS® surveys have been mailed since April of 2011 with a return of 56 (22%) responses. After reviewing the responses of the survey, our data shows that patients are overall pleased with their care. “Before Surgery”− mean = 12.11, range = 11−29. “Your Surgery”− mean = 3.55, range = 3−9. “Anesthesiology”−mean = 7.91, range 7−18. “After Your Surgery”−mean = 10.8, range 10−29. Anesthesiologist rating− mean = 8.8, range of answers = 1−10. Surgeon Rating− mean = 9.3, range of answers = 8−10.

Conclusions: There was a poor response rate of the survey at 22%. Future research will be focused on improving the response rate. Once the response rate is improved, this data will be used to hopefully make positive changes that will improve patient care.
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SUFU at the AUA 2012
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SUFU 2013 Annual Meeting
February 26 – March 2, 2013
Caesar’s Palace
Las Vegas, NV

SUFU 2014 Annual Meeting
February 25 – March 1, 2014
Miami, FL
Podium #1

LONG-TERM FOLLOW-UP OF PORCINE DERMIS PUBOVAGINAL SLINGS

Andre P. Broussard, MD¹, Thanmaya G. Reddy, BS¹, Clifton F. Frilot II, PhD¹; William S. Kubricht III, MD² and Alex Gomelsky, MD¹

¹LSU Health – Shreveport, LA; ²Urology Center for Women, Baton Rouge, LA
(Presented by: Andre P. Broussard)

Introduction and Objectives: Long-term outcomes of biologic substitutes for autologous tissue in sling surgery are rare due to their unpredictable nature in incorporation and impact on stress urinary incontinence (SUI) in women. We report long-term outcomes of women who underwent porcine dermis (PD) bladder neck sling.

Methods: We retrospectively identified 238 women who underwent PD sling at our institution from 2001–06. Pre- and post-operative assessment included pelvic exam, SEAPI classification and quality of life (QoL) questionnaires. “Global cure” was defined as SEAPI subjective composite=0 and visual analog score≥8. “SUI cure” was defined as SEAPI–subjective(S) subset=0 and a negative cough–stress test. Demographics and perioperative morbidity were abstracted from the hospital and clinic charts. Statistical evaluation was conducted.

Results: Seventy women (29.4%) completed a minimum follow-up of 36 months (mean: 62 months; range: 36–115 months). Twenty of these (28.6%) underwent ≥1 previous anti-incontinence procedure. Women achieving long-term follow-up were not significantly different from those with shorter follow-up in terms of demographic variables, types of previous pelvic surgeries, and % of perioperative and postoperative complications. The “SUI cure” rate in the long-term group was 42.9% and the “global cure” rate was 11.4%. Perioperative complications, including rates of short-term and long-term voiding dysfunction, were low and <10%. The mean time to SUI recurrence was 10.4 months, with 18 of 40 women having persistent incontinence immediately after PD sling (recurrence at 0 months). An additional 12 women developed recurrent SUI at <12 months of follow-up. Forty-six of 70 women (65.7%) had additional surgery during the follow-up period. Twelve women underwent an anti-prolapse procedure, while 20 of 46 (43.5%) underwent an anti-incontinence procedure. Six of 20 (30%) had ≥1 anti-incontinence procedure. Nevertheless, there was a significant postoperative improvement in SEAPI scores, daily pad use, and all QoL indices.

Conclusions: At long-term follow-up, PD is not a durable substitute for autologous tissue in sling surgery. Most SUI recurrences were at <12 months after surgery and a significant % of women had persistent SUI. Although complication rates were low and QoL indices generally improve after surgery, there is little evidence to suggest that this material is a durable option for surgical treatment of SUI.

Podium #2*

SHORT-TERM OUTCOMES OF VAGINAL MESH PLACEMENT AMONG FEMALE MEDICARE BENEFICIARIES

Jennifer Anger, MD, MPH¹, Karyn Eilber, MD¹, Aqsa Khan, MD², Stephanie Histed, BA³, Ning Wu, PhD⁴, Chris Pashos, PhD⁴ and J. Quentin Clemens, MD, MSCI⁵

¹Cedars-Sinai Medical Center, Los Angeles, CA; ²Department of Urology, University of California, Los Angeles, Los Angeles, CA; ³David Geffen School of Medicine at UCLA, Los Angeles, CA; ⁴United BioSource Corporation, Lexington, MA; ⁵Department of Urology, University of Michigan, Ann Arbor, MI
(Presented by: Jennifer Anger)

*Not CME accredited

Introduction and Objective: Mesh use in pelvic organ prolapse (POP) and stress urinary incontinence (SUI) surgery has gained wide popularity in the past decade, with a concurrent increase in mesh related complications. Mesh-associated morbidity led to FDA warnings in October 2008 and July 2011 against transvaginal mesh placement for POP and SUI. We used a national dataset to compare real-world short-term outcomes between prolapse repairs without and with mesh placement.
Methods: We used the Public Use Files from the Centers for Medicare and Medicaid Services to identify a 5% random national sample of female Medicare beneficiaries age 65 or over. Women who had prolapse surgery with a Current Procedural Terminology Coding System (CPT−4, 4th edition) code were included. Since the CPT−4 code for mesh placement was effected in 2005, we separated patients into those who had prolapse repairs in 1999−2000 and those who had repairs with mesh in 2007−2008. Outcomes of surgery up to one year were identified using ICD−9 and CPT−4 codes for complications and early reoperations for POP with a subset analysis to analyze outcomes related to concomitant sling surgery.

Results: 9,180 prolapse repairs were performed during 1999−2000, including 1,484 with concomitant sling. 1,804 prolapse repairs with mesh were performed in 2007−2008, including 870 with concomitant sling. Need for further prolapse treatment including pessary use and re−operations was higher in the non−mesh vs. mesh cohort (Table). Mesh removal rates increased when mesh was used (from 0.02% to 3.3%). When controlling for concomitant sling, mesh use was associated with more dyspareunia, mesh−related complications, and urinary retention.

Conclusion: Mesh placement for POP and SUI was associated with a decrease in early prolapse recurrence. However, this occurred at the expense of an increased rate of pain, retention, mechanical mesh−related complications and mesh removal procedures. Whether the short−term decrease in early prolapse recurrences represents a direct benefit of mesh is not discernable from claims−based data.

Funding: Funded by NIDDK Patient−Oriented Career Development Award 1 K23 DK080227−01 JTA and American Recovery and Reinvestment Act Supplement 5K23DK080227−03 JTA.

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Podium #3
FINAL OFFICE EVALUATION FINDINGS IN E-SISTER PARTICIPANTS AT ONE CENTER: A GLIMPSE INTO THE LONG-TERM RESULTS OF STRESS INCONTINENCE SURGERY
Philippe Zimmern, MD, Hong Zhao, Tamara Dickinson, Xian-Jin Xie and Gary Lemack, MD
UT Southwestern Medical Center, Dallas, Texas
(Presented by: Philippe Zimmern)

Introduction and Objectives: Because of attrition rate in long−term surgical incontinence studies, most available data are derived from phone interviews or postal questionnaires. We report on an ancillary study of E−SISTEr participants at one center who returned for long−term office evaluation.

Methods: Following IRB and UITN approval, participants in E−SISTEr at one center were invited to return for an extensive final office evaluation, including validated questionnaires, physical examination (with POP−Q), cough stress test, and a non−invasive flow rate test. The intent of this visit was to explore the rate of recurrent urethral hypermobility, secondary prolapse, voiding changes over time, patient satisfaction. All visits were conducted by an expert examiner unaware of patient original surgical assignment. A mixed model analysis was used to compare baseline, 2 year (end of SISTER trial), and last visit/evaluation datasets between the 2 groups.
Results Obtained: Of 31 patients, 27 returned for a final assessment, including 12 Burch (B) and 15 Fascia sling (S). Median follow-up was 7.2 years. Using strict 5 SISTEr criteria, success rate was 25% for Burch and 40% for Sling (p=0.68). Over 85% of patients had a negative stress test. Reduction in incontinence episodes was high compared to baseline (p=0.009), Point Aa, a surrogate marker for bladder neck and proximal urethral support, improved in both groups after surgery, but did not change over time for the B group while it kept improving for S, possibly from retraction and scarring effect. No significant changes were observed for all other POPQ points over time. Mean PdetQmax unchanged in the B group but was significantly higher in the S group at 2 years (baseline 18.5 cm H2O versus 32.1 cm H2O at 2 years). Mean maximum flow rate dropped considerably in the S group over time (baseline 29 to 16.7 ml/sec at last visit), but remained unchanged in the Burch group. PVR remained low in both groups. 100% recommended the surgery to a friend or would have the surgery done again. QoL scores went down significantly at 2 years and trended upward at last evaluation, although much lower than at baseline.

Conclusion: We found stable urethral support, no secondary prolapses, concerning changes in flow parameters in the sling group over time, and a high level of satisfaction despite a notable failure rate based on very strict SISTEr outcome criteria.

Funding: Supported by NIH grant # NIH U01DK60395−01

Podium #4*
PREVALENCE AND ASSOCIATION OF PELVIC FLOOR SYMPTOMS IN WOMEN SEEKING CARE IN AN OSTEOPOROSIS CLINIC
Jonathan Gleason, MD¹, Sarah Morgan, MD², Jeff Szychowski, PhD³, Goode Patricia, MD⁴, Howell Alice, RN¹, Kathryn Burgio, PhD⁵ and Richter Holly, PhD, MD⁷
¹Urogynecology and Pelvic Reconstructive Surgery, University of Alabama at Birmingham, Birmingham, AL; ²Department of Medicine, University of Alabama at Birmingham, Birmingham, AL; ³Department of Biostatistics, University of Alabama at Birmingham, Birmingham, AL; ⁴Department of Veterans Affairs, Birmingham, AL
(Presented by: Jonathan Gleason)

*Not CME accredited

Introduction and Objectives: Increasing age, obesity and osteoporosis are all processes reflective of systemic tissue remodeling. These processes may also be associated with the development of incontinence and prolapse. The aim of this study was to characterize pelvic floor symptoms in post-menopausal women presenting for evaluation to an Osteoporosis Clinic.

Methods: This study was funded by the Protective Life Clinical Initiative Award. Validated pelvic floor symptom questionnaires were mailed to patients in an IRB-approved osteoporosis database (Jan. 2007–Oct. 2010). Questions assessed fecal incontinence (FI) of liquid/solid stool over the past month, urinary incontinence (UI) in the past 3 months, UI frequency, and bothersome prolapse symptoms. Multivariable logistic regression models controlling for age, race, body mass index, and COPD were performed to compare symptoms in women with osteopenia and osteoporosis at any site to women with normal bone mineral density (BMD).

Results: 1774/4026 (44%) questionnaires were returned. Premenopausal women and those without BMD diagnoses were removed, leaving 1655 for analysis (423 normal BMD, 870 osteopenia, 362 osteoporosis). Mean(±SD) age was 63(±9) years and 78% were Caucasian, 18% African American. Overall prevalence of UI was 1226 (75%), with UI frequency >2–3 times/week in 699 (58%), FI in 247 (16%), and bothersome prolapse in 162 (10%). Women with osteoporosis or osteopenia were older, with a higher prevalence of Caucasian race, rheumatoid arthritis and COPD (p<0.01). Multivariable analyses revealed that women with osteoporosis had increased risk of incontinence of solid stool (OR:1.8, 95% CI:1.2–2.8); no association was seen with osteopenia (OR:1.7, 95% CI:0.9–2.8). Risk of UI >2–3 times/week was less in women with osteopenia (OR:0.7, 95% CI:0.5–0.9). No association was seen with osteoporosis and UI (OR:0.9, 95% CI:0.6,1.3). Prevalence of prolapse did not differ by BMD group (p=0.87).

Conclusions: Urinary and bowel incontinence were prevalent in a population of women undergoing BMD evaluation. Further studies could determine if common pathophysiologic connective tissue mechanisms exist in the development of osteoporosis and incontinence.
Introduction and Objectives: Bladder puncture with a trocar is a common intraoperative complication during retropubic midurethral sling (MUS) surgery and is typically treated with trocar repositioning and bladder drainage. However, there is little information regarding the impact of bladder puncture on short- and long-term bladder storage and emptying.

Methods: We retrospectively identified 442 women who underwent one of 2 top-down MUS procedures. Pre- and postop assessment included subjective SEAPI classification and quality of life (QoL) indices [SF-IIQ-7, UDI-6, and visual analog scale (VAS, 1–10)]. All women had a voiding trial (VT) per protocol on the 1st postop day. Those failing the VT were discharged with a urethral catheter and repeated VT as an outpatient. Demographics and perioperative morbidity were obtained from the hospital and clinic charts. Statistical evaluation was conducted.

Results: All had a minimum follow-up of 6 months. Twenty-eight (6.3%) had a bladder puncture during MUS [right (17), left (7), bilateral (4)]. Women in the puncture group had a statistically lower BMI than the non-puncture group. Mean age, parity, daily pad use, Baden-Walker prolapse grades, and % previous pelvic surgery were not statistically different. Mean preoperative UDI-6 was statistically lower in the puncture group, while mean SEAPI and other QoL indices were not statistically different. Mean day of discharge (1.6 vs. 1.6) was not significantly different between the 2 groups, while day of successful voiding (4.2 vs. 2.3) was significantly higher in the puncture group. The incidence of subjective postop emptying and urgency incontinence was not significantly different between the 2 groups. There were essentially no significant differences between the 2 MUS procedures and there were no associations between laterality of puncture and postop storage and voiding symptoms. No patient suffered an intraoperative urethral injury and none developed delayed bladder erosion. Postop QoL indices improved significantly regardless of bladder puncture.

