Pediatric Insights

BEST CHILDREN'S HOSPITALS U.S.News & WORLD REPORT UROLOGY 2018-19

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An Update From the Division of Pediatric Urology

In This Issue

New Division Chief Appointed

On May 1, **Glenn M. Cannon, MD**, was appointed as chief of the Division of Pediatric Urology at UPMC Children's Hospital of Pittsburgh. Dr. Cannon served as the interim division chief for the 10 months prior to his promotion.

Dr. Cannon joined the Division in 2011 and is currently an associate professor of urology at the University of Pittsburgh School of Medicine. A graduate of Thomas Jefferson University Medical College, Dr. Cannon completed his residency in urology at the University of Pittsburgh, and followed that up with a fellowship in pediatric urology at Boston Children's Hospital.

Clinically, and with respect to research, Dr. Cannon specializes in the treatment of spina bifida, urinary tract reconstruction, ureteropelvic junction obstruction, vesicoureteral reflux, and hypospadias.

"Dr. Cannon has become a nationally recognized expert in minimally invasive surgery in pediatric urology. Having served as interim chief for 10 months, Dr. Cannon demonstrated effective leadership of the Division of Pediatric Urology, and it is my pleasure to see him elevated to this important leadership position at UPMC Children's Hospital," says Joel B. Nelson, MD, Chief Clinical Officer, Health Services Division, UPMC, Frederic N. Schwentker Professor and Chairman, Department of Urology, University of Pittsburgh School of Medicine.

ABOUT THE DIVISION

The Division of Pediatric Urology offers diagnostic evaluation and surgical treatment for children with genitourinary disorders, including ureteropelvic junction obstructions, vesicoureteral reflux, hydronephrosis, and other conditions. The Division supports robust clinical and research programs, as well as offering an accredited two-year fellowship program featuring an active basic science research laboratory experience.

Our division is a national leader in providing minimally invasive urologic surgical options for an array of urological conditions. Reconstructive and extirpative techniques can be accomplished laparoscopically, robotically, and endoscopically. Common conditions treated by these modalities include UPJO, duplication abnormalities, reflux disease, and complex stone disease.

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UPMC CHILDREN'S HOSPITAL OF PITTSBURGH

International Travels

For nearly 20 years, **Francis X. Schneck, MD**, has volunteered his time and surgical expertise to innumerable children in Africa and other parts of the world who are in desperate need of oftentimes complex urologic surgical procedures. His volunteer work also extends to the training of other surgeons and care providers in the host countries and hospitals he has visited as a member and team leader with International Volunteers in Urology, a nonprofit NGO, for which he sits on the board and is currently vice chair.

Dr. Schneck typically makes two to four trips abroad every year, mostly to places in sub-Saharan Africa, for eight to 10 days at a time. He's operated and helped to train surgeons in Senegal, Ghana, Zambia, Cameroon, Kenya, Ethiopia, Tanzania, and other countries. In 2018, he'll be traveling with teams of volunteers to Senegal, Thailand, Tanzania, and Rwanda to screen patients, conduct workshops, and lecture on topics in pediatric urology.

Dr. Schneck first traveled to Africa while in medical school and immediately became enamored of its peoples, cultures, sights, and sounds, and he knew after his first medical-related trip in 2001 that it was the right place to be to treat patients and educate fellow colleagues.

"When I first started making these trips, I don't think there were any trained pediatric urologists in all of sub-Saharan Africa. There are a only a few now, but that doesn't even begin to approach the level of need that exists," says Dr. Schneck. The population in sub-Saharan Africa is 926 million people, of which about 50 percent are under the age of 18 years.

Cases of All Kinds — and Lots of Them

From the simple to the complex, Dr. Schneck has seen much in the spectrum of conditions and congenital diseases that can present themselves. "We see a lot of traumatic injuries, a lot of crush-type injuries from automobile accidents, falls, and the like. And, of course, we see many cases of a congenital nature that are amenable to surgery. We try to see as many patients as possible during our trips, make recommendations and plans for care, and work with the team onsite to perform as many surgeries as we can in our limited amount of time. However, some of our cases can take six hours or more, so the reality is we can only do so much, which is why education and training of our host colleagues and visitors from neighboring countries is such an important aspect of what we do on these trips," says Dr. Schneck.

