

# *C U R R I C U L U M V I T A E*

**Phillip P. Smith, M.D.**

## **DEPARTMENT OF PRIMARY APPOINTMENT:**

Department of Surgery / Division of Urology  
University of Connecticut Health Center  
263 Farmington Avenue  
Farmington, CT 06032

## **ACADEMIC APPOINTMENTS, UNIVERSITY OF CONNECTICUT:**

- 2014- Associate Professor, University of Connecticut Health Center  
Key Faculty, UCHC Residency in Urology, 2007-present  
Secondary Appointment: Ob/Gyn, 2007-present  
Graduate Faculty, Biomedical Science/Neuroscience, 2017-present
- 2009 -2016 Connecticut Children's Hospital, Hartford CT  
Primary Appointment, Urology
- Director, Voiding Dysfunction and Urodynamics Lab, 2009-2016
  - Key Faculty, UConn Pediatric Urology Fellowship Program, 2011-2016
- 2008- Center on Aging, University of Connecticut Health Center
- Core Research Faculty (secondary appointment)
- 2007 - 2014 Assistant Professor, University of Connecticut Health Center

## **PROFESSIONAL EXPERIENCE PRIOR TO UNIVERSITY OF CONNECTICUT**

- July 2005-June 2007: Baylor College of Medicine, Scott Department of Urology, Fellow in Female Urology and Voiding Dysfunction, Rodney A. Appell, Director.
- 2004-2005: Baylor College of Medicine, Department of Obstetrics and Gynecology, Fellow in Female Pelvic Medicine and Reconstructive Surgery, Paul M. Fine, Director.
- 1988 - 2004: Partner at Sycamore Medical Associates, Sycamore, Ohio. Private practice in ob/gyn. Primary hospital affiliation Wyandot Memorial Hospital, Upper Sandusky OH.

## **EDUCATIONAL BACKGROUND:**

- August 2014 **Butler-Williams Scholars Program**, National Institute on Aging, NIH, Bethesda Md
- June 2013 **Board certification, ABOG/ABU Female Pelvic Medicine and Reconstructive Surgery**
- 2005-2007 **Fellowship in Voiding Dysfunction and Female Urology**, Scott Department of Urology, Baylor College of Medicine, Houston TX

- 2004-2005      **Fellowship training in Female Pelvic Medicine and Reconstructive Surgery**, Department of Obstetrics and Gynecology, Baylor College of Medicine, Houston TX
- 1990-present      **Board Certification, American Board of Obstetrics and Gynecology**
- 1985-1988      **Residency in Obstetrics and Gynecology**, including Chief Residency, University of Cincinnati Hospital, Cincinnati, Ohio.
- 1984      **Doctor of Medicine (M.D.)**, University of Cincinnati College of Medicine, Cincinnati, Ohio
- 1980      **Bachelor of Arts (A.B.)** in Chemistry with Honors, magna cum laude, Kenyon College, Gambier, Ohio.

**PRINT AND ORAL SCHOLARSHIP:**

**PUBLICATIONS:**

**Peer-Reviewed Research Reports**

1. Smith PP, Pregoner G, Galffy A, Kuchel GA. Underactive Bladder and Detrusor Underactivity Represent Different Facets of Volume Hyposensitivity and not Impaired Contractility. *BLADDER* 2015, 2(2), e17 DOI: 10.14440/bladder 2015.60
2. Kashyap M, Yoshimura N, Smith PP, Chancellor M, Tyagi P. Characterization of The Role of HCN Channels In  $\beta$ 3-Adrenoceptor Mediated Rat Bladder Relaxation. *BLADDER* 2015, 2(2), e15 DOI: 10.14440/bladder 2015.44
3. Smith PP, DeAngelis A, Simon R. Evidence of increased centrally enhanced bladder compliance with ageing in a mouse model. *BJU Int* 2015. 155(2): 322-9. doi: 10.1111/bju.12669. PubMed PMID 25116343.
4. Smith PP, Chalmers DJ, Feinn RS. Does defective volume sensation contribute to detrusor underactivity? *Neurourol Urodyn*. 2014 Sep 14. doi: 10.1002/nau.22653. [Epub ahead of print] PubMed PMID: 25220925.
5. Moody BJ, Liberman C, Zvara P, Smith PP, Freeman K, Zvarova K. Acute lower urinary tract dysfunction (LUTD) following traumatic brain injury (TBI) in rats. *Neurourol Urodyn*. 2014 Sep;33(7):1159-64. doi: 10.1002/nau.22470. Epub 2013 Aug 29. PubMed PMID: 24038177.
6. Wolff GF, Smith PP. Pseudoreflux and detrusor overactivity due to accidental ureteral catheterization during cytometry in a pediatric patient. *J Pediatr Urol*. 2013 Feb;9(1):e68-71. doi: 0.1016/j.jpuro.2012.08.010. Epub 2012 Sep 27. PubMed PMID: 23022154.
7. Suskind AM, Smith PP. Evidence of a functional effect of transient transurethral catheterization on micturition in women. *Int Urogynecol J*. 2012 Sep;23(9):1245-8. doi: 10.1007/s00192-011-1646-2. Epub 2012 Jan 17. PubMed PMID: 22249279.
8. Smith PP, DeAngelis A, Kuchel GA. Detrusor expulsive strength is preserved, but responsiveness to bladder filling and urinary sensitivity is diminished in the aging mouse.