Conclusions: Bladder puncture during MUS surgery does not seem to be associated with additional urinary storage or voiding sequelae. In our cohort, lower BMI was associated with bladder puncture, while previous pelvic surgery was not. Women sustaining a bladder puncture may take longer to achieve successful and efficient voiding than women without puncture. Commercial sling type does not appear to impact puncture rate.
Results: 53 articles with more than 5 year follow–up including 35 R, 12 P and 6 RCT were identified. Office visit with a physical examination was documented in 31/53 articles. An average of 2 OMs per study for R, 4 for P, and 3 for RCT was observed. For R studies, 17/35 used unspecified questionnaires, 9/35 a stress test, 7/35 a pad test and 3/35 a voiding diary. For P studies, 8 different questionnaires were selected with no predominance for anyone, whereas stress test was done in 6/12, pad test in 7/12 and voiding diary in 1/12. For RCT studies, 4 chose UDI–6 or IIQ–7, Q–tip test in 3, and pad test or stress test in 2 each. The least performed OMs were BFLUTS, PGI–I, KHQ, ICIQ–SF, pad usage, Bonney test, voiding diary and imaging. Urodynamic was chosen in 6 R, 5 P and 1 RCT, and flow rate in 6 R, 4P and 1 RCT. Studies since 2006 tended to report more OMs than studies from prior years.

Conclusion: We found no uniformity in reporting in the long–term studies of surgery for SUI in women. Regardless of study design, few OMs were used, although an increase was noted in the past 5 years. Study comparisons and meta–analyses will remain hampered by the lack of agreement on a minimum set of OM that all studies should provide for meaningful interpretation [1].


Podium #7
IS THERE A RELATIONSHIP BETWEEN UROGENITAL DISTRESS INVENTORY 6 SCORE AFTER SURGERY FOR STRESS URINARY INCONTINENCE AND PATIENT–PERCEIVED SATISFACTION AND IMPROVEMENT?
Jason Kim, MD¹, Wai Lee, BA¹, Rosa Park, BA¹, Alvaro Lucioni, MD², Fred Govier, MD² and Kathleen Kobashi, MD²
¹Stony Brook, NY; ²Seattle, WA
(Presented by: Jason Kim)

Introduction: The UDI–6 has been routinely used to assess outcomes after treatment for stress urinary incontinence (SUI). However, given that UDI–6 is composite from various symptom domains, the significance of change in the UDI–6 score is unknown. We attempt to correlate changes in the score with patient–perceived satisfaction and improvement after treatment for stress urinary incontinence.

Methods: Patients who underwent treatment for stress urinary incontinence were asked to answer the UDI–6 questionnaire pre– and post–operatively. We assessed satisfaction and improvement using a graded Likert scale.

Results: We identified 233 patients who answered all questions regarding satisfaction and 194 patients who answered all questions regarding improvement. We found that comparing the total difference in pre–operative to post–operative UDI–6 score that there was a moderate correlation to satisfaction and improvement. We also assessed correlation of change in UDI–6 score of each individual question and domain (irritative symptoms, stress symptoms, obstructive/discomfort). These correlations and absolute differences in scores can be seen in table 1. The stress symptoms (questions 3+4) had the strongest correlation to satisfaction and improvement. The obstructive/discomfort domain had no correlation to satisfaction or improvement.

Conclusion: The strongest correlation between satisfaction and improvement and treatment for SUI was seen from questions 3+4 of the UDI–6.

UDI 6 difference and Improvement

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Podium #8
DELAY IN DIAGNOSIS OF MESH−RELATED LOWER URINARY TRACT COMPLICATIONS RESULTS IN PROLONGED PATIENT MORBIDITY IN A RURAL POPULATION
Richard Kershen, MD
University of Vermont College of Medicine, Burlington, Vermont
(Presented by: Richard Kershen)

Introduction: The availability and marketing of minimally invasive synthetic polypropylene mesh kits for the correction of stress urinary incontinence and pelvic organ prolapse has resulted in their widespread usage by urologists and gynecologists alike. Mesh−related lower urinary tract (LUT) complications including bladder outlet obstruction (BOO) and entry/erosion into the bladder or urethra may present with a variety of early and sometimes subtle symptoms. A high index of suspicion must be maintained for prompt diagnosis of these complications, as delay will prolong patient suffering and potentially result in irreversible changes in LUT function.

Objectives: To evaluate timeliness of diagnosis and treatment of mesh−related lower urinary tract complications in a rural patient population served by a tertiary care referral center.

Methods: This is a retrospective review of all patients referred to our center with transvaginal mesh−related LUT complications who underwent surgical removal over a 6−year period. Non−LUT related mesh complications such as vaginal extrusion, infection, and/or vaginal or pelvic pain were excluded from analysis. Patients diagnosed with a mesh−related LUT complication needed to have LUT symptoms (S) related to BOO or mesh entry/erosion into the LUT.
Results: Twenty patients with mesh-related LUT complications were treated between November 2005 and September 2011. Eight patients had refractory LUTS found to be related to BOO. Twelve patients had LUTS related to mesh entry into the LUT. The majority (85%) of patients with LUT complications developed symptoms within 3 months (mos.) of mesh implantation. The remaining 15% developed symptoms within 6–12 mos. of surgery. The average amount of time between mesh insertion and removal was 28.6 mos. (range: 4–77 mos.; median: 28 mos.).

Conclusions: Symptoms suggestive of a LUT complication related to vaginal mesh commonly present within 3 mos. of implantation. In a rural patient population, definitive diagnosis and treatment of these complications is delayed by more than two years on average. Improved education of mesh-implanting physicians on how to suspect and diagnose these complications earlier will prevent prolonged patient suffering, and potentially avoid the development of permanent LUT dysfunction.

Podium #9
ARE URODYNAMICS USEFUL IN THE SETTING OF OBSTRUCTION SECONDARY TO ANTI-INCONTINENCE SURGERY?
Margarita Aponte, MD¹, Sagar Shah, MD², Duane Hickling, MD¹, Benjamin Brucker, MD¹, Nirit Rosenblum, MD¹ and Victor Nitti, MD¹
¹Department of Urology, New York University School of Medicine, New York, NY; ²Department of Urology, St. Vincent’s Medical Center, Jacksonville, FL
(Presented by: Margarita Aponte)

Introduction and Objectives: To determine the utility of urodynamics (UDS) in patients with obstruction secondary to anti-incontinence surgery (AIS).

Methods: A retrospective review of all procedures performed to relieve obstruction due to AIS from 01/01–06/11. Patient demographics, UDS findings, type of AIS, indication for intervention, procedure to relieve obstruction, preoperative and postoperative symptoms were recorded. Patients were excluded if this was not the primary procedure to relieve obstruction, if follow up data was missing, or if a neurologic disorder was present. Patients were grouped into the following categories prior to intervention: UDS diagnosis of obstruction vs. non-diagnostic UDS or no UDS testing and patients with predominantly storage symptoms vs. patients with elevated PVR/retention and voiding symptoms. Outcomes were compared between these groups using SPSS statistical software and chi-square test. Cure was defined as resolution of symptoms for which intervention was indicated at last follow-up.

Results: A total of 71 women were included in the analysis. There were 53 women with elevated PVR/retention, 32 (60.3%) were diagnosed with obstruction on UDS, 4 (7.5%) had non-diagnostic UDS and 17 (32%) did not undergo preoperative UDS. All 18 patients with predominantly storage symptoms underwent UDS. In patients with elevated PVR/retention there was no difference in age, type of AIS procedure, time to intervention, follow up, preoperative voiding symptoms or type of intervention between groups. Patients who had diagnostic UDS had significantly more storage symptoms than those who had non diagnostic UDS or who did not undergo UDS (81.2%% vs. 18.7% p=0.01). In patients who had storage symptoms and underwent UDS, those without evidence of detrusor overactivity (DO) had significantly greater improvement of their storage symptoms when compared to those with DO (85.7% vs. 53.8%, p=0.02). Overall 90.1% of patients improved and 74.6% were cured. In patients with elevated PVR/Retention there was no difference between groups with respect to improvement in symptoms, overall cure, and overall success according to whether they had diagnostic UDS or not.

Conclusion: If voiding symptoms or urinary retention/elevated PVR are the primary indication for intervention following AIS, it appears UDS are not required to proceed with intervention. If storage symptoms are the main indication for intervention, UDS may be a valuable tool for patient counseling.
Podium #10
PRE-OPERATIVE CLINICAL, DEMOGRAPHIC AND URODYNAMIC MEASURES ASSOCIATED WITH FAILURE TO DEMONSTRATE URODYNAMIC STRESS INCONTINENCE IN WOMEN
ENROLLED IN TWO RANDOMIZED CLINICAL TRIALS OF SURGERY FOR STRESS URINARY INCONTINENCE
Gary Lemack, MD¹, Heather Litman, PhD², Charles Nager, MD³, Linda Brubaker, MD⁴, Jerry Lowder, MD⁵, Peggy Norton, MD⁶, Larry Sirls, MD⁷, Keith Lloyd, MD⁸ and John Kusek, PhD⁹
¹University of Texas Southwestern, Dallas, Texas; ²New England Research Institutes, Watertown, Massachusetts; ³University of California, San Diego, San Diego, California; ⁴Loyola University Medical Center, Maywood, Illinois; ⁵Magee-Women's Hospital, University of Pittsburgh, Pittsburgh, Pennsylvania; ⁶University of Utah Health Sciences Center, Salt Lake City, Utah; ⁷Beaumont Hospital Medical Center, Royal Oak, Michigan; ⁸University of Alabama at Birmingham, Birmingham, Alabama; ⁹National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, Maryland
(Presented by: Gary Lemack)

Aims: The inability to observe urodynamic stress incontinence (USI) in women planning surgery to alleviate symptomatic stress urinary incontinence (SUI) is a challenge to surgeons. We examined the prevalence and clinical and demographic factors associated at baseline (pre-operatively) with the absence of USI among study participants of two multi-center randomized clinical trials of surgery for treatment of SUI.

Methods: Women with stress incontinence symptoms and positive stress tests on physical examination enrolled in clinical trials comparing the autologous fascial sling with the Burch suspension (SISTEr trial), and the retropubic mid urethral sling compared to the transobturator mid urethral sling (TOMUS), were evaluated for USI preoperatively. The association of clinical, demographic and urodynamic parameters was examined in women without USI in univariable and multivariable analyses.

Results: Overall, 144 of 1233 women (11.7%) enrolled in the two studies failed to show USI. In both studies, women who did not show USI had a significantly lower mean volume at maximum cystometric capacity than those with USI (347.5 vs. 395.8 in SISTEr, p = 0.012), (315.2 vs. 358.2 in TOMUS, p = 0.003), and a lower mean number of daily accidents reported on a three day diary (2.2 vs. 2.7 in SISTEr, p = 0.030) (1.7 vs. 2.7 in TOMUS, p < 0.001). Additionally, those without demonstrable USI were more likely to have POPQ stage III/IV (31.7% vs. 14.4% in SISTEr, p = 0.002), (15.5% vs. 6.9% in TOMUS, p = 0.025). Severity of SUI as recorded on Urogenital Distress Inventory correlated strongly with the presence of USI in both studies.

Conclusions: Absence of USI is relatively common among women planning surgery for SUI. Among women enrolled in two clinical trials of surgery for stress urinary incontinence, severity of stress incontinence and Stage 3/4 pelvic organ prolapse was strongly associated with the inability to demonstrate USI. A diminished urodynamic bladder capacity among women who did not display USI may reflect an inability to reach the limits of capacity during urodynamics, at which these women normally leak.

Podium #11
RADIATION DURING VIDEOURODYNAMICS: ESTABLISHING A BASELINE
Benjamin Brucker, MD, Eva Fong, MD, Duane Hickling, MD, Margarita Aponte, MD, Justin Han, MD, Max Abramsky, MD, Nirit Rosenblum, MD and Victor Nitti, MD
New York University, NY, NY
(Presented by: Benjamin Brucker)

Introduction: The simultaneous use of fluoroscopy during urodynamics can be helpful in the evaluation of patient with lower urinary tract dysfunction. Based on the FDA’s Initiative to Reduce Unnecessary Radiation Exposure from Medical Imaging, our aims were to define radiation exposure during adult videourodynamics (VUDS) and to define the factors that may increase patients’ risk for radiation exposure.
Methods: We reviewed all VUDS from 8/30/10−5/23/11. Patients were included if they were >18 years old and had data recorded on total radiation exposure (rad/cm2). We also collected data on fluoroscopy time, diagnosis, sex, BMI, and urodynamic finding (first desire, normal desire, capacity, detrusor overactivity, incontinence associated with detrusor overactivity, stress urinary incontinence, vesicoureteral reflux, reduction of prolapse, obstruction, position of patient, number of fill cycles, number of void cycles). Multivariate linear regression analysis was performed to identify risk factors for increased radiation exposure.

Results: 203 VUDS were assessed in 106 female and 97 male patients. The demographics and urodynamic findings are found in the table below. The average fluoroscopy time/study was 100.2 seconds (1.4−294.2) and the average exposure was 560.9 rad/cm² (8.51−2053). Studies were done for incontinence in 40.9%, LUTS 13.3%, Retention/Elevated PVR 10.8%, Neurogenic Voiding Dysfunction 12.3%, Prolapse 9.9%, OAB 8.4%, Recurrent UTI w/LUTS 4.4%. Regression analysis showed that larger BMI, presence of reflux, female sex, increased number of fill cycles, larger capacity were all independent predictors of increased radiation exposure. There was also variation based on the physician performing the study.