A Different Type of Teaching Experience

It can be a bit unnerving operating and teaching at the same time in a crowded, hot surgical amphitheater, but this is simply the reality of the situation, as Dr. Schneck explains. "We want as many people as possible observing and assisting with our surgeries. It's critical to the learning experience. I don't think I've ever gotten completely comfortable with the cramped confines, but you keep yourself focused on the tasks at hand and talk the observers through the procedure. I like to say it's a bit like being a hockey goaltender — those guys can sweat off 10 or 12 pounds in a game, and that's what it can be like operating and teaching for 10 or 12 hours at a stretch with up to 20 people surrounding you. It's an intense experience, but one that I find incredibly rewarding. It's one that our students and observers can take so much from, which at the end of the day is what it's all about. Our teams are going to leave in a short amount of time, but it's our goal to leave a lasting impact with everyone we meet and collaborate with."

A Typical Trip

Outside of the significant logistics exercise needed to coordinate such an endeavor, and the packing up of all the necessary gear and supplies that will be needed to perform multiple surgeries over a 10-day period, the volunteer teams usually consist of several pediatric urologists, a pediatric anesthesiologist, residents or fellows, nurses, and support staff. Anywhere from five to 10 people may be on a trip, depending on circumstances. "We also typically have a resident scholar with us from somewhere in the United States who has applied and received funding to attend. For certain, I always take one of our pediatric urology residents and fellows from UPMC Children's because it is an incredible learning experience for a number of reasons — one of which is the

New Research:

Radiation Dose in Fluoroscopic Voiding Cystourethrogram

Presented as an abstract[1] at the 2018 AUA annual meeting, **Rajeev Chaudhry, MD**, along with division colleagues **Francis Schneck, MD**, and **Glenn Cannon, MD**, and other collaborators, discussed the findings from a recent prospective pilot study designed to measure the radiation dose in fluoroscopic voiding cystourethrogram (VCUG) in pediatric patients using a single point dosimeter.

Fluoroscopic radiation dose is always a concern, both for very young patients, or those who may need repeat scans or monitoring over time for their underlying condition, and for the physicians and OR staff members performing the procedures, particularly those operating in high-volume centers and academic teaching environments.

This new pilot study sought to measure absorbed radiation dose from a VCUG used to diagnose cases of vesicoureteral reflux. Prior to this study, accurate information on radiation exposure has not been reported in the literature.

For this study, single dosimeters were used, applied to the enrolled patient's (n=38) sacrum. During the procedures, all patients received the same fluoroscopy settings: low dose, three pulses per second from a distance of 60 cm from the source to the skin. The smallest possible area was used on conjunction with a tightly collimated x-ray beam.

With these settings, image quality was not degraded or compromised, and the absorbed dose at the skin was low for a single VCUG procedure, showing that within these parameters and settings, and for a single procedure, VCUG is a safe diagnostic procedure for these very young patients (median age of enrolled subjects was 12.5 months). Median radiation dose at the skin was 0.33 mGy at a median fluoroscopy time of 54 seconds.

[1] Use of Single Point Dosimeter to Evaluate Radiation Dose With Fluoroscopic Voiding Cystourethrogram in Pediatric Patients: A Prospective Pilot Study. Rajeev Chaudhry, Patrick J. Fox, Pankaj Dangle, Wael Abdalla, Helen Bradley, Mark Duranko, Michael Sheetz, Francis X. Schneck, Glenn M. Cannon, Michael C. Ost, Heidi A. Stephany. Abstract Presented at American Urological Association 2018 Annual Meeting.

type of cases we typically see: cases that are relatively rare in the United States, but more common in the places we visit."