- Am J Physiol Regul Integr Comp Physiol. 2012 Mar 1;302(5):R577-86. doi: 10.1152/ajpregu.00508.2011. Epub 2011 Dec 28. PubMed PMID: 22204955; PubMed Central PMCID: PMC3311525.
9. Smith PP, Deangelis AM, Kuchel GA. Evidence of central modulation of bladder compliance during filling phase. *Neurourol Urodyn*. 2012 Jan;31(1):30-5. doi: 10.1002/nau.21223. Epub 2011 Oct 28. PubMed PMID: 22038779; PubMed Central PMCID: PMC3265612.
  10. Smith PP, Kuchel GA. Continuous uroflow cystometry in the urethane-anesthetized mouse. *Neurourol Urodyn*. 2010 Sep;29(7):1344-9. doi: 10.1002/nau.20850. PubMed PMID: 20127833; PubMed Central PMCID: PMC2892555.
  11. Smith PP, Hurtado EA, Appell RA. Post hoc interpretation of urodynamic evaluation is qualitatively different than interpretation at the time of urodynamic study. *Neurourol Urodyn*. 2009;28(8):998-1002. doi: 10.1002/nau.20730. PubMed PMID: 19322793.
  12. Smith PP, Hurtado E, Smith CP, Boone TB, Somogyi GT. Comparison of cystometric methods in female rats. *Neurourol Urodyn*. 2008;27(4):324-9. PubMed PMID: 17849479.
  13. Smith PP, Appell RA. Does uroflow predict ISD? *Neurourol Urodyn*. 2008;27(1):40-4. PubMed PMID: 17595011.
  14. Smith PP, Smith CP, Boone TB, Somogyi GT. Is abdominal wall contraction important for normal voiding in the female rat? *BMC Urol*. 2007 Mar 7;7:5. PubMed PMID: 17343732; PubMed Central PMCID: PMC1831476.
  15. Smith PP, Appell RA. Transobturator tape, bladder perforation, and paravaginal defect: a case report. *Int Urogynecol J Pelvic Floor Dysfunct*. 2007 Jan;18(1):99-101. PubMed PMID: 16444495.

#### **Peer-Reviewed Reviews, Reports and Hypothesis papers**

1. Smith PP, Pathophysiology of the Underactive Bladder: Evolving new Concepts. *Current Bladder Dysfunction Reports*, 2017 *in press*; NIHMS848774,
2. Smith PP, Birder LA, Abrams P, Wein AJ, Chapple CR. Detrusor Underactivity and the Underactive Bladder: Symptoms, Function, Cause—What DO We Mean? ICI-RS Think Tank 2014. *Neurourol Urodyn* 2016 Feb;35(2):312-7. doi: 10.1002/nau.22807.
3. Anding R, Smith PP, de Jong Tom, Constantinou C, Cardozo L, Rosier P; When should video and EMG be added to urodynamics in children with lower urinary tract dysfunction and is this justified by the evidence? ICI-RS 2014. *Neurourol Urodyn* 2016 Feb;35(2):331-5. doi: 10.1002/nau.22894
4. Anding R, Rosier P, Smith PP, Gammie A, Giarenis I, Rantell A, Thiruchelvam N, Arlandis S, Cardozo L. When should video be added to conventional urodynamics in adults and is it justified by the evidence? ICI-RS 2014. *Neurourol Urodyn* 2016 Feb;35(2):324-9. doi: 10.1002/nau.22865

5. Smith PP, Kuchel GA, Griffiths D. Functional Brain Imaging and the Neural Basis for Voiding Dysfunction in Older Adults. *Clin Geriatr Med* 2015. 4: 549-65
6. Chapple CR, Osman NI, Birder L, van Koeveringe GA, Oelke M, Nitti VW, Drake MJ, Yamaguchi O, Abrams P, Smith PP. The Underactive Bladder: A New Clinical Concept? *Eur Urol*. 2015 . 68(3); 351-3. PubMed PMID: 25770481.
7. Wolff GF, Kuchel GA, Smith PP. Overactive bladder in the vulnerable elderly. *Res Rep Urol*. 2014 Oct 3;6:131-8. doi: 10.2147/RRU.S41843. eCollection 2014. Review. PubMed PMID: 25328867; PubMed Central PMCID: PMC4199655.
8. Smith PP, Tyagi P, Kuchel GA, Pore S, Chermansky C, Chancellor M, Yoshimura N, Levanovich P. Advanced therapeutic directions to treat the underactive bladder. *Int Urol Nephrol*. 2014 Sep;46 Suppl 1:35-44. doi: 10.1007/s11255-014-0809-8. Epub 2014 Sep 20. PubMed PMID: 25238893.
9. Smith PP. Anatomy and Physiology: Lower Urinary Tract. AUA University Core Curriculum, American Urological Association, 2014.  
<https://www.auanet.org/university/search.cfm?byYear=undefined&CourseType=6&CourseTrack=&keyword=&language=&intl=>
10. Tyagi P, Smith PP, Kuchel GA, de Groat WC, Birder LA, Chermansky CJ, Adam RM, Tse V, Chancellor MB, Yoshimura N. Pathophysiology and animal modeling of underactive bladder. *Int Urol Nephrol*. 2014 Sep;46 Suppl 1:11-21. doi: 10.1007/s11255-014-0808-9. Epub 2014 Sep 20. PubMed PMID: 25238890.
11. Krhut J, Zachoval R, Smith PP, Rosier PF, Valanský L, Martan A, Zvara P. Pad weight testing in the evaluation of urinary incontinence. *Neurourol Urodyn*. 2014 Jun;33(5):507-10. doi: 10.1002/nau.22436. Epub 2013 Jun 24. PubMed PMID: 23797972.
12. Smith PP, van Leijssen SA, Heesakkers JP, Abrams P, Smith AR. Can we, and do we need to, define bladder neck hypermobility and intrinsic sphincteric deficiency? ICI-RS 2011. *Neurourol Urodyn*. 2012 Mar;31(3):309-12. doi: 10.1002/nau.22220. Epub 2012 Mar 13. Review. PubMed PMID: 22415935.
13. De Wachter S, Smith PP, Tannenbaum C, Van Koeveringe G, Drake M, Wyndaele JJ, Chapple C. How should bladder sensation be measured? ICI-RS 2011. *Neurourol Urodyn*. 2012 Mar;31(3):370-4. doi: 10.1002/nau.22214. Epub 2012 Mar 13. Review. Erratum in: *Neurourol Urodyn*. 2012 Sep;31(7):1203. Smith, P [corrected to Smith, Philip P]. PubMed PMID: 22415808.
14. Smith PP, Wolfson LI, Kuchel GA\*. The Neurourology of Urinary Symptoms in Older Adults, BJU Int Virtual Editions, 2011 online DOI: 10.1002/BJUIw-2011-010-web, <http://www.bjui.org/ContentFullItem.aspx?id=665&SectionType=1&title=The-Neurourology-of-Urinary-Symptoms-in-Older-Adults> An on-line peer-reviewed invited review. I contributed the majority of manuscript writing and preparation.
15. Harris C, Smith PP\*. Overactive Bladder in the Older Woman. *Clinical Geriatrics* 2010; 18(9); 41-47.