Conclusion: We have defined a set of baseline exposure data for adult VUDS. Female sex and increasing BMI are independent risk factors for exposure that can be used in counseling patient about risk prior to performing a study. More complicated studies (vesico-ureteral reflux, and increase bladder capacity) also increase exposure. The operator of the equipment is another factor that leads to differences in exposure, suggesting a modifiable component. Further studies are needed to attempt to reduce exposure.
EMG LAG TIME AS A SPECIFIC FINDING IN THE DIAGNOSIS OF PRIMARY BLADDER NECK DYSFUNCTION

Steven Weissbart, MD, Leslie Schlachter, PA and Neil Grafstein, MD
Mount Sinai School of Medicine, New York, NY
(Presented by: Steven Weissbart)

Introduction and Objectives: A key finding on videourodynamic studies (VUDS) in primary bladder neck dysfunction (PBND) is a prolongation of the time between the start of a voluntary detrusor contraction and the start of urine flow. A voluntary detrusor contraction is immediately preceded by pelvic floor relaxation, which may be seen on pelvic floor electromyography (EMG). It has, therefore, been suggested that measuring the EMG lag time, i.e. the time interval between pelvic floor relaxation and the start of urine flow, could be a minimally invasive alternative to VUDS to diagnose PBND. In addition, EMG lag time measurement might serve as a noninvasive modality for monitoring a patient’s response to treatment with alpha-blockers. One critique of the use of prolonged EMG lag time to diagnose PBND is that this finding may also be present in all causes of bladder outlet obstruction (BOO), including benign prostatic hyperplasia (BPH), but there is no study that has examined this possibility. In this study, we compare the EMG lag times in patients who underwent VUDS prior to transurethral resection of the prostate (TURP) for BOO secondary to BPH with the EMG lag times in patients with PBND.

Methods: EMG lag time was measured in 16 patients who underwent VUDS prior to TURP for BOO caused by BPH. Pelvic floor EMG activity was measured with patch electrodes. A Student’s t-test was used to compare the mean EMG lag time in this cohort of patients with a previously reported mean EMG lag time for patients with PBND.

Results Obtained: The mean age of patients who underwent VUDS prior to TURP for BOO caused by BPH was 68. The mean bladder outlet obstructive index on preoperative VUDS was 54.6. Operative findings in all patients at the time of TURP included obstructive prostatic tissue. Pathology of the TURP chips revealed BPH in all specimens. Mean EMG lag time in our cohort of patients with BOO caused by BPH was $4.05\pm1.37$ seconds (95% CI). The mean EMG lag time previously reported in a published cohort of patients with PBND was 23.9 seconds. A Student's t-test revealed a significantly lower EMG lag time in the patients with BOO caused by BPH compared to the published cohort of patients with known PBND ($p<0.0001$).

Conclusions: Our study demonstrates that the EMG lag time is not prolonged in patients with BOO secondary to BPH. Thus, EMG lag time prolongation remains a unique urodynamic finding in patients with PBND.

Funding: None.

Podium #12

COMPLEX ARTIFICIAL URINARY SPHINCTER REVISION AND REIMPLANTATION CASES—HOW DO PATIENTS DO COMPARED TO VIRGIN CASES?

H. Henry Lai, MD and Timothy Boone, MD, PhD
Washington University in St. Louis; The Methodist Hospital, Houston, TX
(Presented by: H. Henry Lai)

Introduction and Objectives: To compare artificial urinary sphincter (AUS) complication rates, overall reoperative rates, and continence results in virgin cases, revision cases, and secondary reimplant cases (with prior erosion or infection).

Methods: Only male post-prostatectomy stress incontinence patients with AMS 800 placement in the bulbar urethra by a single surgeon were included. 169 virgin cases (no prior AUS surgery), 37 revision cases (e.g. cuff revision for urethral atrophy, revision of failed components) and 21 secondary reimplant cases (e.g. after prior explant from urethral erosion or infection) were compared.
Results: Secondary AUS reimplant cases (e.g. after prior explant from urethral erosion or infection) have four-fold higher erosion rates compared to virgin cases (p=0.02, 14.3% versus 3.6%, RR=4.02). Besides this, there was no difference in the rates of other complications (device infection, urethral atrophy, mechanical failure, leaks), overall reoperation rates, and postoperative continence outcomes (measured by daily pad use) compared to virgin cases. AUS revision cases do not have higher complication rates (including subsequent urethral erosion), reoperation rates, or worse postoperative continence outcomes compared to virgin cases. Although the difference was not statistically significant, a trend towards higher future leak rates (10.8% versus 3.6%, RR=3.05, p=0.063) and higher urethral atrophy rates (16.2% versus 8.9%, RR=1.83, p=0.18) was noted in AUS revision cases compared to virgin implant cases.

Conclusion: Patients with a prior history of AUS explant have a 4-fold increased risk of future cuff erosion. Nevertheless, good functional outcome with acceptable complication rate may be achieved in most complex reoperative AUS cases.

Disclosure: Consultant for American Medical System (TBB)

Funding: None.

Podium #14
DULOXETINE FOR THE TREATMENT OF POST-PROSTATECTOMY STRESS URINARY INCONTINENCE
R. Corey O'Connor, MD, Amy Guise, MD, Donald Neff, MD, Peter Langenstroer, MD, William See, MD and Michael Guralnick, MD
Medical College of Wisconsin, Milwaukee, Wisconsin
(Presented by: R. Corey O'Connor)

Introduction: Stress urinary incontinence (SUI) is a known complication following radical prostatectomy. Duloxetine, a combined serotonin and norepinephrine reuptake inhibitor, has been shown to decrease SUI by increasing urethral sphincter contractility. We examined the outcomes of patients with mild to moderate post-prostatectomy SUI treated with duloxetine.

Methods: A retrospective chart review of all men treated with duloxetine for the management of mild to moderate post-prostatectomy SUI from 2006 to 2011 was conducted. Mild to moderate SUI was defined as urethral leakage with physical activity requiring 5 or fewer absorptive pads per day. Patients with a history of pelvic radiation therapy or previous anti-incontinence surgery were excluded from the study. Data extracted included patient age, daily pad usage, date of prostatectomy and medication side effects. In addition, pre and post treatment incontinence impact questionnaire (IIQ-7) and linear satisfaction [0 (unsatisfied) to 3 (greatly satisfied)] scores were recorded. All patients received duloxetine 30mg by mouth Qhs x one week, then 60mg Qhs thereafter. Patients were seen one month later to determine drug efficacy and side effects.

Results: Seventy-five men were included in the study. Mean patient age was 65.3 years (range 47 – 83). Average time from radical prostatectomy was 19.3 months (range 9 – 49). Daily pad usage decreased from 2.9 (range 1 – 5) to 1.4 (range 0 – 4) (p < 0.05). IIQ-7 scores decreased from 12.8 (range 6 – 18) to 7.5 (range 2 – 16) (p < 0.05). Linear satisfaction scores improved from 0.8 (range 0 – 2) to 2.3 (range 1 – 3) (p < 0.05). Following a one month trial of duloxetine 28/75 (37%) men reported satisfactory SUI improvement and requested to continue the medication. The drug was discontinued in 47/75 (63%) patients due to lack of efficacy in 27/75 (36%), intolerable side effects in 10/75 (13%) or both in 10/75 (13%). Reported side effects included fatigue, insomnia, nausea and dry mouth.

Conclusions: Duloxetine improved post-prostatectomy SUI in 38/75 (51%) men following a one month trial. However, only 28/75 (37%) of these patients were able to tolerate the drug. Duloxetine may be considered a treatment option for mild to moderate post-prostatectomy SUI.
THE VIRTUE SLING FOR POST-PROSTATECTOMY INCONTINENCE—A NOVEL METHOD OF FIXATION IMPROVES OUTCOME

Craig Comiter, MD, Christopher Elliott, MD, PhD and Patricia Glowe, BA
Stanford, CA
(Presented by: Christopher Elliott)

Introduction: The broad-based Virtue® Male Sling (Coloplast, Humlebaek, Denmark) provides proximal urethral relocation and bulbar urethral compression. Recently, a novel method of quadratic fixation was implemented to improve surgical outcome. We compare the results of a prospective, multi-center study without fixation to a single surgeon experience with the fixation procedure.

Methods: Sling fixation involves transferring the transobturator arms to the midline perineal incision, with suture fixation in the midline. Fixation of the prepubic arms involves suturing of the lower portion of the arms to the soft tissue 1 cm lateral and 1 cm inferior to the symphysis pubis. The cohort without fixation (Group I, n=80) is compared to the group with fixation (Group II, n=13) for 24-hr pad test, incontinence section from the UCLA–RAND questionnaire, and PGI–I, and for surgical complications and post void residual urine (PVR).

Results: Mean age was 67 yrs in Group I, and 70 yrs in Group II. In Group I, median 24-hr pad weight improved from 200 to 71 g (p<0.001). Overall, 79% realized a decrease in pad weight, and 54% had >50% reduction in pad weight at 6 months. In Group II, median 24-hr pad weight improved from 333 to 17 g (p<0.001) at 3 months, and to 9 g in 9 evaluable patients at 6 months. Overall, 92% of men realized a >50% decrease in pad weight at last follow-up. UCLA–RAND Incontinence Scores were also improved to a greater degree in Group II: Group I mean = 17.1±12.6 vs 37.7±28.1, p<0.001 and Group II mean =13.6±6.3 vs 41.6±17.2, p<0.001 at 6 months vs baseline. On the PGI–I for Group I, 67% reported subjective improvement at 6 months, 23% had no change, and 10% had worse incontinence. In Group II, at 3 months 92% reported subjective improvement, and 9 of 9 evaluable patients had improvement at 6 months (all very much better or much better). Adverse events included 1 bladder perforation, 1 wound infection, 1 hematoma, 1 UTI, and 1 retention, and 13% rate of perineal pain in Group I. In Group II, there was 1 case each of perineal pain and scrotal paresthesia beyond 12 weeks. In neither Group did mean PVR change following surgery.

Conclusions: The Virtue sling with fixation is associated with improved short-term success without any increase in adverse events or voiding dysfunction, compared to the original procedure. The problem of short-term sling loosening appears to have been solved with this novel fixation technique.

POST-OPERATIVE URINARY RETENTION AFTER MALE SLING INSERTION IS A POSITIVE PROGNOSTIC INDICATOR FOR SLING SUCCESS

Matthew Hall, MD, Steven Weissbart, MD, Steven Mock, MD and Neil Grafstein, MD
Mount Sinai School of Medicine, New York, NY
(Presented by: Matthew Hall)

Introduction and Objectives: While urinary retention (UR) is a recognized complication of Advance Male Sling (MS) placement for post–prostatectomy incontinence (PPI), to our knowledge there is no study to date identifying the incidence and implications of immediate post–operative UR. In this study, we investigate the incidence of immediate post–operative UR and evaluate whether UR is predictive of final continence status.

Methods: All patients post–MS were given a trial of void (TOV) in the recovery room. Statistical analysis was conducted between men with and without post–operative UR to define if post–operative UR impacts overall continence.

Results: 35 patients with PPI were included in this study. At presentation for MS insertion the mean age was 62.9 (range 50 to 76). Mean follow–up was 11.8 months (range 0–42). Mean pre–operative pad usage was 2.67 pads per day (PPD) (range 1–7). Sixteen patients (46%) had post–operative UR requiring either indwelling foley catheter placement or continuous intermittent catheterization (CIC). Nineteen patients (54%) had a successful first TOV. Twenty–four patients had complete continence requiring zero PPD.
Eleven patients required one or more PPD, of which, 36% (4 patients) were significantly improved and subjectively satisfied with the results. Overall, eighty percent of patients (28 patients) were much improved or completely continent. Of the 16 patients in post-operative retention, 100% were completely continent (zero PPD) compared to 8 of 19 patients (42%) who passed their first TOV (P=0.0002). On statistical analysis, there was no significant difference in pre-operative pad usage, 2.63 PPD in post-operative UR group and 2.7 in the successful TOV group (p=0.93). No patient in either group required sling lysis due to post-operative UR. One patient received external beam radiation (XRT), one patient had bladder neck contracture (BNC), and one patient had both XRT and BNC. For patients with post-operative retention, no patient required either CIC or indwelling foley catheter for more than 7 days.

**Conclusion:** Post-operative urinary retention after MS placement for PPI occurs in less than fifty percent of patients and is a good prognostic indicator for sling success at mean follow-up of one year.

**Podium #17**

**DYNAMIC MRI EVALUATION OF CONTINENT AND INCONTINENT MEN POST RADICAL PROSTATECTOMY**

Anne Suskind, MD, John DeLancey, MD, Jerilyn Latini, MD and Anne Cameron, MD

University of Michigan

(Presented by: Anne Suskind)

**Objectives:** One postulated cause of post prostatectomy incontinence is urethral and bladder neck hypermobility. The objective of this pilot study was to determine the magnitude of anatomical differences of urethral and bladder neck position at rest and with Valsalva in continent and incontinent men post prostatectomy based on dynamic MRI.

**Methods:** Fourteen subjects volunteered for this IRB-approved study. All subjects underwent a dynamic MRI protocol with Valsalva and non-Valsalva images and a standard urodynamics evaluation. MRI measurements were taken for rest and Valsalva series, including (1) bladder neck to sacrococcygeal inferior pubic point line (SCIPP), (2) urethra to pubis, and (3) bulbar urethra to SCIPP. Data were analyzed using unpaired two t test.

