The missions of Duke Urology are to provide compassionate and exceptional care for our patients suffering from urologic conditions; to advance the field of Urology through innovation in basic and clinical research and to train the next generation of urologic clinicians and scientists. I believe that this issue of the Duke Urology Newsletter demonstrates that we continue to grow the team across all of our missions. As we finalize this issue of the Newsletter, we have just returned from the Duke Urologic Assembly Meeting in Hilton Head, SC, where close to 75 participants learned from 14 of our Duke Urology faculty members, as well as five of our partners from Medical Oncology, Radiation Oncology and the Duke Cancer Center (http://urology.surgery.duke.edu/education-and-training/continuing-medical-education-cme/dua-2016). The DUA continues to be one of the oldest post graduate courses in the United States as this was our 48th iteration of a comprehensive review of urology. This event is only one example of our educational mission to improve care for patients afflicted by various urologic conditions.

The Newsletter highlights a number of additional missions where we continue to excel. John Wiener reviews the tremendous advances that we have made within Duke Pediatric Urology. Now with five members of the Duke Pediatric Urology Team, we not only offer all-inclusive care for pediatric patients, but also provide tremendous Clinical and basic science research expertise. Todd Purves and Monty Hughes offer a summary of their innovative and important research in bladder dysfunction. In addition, Leah Gerber Davis reviews the significant expansion of our clinical research efforts utilizing the comprehensive Duke Urology Clinical Database to answer clinical questions and to further utilize this information to support our educational efforts. Mike Lipkin, who currently serves as the Chief of the Clinic for the Duke Department of Surgery, provides us with the outstanding improvements being made in the clinical arena both in our outpatient and inpatient operations. In our partnership with Duke Health, we believe that our multiple providers, including additional sites of care such as Duke Urology of Raleigh, now offer our patients a myriad of opportunities to provide cutting edge clinical care. Towards that end, Aaron Lentz, who directs our Duke Urology of Raleigh office, provides our vision for the Duke Center for Male Wellness which will officially open later this spring. This new initiative will now provide an incredible range of services for Men’s Health including sectional sexual dysfunction, urinary incontinence, infertility, low testosterone and BPH in one easy to access location. Finally, Chuck Scales reiterates current innovations in urologic education not only for our students, residents and fellows, but for practicing urologists as well.

Our Residency Program had a major showing at the recent SESAUA meeting in Nashville with over 40 presentations by our medical students, residents, and fellows. Similarly, we expect an even bigger presence at the AUA annual meeting in San Diego this May. We hope to see all of you at our DYSURIA Reception during the AUA meeting on Saturday evening, May 7 (http://urology.surgery.duke.edu/dysuria). Please stop by to say catch up with our current faculty, fellows and residents and also to connect with your fellow Dysurics from around the world. We continue to appreciate your support and hope that you can attend a future Duke Urology event either in Durham or at another educational venue across the US.

All the best,

Glenn M. Preminger, MD
Chief of the Division of Urology
Pediatric Urology Updates

by John Wiener, MD

Pediatric Urology at Duke continues to grow as a clinical center of excellence in the Southeast and as a research leader nationally. The program has earned national ranking in pediatric urology every year by US News and World Report. The addition of new providers in the past year has boosted our productivity on both fronts. Maryellen Kelly, DNP joined in May 2015, bringing her clinical expertise from Children’s Hospital of Orange County, CA, and J. Todd Purves, MD, PhD arrived in July 2015 from Medical University of South Carolina.

The clinical enterprise includes clinical locations at Duke Children’s Health Center on the main campus, Southpoint clinic in south Durham, Duke Children’s Specialty Services in Raleigh, and Duke Children’s Specialties of Greensboro, as well as the Duke Comprehensive Spina Bifida Clinic at Lenox Baker Children Hospital in Durham. With three pediatric urologists, two nurse practitioners, and a pediatric urotherapy nurse, Duke Pediatric Urology is able to offer care from consultations for fetal uropathies before birth to surgical and medical management of urologic problems throughout children and into adulthood for those with congenital urologic disorders. We have the only pediatric urodynamics and pelvic floor biofeedback facility in the state. Surgery is performed at Duke University Hospital, Duke Ambulatory Surgery Center, and Duke Raleigh Hospital from the simple to the most complex reconstructive cases, including robotic assisted laparoscopic procedures. John S. Wiener, MD is director of the urologic portion of the Duke Comprehensive Spina Bifida Clinic and Fetal Urology Clinic. Jonathan C Routh, MD, MPH is in charge of the pediatric urologic oncology program and sits on the national Children’s Oncology Group, as well as initiating Duke Center for Child and Adolescent Gender Care. Dr. Purves is director of the Duke Pediatric Stone Clinic, and Cythnia Camille, FNP continues to head up the Achieving Bladder Control at Duke (ABCD) clinic.