Planning Care When Follow-Ups Are Impossible

Because Dr. Schneck has visited some of the same countries and hospitals repeatedly, he has on occasion seen past patients in follow-up, but it is rare unless they live in the city in which they were seen. As he explains, many of the families and children travel significant distances — 300 or 400 kilometers — and likely have expended their entire financial means to be seen and treated. They simply don't have the means to return for follow-up care. "We talk to our colleagues in the hospitals we visit and try to learn about any of our past patients, but it's difficult to know. They will often say, without being glib, that they (the seriously ill kids) were discharged and are either doing fantastic or have possibly experienced complications. This point underscores the fact that when we are there and planning for a patient's care, it is

vitally important to realize that after a couple of weeks the patients and their families are going to be on their own without follow-up. You must take this into account when you are planning their surgical care."

The Work Changes How You Work

Dr. Schneck says that his international work and experiences have, over the years, changed some of how he practices in his everyday work at UPMC Children's. One aspect is he has experienced and performed a lot of procedures for conditions that he would otherwise only see once or twice a year practicing in Pittsburgh. "The other aspect that I think has happened in my practice of medicine and surgery is that you realize surgery is just a small part of a person's care. My international work has helped me to focus my efforts more on the patient and their family and less on the underlying condition. Even if the case is difficult and we know in advance there might not be a good outcome, or if we can only help in a limited way, just being there for the family, walking them through what we can and cannot do is just as important as being skilled at the actual surgical procedure."

Lending a Hand

Physicians interested in volunteering their time and expertise should visit **IVUMed.org** for more information.

Studying ERAS in a Pediatric Population

Enhanced recovery after surgery (ERAS) has been studied extensively in adult populations, and its principles and practice continue to expand to even more specialties as the evidence base accumulates with respect to its benefits to patient care and the ever-growing demand for the provision of quality of care. However, there have been few studies to date related to how ERAS works with pediatric populations.

The Division of Pediatric Urology is currently participating in a multi-center, multidisciplinary study with four other institutions to analyze the benefits and outcomes of applying ERAS protocols to pediatric bladder and bowel surgery patients. Leading the study at UPMC Children's Hospital of Pittsburgh is **Rajeev Chaudhry, MD**, assistant professor of urology in the Division of Pediatric Urology.

At UPMC Children's, the study is a close collaboration between pediatric urology and pediatric anesthesiology, as well as with partners in nursing and other areas. "Having a group of close collaborators from anesthesiology and nursing is not only a key part of the study, but a key part of our ERAS work in general as we continue to evolve our understanding of what techniques and practices provide the most benefit to our patients in all aspects of the pre, surgical, and postoperative environments," says Dr. Chaudhry.

Patient recruitment for this new study actively began in the spring of 2018, with the goal of 10 patients per year at each of the five participating institutions. However, the idea for the study came about over the last two years in ongoing conversations between Dr. Chaudhry and his colleagues at the other participating centers. "I think we all realized that in recent years we've been implementing different aspects of ERAS in our practices because of the successes seen in the adult world, and those have translated into benefits for our patients. But that is, of course, largely anecdotal evidence. This study will begin to add the hard data we need to show in order to change practice on a broad basis," says Dr. Chaudhry.

Protocols and Practices: Before and After ERAS

The use of ERAS in pediatric bladder and bowel surgery patients at UPMC Children's hasn't been an overnight switch. Dr. Chaudhry and his colleagues have been using and transitioning to various aspects of ERAS for several years.

Complex surgical cases, for example an individual with spina bifida and neurogenic bladder, by their very nature are an ideal population on which to use ERAS measures and study their benefits. These cases tend to be complex, require extensive intraoperative IV fluids, and usually require postoperative pain control measures.

"We used to admit many of these patients preoperatively for bowel preps, because with many spina bifida cases with neurogenic bladder, they also have neurogenic bowel. They would receive NG tubes to administer the prep, but oftentimes it was not effective and the patient would end up with fluid and electrolyte imbalances and dehydration, which further complicates the surgery and extends the postoperative recovery period, so we stopped administering the bowel preps in these circumstances," says Dr. Chaudhry.