16. Smith PP. Aging and the underactive detrusor: a failure of activity or activation? *Neurourol Urodyn*. 2010 Mar;29(3):408-12. doi: 10.1002/nau.20765. Review. PubMed PMID: 19760756.
17. Smith PP, McCrery RJ, Appell RA. Current trends in the evaluation and management of female urinary incontinence. *CMAJ*. 2006 Nov 7;175(10):1233-40. Review. PubMed PMID: 17098954; PubMed Central PMCID: PMC1626507.

### **b-1. Invited Reviews (non-peer reviewed)**

1. Wolff GW, Winters JC, Smith PP. Underactive bladder: Definition, diagnosis, and treatment. *Urology Times, urologytimes.modernmedicine.com*, December 1, 2015.
2. Smith PP\*. Purinoceptors and Bladder Dysfunction. *Curr Bladder Dysfunct Rep* 2011; 6:85–92
3. Suskind AM, Smith PP\*. A new look at detrusor underactivity: impaired contractility versus afferent dysfunction. *Curr Urol Rep*. 2009 Sep;10(5):347-51. PubMed PMID: 19709481.
4. Smith PP, Appell RA\*. Functional obstructed voiding in the neurologically normal patient. *Curr Urol Rep*. 2006 Sep;7(5):346-53. Review. PubMed PMID: 16959173.
5. Smith PP, Lai HH, Appell RA\*, Darifenacin: Selective M3 Muscarinic Receptor Antagonist for the Treatment of Overactive Bladder. *Therapy* 2006; 3: 723-732.
6. McCrery RJ, Smith PP, Appell RA\*. The emergence of new drugs for overactive bladder. *Expert Opin Emerg Drugs*. 2006 Mar;11(1):125-36. Review. PubMed PMID: 16503831.
7. Smith PP, Appell RA\*. Pelvic organ prolapse and the lower urinary tract: the relationship of vaginal prolapse to stress urinary incontinence. *Curr Urol Rep*. 2005 Sep;6(5):340-7. Review. PubMed PMID: 16120234.

### **b-2. Book Chapters:**

1. Smith PP, Kuchel G : Aging of the Urinary Tract. Chapter 18, In Brocklehurst's Textbook of Geriatrics and Clinical Gerontology, Edited by Raymond Tallis, Howard M. Fillit, Ken Rockwood.
  - a. 7th edition. Elsevier Publishers 2009
  - b. 8<sup>th</sup> edition. Elsevier Publishers 2015
2. Harris C, Smith PP, Gousse AE: Bladder Emptying: Coordination of Bladder and Sphincters. Chapter 17 in Rapid and Practical Interpretation of Urodynamics, E.S. Rovner and M.E. Koski editors, Springer Science + Business Media New York 2015
3. DeAngelis A, Smith PP, Kuchel GA: MIF and Lower Urinary Tract Disorders. Chapter III-5 in The MIF Handbook, Richard Bucala Ed., World Scientific 2012

4. Phillip P. Smith and Christopher P. Smith, Botulinum Toxin in the Treatment of Chronic Pelvic Pain Syndromes, in *Botulinum and Other Neurotoxins: Translating Science into Therapeutic Applications*, J. Jankovic et al., Editors, Elsevier Publishers, 2009
5. Smith PP, Smith CP: Urinary tract infections. In *Urology and the Primary Care Practitioner*, 3rd Edition, Chapter 4. Edited by LI Lipshultz, M Khera, DT Atwal DT. 2008.

### c. Online Educational Materials

1. **Smith PP**, *Lower Urinary Tract Anatomy and Physiology*, AUA University Core Curriculum, American Urological Association, Linthicum MD, [https://www.auanet.org/university/core\\_topic.cfm?coreid=131&page=authors](https://www.auanet.org/university/core_topic.cfm?coreid=131&page=authors) , 2014

### d. Invited Editorials

**Smith PP**, Kuchel GA. **Invited Editorial Comment:** Clinical Meaning of a High Postvoid Residual: When the Value of a Result Is Less and More than One Would Expect. *J Am Geriatr Soc.* 2015 Jul;63(7):1432-4. doi: 10.1111/jgs.13479. No abstract available. PMID: 26189846 [PubMed - in process]

**Smith PP**, Klausner AP. **Invited Editorial Comment:** Crossroads of age, diet and bladder function. *J Urol.* 2015 Jun;193(6):1884-5. doi: 10.1016/j.juro.2015.03.068. Epub 2015 Mar 17. PubMed PMID: 25790816.