**Results Obtained:** A total of 14 subjects (7 continent and 7 incontinent) had complete data and were included in the final analysis. The two groups were similar in demographic characteristics. Urodynamics ruled out detrusor overactivity as the source of incontinence. There were no statistical differences in urodynamic parameters between groups except that the incontinent group demonstrated stress incontinence. On MRI the position of the urethra relative to the pubis and the position of the bladder neck at rest and on Valsalva were not different between groups. However, the bulbar urethra was 0.4 cm and 0.5 cm lower in the incontinent group at rest and with Valsalva respectively. There were no statistically significant differences between groups in the amount of hypermobility of the bladder neck or urethra on Valsalva (see Table).

**Conclusions:** The bulbar urethra is lower in incontinent than continent men after prostatectomy. There were no differences in the amount of bladder neck and bulbar urethral mobility. This finding suggests that post-prostatectomy incontinence is impacted by the position of the urethra after surgery but not by urethral mobility. A more complex mechanism for post prostatectomy incontinence needs to be modeled in order to offer better treatments for this growing population of patients.

**Funding:** This study was funded by the Michigan Institute for Clinical and Health Research UL1RR024986

<table>
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<tr>
<th>Position of anatomical structures (means in cm with standard deviations)</th>
<th>Incontinent (n=7)</th>
<th>Continent (n=7)</th>
<th>P value</th>
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</thead>
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<tr>
<td><strong>Rest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bladder neck to SCIPP</td>
<td>0.6 (± 0.19)</td>
<td>1.2 (± 0.49)</td>
<td>0.3230</td>
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<td>Urethra to pubis</td>
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<td>-1.0 (± 0.20)</td>
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<td>Bulbar urethra to SCIPP</td>
<td>-1.1 (± 0.09)</td>
<td>-0.7 (± 0.16)</td>
<td>0.0366</td>
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<td><strong>Valsalva</strong></td>
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<td></td>
</tr>
<tr>
<td>Bladder neck to SCIPP</td>
<td>0.5 (± 0.26)</td>
<td>1.2 (± 0.40)</td>
<td>0.1730</td>
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<td><strong>MRI measurement of mobility</strong> (Rest minus Valsalva)</td>
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<td>0 (± 0.16)</td>
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<td>0.1 (± 0.05)</td>
<td>0 (± 0.13)</td>
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Podium #18
THE ANATOMIC RELATIONSHIP BETWEEN THE ANTERIOR VAGINAL WALL AND THE VAGINAL APEX IN WOMEN WITH STAGE 2 OR GREATER CYSTOCELE
Christopher Elliott, MD, PhD¹, Craig Comiter, MD¹, Bertha Chen, MD² and Eric Sokol, MD²
¹Stanford Urology, Stanford, CA; ²Stanford Obstetrics and Gynecology, Stanford, CA
(Presented by: Christopher Elliott)

Introduction: Recurrence rates of 30% or more have been reported after traditional surgical repair of cystocele. Recent studies, showing a correlation between anterior vaginal wall and vaginal apical descent, suggest that cystoceles may recur if apical prolapse is not corrected at the time of cystocele repair. To date however, the anatomic relationship of apical prolapse as compared to prolapse of the anterior vaginal wall has been incompletely reported. We present the predictive value of anterior vaginal prolapse for clinically significant vaginal apical prolapse in a cohort of women with stage 2 or greater cystocele.

Methods: We performed an IRB−approved retrospective review of all new patient visits to a urogynecology clinic over a 12−month period. Pelvic organ prolapse quantification (POP−Q) measurements, demographics and clinical data were collected on all patients with point Ba values ≥ −1 (stage 2 cystocele and above). Predictive values of “clinically significant” apical prolapse (defined as point C ≥ −3) were calculated and stratified by degree of anterior prolapse.

Results: 197 patients were identified with stage 2 or greater cystocele. Point Ba was the leading edge of the prolapse in 83.4% of cases. The position of the anterior vaginal wall was found to strongly correlate to that of the vaginal apex (Spearman’s p = .746, p<.001). Overall, 60.4% of patients had a point C ≥ −3. The finding of clinically significant apical prolapse increased significantly with increasing Ba values (Table 1). In patients with stage 2, 3 and 4 cystoceles, point C was ≥ −3 in 38%, 88% and 100% of patients respectively. On multivariate analysis increasing Ba measurement, increasing age and prior prolapse surgery were risks factors for point C measurements of −3 or greater.

Conclusion: The finding of stage 2 or greater anterior vaginal wall prolapse is highly suggestive of “clinically significant” apical vaginal vault descent to −3 or greater. Further, as cystocele stage increases, the predictive value for apical prolapse is raised. Surgeons contemplating repair of anterior vaginal wall prolapse should have a high suspicion for vaginal apical prolapse and consider concomitant repair.

<table>
<thead>
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<th>Point Ba (cm)</th>
<th>#women</th>
<th>#with point C ≥ −3 cm</th>
</tr>
</thead>
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<tr>
<td>&lt;0</td>
<td>56</td>
<td>21 (36.2%)</td>
</tr>
<tr>
<td>0−1</td>
<td>64</td>
<td>31 (49.4%)</td>
</tr>
<tr>
<td>&gt;1</td>
<td>75</td>
<td>67 (89.3%)</td>
</tr>
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Podium #19
THE PREVALENCE OF PELVIC ORGAN PROLAPSE IS LOW AMONG WOMEN WITH MULTIPLE SCLEROSIS EVALUATED AT A TERTIARY NEUROUROLOGY CLINIC
Casey Seideman, MD, Benjamin Dillon, MD, Michelle Van Kuiken, BA, Dominic Lee, MD, Benjamin Greenberg, MD and Gary Lemack, MD
University of Texas Southwestern
(Presented by: Casey Seideman)

Introduction: Pelvic organ prolapse (POP) is estimated to be present in 30−94% of patients, with up to 11% undergoing a surgical procedure during their life. Over 80% of patients with Multiple Sclerosis (MS) seek urologic care for lower urinary tract symptoms (LUTS). The proportion of patients in whom these symptoms might be attributable to POP has not been studied. We sought to determine the prevalence of POP in a large cohort of women with MS and LUTS.
**Methods:** MS patients who were referred to a tertiary neurourology clinic for evaluation of LUTS were studied. Demographic data (age, BMI, parity, MS classification –relapsing remitting, primary or secondary progressive), and pelvic exam findings were captured. Prolapse was defined with the POPQ system, focusing on anterior and posterior wall defects. Pelvic organ prolapse was defined as a Stage 2 prolapse or greater.

**Results:** Between 1999−2009, 280 women with MS were referred to the neurourology clinic. Exam data was available in 255 patients. Mean and median age was 50, with a mean duration of MS of 13 years (median 12).

Overall, 23 (9%) women demonstrated POP on exam. Of these 23, 2 (9%) had posterior prolapse only, 8 (35%) had anterior prolapse, and 13 (56%) had both anterior and posterior prolapse. Women with POP had an average parity of 2.5, compared to 1.4 in those without (p<0.01). There was no difference in age (55 vs 50, p=.06), BMI (25.8 vs. 25.3, p=.70), or MS classification between those with and without POP. Patients with POP were more likely to be postmenopausal (57% vs. 39%, p=0.02). Patients with POP were more likely to have undergone prior hysterectomy (61% vs 27%, p<0.01). Six (26%) patients with POP underwent surgical intervention. Regarding LUTS, there was no difference in UDI−6 scores between groups (9.8 vs. 8.8, p =0.50)

**Conclusions:** Despite wide variation in the reported prevalence of prolapse in the general population, the prevalence of 9% is lower than would be expected in an age−matched population, and women with MS and POP do not have more severe LUTS than those without. The low prevalence may reflect inherent differences in pelvic floor strength, diminished mobility creating lesser stresses on the pelvic floor, enhanced neurologically−mediated pelvic floor tone, or other unknown factors. Assessing for advancement of prolapse in these neurologically impaired women over time may provide insight into the mechanisms underlying common pelvic floor relaxation disorders.

**Podium #20**

**PREDICTORS OF OUTCOMES OF PROLAPSE SURGERY AMONG FEMALE MEDICARE BENEFICIARIES: THE ROLE OF APICAL SUPPORT**

Stephanie Histed, BA¹, Aqsa Khan, MD², Marianna Alperin, MD, MS³, Ning Wu, PhD⁴, Chris Pashos, PhD⁴, J. Quentin Clemens, MD, MSCI⁵ and Jennifer Anger, MD, MPH⁶

¹David Geffen School of Medicine at UCLA, Los Angeles, CA; ²Department of Urology, UCLA, Los Angeles, CA; ³Division of Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, Kaiser Permanente, West Los Angeles, CA; ⁴United BioSource Corporation, Lexington, MA; ⁵Department of Urology, University of Michigan Medical Center, Ann Arbor, MI; ⁶Cedars Sinai Medical Center, Los Angeles, CA

(Presented by: Stephanie Histed)

*Not CME accredited

**Introduction and Objective:** Recurrence rates after anterior colporrhaphy are historically high. Explanations for this high failure rate include the use of inherently weak tissue and the failure to provide concomitant apical support. We used a national dataset to compare long−term re−operation rates of prolapse surgery with and without apical support.

**Methods:** A 5% random national sample of female Medicare beneficiaries 65 years or older was obtained from the Public Use Files from the Centers for Medicare and Medicaid Services (CMS). Women with an ICD−9 code for pelvic prolapse were identified by a Current Procedural Terminology (CPT−4) code for prolapse surgery during 1999. These women were tracked through the end of 2009. Repairs were subdivided into anterior, posterior, or both anterior/posterior compartment repairs. These repairs then further compared between those performed with a concomitant apical repair.

**Results:** In 1999, 21,245 women had a diagnosis of POP. Of these, 3,244 (15.3%) underwent a prolapse surgery during that year. 2,756 women underwent an apical and/or posterior repair with and without an apical component and were included in this cohort. Overall, re−operative rates were highest in women who had an anterior repair only (20.2%). Women who underwent anterior repair without apical management had significantly higher rates of reoperation compared with women who had a concomitant apical surgery (20.2% vs. 11.6%, p < 0.03). A similar trend was seen for combined anterior/posterior repair (14.7% vs. 10.2%, respectively, see Table).
Conclusions: Isolated anterior repair had the highest failure rate, but this was significantly reduced when combined with an apical repair. A significantly higher re-operation rate was also found for women who underwent anterior and posterior repair without apical management. Though these claims-based data are limited by a lack of detail on the stage of prolapse or severity of each compartment, they shed light on the role of apical support in preventing long-term prolapse recurrence.

Funding: Funded by the NIDDK (1 K23 DK080227-01, JTA) and an American Recovery and Reinvestment Act (ARRA) Supplement.

Podium #21
RISK FACTORS FOR VAGINAL MESH EXPOSURE AFTER ROBOTIC-ASSISTED LAPAROSCOPIC SACROCLOPOPEXY: A RETROSPECTIVE COHORT STUDY
Dominique EL-Khawand, MD¹, Salim Wehbe, MD¹, Howard Goldstein, DO², Kristene Whitmore, MD¹ and Babak Vakili, MD²
¹Drexel University College of Medicine, Philadelphia, PA; ²Christiana Care Health System, Newark, DE
(Presented by: Dominique EL-Khawand)

Objective: To identify risk factors for vaginal mesh exposure after robotic-assisted laparoscopic sacrocolpopexy (RSC).

Methods: This is a retrospective cohort study of all patients who had RSC by one urogynecology group (3 providers) between 1/2009 and 12/2010. Data were extracted from medical records and included demographics, surgical techniques, and outcomes. Potential risk factors were selected from previous reports or clinical observation. The primary outcome was vaginal mesh exposure rate. The association between risk factors and mesh exposure rates was analyzed using the chi-square and Fisher’s exact tests, and Mann-Whitney U test. Relative risks (RR) and 95% confidence intervals (CI) were calculated. Multivariate analysis was done using logistic regression models.

Results: A total of 93 subjects underwent RSC. Mean follow up was 20 weeks (SD ±15). Exposures occurred in 15 (16.1%) subjects with 14 as mesh exposure and 1 as a suture exposure. Most exposures (86.7%) occurred at the vaginal apex. There were no posterior exposures. Twelve (80%) exposures needed surgical therapy after failed medical treatment.
On univariate analysis, risk factors that showed statistically significant association with exposure rates were: Incidental anterior vaginotomy, 40% versus 13.3% (RR 3.02; 95% CI 1.18 to 7.71), and early learning curve (2009 versus 2010), 30% versus 9.5% (RR 3.15; 95% CI 1.23 to 8.04). Other factors that suggested a higher risk of exposure but did not reach statistical significance were: Ethibond suture compared to prolene, 30% versus 9.8% (RR 3.08; 95% CI 0.98 to 1.68); Cautery use for the rectovaginal space dissection, 20.3% versus 6.9% (RR 2.95; 95% CI 0.71 to 12.2); concomitant suburethral sling, 24.4% versus 9.6% (RR 2.54; 95% CI 0.94 to 6.84). BMI ≥ 30 seemed to be protective (RR 0.28; 95% CI 0.04 to 1.99). Concurrent total hysterectomy did not increase exposure rates (RR 1.06; 95% CI 0.41 to 2.72). Age, smoking, menopause status with and without hormone replacement therapy, intraoperative blood loss, and perineopexy did not significantly change the exposure rates. Multivariate analysis failed to demonstrate a significant association with any of the risk factors.

**Conclusion:** Although no definitive risk factors were identified on multivariate analysis, incidental anterior vaginotomy, early learning curve, cautery use, and suture material may be associated with higher vaginal mesh exposure rates after RSC and warrant further research.