Research in pediatric urology is truly taking off. Duke is the only center in the country where all of the urologists are federally-funded researchers. Dr. Wiener is the Principal Investigator at Duke for the CDC’s National Spina Bifida Patient Registry with over 350 patients enrolled locally (and 6000 nationally) and recently initiated Urologic Protocol for Young Children. The latter study is chaired nationally by Dr. Routh and is a prospective protocol to determine the optimal urologic management of children with spina bifida from birth to five years. Dr. Wiener is continuing as Co-Director of a NIH-funded center at Duke employing whole exome analysis to identify genetic causes of congenital abnormalities of the kidneys and urinary tract.

Dr. Routh is in the third year of his NIH K-08 award and continues to mentor PGY-3 residents and Duke medical students during their respective research years. His work is focused on health services and population-level analyses of pediatric urology topics, particularly vesicoureteral reflux, urolithiasis, spina bifida and neurogenic bladder, Wilms tumor, and disorders of sex development. By defining the underlying
evidence behind surgical decision-making, primarily through identifying variations in surgical practice, he aims to improve overall care with a proven scientifically sound approach. His groundbreaking work resulted in 15 peer-reviewed publications in 2015. Further demonstrating the breadth of his curiosity, he was recently awarded the internal Department of Surgery Clarence Gardner Grant to conduct basic science immunologic investigation of Wilms tumor specimens.

Dr. Purves arrived at Duke with his lab director Francis “Monty” Hughes, PhD last summer with a newly awarded NIH R-01 grant in hand titled “Inflammasomes Mediate Inflammation in Bladder Outlet Obstruction.” They have established Duke University Urinary Dysfunction (DUUD) Laboratory on Research Drive to investigate inflammatory mechanisms of deterioration of the obstructed bladder in rats mediated by inflammasomes. This work is applicable to, not just pediatric urologists managing boys with posterior urethral valves, but to most urologists managing men with prostatic enlargement. Their goal is to identify pharmacologic mechanisms to alter the innate immune system in order to prevent bladder deterioration. In a related mechanism, they have found a lipopolysaccharide in cell membranes of gram negative uropathogens responsible for activating inflammasomes during cystitis, offering an avenue to enable faster recovery from UTIs. This sum of this work has resulted in three publications in the past four months. They are branching out to investigate the role of inflammasones in diabetic bladder dysfunction; the promise of this work has led to the recent announcement that PGY-2 resident Brian Inouye, MD was awarded the 2016 Urology Care Foundation/ AUA Residency Research Award to work with Drs. Purves and Hughes next year. This marks the third time in the seven years of this award’s existence that it has been won by a Duke resident doing basic science research in pediatric urology!

Dr. Purves is also working on constructing a three dimensional map of bladder innervation. This will allow chemodenervation of the neurogenic or overactive bladder with agents such as BoTox to more selective target appropriate nerves where they penetrate the bladder wall while avoiding the risk of urinary retention. The ultimate goal of this work based on human cadaveric specimens is to develop an optimal bladder injection template for chemical agents.

Finally, Dr. Purves has begun work on an environmentally-friendly biodegradable urinary catheter for patients who require intermittent catheterization of their bladder. This work will allow patients to flush their catheters down the toilet after use to avoid embarrassment and contributing to trash in our landfills. We are grateful to one of patients who has contributed funds to CURED to directly impact the lives of patients with spina bifida.

Maryellen Kelly, DNP is continuing her research that she began in California involving management of neurogenic bladder in spina bifida patients and transition of care in patients as they reach adulthood. She presented her work at the Society of Pediatric Urology meeting in Prague in October and will be presenting at the AUA meeting in San Diego.

*Recent publications continued on next page.*
Recent publications:


Bladder outlet obstruction can occur in response to many agents such as bladder stones and in response to many different conditions, such organ prolapse in older women or congenital defects in children, but by far the most prevalent and clinically important cause of BOO is BPH in older men. Consider the typical BPH patient who presents to his physician. If presenting in the early stage of the condition, he will likely complain of urinary hesitancy, slow stream, straining, and difficulties emptying the bladder, all classical symptoms of obstruction. The vast majority of these men will be started on alpha blockers to relax the sphincter and/or a 5-alpha reductase inhibitor to shrink the prostate. Few men at this point will opt for surgical resection of the prostate due to its morbidity and potential complications and, in fact pharmacotherapy is very effective in reducing symptoms to a tolerable level. However, this treatment does not completely eliminate the pathologically high bladder pressures that the patient will experience. Over time these persistently elevated pressures produce a chronic non-pyrogenic inflammatory state, referred to in other fields as meta-inflammation, that leads to irritative symptoms such as urinary frequency, urgency and urge incontinence. Meta-inflammation eventually leads to bladder fibrosis and once fibrosis is established, current therapies, such as invasive de-obstruction surgery, have poor success rates in relieving patients of their symptoms.