**Smith PP**, Kuchel GA. **Invited Editorial Comment**, on *Increased risk of large post-void residual urine and decreased long-term success rate after intravesical onabotulinumtoxinA injection for refractory idiopathic detrusor overactivity.* [*J Urol.* 2013], *J Urol.* 2013 May;189(5):1810.

Suskind AM, **Smith PP**. **Response to Comment:** Functional effect of transient transurethral catheterization on micturition in women: reply. *Int Urogynecol J.* 2013 Mar;24(3):525. doi: 10.1007/s00192-012-1975-9. PubMed PMID: 23152046

Hurtado EA, **Smith PP**, McCrery RJ, Jayne C. **Letter:** Rodney A. Appell. *Neurourol Urodyn.* 2009;28(3):166

### ORAL PRESENTATIONS:

#### a. Peer-reviewed Submissions:

**DHIC Revisited: Unravelling the complexity of a common geriatric condition.** Smith PP, Kuchel GA, 2015 International Continence Society, Montreal Canada

**Underactive Bladder is a Volume Hyposensitivity Syndrome and Does Not Predict Detrusor Underactivity.** Smith PP, 2015 Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction (SUFU) Annual Scientific Meeting, Phoenix AZ

**Aging and Maturation produce different effects on bladder function in an aging mouse model.** Smith PP, DeAngelis A, Kuchel GA. 2011 American Geriatrics Society annual meeting, Washington DC

**Oophorectomy may impair detrusor contractility in a murine model.** Smith PP, Zvara P, Heppner TJ, Nelson MT, Kuchel GK. 2009 American Geriatrics Society annual scientific meeting, Chicago IL

**Long-term durability of a non-surgical transurethral radiofrequency treatment for female stress urinary incontinence: a retrospective analysis,** Smith PP, Appell RA, Northeast Section American Urological Association Annual Meeting, Rochester NY, 2007

**The Rectus Abdominus Visceromotor Reflex Is A Normal Feature of the Voiding Reflex in Rats.** Phillip P. Smith, Christopher P. Smith, Timothy Boone, George Somogyi, presented at Society for Urodynamics and Female Urology Scientific Meeting, February 2006.

**Intact Bladder Efferent Function is Required for Normal Afferent Function in Rat Voiding Under Cystometric Conditions.** Phillip P. Smith, Christopher P. Smith, Timothy B. Boone, George T. Somogyi; Scott Department of Urology, Baylor College of Medicine  
· 31<sup>st</sup> Annual Meeting of the International Urogynecological Association, Athens, Greece, 2006 PUBLISHED *Int Urogyn J* 2006 17 (Suppl 2): S90

**Abdominal Wall Activity is Necessary for Normal Female Rat Voiding.** Phillip P. Smith, Christopher P. Smith, Timothy B. Boone, George T. Somogyi; Scott Department of Urology, Baylor College of Medicine  
· 31<sup>st</sup> Annual Meeting of the International Urogynecological Association, Athens, Greece, 2006 PUBLISHED *Int Urogyn J* 2006 17 (Suppl 2): S89

## **b. Invited Oral Presentations:**

### **At Professional Society/Scientific Meetings**

**Bladder Volume Sensation and Sensory Processing.** 9th annual Bedside-to-Bench Conference “Urinary Incontinence in the Elderly: A Translational Research Agenda for a Complex Geriatric Syndrome”, Bethesda MD, October 2016

**Urinary Retention in the Geriatric Patient.** 2016 American Geriatrics Society annual scientific meeting, Long Beach CA (*given by Dr. George Kuchel in my absence*), May 2015

**Preclinical Urodynamics: Multichannel Urodynamics in Rodents.** Workshop presentation, 2016 International Continence Society annual scientific meeting, Tokyo Japan, (*given by Dr. George Kuchel in my absence*). September 2016.

**How Can Animal Models Help Us Understand The Aging Bladder?** 2015 Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction (SUFU) Annual Scientific Meeting, Phoenix AZ, February 2015

**The (Underactive) Bladder, a Homeostatic Model.** Keynote speaker. Young Urologists Meeting, Bristol UK, September 2014

**Video in Pediatric Urodynamics, Think Tank 1 presentation.** International Consultation on Incontinence Research Society (ICI-RS) meeting, Bristol UK, September 2014

**Does detrusor underactivity exist, and if so is it neurogenic, myogenic or both? Think Tank 9 presentation.** International Consultation on Incontinence Research Society (ICI-RS) meeting, Bristol UK, September 2014

**Advanced Urodynamics for the Urogynecologist** workshop, chair, AUGS/IUGA joint annual scientific meeting, Washington DC, July 2014

**Aging and Bladder Homeostasis.** UConn Center on Aging/Jackson Labs Aging Symposium, Univ. of Connecticut Storrs, March 2014

**Detrusor Underactivity: Homeostatic Failure Model.** 1<sup>st</sup> CURE-UAB Congress (NIA-sponsored underactive bladder conference), Bethesda MD February 19-20 2014.

**Moderator, Think Tank 4, New Therapy Development,** 1<sup>st</sup> CURE-UAB Congress (NIA-sponsored underactive bladder conference), Bethesda MD February 19-20 2014.

**Moderator, Pathophysiology of Underactive Bladder panel discussion,** 1<sup>st</sup> CURE-UAB Congress (NIA-sponsored underactive bladder conference), Bethesda MD February 19-20 2014.