**Podium #22**

**APICAL AND POSTERIOR COMPARTMENT RECURRENCE AFTER CONCURRENT TOTAL HYSTERECTOMY AND ANTERIOR VAGINAL WALL SUSPENSION FOR BLADDER WITH UTERINE PROLAPSES**

Dominic Lee, MD, Benjamin Dillon, MD, Karen Bradshaw, MD and Philippe Zimmern, MD

UT Southwestern Medical Center, Dallas, Texas

(Presented by: Philippe Zimmern)

**Introduction and Objectives:** The role of apical/posterior compartment repair during a combined hysterectomy and anterior compartment procedure remains debated. We examined the incidence of apical and posterior compartment recurrence following concurrent total hysterectomy (abdominal, transvaginal and laparoscopic assisted vaginal hysterectomy) and anterior vaginal wall suspension for repair of cystocele with uterine prolapse.

**Methods:** Following IRB approval, charts of women who underwent concurrent anterior and uterine prolapse repair with anterior vaginal wall suspension (AVWS) plus total hysterectomy (TH) at a single tertiary institution with a minimum 6 months follow-up were reviewed from a prospective prolapse database by a third party investigator. All procedures were performed by the same surgical team. The definition of prolapse recurrence in our study was POP-Q > Stage 2 and any re-operation for prolapse.

**Results:** From 1998 to 2009, 107 women were identified, with 94 currently followed. Group 1 [G1= 26 patients] underwent AVWS/TH and intra-operative apical and/or posterior repair based on preoperative symptoms in 8 patients and intra-operative advanced degree of prolapse in 18 patients. Group 2 [G2= 68 patients] underwent AVWS/TH alone. Mean age was 67 and 60.5 years for G1 and G2 respectively (range: 35−85) with mean duration of follow up at 39 and 38 months respectively (range: 6−157). In [G1], 17 patients remained recurrence free (65.4%) while 9 patients (34.6%) developed recurrence of prolapse. Four patients (15.4%) required reoperation− 3 robotic and 1 open sacrocolpopexy for apical prolapse. Mean time to reoperation was 16.6 months (range 9−36). In [G2] 40 women were recurrence free (60%) while 28 women (41.2%) developed progression and/or recurrence of prolapse. Eleven patients (16.2%) required reoperation− 9 robotic and 1 open sacrocolpopexy for apical prolapse and 1 rectocele, vault fixation and enterocoe repair for apico-posterior prolapse. Mean time to reoperation was 35.6 months (range 10−101).

**Conclusions:** De novo, progressing, or recurrent apical/posterior compartment prolapse on intermediate follow up after TH/AVWS between the 2 groups was about 40%, with less than 20% requiring a secondary apical or posterior compartment repair. [1]

Podium #23

FACTORS ASSOCIATED WITH VAGINAL MESH EXPOSURE USING THE ELEVATE® SYSTEM

Larry Sirls, MD, Miriam Bentley-Taylor, MD, Greg McLennan, MD, Kim Killinger, RN, MSN and Ken Peters, MD
William Beaumont Hospital, Royal Oak, MI

(Presented by: Larry Sirls)

Introduction: Complications from mesh use for vaginal prolapse repair have been under intense scrutiny. This study looks at patients’ clinical characteristics and operative data to determine whether any are associated with vaginal mesh exposure after repair with the Elevate® system.

Methods: Women who underwent vaginal prolapse repair with Elevate® between July 2009 and June 2011 were all retrospectively reviewed in September, 2011. Baseline patient demographics and clinical characteristics, including age, body mass index (BMI), medical and surgical history, and operative data including compartment repaired, concurrent hysterectomy, operative time, and change in hemoglobin (ΔHGB) and hematocrit (ΔHCT) were evaluated with Fisher’s Exact or Wilcoxon rank tests.

Results: 60 women (mean age 69 ± 9 years, BMI 26.7 ± 3.8, 98% postmenopausal; 80% not using estrogen replacement of any kind) had a repair with Elevate® by one of 3 fellowship−trained surgeons at a urology teaching institution. 48/60 (80%) had an anterior repair, 4/60 had a posterior repair, 17/60 (28%) had concurrent hysterectomy. Operative time was 102.8 ± 55.5 minutes. Mesh exposure was identified in 6/60 (10%) at a mean (median) of 109 ±109 (112) days postoperatively. When those with mesh exposure were compared to those without, the only clinical characteristic associated with exposure was steroid use; 2/6 (33%) vs. 1/54 (1.9%) (p=0.024). Although no patient required transfusion, both measures of mean operative blood loss were significantly higher in the mesh exposure group compared to no mesh exposure (ΔHGB − 3.5 g/dl vs. − 2.1 g/dl, p = 0.17; ΔHCT − 10 g/dl vs. −5.6 g/dl, p = 0.023). Prior or concurrent hysterectomy, prior prolapse surgery, diabetes, smoking, estrogen use/menopausal status and operative time were not significantly different between the two groups.

Conclusions: Vaginal mesh exposure may be associated with pre−operative steroid use and bleeding measured by drop in HGB and HCT. Bleeding after vaginal mesh placement may drain through the anterior vaginal wall incision resulting in a mucosal gap and mesh exposure. Longer follow up is needed to fully evaluate incidence/predictors of mesh exposure.

Funding: American Medical Systems (AMS)

Podium #24

TRANSLABIAL ULTRASOUND FOR LOCALIZATION OF VAGINAL MESH

Denise Chow, MD¹, Forrest Jellison, MD¹, Tamara Hartshorn, MD², Lisa Rogo-Gupta, MD¹, Ngoc Bich Le, MD¹, A. Lenore Ackerman, MD¹, Andrea Staack, MD¹, Larissa Rodriguez, MD¹ and Shlomo Raz, MD¹
¹University of California, Los Angeles, Department of Urology, Los Angeles, CA; ²University of California, Los Angeles, Department of Obstetrics and Gynecology, Los Angeles, CA

(Presented by: Denise Chow)

Introduction: Transvaginal mesh (TVM) has been under scrutiny due to increasing reports of complications. We adapted the use of translabial ultrasound (TLUS) to examine TVM in patients with mesh related complications. Our purpose is to report the technique and utility of TLUS for vaginal mesh localization.

Methods: A retrospective review of patients who underwent a TLUS from May 2009 to July 2011 for mesh complications was performed and ultrasound images reviewed. The technique to evaluate TVM via translabial ultrasound includes:

1. Patient in dorsal lithotomy position
2. Curvilinear 4–9 mHz transducer probe placed against the pubic symphysis
3. Still images in the axial, sagittal, coronal planes: sagittal midline, sagittal right and left spaced one centimeter and coronal images anterior to posterior
4. Cine loops while relaxed, straining, valsalva, and Kegel maneuvers
5. 3-D reconstruction of the urethra.
Results: 86 patients underwent TLUS for identification of vaginal mesh due to mesh related complications. Patients’ chief complaints included pelvic pain 40 (47%), incontinence 27 (31%), recurrent urinary tract infections 16 (19%), obstructive voiding 14 (16%), prolapse 8 (9%), urinary retention 7 (8%), and hematuria 4 (5%). 37 (43%) of patients had sling only, 7 (8%) patients had TVM for prolapse only, and 38 (44%) patients had both a sling and TVM. 24 (28%) patients had prior attempts at corrective surgery prior to presentation.

TLUS enables compartmental localization of mesh and provides information about the relationship to the proximal, mid, and distal urethra. Greater detail including proximity to sphincteric unit in patients with obstruction, fragmentation, presence of mesh arms and central segment, mesh redundancy and folding is also obtained. This information is high yield in patients who had prior attempts at removal who continue to be symptomatic.

Conclusions: TLUS is a useful adjunct to clinical history and physical examination for precise localization of TVM. It is essential in re-operative procedures providing key information to aid in surgical planning. Information gathered from the study enables targeted exploration, providing the best attempts at success in mesh removal.

Podium #25
INCONTINENT ILEOVESICOSTOMY IS A VALID OPTION FOR PATIENTS WITH NEUROGENIC BLADDER DYSFUNCTION: RESULTS FROM A SINGLE CENTER EXPERIENCE
Shubham Gupta, MD¹ and Charles Secrest, MD²
¹University of Mississippi, Jackson, MS; ²Mississippi Urology Clinic, Jackson, MS
(Presented by: Shubham Gupta)

Introduction: Incontinent ileovesicostomy has been described for bladder management in the neurogenic population. We review a single surgeon experience with this procedure in 54 patients.

Material and Methods: From July 1994 to Feb 2011, 54 patients underwent incontinent ileovesicostomy. Several patients underwent other concomitant surgeries. Follow up data were available for 42 patients. Mean length of follow up was 48 months (range 6 weeks–12 years).

Results: All patients had failed clean intermittent catheterization, indwelling or external catheter drainage, or prior surgical procedures for bladder management. 28 patients were quadriplegic, 11 were paraplegic, and the rest had other causes of neurogenic bladder including spina bifida and multiple sclerosis. Many patients had other complicating factors including urethral stricture, erosion, and fistula.

30 patients underwent a transabdominal bladder neck closure, while 9 patients underwent a transperineal urethral closure. Concomitant general surgical procedures were done in 14 patients.

30 patients underwent a transabdominal bladder neck closure, while 9 patients underwent a transperineal urethral closure. Concomitant general surgical procedures were done in 14 patients.

There were no perioperative deaths. 9 patients required adjunctive procedures for incontinence or fistula. Of these patients, 2 required conversion to ileal conduit urinary diversion. Both of these events occurred within the first 3 months of the surgery.
2 other patients underwent cystectomy and ileal conduit diversion due to recurrent infections and inability to perform regular irrigations. 4 patients had parastomal or ventral hernia requiring repair.

At last follow up, 35/42 patients were happy with the stoma and the operation. 9 patients have required endoscopic management of bladder debris and stones, and have done well on daily irrigations. Preservation or improvement in upper tracts and renal function was noted in all patients, and new upper tract stone formation was noted in 4 patients.

**Conclusions:** Incontinent ileovesicostomy is a safe and effective method for bladder management in selected patients with neurogenic dysfunction. Satisfactory long term follow-up with acceptable reoperation rate and preservation of upper tracts is noted.

Podium #26
A UNIQUE MODIFICATION TO AUGMENTATION CYSTOPLASTY WITH CATHETERIZABLE STOMA FOR NEUROGENIC PATIENTS: TECHNIQUE AND LONG TERM RESULTS
Rose Khavari, MD¹, Jocelin Liu, MD², Timothy Boone, MD³ and Sophie Fletcher, MD¹
¹The Methodist Hospital, Houston, TX; ²Northwestern University, Chicago, IL
(Presented by: Judy Choi, MD)

**Introduction:** Neurogenic bladder (NGB) with incontinence can be devastating for patients with neurologic illness. Augmentation cystoplasty with a continent catheterizable stoma creates a continent, low pressure storage system, with an easily catheterizable cutaneous stoma leading to both decreased urinary tract morbidity and increased quality of life. This study evaluates the use of a novel procedure, the ileocecal augmentation cystoplasty, or “Indiana augment,” for patients with NGB.

**Design:** Retrospective chart review of Indiana augment procedures by a single surgeon between 1993 and 2009 was performed. Subjects with NGB and minimum 1-yr follow up were included. All patients underwent the modified Indiana continent urinary reservoir procedure in which the large bowel portion of the ileocecal segment is used to augment the native bladder. The efferent limb is tapered and the ileocecal valve is reinforced to form the continent catheterizable cutaneous stoma. Patient demographics, neurologic illness, NGB diagnosis, surgery details, concurrent operations, complications, estimated blood loss, continence outcomes and long term complications were recorded.

**Results:** Fifty eight patients underwent Indiana augment, 35 met inclusion criteria. Mean age at time of surgery was 39.8 (SD 12.8) years. Neurologic diagnoses included MS (n=12), spina bifida (n=9), and spinal cord injury (n=14). Urodynamic findings were: decreased capacity (n=4), decreased compliance (n=4), detrusor external sphincter dyssynergia (n=5), detrusor overactivity with incontinence (n=3), hypocontractility (n=5), or combination (n=14). Concurrent surgeries included: bladder neck closure (n=3), pubovaginal sling (n=4), hysterectomy (n=3), artificial urinary sphincter (n=1), and cystolithotomy (n=1). Mean estimated blood loss was 253.6 mL (SD 136.5). There were no intra operative complications. Short term complications were: prolonged ileus (n=1), wound infection (n=1), low hematocrit requiring transfusion (n=1). Median follow up was 31 months. Long term complications occurred in 10 (29%) patients: recurrent cystitis (n=4), bladder stones (n=2), SBO (n=1) and stomal revision (n=3). All patients were continent at latest follow up.

**Conclusion:** This unique modification of the Indiana continent urinary reservoir is an excellent surgical option providing a low-pressure reservoir with a reliable continence mechanism and easily catheterizable stoma with few complications or need for reoperation.
Podium #27

CHANGES IN SEXUAL FUNCTIONING IN WOMEN AFTER NEUROMODULATION FOR VOIDING DYSFUNCTION
Kenneth M. Peters, MD¹, Jessica M. Yih², Kim A. Killinger¹ and Judith A. Boura¹
¹Beaumont Health System, Royal Oak, MI; ²Wayne State University-Detroit, MI
(Presented by: Kenneth M. Peters)

Introduction: Sacral neuromodulation is now a well-established treatment for urinary and bowel disorders and its uses are being investigated for efficacy in other disorders such as sexual dysfunction. We evaluated changes in sexual functioning in women after neuromodulation for voiding symptoms.