The Duke University Urinary Dysfunction Laboratory, led by Dr. J Todd Purves MD, PhD and Monty Hughes Jr. PhD received a four year R01 grant, entitled “Inflammasomes Mediate Inflammation in Bladder Outlet Obstruction” from the NIH-NIDDK to study this problem. Their lab was the first to localize and characterize several types of pattern recognition receptors that form supramolecular complexes, called inflammasomes, in bladder tissue. These structures are able to sense stress from external sources such as pressure or stretch and they can recognize distress signals from neighboring cells to initiate the process of inflammation. In an article published this year in the Journal of Urology, they demonstrated for the first time how the NLRP3 inflammasome located in the bladder urothelium becomes activated during outlet obstruction, leading to inflammation and pathologic changes in urinary physiology. Blocking the activation of the inflammasome with a pharmacological inhibitor diminished the inflammatory response to BOO and prevented inflammation-induced changes in voiding function as determined by cystometry.

The results from this project may produce an important therapeutic target that we can use to better treat our patients whose urinary symptoms arise from obstructive causes. More generally, an understanding of how the innate immune system senses and responds to environmental changes may open new avenues in how we approach many other chronic urologic problems. In the aging bladder, traumatic episodes from recurrent urinary tract infections, surgery or from hostile conditions such as diabetes all contribute to a life-long inflammatory process that culminates in functional deterioration. Specific modulation of the innate immune system will allow us to mitigate sterile inflammation and prevent LUTS in our aging population.
The current trend in the healthcare industry is towards a rapid digitization of health records. Historically, a big challenge in research has been finding the data to analyze. Today, we have massive amounts of diverse data at our fingertips which bring revolutionary implications by potentially improving outcomes while lowering costs. These ‘big data’ bring enormous opportunities but also significant risk and require careful research consideration.

“The importance of high quality statistical analysis in modern urological research cannot be overemphasized. Rigorous and technical statistical data analysis allows not only for more accurate and reproducible research, but also tends to lead to the use of novel and more informative research methodologies than those available to most researchers. As Duke Urology pushes forward in the next decade, I envision our research portfolio to consist of projects of only the highest level of quality and with the best probability of significant medical impact. Without a doubt, biostatistics will be a cornerstone of this vision.” – Brant Inman, MD

There is considerable value in integrating subject matter knowledge with biostatistical support to facilitate research by providing methodological expertise and by closely collaborating with faculty and trainees on all aspects of research studies from design and conduct of experiments, the mode and manner in which data are collected or obtained, the analysis of data, and the interpretation of results. By combining breadth of expertise in urologic research, data management, data visualization, and analytics we will ensure that Duke Urology remains at the forefront of urologic research.

“As the quantity and quality of our research in the Division of Urology grows, we are increasingly going to need high quality statistical insight provided in a timely manner by someone well versed in urological research. To this end, we have helped support the development of Leah Gerber Davis, who currently oversees all Urology data issues, to obtain Master’s of Science level training in Biostatistics at Duke. Leah is a very talented individual and seeing her grow academically is precisely the type of thing we want to encourage within our Division.” – Brant Inman, MD

Duke Urology’s commitment to research and education, coupled with collaboration with Duke’s strong program in Biostatistics, provides a logical and seamless path to maintaining and promoting state-of-the-art analytic methods and expertise within Urology.

“It is my belief that allowing our research team to grow professionally by supporting training opportunities will increase their job satisfaction, improve the quality of the work provided, and ultimately position Duke to better lead the field of Urology in the future.”

– Brant Inman, MD
Ur ology is unique amongst surgical specialties in that we not only perform surgeries, we also medically manage a number of conditions. Due to this fact, we spend approximately 50% of our clinical time seeing patients in the clinic. Clinical operations can be complex requiring coordination of a number of separate processes and functions. These include patient scheduling, patient check-in and intake, preparing and completing procedures, and providing education and instructions upon discharge of patients from clinic. When these processes are not in sync, it can negatively impact both patient and provider satisfaction.

Recently there has been renewed interest in rigorously evaluating clinical operations within the PDC and Health System. Under the guidance of Dr. David Attarian, Chief Medical Office for the PDC, the PDC has held two clinical leadership summits. These have been interactive, one day summits focused on identifying both issues hindering the proper functioning of the clinics as well as best practices that can be shared between the clinics. These summits are the beginning of a process to bring improvements to the clinic environment and experience.