**How to do Prolapse Repairs without Mesh: How I Do It.** New England AUA Annual Scientific Meeting, Boston MA, September 6, 2012.

**Can we, and do we need to, define bladder neck hypermobility and ISD? Assignment: NO.** ICI Research Society Annual Meeting, Bristol UK, Think Tank 1 presentation, June 14, 2011.

**The Aging Bladder: Is the Detrusor to Blame?** Society for Basic Urologic Research annual meeting, American Urological Association, Linthicum MD, July 16, 2011.

**Detrusor Underactivity and The Aging Bladder** Geriatrics Urology Society annual meeting, American Urological Association annual scientific meeting, Washington D.C., May 15, 2011

**Can We, and Do We Need to, Define Bladder Neck Hypermobility and Intrinsic Sphincteric Deficiency?- NO.** International Consultation on Incontinence Research Society (ICI-RS) meeting, June 2011 Bristol UK

**A Guide to Evaluating Urinary Symptoms in the Aged** American Geriatrics Society annual scientific meeting, Orlando FL, May 2010

**The Evolving Role of Botulinum Toxin: Rationale, Application, and Techniques in the Management of Voiding Dysfunctions,** State of the Art lecture, 54<sup>th</sup> Annual James C. Kimbrough Urological Seminar, January 17 2007, Houston TX

**What's New in Overactive Bladder?** 2007 American Urogynecologic Society annual scientific meeting, Ft. Lauderdale FL



## **Invited Presentations at other academic institutions:**

### **Urodynamics for LUTS in the Older Man.**

Urology Grand Rounds, New York Medical College, Valhalla NY, April 2017

Urology Grand Rounds, University of Connecticut College of Medicine, Farmington CT, June 2017.

**Impaired Contractility, Detrusor Underactivity, and Underactive Bladder.** Urology Grand Rounds, University of Texas Southwestern, Dallas TX, November 2014

**Aging and the Bladder: Solipcystic vs. Solipsistic.** Geriatrics Grand Rounds, University of Texas Southwestern, Dallas TX, November 2014

**Underactive Bladder and Detrusor Underactivity.** Urology Grand Rounds, The Ohio State University, Columbus OH June 2014

**Urodynamic Amusements**, first 20-30 minutes of the monthly urodynamics/preoperative conference, Department of Urology, Connecticut Childrens Medical Center, 2010-2016 (*in this initial segment of the conference, I presented and discussed an unusual or educational aspect of urodynamic examination(s) conducted within the previous month.*)

**Aging and Maturation produce different effects on bladder function in an aging mouse model.** Case Western Reserve University Urology research meeting, Cleveland OH, May 2011.

**Urinary Symptoms in the Aged: How to evaluate,** Geriatrics Core Conference, Massachusetts General Hospital, April 20, 2010

## **Other:**

### **1. Educational/CME Conferences to other Departments, UCHC**

**Symptoms and Function: What's the Problem? Avoiding Genitourinary Primrose Pathways.** Current Clinical Medicine, Update and Review, University of Connecticut Health Center, February 2013

**Evaluation of the lower urinary tract: What to look for, and How to look for it.** Recent Advances in Internal Medicine, UCHC, January 20, 2010

### **2. Grand Rounds Presentations**

#### **Sacral Nerve Stimulation for Fecal Incontinence**

Gastroenterology Grand Rounds, March 2017

#### **Impaired Contractility, Detrusor Underactivity and Underactive Bladder.**

Center on Aging Grand Rounds, November 2014

**Underactive Bladder**

Grand Rounds, St Vincent Hospital Ob/Gyn, Bridgeport CT, May 2014

**Voiding Dysfunction and Dysfunctional Voiding in Children.**

Grand Rounds, Connecticut Childrens Medical Center, December 2012

**Dysfunctional Voiding**

Grand Rounds, UConn Ob/Gyn Unicorn Series (multiple Ob/Gyn Grand Rounds at twelve referring hospitals), coordinated by Department of Obstetrics and Gynecology, University of Connecticut Health Center), November 2012 (adult focus)

**The Old Bladder, Aging and Urinary Symptoms**

- Grand Rounds, Charlotte Hungerford Hospital, Torrington CT, April 2011
- Grand Rounds, St. Vincent's Hospital, Bridgeport CT, April 26, 2011

**Pelvic Organ Prolapse: Surgeon's Perspective**

Grand Rounds, Ob/Gyn Bridgeport Hospital, December 13, 2009

- Unicorn Series, February –March 2010
- Urology Grand Rounds, UConn Health Center, March 4, 2010

**Fundamentals of the Evaluation of Urinary Incontinence**

Invited Resident lecture, Bridgeport Hospital, March 12, 2009

**Update on Overactive Bladder**

- Grand Rounds, Bridgeport St Vincent Hospital, October 22, 2008
- Grand Rounds, Department of Internal Medicine, University of Connecticut Health Center, January 8, 2009
- Grand Rounds, Ob/Gyn, Bridgeport Hospital, March 12, 2009

**Urinary Incontinence and Pelvic Organ Prolapse**

- Grand Rounds, Department of Obstetrics and Gynecology, University of Connecticut Health Center, January 16, 2008.
- Unicorn Series (multiple Ob/Gyn Grand Rounds at twelve referring hospitals), coordinated by Department of Obstetrics and Gynecology, University of Connecticut Health Center, February 2008

**Evaluation of the Female Patient**

- Grand Rounds, Division of Urology, University of Connecticut Health Center, November 6, 2008

**The Evolving Role of Botulinum Toxin: Rationale, Application, and Techniques in the Management of Voiding Dysfunctions,**

Grand Rounds, Division of Urology, University of Connecticut Health Center, September 13, 2007

**Functional Voiding Obstruction**

- Grand Rounds, Department of Obstetrics and Gynecology, Albany Medical Center, Albany NY, June 2006

**Aspects of Voiding Dysfunction, Human and Animal**

- Grand Rounds, Scott Department of Urology, Baylor College of Medicine, Houston TX, January 2006.