Methods: Patients enrolled in our prospective, longitudinal neuromodulation database study were evaluated. Data were collected from medical records. Patients completed the Female Sexual Function Index (FSFI) which consists of 6 subscale domains, and Interstitial Cystitis Symptom and Problem Indices (ICSIPI) at baseline, and 3, 6, and 12 months post implant. We grouped the women into two groups using baseline FSFI scores: less sexually functional (FSFI score <26) and more functional (score ≥26). Data were analyzed with Pearson’s Chi-square or Fisher’s Exact test and Wilcoxon rank tests.

Results: Of 167 women evaluated, total FSFI scores improved from preimplant (mean 13.5 ± 8.5) to 12 months (n=72; mean 15.9 ± 8.9) (p=0.0044). Women were then grouped into FSFI <26 (n=152) and FSFI ≥26 (n=15) and compared. The groups were similar in demographics. However, since FSFI scores are dependent on sexual activity, all patients in the FSFI ≥26 group were sexually active compared to 46% in the <26 group. At baseline and each follow up point, ICSIPI scores were similar for both groups and improved through time (p<0.0001). For patients with data at 12 months follow up, in the FSFI <26 group there was an improvement from baseline scores (n=63; mean improvement 2.9 ± 6.3; p=0.0006). FSFI domains that improved included desire (p=0.047), orgasm (p=0.0051), satisfaction (p<0.0001), and pain (p=0.011). Furthermore, of the 62 subjects in this group not sexually active at baseline, 10 became sexually active during follow up: 4 at 3 months, 3 more at 6 months, and 3 more at 12 months. In the FSFI ≥26 group there was a significant decline in mean scores at 12 months (n=9; mean −2.8 ± 3.2; p=0.030), however one of the nine had become sexually inactive at 12 months. Significant decreases in domain scores were seen for orgasm (p=0.0155) and satisfaction (p=0.0458), but desire and pain did not change. No changes in arousal or lubrication domains were seen in either group.

Conclusions: Many factors affect sexual functioning in women; however sexual function may improve along with urinary symptoms after neuromodulation.

Funding: Ministrelli Program for Urology Research and Education (MPURE).

Podium #28*

COST-EFFECTIVENESS OF SACRAL NEUROMODULATION AND BOTULINUM TOXIN-A FOR PATIENTS WITH REFRACTORY IDIOPATHIC OVERACTIVE BLADDER
J. Quentin Clemens, MD¹, Jennifer T. Anger², Michael L. Ganz³, Svetlana Denevich³, Dhvani Shah³, Angeline M. Carlson⁴, Michael R. Wittek⁵ and Chris L. Pashos⁶
¹University of Michigan; ²Cedars-Sinai Medical Center, Los Angeles, CA; ³United Biosource Corporation, Lexington, MA; ⁴Data Intelligence Consultants, LLC, Eden Prairie, MN; ⁵Medtronic, Inc., Minneapolis, MN
(Presented by: J. Quentin Clemens)

*Not CME accredited

Introduction and Objectives: Previous cost-effectiveness models comparing sacral nerve neuromodulation (SNM) with intravesical botulinum toxin-A injections (BoNT-A) for the treatment of idiopathic overactive bladder (OAB) have not comprehensively specified clinical pathways and costs. We developed a model, from the Medicare perspective, that expands on previous models and includes a longer time horizon and more flexibility for accounting for treatment options and success probabilities.
Methods: Our model compares two clinically similar cohorts of hypothetical patients with idiopathic OAB refractory to conservative care: those initiating therapy with SNM and those initiating with BoNT–A. Incremental cost-effectiveness ratios for cost per quality-adjusted life year (QALY) and cost per successfully treated month (STM) were computed for 5.5 years of treatment. Patients not responding successfully to initial therapy discontinued or switched therapies (patients try each therapy once). Costs (manufacturer prices and 2010 Medicare payment schedules) and benefits were transformed to present values using a 3% per annum discount rate.

Results: After two years, SNM is more effective, yet more costly ($1,529 per STM and $92,766 per QALY). After 5.5 years of treatment patients initiating treatment with SNM experienced more clinical benefits (45.0 vs. 42.4 STMs and 4.09 vs. 4.04 QALYs per patient) and fewer complications (1,879 vs. 3,434 per 1,000 patients) at lower total costs ($23,466 vs. $27,491 per patient) corresponding to $1,550 saved per STM gained and $87,858 saved per QALY gained. Sensitivity analyses confirmed these results.

Conclusions: Based on this clinically comprehensive model and set of parameters we found that, after 5.5 years, initiating treatment with SNM was more effective and less costly than initiating treatment with BoNT–A.

Podium #29
WITHDRAWN

Podium #30
COMPARISON OF MOTOR AND SENSORY RESPONSE OF INTERSTIM FOR OVERACTIVE BLADDER
Jennifer Lee, MD¹, Kathryn Osann, PhD² and Karen Noblett, MD³
¹Orange, CA; ²University of California Irvine, Department of Medicine, Irvine, CA; ³University of California Irvine, Division of Urogynecology, Orange, CA
(Presented by: Jennifer Lee)

Introduction: The mechanism of sacral nerve stimulation (SNS) for overactive bladder (OAB) is thought to be mediated primarily via sensory afferent inhibitory pathways but may also work indirectly via motor efferent input to the urethral sphincter, promoting the urethral-bladder reflex and detrusor relaxation.

Objective: 1) To determine correlation of motor and sensory response of SNS in subjects with OAB. 2) To determine if subjects reprogrammed to achieve motor response had improved voiding diary parameters.

Materials and Methods: Descriptive pilot study of patients with existing SNS device for OAB. Subjects completed voiding diaries and were questioned regarding subjective improvement at current settings. Subject’s implantable pulse generator was interrogated while surface electromyography (EMG) was performed using rectal sponge electrode. EMG screen was evaluated for baseline motor response demonstrated by compound muscle action potential (cMAP) at current settings. Stimulation was reduced to zero then incrementally increased. Stimulation levels evoking subject sensation and motor response were recorded and used for correlation calculation. Subjects without baseline motor response were reprogrammed to achieve cMAP and voiding diaries were completed post-reprogramming.

Results: 31 subjects were recruited. 12 subjects (39%) had motor response (cMAP) at current settings. Subjects with motor response were significantly more likely to report sensation of stimulation vs. those without (58 v. 11%, p=.02). Of subjects with baseline cMAP, 83% reported ≥50% improvement in symptoms v.68% without cMAP (NS). Motor response was found to be significantly correlated with sensory response (r=0.90, p<.0005). 16 of 19 subjects without baseline motor response were successfully reprogrammed to achieve cMAP. Improvement in nocturia, incontinence, and urgency incontinence episodes (14.4, 19.8, 18.2%,NS) was seen in the reprogrammed group.

Conclusion: SNS motor and sensory response stimulation levels are significantly correlated. Reprogramming to achieve cMAP resulted in 15–20% improvement in OAB symptoms over baseline improvement. This supports the idea that both motor efferent and sensory afferent portions of the sacral nerve may contribute to SNS mechanism.

Funding: American Urogynecologic Society Grant.
Podium #31
RADIATION EXPOSURE TO THE PATIENT AND PHYSICIAN DURING SACRAL NEUROMODULATION
Alana Murphy, MD, Courtney Lee, MD, Kevin Wunderle, Howard Goldman, MD and Sandip Vasavada, MD
Cleveland Clinic, Cleveland, OH
(Presented by: Alana Murphy)

Introduction and Objective: In 2010, the FDA launched an initiative to reduce radiation exposure during medical diagnostics and medical procedures. Radiation exposure to the patient and physician during sacral neuromodulation has not been reported in the literature. This study aims to calculate the radiation exposure to both the patient and physician during sacral neuromodulation with the InterStim® device.

Methods: We conducted a prospective IRB approved study to determine the radiation exposure to both the patient and physician during sacral neuromodulation. The study population included patients undergoing initial lead placement, peripheral nerve evaluation (PNE) or lead revision for urinary frequency, urge incontinence or non-obstructive urinary retention. Each procedure was performed by one of four fellowship trained urologists. The physician’s radiation exposure was measured using an electronic radiation dosimeter placed on the outside of their lead apron and the patient’s radiation exposure was measured using a radiation sensitive film placed on the lateral hip facing the x-ray source.

Results: A total of 34 patients have been enrolled. Four patient dose readings were excluded based on improper handling of the radiation sensitive film. The patients were predominantly female (91.2%) with a mean age of 60.7 years old (23.2–90.5) and a mean BMI of 30.2 kg/m2 (17.7–45.7). Indication for sacral neuromodulation included urinary frequency in 9 patients (26.5%), urge incontinence in 14 patients (41.2%) and non-obstructive urinary retention in 11 patients (32.3%). Details of the procedures and radiation exposure for the patient and physician are characterized in table one.

Conclusion: Radiation exposure to both the patient and physician is lowest during a PNE procedure and greatest during the initial lead placement. Although our results indicate that radiation exposure is minimal during sacral neuromodulation, the cumulative dose for physicians should not be ignored. With a mean exposure of 1.7 mrem during an initial lead placement, a physician is exposed to the equivalent of one chest x-ray with every 4.7 procedures.

Funding: This project was supported by a grant from SUFU.

<table>
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<th>Procedure</th>
<th>No. Patients</th>
<th>No. Leads</th>
<th>Procedure Time* (min)</th>
<th>Fluoro Time* (sec)</th>
<th>Physician Dose* (mrem)</th>
<th>Patient Dose* (mGy)</th>
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<td>1 n=1 2 n=7</td>
<td>23 (20-32)</td>
<td>8.3 (6-16)</td>
<td>0.3 (0-1.2)</td>
<td>3.8 (0.1-10.5)</td>
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<td>29.5 (6-60)</td>
<td>1.7 (0-6.1)</td>
<td>37.2 (14.1-64.2)</td>
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<tr>
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<td>1 n=9</td>
<td>51 (42-74)</td>
<td>13.1 (6-30)</td>
<td>0.5 (0-2.4)</td>
<td>14.0 (9.8-21.5)</td>
</tr>
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</table>

* All values listed are means

Podium #32
THULIUM LASER VAPORIZATION OF THE PROSTATE: INITIAL SHORT-TERM OUTCOMES
Olufenwa Famakinwa, MD and Doreen Chung, MD, FRCSC
University of Chicago Medical Center – Section of Urology, Chicago, Illinois; Mount Sinai Hospital – Chicago, Illinois
(Presented by: Olufenwa Famakinwa)

Introduction and Objectives: The Thulium laser was introduced in 2005. Existing data from outside North America shows comparable efficacy and lower morbidity to TURP. The predominant methods in these studies are VapoEnucleation or VapoResection. Few studies exist concerning vaporization. To our knowledge, this is the first North American study reporting outcomes of transurethral thulium vaporization of the prostate (ThuVP).

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Methods: From December 2010 to September 2011, 19 men underwent ThuVP by a single surgeon at a teaching institution using the Cyber TM ®. Patients had a thorough preoperative assessment including uroflowmetry ± urodynamic testing, International Prostate Symptom Score (IPSS), and quality of life (QoL) questionnaires. Indications for surgery were refractory lower urinary tract symptoms, recurrent hematuria, recurrent urinary tract infection (UTI), or urinary retention. Changes in serum hemoglobin, sodium, IPSS, QoL score, maximum flow rate (Qmax) and post–void residual (PVR) were evaluated postoperatively. Adverse events were documented. There are no financial disclosures or funding to report.

Results: Mean age was 68 ± 10 years, and mean prostate size 68.8 ± 51.3 cc. Mean laser time was 34.7 ± 15.4 minutes, and mean total energy was 240,477 ± 136,626 J. No blood transfusions were required. There was no significant change in pre– and post–operative serum hemoglobin (mean drop 0.4, p = 0.082) or sodium (mean drop 0.4, p = 0.68). The only complication was initial postoperative retention in 1 patient. Significant improvement was seen in all voiding parameters (figure 1): 1–week mean Qmax (7.0 vs.17.1, p =0.002), 1–month mean Qmax (7.0 vs. 22.1, p= 0.012), 1–month mean IPSS score (21.4 vs. 10.8, p = 0.041), 1–week mean PVR (209 vs. 20 mL, p=0.039),1–month mean PVR (209 vs. 35, p = 0.03), and 1 month mean QoL score (5 vs. 2, p = 0.01). All 5 patients initially in urinary retention were voiding spontaneously at 1–month follow up.

Conclusions: Short–term results of ThuVP demonstrate good safety and efficacy with minimal complications. Further following up is needed to evaluate its durable efficacy.

Podium #33
Moved to Thursday Female Urology / Incontinence Moderated Poster Session (Poster #M10.5)

Podium #34*
PREVALENCE AND CORRELATES OF URINARY INCONTINENCE AMONG OLDER, COMMUNITY-DWELLING CALIFORNIANS
Aqsa Khan, MD¹, Catherine Bresee, MS², Claudia Sevilla, BS³, Emily Dubina, BS³ and Jennifer Anger, MD²
¹UCLA Department of Urology; ²Cedars-Sinai Medical Center, Los Angeles, CA; ³UCLA David Geffen School of Medicine, Los Angeles, CA
(Presented by: Aqsa Khan)
*Not CME accredited

Introduction: Understanding the prevalence and correlates of urinary incontinence (UI) becomes increasingly important as the older population in the United States rapidly grows. UI among community–dwelling adults is associated with an increased risk of nursing home admission. UI may be an important predictor of health in older, non–institutionalized adults.