On the hospital side, Chad Seastrunk, Vice President of Ambulatory Operations for Duke Hospital, has formed an Ambulatory Executive Committee made up of physician clinic leaders as well as himself and nursing leadership. The goal of this committee is to identify issues in the operations of the hospital based clinics as well as to share processes that are working amongst the clinics. This committee is a genuine effort to increase the involvement of physician leaders in decision making and operations of the hospital based clinics. This is a tremendous step forward and will hopefully lead to better understanding and communication between providers and hospital leadership.

The goal of both these initiatives is to standardize and improve the clinical experience for providers in PDC and hospital based clinics. The groups are dedicated to identifying ways to better support providers in delivering timely and excellent care to their patients. Though we have a number of challenges that need to be addressed, these are two very positive steps toward improving the clinic experience.
Residents today must learn not only the fundamentals of urology, but also the increasingly important principles of patient safety and quality improvement. These are critical skills for future practice in an environment that will place greater emphasis on patient outcomes than ever before. However, several barriers challenge resident education in this area, including limited faculty expertise, time demands of clinical care, and geographic distribution of learners across multiple training sites.

To overcome these challenges, Dr. Chuck Scales, along with colleagues at UCLA, created a curriculum about quality improvement and patient safety, and delivered it via a web-based, mobile-compatible platform. The curriculum was delivered to approximately 400 resident physicians from multiple specialties at UCLA.

“One of our goals was to discover how we could create greater engagement in the program among the residents,” said Scales. Participants in the educational program were randomized to either a team competition environment, or an individual progress environment. In the competition environment, residents were assigned to teams based on their specialties (urology, general surgery, etc.). Each week, teams would be ranked by average score and a leaderboard distributed to participants. In the individual progress environment, participants only saw how many key topics they had attempted and mastered. The game also used adaptive reinforcement and spaced learning, evidence-based techniques to improve knowledge uptake and retention.

The results of the randomized trial were recently published in the International Journal for Quality in Health Care. The team competition environment increased resident participation on several measures. Competition residents answered questions faster and attempted more questions at least once. In addition, a dose-response relationship was observed: the longer a resident was in the competition environment, the greater the difference in participation versus the individual progress arm.

These findings support the use of behavioral economic principles, such as natural allegiances and low-stakes competition, to increase physician engagement in educational activities. To explore this further, Dr. Scales has obtained funding from the Society of Urologic Chairpersons and Program Directors to develop and deploy a urology-specific program regarding quality improvement. The program will simultaneously compare the effect of team competition to individual lottery-based incentives to determine which approach fosters greater resident engagement. The program will be deployed to approximately 40 urology residency programs across the United States.
For many years, Men’s Health has focused on single-system diseases, mostly of the GU tract. Problems were isolated and treated in a targeted fashion with little consideration for the inter-relatedness of systems or the influence of factors beyond the GU tract.

At Duke, an evolution is occurring for Men’s Health. Much of what men are concerned about as they age – sexual dysfunction, urinary incontinence, infertility, low testosterone, and enlarged prostate glands – falls to urologists to treat. These sensitive health topics frequently bring men to the doctor when they might otherwise be reluctant to have an annual physical exam with their primary care physician. Urologists have a unique opportunity to influence healthy lifestyle choices while developing consistent, sustained relationships with their patients. Recognizing this opportunity, Duke Urology now offers an innovative program caring for male patients.
The Duke Center for Male Wellness (DCMW) is a comprehensive approach to Men’s Health that will promote collaboration between specialists to eliminate barriers and coordinate care in all areas of men’s health. The DCMW will simplify the health care experience so that the first point of contact becomes the gateway for access to all-inclusive specialty care.

“Our Duke Raleigh team is committed to improving the health of our local community in all of our initiatives”, say Duke Raleigh President David Zaas, MD. “The launch of the Duke Men’s Health Program in Raleigh is an exciting next step to help improve the outcomes and quality of life for men in Wake County by providing the highest quality multi-disciplinary services all coordinated to provide the best experience for our patients.”

The DCMW will be located on the 5th Floor of Medical Office Building 8 on the campus of Duke Raleigh Hospital. The center will offer the services of two urologists, Aaron Lentz, MD and Brian Whitley, MD, an advanced practice provider, and a patient navigator. Included in the DCMW will be a primary care physician offering annual physical exams and preventive care exams for men. Additional services will include laboratory testing to assess for diabetes, HTN, hyperlipidemia as well as referrals to other ancillary health services such as physical therapy or registered dietician when a fitness evaluation or nutritional assessment is required.