**Urogynecologic Office Evaluation**

Grand Rounds, Scott Department of Urology, Baylor College of Medicine, Houston TX, January 2006

**c. Peer-reviewed Poster Presentations:**

**Increasing Abdominal Pressure During Bladder Filling in Pediatric and Adult**

**Urodynamics, Is the Standard Definition of Pdet Sufficient?** Nelson ED, Wolff GF, Crawley D, Silvis R, Herbst KW, **Smith PP**, American Urological Association Annual Meeting, Orlando FL May 2014

**Is loss of bladder sensitivity with aging primary or compensatory?** **Phillip P. Smith**, Anthony DeAngelis, Andrew Galffy, George A. Kuchel.

- 1<sup>st</sup> CURE-UAB Congress, Bethesda MD, Feb 2014
- SUFU Annual Scientific Meeting, Miami FL, Feb 2014
- UConn Center on Aging/Jackson Lab Aging Symposium, Storrs CT, March 2014

**MIF is associated with prevention of oophorectomy-induced effects on bladder filling.**

**Phillip P. Smith**, Anthony DeAngelis, Andrew Galffy, George A. Kuchel

- 1<sup>st</sup> CURE-UAB Congress, Bethesda MD, Feb 2014
- SUFU Annual Scientific Meeting, Miami FL, Feb 2014
- UConn Center on Aging/Jackson Lab Aging Symposium, Storrs CT, March 2014

**Post-Hoc Tracing Interpretation Does Not Reliably Detect Artifactual Depression of Detrusor Pressure Due to Rising Abdominal Pressure Readings in Pediatric**

**Urodynamics** Eric Nelson, MD, Gillian Wolff, MD, Renee Silvis, M.Sc., Christine Kim, MD, John Makari, MD, Fernando Ferrer, MD, **Phillip Smith, MD**. 2013 NEAUA Annual Scientific Meeting, Hartford CT

**Increasing Abdominal Pressure During Bladder Filling in Pediatric Urodynamics; is the Standard Definition of Pdet Sufficient?** Eric Nelson, MD, Gillian Wolff, MD,

Katherine Herbst, M.Sc., Christine Kim, MD, John Makari, MD, Fernando Ferrer, MD, **Phillip Smith, MD**. 2013 SUFU Annual Meeting, Las Vegas, NV; 2013 NEAUA Annual Scientific Meeting, Hartford CT

**Nonvoiding Contractile Activity May Suppress Bladder Stiffness in the Mouse Cystometric Model, Smith PP**, Simon R, 2013 SUFU Annual Meeting, Las Vegas NV

**Post-hoc Tracing Interpretation Does Not Reliably Detect Artifactual Depression of Detrusor Pressure Due to Rising Abdominal Pressure Readings in Pediatric**

**Urodynamics**, Wolff G, Nelson E, **Smith PP**, 2013 SUFU Annual Meeting, Las Vegas NV

**Evidence of Central Age-Dependent Bladder Compliance Control, Smith PP,**  
DeAngelis, Kuchel GA, 2012 SUFU Annual Meeting, New Orleans LA

**Maturation, not Aging, Is Associated with Altered Urine Storage and Voiding in a  
Mouse Cystometric Model, Smith PP,** DeAngelis A, DeAngelis L, Kuchel GA. 2011  
SUFU Annual Meeting, Phoenix, AZ; **Basic Science Poster Prize**

**An Expanded Model of Pressure/Flow Mouse Cystometry, Smith PP,** DeAngelis A,  
DeAngelis L, Kuchel GA. 2011 SUFU Annual Meeting, Phoenix, AZ

**An Expanded Model of Pressure/Flow Mouse Cystometry, Smith PP,** DeAngelis A,  
DeAngelis L, Kuchel GA. 2010 AUA/SBUG Annual Basic Science Research **Meeting,**  
**Linthicum MD**

**Sensory Dysfunction in Lower Urinary Tract Disorders: Preliminary Investigations.**  
**Smith PP,** Kuchel GA. 2010 American Geriatrics Society annual scientific meeting,  
Orlando FL

**The effect of transurethral catheterization on uroflow parameters.** Suskind A, **Smith  
PP.** 2010 Society for Urodynamics and Female Urology Annual Scientific Meeting, St.  
Petersburg FL

**Post hoc interpretation of urodynamic evaluation is qualitatively different than  
interpretation at the time of urodynamic study Smith PP,** Hurtado EA, Appell RA,  
2009 Society for Urodynamics and Female Urology Annual Scientific Meeting, Las  
Vegas NV.