Objectives: To determine the prevalence and correlates of UI among older, community–dwelling Californians by analyzing data from the California Health Interview Survey (CHIS).
Methods: CHIS is a biennial, population-based random digit dialing telephone survey which began in 2001. The CHIS 2003 adult survey included one question for Californians aged 65+ about UI: “In the past 30 days, have you been incontinent, that is unable to hold or control your urine more than once?” Univariate and multivariate analyses were conducted for correlates of UI with respect to demographics, general health, co-morbidities, and health behaviors.

Results: 8,668 individuals aged 65+ responded. Overall prevalence was 25.4% and 14.5% among females and males respectively. UI was significantly associated with poorer health, increased falls, decreased mobility, and other co-morbidities (see Table). Prevalence increased with age and female gender. After adjusting for other health factors there was no significant association found with level of education, household income, smoking status, or alcohol consumption.

Conclusions: UI prevalence among men and women in California parallels that of other population-based studies. CHIS demonstrated that poor health, falls, and mobility are strongly correlated with UI. CHIS data did not find a correlation between UI and smoking after adjusting for other health factors, a debated association in prior studies.

Funding: Funded by an NIDDK Patient-Oriented Career Development Award (1 K23 DK080227, JTA) and an American Recovery and Reinvestment Act Supplement.

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Podium #35

URINE CHEMOKINES LEVELS CORRELATE WITH TREATMENT RESPONSE TO PHOSPHODIESTERASE 4 INHIBITOR DRUG IN PROSTATITIS PATIENTS

Pradeep Tyagi, PhD, Kim Killinger, MSN, Gregory McLennan, MD, Nirmal Jayabalan, PhD, Michael Chancellor, MD and Kenneth Peters, MD
(Presented by: Pradeep Tyagi)

Introduction: We examined the levels of cytokines/chemokines in urine of CP/CPPS patients and their correlation with the treatment response response of patients on Ampremilast (phosphodiesterase 4 inhibitor), which is known to modulate the expression of various mediators involved in inflammation and angiogenesis.

Methods: Levels of chemokines and growth factors quantified by MILLIPLEX™ MAP immunoassay in urine collected from 18 CP/CPPS patients and 7 asymptomatic subjects at baseline and at 4, 8, 12 and 16 weeks in 8 patients (mean age 46.5 ± 9.4 years) who consented and adhered to a minimum of 8 weeks of treatment. Bivariate and multivariate association between chemokine levels and improvements in clinical outcomes measured by the Chronic Prostatitis Symptom Index (CPSI) and pain Visual Analog Scale (VAS) were examined.

Results: Urine levels of CXCL-1 (GRO-a), CXCL-8 (IL-8), CXCL-10 (IP-10) and CCL5 (RANTES) chemokines at baseline were significantly elevated in CP/CPPS patients and levels of sIL-1RA were significantly lower compared to asymptomatic controls (*p<0.05; see attached fig). Multivariate modeling of (n=8) both treatment adherent and non-adherent patients showed elevation of CXCL-8 and CCL5 increased the odds for higher CPSI by 54% and 25%, respectively (F test, p=0.00007). Bivariate analysis of longitudinal data of adherent patients (n=5) showed strong linear correlation of reduced levels of CXCL-10, CXCL-8, CCL5, CCL2 and PDGF with improvement in clinical activity as measured by VAS and CPSI (Pearson r =0.83– 0.97; p<0.05).
Conclusions: This is the first report documenting the successful longitudinal measurement of chemokines in urine of CP/CPPS patients instead of seminal plasma. Urine levels of chemokines such as CXCL−10, CCL5 and PDGF can be sensitive, objective and non−invasive biomarkers for monitoring patient response to new therapeutic intervention for CP/CPPS. The study offers insight into the mechanisms underlying the efficacy of ampremilast in prostatitis.

Podium #36
Moved to: Friday Male Incontinence / Urodynamics Moderated Poster Session (Poster #M20.5)

Podium #37
CAN URINE CXCL−1 AND CXCL−10 LEVELS SERVE AS NOINVASIVE MARKERS FOR HUNNER LESIONS IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME?
Lauren Hendrix, MD and Deborah Erickson, MD
Lexington, KY
(Presented by: Lauren Hendrix)

Introduction and Objectives: Interstitial cystitis/bladder pain syndrome (IC/BPS) has two types: with or without Hunner lesions (HL). Two recent pilot studies used array technology to seek noninvasive markers for HL. [1,2] Comparing HL patients, non−HL patients and controls, the HL patients had increased inflammatory gene expression in the urine sediment [1] and increased CXCL−1, CXCL−10 and IL−6 protein levels in the urine supernatant. [2] To confirm the most promising results from these array studies, and to evaluate a more inexpensive and clinically feasible method of urine testing, we assayed IC/BPS and control urine for CXCL−1 and CXCL−10 using ELISA kits.

Methods: Urine was collected from IC/BPS patients and controls. Urine was centrifuged and the supernatants were stored at −80 C until assayed. CXCL−1 and CXCL−10 were assayed using Quantikine kits from R&D systems (Minneapolis, MN). Urine creatinine was assayed using the Parameter kit from R&D systems. Cytokine levels (pg/mg creatinine) for 11 HL patients, 16 non−HL patients and 10 controls were compared using the Kruskal−Wallis test with Dunn post−test.

Results: CXCL−10 levels (median, range) were 0.4 (0.18−1.47) for HL patients, 0.055 (0.01−0.52) for non−HL patients and 0.065 (0.04−0.26) for controls. Levels for HL patients were significantly higher than for non−HL patients (p<0.001) and controls (p<0.01). For CXCL−1, levels were 0 for all controls. Median and range levels for non−HL and HL patients were 0 (0−0.23) and 0.01 (0−0.26), respectively.

Conclusions: The Quanitkine ELISA assay for urine CXCL−1 is unlikely to be a useful clinical marker for IC/BPS. In contrast, urine CXCL−10 levels were about 10−fold higher for HL patients, compared to non−HL patients and controls. CXCL−10 may be a useful noninvasive marker for HL.

Funding: University of Kentucky: Division of Urology and Endowment for Neuro−urologic Research
Podium #38

UTILIZATION AND TECHNIQUE OF HYDRODISTENSION FOR INTERSTITIAL CYSTITIS: OUTCOMES OF A SOCIETY FOR URODYNAMICS AND FEMALE UROLOGY (SUFU) SURVEY

Kristin Broderick, MD, Benjamin G. Martin, MD, L. Keith Lloyd, MD and Tracey S. Wilson, MD
University of Alabama at Birmingham, Birmingham, AL
(Presented by: Kristin Broderick)

Introduction and Objectives: To our knowledge the indications for and technique of hydrodistension (HD) for the diagnosis and treatment of interstitial cystitis/bladder pain syndrome (IC/BPS) are not standardized. We surveyed members of the Society for Urodynamics and Female Urology (SUFU) to assess the variability of this technique amongst the subspecialty’s experts.

Methods: With SUFU approval, a 16 item, multiple choice email-based survey was confidentially distributed to 518 members of SUFU. The questions focused on indications for and the technique of HD. The results were analyzed using web-based survey software.

Results: The response rate for the survey was 28.6%. Eighty-nine percent of the respondents were urologists. Of those in practice 1–5 years 92% were fellowship trained versus 26% of those in practice >20 years. Eighty-six percent believe that HD has a role in the diagnosis and management of IC, but only 49% routinely perform it. Urodynamic studies are not routinely performed prior to HD in 70.6% of those surveyed. Eighty-nine percent use general anesthesia when performing HD and 91% raise the height of the fluid bag to generate the distension pressure. The pressure to distend the bladder varies with 39.6% and 34.5% distending to 60–80 and 80–100 cm of water respectively. The duration of distension also varies from 2 minutes to >10 minutes, with the majority (42.5%) distending for 2–5 minutes. Thirty-nine percent distend the bladder once, while 56.3% distend twice during a single operative session. Twenty-one percent perform a biopsy in the presence of normal appearing bladder mucosa, and 30.6% instill rescue solution of varying components at the end of the distension. There is no difference in HD technique or utilization between members in practice 1–5 years versus those in practice >20 years.

Conclusions: Despite the utilization of this practice for decades, the indications for and the technique of HD vary greatly amongst the experts in the field of female urology, and are just as varied for younger versus older, and fellowship trained versus non–fellowship trained physicians. Standardization of the indications for and the technique of HD will allow comparison of diagnostic and therapeutic studies, thereby allowing us to serve those patients who suffer from IC/BPS more effectively.
Podium #39

MAST CELL INDUCES CHRONIC PELVIC PAIN IN EXPERIMENTAL AUTOIMMUNE CYSTITIS
Fuat Bicer, MD¹, 4, Cengiz Z. Altuntas, PhD¹, Kenan Izgi, MD¹, 4, Ahmet Ozer MD¹, 2, Ismail Sayin, MS ¹, 3 and Firouz Daneshgari, MD¹
¹Urology Institute, University Hospitals Case Medical Center, Cleveland OH, ²Department of Genetics; ³Department of Biology, Case Western Reserve University, Cleveland OH; ⁴Department of Clinical Chemistry, Cleveland State University, Cleveland, OH
(Presented by: Fuat Bicer)

Background: Interstitial Cystitis IC/PBS is a chronic inflammatory bladder condition with unknown pathophysiology. Mast cell (MC) leading autoimmune condition is the most probable reason for the condition.

Objective: The main reason of the condition and cause of pain in IC/PBS is still an enigma. The aim of this project was to identify the pathophysiology of IC/PBS and the origin of the pelvic pain by using recently created animal model.

Design, Setting, and Participants: We used a recently created animal model. BALB/C mice, which are at 6-8 weeks of age, were immunized with UPK3A 65-84 peptide in an emulsion and Complete Freund’s Adjuvant (CFA) via subcutaneous injection of 200 µg of UPK3A 65-84 in 200 µl of an emulsion.

Measurements: The visceral pain was measured from the supra-pelvic region and hind paw region of the immunized and control mice by using calibrated von Frey monofilaments. Urodynamic chambers were used for analyzing the urodynamic function of each immunized and control mice. Immunized and control mice were sacrificed at 10th, 20th and 40th day and their organs were harvested for RT PCR, and immunohistochemistry.

Results and Limitations: We found that visceral pain responses measured by using von Frey monofilaments of the immunized mice were significantly different from control group. We showed MC accumulation in whole bladder by RT-PCR and immune-staining methods. We also showed mast cell blocking by certain medications significantly decreased visceral hyperalgesia. The bladder-body weight ratio was increased in immunized mice compared control mice. FVC (Frequency voiding chart) analysis showed increased micturition frequency and decreased urine output per micturition in immunized mice compared to control mice.

Conclusions: We clearly showed that the former created novel EAC model induces chronic pelvic pain. We also showed that MC accumulation at different time points increases in bladder and causes chronic visceral pain.

Funding: This work has been supported through NIH Grant 1 R03 HD061825 (PI: Daneshgari).

Podium #40

POLY-SYMPOTOMATIC, POLY-SYNDROMIC SOMATOFORM PRESENTATION IN PATIENTS WITH UROLOGIC CHRONIC PELVIC PAIN SYNDROME (UCPPS)
H. Henry Lai, MD¹, Carol North, MD, MPE², Gerald Andriole, MD¹, Gregory Sayuk, MD, MPH¹ and Barry Hong, PhD¹
¹Washington University in St. Louis, St. Louis; ²University of Texas Southwestern Medical Center, Dallas, TX
(Presented by: H. Henry Lai)

Introduction and Objectives: Somatoform disorders have been described in several comorbid functional syndromes of UCPPS, such as in irritable bowel syndrome. The goal of this study is to investigate if a subset of UCPPS patients may have somatoform disorders.

Methods: 70 male and female UCPPS patients and 35 age–matched control patients without UCPPS completed a 59–item questionnaire that assessed both pain and non–pain somatic symptoms across 10 symptom categories. Patients with somatoform disorders, especially somatization disorder, endorse multiple symptoms in many organ systems in a classic “poly–symptomatic, poly–syndromic” symptom pattern. In this study, we had used two operational tools (Perley–Guze–derived symptom checklist and DSM–IV–TR symptom criteria) to assess for the “poly–symptomatic, poly–syndromic” symptom pattern characteristic of somatoform disorders.
Results: Female UCPPS patients (IC/BPS) reported significantly more non–pain symptoms and pain symptoms outside the pelvis compared to female urology patient controls (p=0.0016 and 0.0018). Female UCPPS patients were more likely to report a constellation of symptoms characteristic of somatoform disorders than female controls. About 1 of out 4 female UCPPS patients endorsed a “poly–symptomatic, poly–syndromic” symptom pattern characteristic of somatoform disorders. In contrast, male UCPPS patients (IC/BPS and/or CP/CPPS) did not report more extra–pelvic pain compared to male controls (p=0.89). Male UCPPS patients were not more likely than male controls to have a somatoform symptom pattern. Only 1 out of 10 male UCPPS patients exhibited a somatoform symptom pattern.

Conclusion: A subset of female and male UCPPS patients who report numerous extra–pelvic symptoms across multiple organ systems may have somatoform disorders. The symptom checklist may be valuable in assessing patients for a “poly–symptomatic, poly–syndromic” symptom pattern characteristic of somatoform disorders. Recognition of this somatoform presentation may allow optimization of care of UCPPS patients.

Disclosure: No conflict of interest.