**Video-urodynamic evaluation of a nonsurgical transurethral radiofrequency collagen  
remodelling treatment of stress urinary incontinence Smith PP,** Appell RA, Cline K,  
, Northeast Section American Urological Association Annual Meeting, Rochester NY,  
2007

**Does uroflow predict ISD? Smith PP,** Appell RA  
2007 American Urogynecologic Society Annual Scientific Meeting. Hollywood FL  
2007 Society for Urodynamics and Female Urology Annual Meeting, San Diego CA

**Pressurization of the Mid-urethra activates the external urethral sphincter in rats.**  
Hurtado E, **Smith PP,** Boone TB, Smith CP, Somogyi GT.  
2007 American Urogynecologic Society Annual Scientific Meeting. Hollywood FL  
2007 Society for Urodynamics and Female Urology Annual Meeting, San Diego CA

**Comparison of Cystometric Methods in Female Rats. Phillip P. Smith,** Eric A.  
Hurtado, Christopher P. Smith, Timothy B. Boone, George T. Somogyi; Scott  
Department of Urology, Baylor College of Medicine

**Abdominal Wall Activity is Necessary for Normal Female Rat Voiding. Phillip P. Smith,** Christopher P. Smith, Timothy B. Boone, George T. Somogyi; Scott Department of Urology, Baylor College of Medicine

2007 Society for Urodynamics and Female Urology Scientific Meeting, February 2007

2006 NIDDK Symposium: Frontiers in Painful Bladder Syndrome and Interstitial Cystitis, Bethesda MD, October 2006

**The Urethra as Sensor: Characterization of Voiding-Associated Abdominal Wall Activity in the Rat and Its Role in Normal Voiding. Phillip P. Smith,** Christopher P. Smith, Timothy B. Boone, George T. Somogyi; Scott Department of Urology, Baylor College of Medicine

**Visceromotor Reflex In the Rectus Abdominus During Voiding Requires Intact Efferent Ganglionic Function. Phillip P. Smith,** Rebecca J. McCrery, Christopher P. Smith, Timothy B. Boone, George T. Somogyi, Scott Department of Urology, Baylor College of Medicine. American Urologic Association Scientific Meeting, May 2006.

## **RESEARCH SUPPORT**

### Redefining the Aging Bladder: A Genomic Approach

**The Connecticut Institute for the Brain and Cognitive Sciences, Seed Grant**

Phillip P. Smith PI

\$9900 (1 year, AY 2017/2018)

Aging is associated with diminished bladder volume sensitivity. Common age-associated urinary symptom complexes such as overactive and underactive bladder as well as incontinence are similarly associated with altered bladder volume sensitivity. Bladder volume sensations are the product of bidirectional signaling between brain and bladder. Understanding how bladder factors affecting volume sensitivity respond to brain control, and the impact of aging on those factors, may be a key to improved disease modelling and therefore novel therapeutic applications for urinary problems in later life. Single cell genomic sequencing (SCGS) data from urinary tissues of different age (and disease) groups permits comparisons never before possible, and enhances targeting for more traditional laboratory molecular, cellular, and tissue techniques. We will partner with Dr. Paul Robson at the UCONN-JAX Single Cell Genomics Core to conduct SCGS studies on Young and Old mouse bladders. Ultimate, this technology will allow us to specifically target cell types likely to be involved with HCN and the brain-mediated regulation of bladder volume sensitivity. Data gathered from these experiments will guide our future work on brain-bladder control and aging in the Center on Aging laboratory.

### HCN - Interstitial Cell Interactions in the Autonomic Control of Bladder Muscle

**The Connecticut Institute for the Brain and Cognitive Sciences, Seed Grant**

Phillip P. Smith PI, Dan Mulkey co-PI

\$24,100 (1 year, AY 2016/17)

A network of Cx43 gap-junction linked interstitial cells (IC) is postulated to be a control network, mediating the autonomic regulation of detrusor myocyte activity. These cells have recently been

found to express the molecular analog of the “funny current” involved in pacemaker functions, the Hyperpolarization gated, Cyclic Nucleotide activated (HCN) channel. HCN channels have a high propensity for modulation by transmitters of the autonomic nervous system, therefore, we hypothesize that HCN channels in IC cells contribute to autonomic regulation of bladder tension. Using descriptive tissue studies, immunoimaging, and patch clamp techniques, we propose to investigate contributions of HCN channels in ICs to detrusor tension in established an established mouse system.

**Regulatory Mechanisms in a Homeostatic Model of Geriatric Voiding Problems and Incontinence 1K76AG054777-01**

**Beeson Emerging Leaders Career Development Award in Aging (K76) (NIA/NIH)**

Phillip P. Smith PI

Award Period Sept 2016 – May 2019, \$600,000

Urinary symptoms are major contributors to expense and morbidity in later life. Mono-etiological conceptions of etiology and treatment are insufficient, and not consistent with the syndromic nature of urinary dysfunction in the elderly. Urinary performance is predicated on autonomic regulation of bladder characteristics resulting in sensory information about bladder volume. A network of special interstitial cells (IC) containing the structural analog of the “pacemaker” current  $I_h$  (HCN channel) appear to mediate the balance of paracrine and autonomic influence over detrusor myocyte activity, thereby influence the sensitivity of volume transduction. Age-associated alterations in this signaling may render responses to brain control less precise and of limited range, increasing the likelihood of maladaptive responses. We will test the hypothesis that age-associated changes in HCN isoform and IC signaling affect responsiveness to sympathetic input, using tissue descriptive studies, molecular biology, and single cell studies of the interstitial cell/HCN interaction in an aging mouse model.

**Completed**

**Mechanotransduction and Bladder Sensations: A Pilot Methodology Study**

**American Urogynecologic Society / Astellas Research Award**

Phillip P. Smith MD, PI

Award Period 2/1/2011 – 12/31/2013; \$30,000 total

Urinary symptoms are prevalent and bothersome in aging women, and are disproportionately attributable to non-obstructive urinary dysfunctions. Age-associated structural and neuropharmacologic changes of the lower urinary tract may be significant contributors to urinary dysfunctions via impaired volume/flow responsiveness. The demonstration of altered mechanosensitivity in aging humans would provide clinical support for this concept, supporting and corroborating ongoing and planned animal studies testing this hypothesis. However, direct assessment of sensory mechanotransduction is not currently feasible in humans, and alternatives have not been reported. We hypothesized that comparison of bladder-anal and urethral anal reflexes stimulated mechanically and electrically will allow indirect assessment of mechanosensitivity. We proposed to elicit perianal EMG responses to graded mechanical and electrical stimuli in healthy asymptomatic women. Comparison of response rates will generate an index of mechanosensitivity. Data analysis is in progress. The successful demonstration of the methodology tested under this Award would constitute a novel and powerful tool for future research contributing to the understanding of other lower urinary dysfunctions common in women.