Funding: NIH DK082315
ANALYSIS OF TRP RECEPTORS INVOLVED IN PELVIC ORGAN CROSS-SENSITIZATION IN RATS
Akira Furuta, MD, PhD, Shin Egawa, Michael B. Chancellor, Naoki Yoshimura
Department of Urology, Jikei University School of Medicine, Tokyo, Japan
(Presented by: Akira Furuta)

Purpose: Pelvic organ cross-sensitization could play a role in the overlap of chronic pelvic pain disorders such as bladder pain syndrome/interstitial cystitis (BPS/IC), irritable bowel syndrome and endometriosis by the convergence of pelvic afferents, on which transient receptor potential (TRP) receptors are expressed. Thus, we analyzed TRP receptors involved in the pathogenesis of BPS/IC using rat models of pelvic organ cross-sensitization.

Materials and Methods: Cystometry was performed in an awake condition when allyl isothiocyanate (AI: 10-300mM), a TRPA1 activator, capsaicin (0.1-3mM), a TRPV1 activator, RN1747 (0.1-3mM), a TRPV4 activator, or menthol (30-1000mM), a TRPM8 activator, was cumulatively applied into the colon or uterus. Effects of ruthenium red (RR), a TRPA1 inhibitor, on bladder overactivity triggered by intracolonic AI (100mM) application was also examined. Nociceptive behavior triggered by intracolonic or intrauterine AI application was scored, and Evans blue (EB) dye extravasation was then determined in each organ.

Results: Decreased voiding threshold pressure and bladder capacity were induced by 100mM or greater intracolonic or intrauterine AI application, but not by TRPV1, TRPV4 or TRPM8 stimuli. Bladder overactivity via TRPA1 stimulation was prevented by the intravenous pretreatment of RR. Nociceptive behavior scores were significantly increased in AI applied groups compared with controls. Plasma (EB dye) extravasation was significantly increased in the inflamed organs and the bladder.

Conclusions: TRPA1 stimulation in the colon or uterus can induce bladder overactivity, visceral pain and bladder inflammation. Therefore, the TRPA1 receptor plays an important role in pelvic organ cross-sensitization and may contribute to the pathogenesis of BPS/IC.

Keywords: transient receptor potential channels, interstitial cystitis, colon, uterus, cross-sensitization
Objective: Since the first reported laparoscopic sacrocolpopexy in 1991, retrospective and prospective studies have shown similar outcomes to the open approach. To capture real-world outcomes of sacrocolpopexy, we sought to compare surgical outcomes between open and laparoscopic-assisted (including robotic) approaches using Medicare claims data.

Methods: Data for a 5% random national sample of Medicare beneficiaries age 65 and older were obtained from Public Use Files from the Centers for Medicare and Medicaid Services for years 2004–2008. Women with pelvic organ prolapse were identified using ICD-9 diagnosis codes. CPT-4 procedure codes were used to identify women with open (code 57280) or laparoscopic (code 57425) sacrocolpopexy with follow-up for one year. Outcomes measured included medical and surgical complication rates and early re-operation rates using ICD-9 and CPT-4 codes.

Results: A total of 970 women underwent sacrocolpopexy from 2004 to 2008. Of these, 794 were open and 176 were laparoscopic. More cardiopulmonary complications occurred post-operatively in the open group. Patients that had a laparoscopic sacrocolpopexy had an increased rate of re-operation for anterior vaginal wall prolapse (3.4% vs. 1%, P = 0.018). Mesh-related complications were significantly higher in the laparoscopic group with concomitant hysterectomy when compared to an open sacrocolpopexy with concomitant hysterectomy (5.4% vs. 0.0%, P = 0.026)

Conclusion: Perioperative complication rate was higher in the open sacrocolpopexy group. However, laparoscopic sacrocolpopexy resulted in increased rate of reoperation for recurrent prolapse and more mesh-related complications when performed together with a hysterectomy.

Funding: Funded by a National Institute of Diabetes and Digestive and Kidney Diseases Patient-Oriented Research Career Development Award (1 K23 DK080227, JTA) and an American Recovery and Reinvestment Act (ARRA) Supplement
Podium #42
NEUROTROPHIN THERAPY IMPROVES RECOVERY OF THE NEUROMUSCULAR CONTINENCE MECHANISM FOLLOWING SIMULATED BIRTH INJURY IN RATS
Bradley Gill, BSE¹, Brian Balog, BS¹, Charuspong Dissaranan, MD¹, Hai-Hong Jiang, MD, PhD¹, James Steward, BS¹, Dan Li Lin, MD² and Margot Damaser, PhD¹
¹Cleveland Clinic, Cleveland, OH; ²Louis Stokes VA, Cleveland, OH
(Presented by: Bradley Gill)

Introduction and Objectives: Inadequacy of the neuromuscular continence mechanism comprised of the pudendal nerve (PN) and external urethral sphincter (EUS) has been implicated in the pathogenesis of Stress Urinary Incontinence (SUI), both acutely and long after childbirth. Neurotrophins such as brain−derived neurotrophic factor (BDNF) are over−expressed by innervated target organs after nerve injury to stimulate neuroregeneration. However, simultaneous EUS trauma during childbirth opposes the effects of PN injury on EUS BDNF expression. This study investigated the functional and neuroregenerative response of the neuromuscular continence mechanism to neurotrophin treatment after simulated childbirth injury.

Methods: Age−matched virgin Sprague−Dawley rats received either untreated sham PN injury or simulated childbirth injury consisting of PN crush and vaginal distention followed by a continuous, targeted infusion of either BDNF or saline placebo to the PN injury site. The neuromuscular continence mechanism was assessed 14 and 21 days after injury and treatment initiation by leak point pressure (LPP) and EUS electromyography (EMG). The neuroregenerative response of the pudendal nerve (BII−tubulin expression) and the expression of BDNF in the EUS were assessed by PCR 4, 8, and 12 days after injury along with EUS histology. Immunofluorescence was utilized to confirm protein expression.

Results Obtained: LPP was significantly decreased with saline compared to BDNF treatment or sham injury 14 days after injury. Compared to sham injury, EUS EMG amplitude during LPP and at rest was reduced significantly with saline but not BDNF treatment 14 days after injury, as was resting EUS EMG firing rate. There were no significant differences between groups 21 days after injury. EUS BDNF and PN BII−tubulin expression suggested BDNF improved the neurogenerative response and facilitated EUS recovery and re−innervation while saline did not. Compared to sham injury, histology revealed less atrophy and fibrosis in the EUS with BDNF than saline.

Conclusions: Continuous, targeted, neurotrophin therapy accelerated functional recovery of the neuromuscular continence mechanism after simulated childbirth injury. This likely occurred via a combined stimulation of PN neuroregeneration and EUS recovery and re−innervation. Treatment with neurotrophins or targeted upregulation of neurotrophin levels may be useful for treating SUI in women.

Funding: NIH Grant R01−038679, VA
Video #1
DORSAL VAGINAL GRAFT URETHROPLASTY FOR FEMALE URETHRAL STRICTURE DISEASE
Alexandra Rogers, MD and Steven Petrou, MD
Department of Urology, Mayo Clinic Florida, Jacksonville, Florida
(Presented by: Alexandra Rogers)

Video #2
ILEOCECAL AUGMENTATION CYSTOPLASTY: THE INDIANA AUGMENT
Judy Choi, MD¹, Joceline Liu, MD¹, Rose Khavari, MD², Timothy Boone, MD, PhD² and Sophie Fletcher, MD²
¹Baylor College of Medicine, Houston, Texas; ²The Methodist Hospital, Houston, Texas
(Presented by: Judy Choi)

Video #3
MANAGEMENT OF AN INTRAVESICAL TRANSVAGINAL TAPE MESH WITH CALCULUS FORMATION
Yvonne Koch, MD¹ and John Shields, MD²
¹University of Miami, Miami, Florida; ²University of Miami, Department of Urology, Miami, Florida
(Presented by: John Shields)

Video #4
NARROW BAND IMAGING IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME
Dominique El-Khawand, MD, Salim Wehbe, MD and Kristene Whitmore, MD
Drexel University College of Medicine, Philadelphia, PA
(Presented by: Dominique EL-Khawand)

Video #5
LAPAROSCOPIC MITROFANOFF APPENDICOVESICOSTOMY
Judy Choi, MD and Lars Cisek, MD, PhD
Baylor College of Medicine, Houston, TX
(Presented by: Judy Choi)

Video #6
URETERAL STENT PLACEMENT: AN EDUCATIONAL VIDEO
Andrea Crane, MD, Kristy Borawski, MD, Elizabeth Calloway, and Anna Marie Connolly, MD
University of North Carolina at Chapel Hill
(Presented by: Andrea Crane)

Video #7
ROBOTIC SACRAL COLPOPEXY TIPS AND TRICKS FOR DIFFICULT SITUATIONS
C.R. Powell, MD
Indianapolis, IN
(Presented by: C.R. Powell)

Video #8
TRANSVAGINAL BLADDER NECK CLOSURE WITH URETHRAL FOLDING
Majid Mirzazadeh, MD¹, Irina Stanasel, MD², John Smith, MD¹ and Gopal Badlani, MD¹
¹Wake Forest University Baptist Medical Center, Department of Urology, Winston-Salem, NC; ²Wake Forest, Winston-Salem, NC
(Presented by: Irina Stanasel)
Video #9
THULIUM LASER VAPORIZATION OF THE PROSTATE: STEPWISE DEMONSTRATION OF TECHNIQUE AND SHORT-TERM DATA
Olufenwa Famakinwa, MD¹ and Doreen Chung, MD, FRCSC¹,²
¹University of Chicago Medical Center, Section of Urology, Chicago, Illinois; ²Mount Sinai Hospital, Chicago, Illinois
(Presented by: Olufenwa Famakinwa)

Video #10
ROBOTIC BLADDER AUGMENTATION
Lee Zhao, MD, Elodi Dielubanza, MD, Stephanie Kielb, MD and John Hairston, MD
¹Northwestern University, Chicago, IL
(Presented by: Elodi Dielubanza)

Video #11
REPAIR OF RECURRENT VESICOVAGINAL FISTULA WITH RIGHT PEDICLE GRACILIS FLAP
Gareth Warren, MD, Christopher Pannuci, MD, Neil Haraway, MD, William Kuzon, MD, and Humphrey Atiemo, MD
University of Michigan, Ann Arbor, MI
(Presented by: Gareth Warren)

Video #12
LAPAROENDOSCOPIC SINGLE-SITE (LESS) HYSTEROPEXY
Michael Ingber, MD
Saint Clare's Health System, Denville, NJ
(Presented by: Michael Ingber)
APPLICATION FOR MEMBERSHIP

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  An individual (MD, PhD, DO) with a strong interest in the field, who has been in practice for at least one year. The individual must submit two letters of recommendation from Full Members. Full Members have voting rights.

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  An individual with an interest in the field who does not satisfy the criteria as a Full Member, including individuals working in training (resident, fellow, post-doc), allied health professional (nurse, NP, PA) or individuals in industry-related positions. Letters of recommendation are not needed. Affiliate Members have NO voting rights.

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Current Position __________________________________________

Number of Refereed Publications __________________________

List two FULL members of the society who will forward reference letters on your behalf:

1) ____________________________ 2) ____________________________

Please send this application along with your CV to:

Society for Urodynamics & Female Urology
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1100 East Woodfield Road, Suite 520
Schaumburg, IL 60173
Phone: (847) 517-7225
Fax: (847) 517-7229
Email: info@sufuorg.com

Signature of Applicant ____________________________ Date ____________________________
# Alphabetic Index of Presenters

Author/Presenter, Date, Time, and Abstract Placement

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2/28/12  5:30 p.m.  Poster #BS11
3/1/12  5:35 p.m.  Poster #M2
3/2/12  8:30 a.m.  Poster #NM32
3/2/12  8:30 a.m.  Poster #NM42

Dissaranan, Charuspong
2/29/12  4:30 p.m.  Poster #BS34

Dover, Crystal M.
3/1/12  5:35 p.m.  Poster #M8

Edokpolo, Leonard
3/2/12  8:30 a.m.  Poster #M15

Eilber, Karyn Schlunt
3/3/12  8:00 a.m.  Poster #NM49

El-Khawand, Dominique
3/1/12  8:00 a.m.  Video #4
3/2/12  9:00 a.m.  Podium #21

Elliott, Christopher Stephen
3/1/12  6:35 p.m.  Podium #15
3/2/12  8:30 a.m.  Podium #18

El-Zawahry, Ahmed Mokhtar
3/1/12  5:35 p.m.  Poster #NM29
3/1/12  5:35 p.m.  Poster #NM18

Enemchukwu, Ekene A.
3/1/12  5:35 p.m.  Poster #M4
3/2/12  8:30 a.m.  Poster #M18

Famakinwa, Olufenwa Juanita
3/1/12  8:00 a.m.  Video #9
3/3/12  8:00 a.m.  Podium #32

Fine, Matthew S
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3/1/12  5:35 p.m.  Poster #NM7

Fok, Cynthia See-Ming
3/3/12  8:00 a.m.  Poster #NM53

Fox, Cara-Louise
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Fraser, Matthew O.
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Ghoniem, Gamal Mostafa
3/1/12  5:35 p.m.  Poster #NM15

Gill, Bradley
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3/3/12  10:00 a.m.  Podium #42

Gleason, Jonathan Lee
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Gomelsky, Alexander
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Gomez, Sandra
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Gupta, Shubham
3/2/12  9:40 a.m.  Podium #25

Hall, Matthew S.
3/1/12  6:45 p.m.  Podium #16

Haraway, Allen McNeil
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3/3/12  8:00 a.m.  Poster #NM60

Hedge, Aparna
3/1/12  5:35 p.m.  Poster #NM20

Hendrix, Lauren
3/3/12  8:50 a.m.  Podium #37
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