Urethral sensory contributions to lower urinary tract function in old age

**Dennis W. Jahnigen Career Development Award, John Hartford Foundation, American Geriatrics Society**

Phillip P. Smith MD, PI; George Kuchel MD primary mentor

Project Period 7/1/09-6/30/11; \$75,000 per year

Changes in urethral afferent activity attributable to aging and concurrent disease may be important contributors to lower urinary tract dysfunction in older adults. The aims of this research were to define normative morphologic and physiologic characteristics of the lower urinary tract with attention to the bladder neck and urethra in a well-established animal model of aging, and establish a methodology permitting investigation of the lower urinary tract neurosensory and biomechanical functions and their role in storage and micturition. Use of the murine model system permits genetic manipulation as a tool for the investigation of the role of individual molecules, in addition to histological, immunohistochemical and cystometric evaluation. The award funded 50% protected time for this research.

Role: Principle Investigator

Pathogenesis of Detrusor Underactivity and Urinary Retention in the Frail Elderly

NIH 5R01AG028657-02,

George Kuchel MD, PI

Project Period 4/15/2007-3/31/2012

The goal of this project is to define the pathogenesis of detrusor underactivity in the frail elderly by focusing on a shared pathway by which three different risk factors (bladder stretch, lack of estrogen, aging) promote bladder muscle loss, fibrosis and axonal degeneration. Studies using genetically-modified mice and tissue culture systems will: 1) implicate MIF, an abundant urothelial cytokine, in the pathways by which all three risk factors contribute to detrusor underactivity AND 2) perform pre-clinical testing of ISO-1, a newly identified MIF inhibitor, offering targeted, mechanism-driven therapy for this complex multifactorial geriatric syndrome.

Role: Co-Investigator

**OTHER RELEVANT INFORMATION:**

**AWARDS AND HONORS**

- Paul Beeson Emerging Leaders Career Development Award in Aging (NIA K76)
- Walzak Residency Teaching Award, Division of Urology, University of Connecticut Health Center, 2009/10, 2014/15.
- Butler-Williams Summer Scholarship, National Institute on Aging, 2014
- Best Doctors listing, 2013, 2014
- Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction (SUFU) Basic Science Poster Prize, 2011
- Neurourology and Urodynamics, “top ten” reviewer, 2010, 2011

- Dennis W. Jahnigen Scholar, American Geriatrics Society, 2009
- V. Bradley Roberts Award for Excellence in Gynecologic Surgery, Christ Hospital, University of Cincinnati Residency in Obstetrics and Gynecology, 1988
- Sigma Xi, Kenyon College, 1980
- Phi Beta Kappa, Kenyon College, 1980
- Carl Djerassi Chemistry Award for liberally educated scientist, Kenyon College, 1980

## REVIEW

NIH Center for Scientific Review:

*Ad-hoc member:*

Digestive, Kidney and Urological Systems IRG [DKUS]  
NIDDK ZDK1 GRB-3 (O2), “Developmental Centers in Benign Urology” (P20).

Manuscript Review:

Neurourology and Urodynamics

*Editorial Board 2011-present*

*Ad-hoc reviewer:*

Age

American Journal of Physiology: Renal Physiology

American Journal of Physiology: Regulatory, Integrative, and Comparative Physiology

American Journal of Obstetrics and Gynecology

Canadian Medical Association Journal

Hospital Practice

International Urology and Nephrology

Journal of the American Aging Association

Journal of Biomechanics

Journal of Urology

PLOS-ONE

American Urologic Association, *reviewer, Clinical Guideline on Overactive Bladder, 2012*

## MEMBERSHIPS:

2016- Member, External Experts Panel (EEP) for NIDDK-supported New England Research Institutes Underactive Bladder Research Project

2016- Member, Institute for Systems Genomics, UConn/Jackson Laboratory

2016- Associate, Connecticut Institute for Brain and Cognitive Science, UConn/Storrs

2015-2016 Member, Organizing Committee NIA 9th annual Bedside-to-Bench Conference “Urinary Incontinence in the Elderly: A Translational Research Agenda for a Complex Geriatric Syndrome”, Bethesda MD, October 2016

2015- Member, Underactive Bladder Working Group, International Continence Society

2014- Member, External Experts Panel (EEP) for the NIDDK-supported Symptoms of Lower Urinary Tract Dysfunction Research Network (LURN)

2012- Member, International Continence Society

2012-2013 International Continence Society working group, Pad Weight Testing

2011- Member, International Consultation on Incontinence Research Society (ICI RS)

2009-2012 Member, International Urogynecologic Association



2007 - Member, Society for Urodynamics, Female Pelvic Medicine and Reconstructive  
Surgery  
2007 - Member, American Urogynecologic Society  
1991 - 2012 Fellow, American College of Obstetricians and Gynecologists  
2005-2007 Residency Review Committee, Baylor College of Medicine  
1995 - 2004 Board Member of the Ohio State Health Network

**PROFESSIONAL AND SCIENTIFIC INTERESTS:**

Neurophysiology and biomechanics of lower urinary tract and vaginal support systems  
Physiologic assessment of lower urinary tract function  
Impact of development/maturation/aging on pelvic and urinary control.