Gut motility, and its early return, is an essential component of the ERAS measures. "There have been a lot of studies showing benefits to feeding the gut prior to and immediately after surgery as a way to promote early and better motility. One of the biggest reasons for discharge delays in these complex cases is postoperative ileus. To combat this, we have started our patients on small amounts of a clear electrolyte beverage a few hours before surgery, and we put them on a clear liquid diet immediately after surgery. The belief is that, again, the earlier you can promote gut motility and return to normal bowel function is a benefit. We've also eliminated the use of NG tubes postoperatively, as we think they may actually delay the return of gut motility. We try to avoid them intraoperatively, as well if at all possible."

Study Sites

Children's Hospital Colorado
Children's Hospital St. Louis
Children's Mercy Kansas City
Cincinnati Children's
UPMC Children's Hospital of Pittsburgh

With respect to anesthesia and postoperative pain control, much has changed. "Working with our anesthesia colleagues in this area has been immensely important to our changes in care. We will try to avoid using opioids as much as possible for a variety of reasons, but mainly because of the potential bowel issues they can cause. We discuss preoperatively what may be best for the patient based on their anatomy and physiology. Our pain anesthesiologists have a broad armamentarium at their disposal, and they are critical in helping to manage the patient and evolve our ERAS protocols. We also work with them to manage fluids, because

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ABOUT THE DIVISION *(Continued from Page 1)*

Along with our nephrology and nutrition colleagues, we are one of the few pediatric urology divisions in the country that offer a multidisciplinary approach to the treatment of pediatric stone disease.

DSD, formerly termed "intersex conditions," often require complex surgical reconstruction in addition to input from endocrinologists and psychiatrists. UPMC Children's Hospital of Pittsburgh is one of the few pediatric hospitals offering a multidisciplinary DSD clinic.

Our multidisciplinary Spina Bifida Clinic currently follows more than 400 patients and offers state-of-the-art reconstructive urologic surgery and ongoing care.

The UTI Center at UPMC Children's takes a multidisciplinary approach to addressing and investigating pediatric urinary tract infections (UTI). This creates a unique setting for providing the highest level of clinical care and research. A resource for families and clinical partners, the Center focuses on UTI and the related conditions of vesicoureteral reflux and bladder and bowel dysfunction. With more than two decades of experience caring for children with UTI, our nationally recognized researchers have changed common practices for treating UTI, improving the lives of children in the process.

Drs. Rajeev Chaudhry, Francis Schneck, and Glenn Cannon in the operating room.

Faculty and Staff

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Division Chief and Associate Professor of Urology

Francis X. Schneck, MD
Clinical Director and Associate Professor of Urology

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Studying ERAS in a Pediatric Population *(Continued from Page 4)*

too much can lead to bowel edema and delay return of function. It's really a multifaceted approach that considers the specifics of the patient balanced against returning them to normal function in the best ways possible," says Dr. Chaudhry.

Study Outcomes and Metrics

Primary outcomes measures of the ERAS study include length of stay, 30- and 90-day morbidity, rates of complication, and readmission rates. "Length of stay will likely be hard to measure because it is intimately tied to the return of bowel function, which for all intents is still quite a subjective measure," says Dr. Chaudhry.

However, as the study progresses over the coming years, the ability to measure and analyze other aspects of the ERAS protocols will present themselves to the research teams. "We should be able to look at the anesthesia protocol and compare it to what was being used prior to the start of the study, how we may be able to reduce the usage of opioids and their accompanying side effects, and likely many other aspects from all of the data the study sites are collecting."

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Recent Publications

Below are select recent publications from Division faculty members.

Yecies T, Bandari J, Schneck F, Cannon G. Direction of Rotation in Testicular Torsion and Identification of Predictors of Testicular Salvage. *Urology.* 2018. Epub ahead of print.

Dangle P, Bansal U, Chaudhry R, Cannon GM, Schneck FX, Ost MC. Trends In Urologic Indications for Pediatric Renal Transplantation Over a 27 Year Period — UNOS Database. *Urology.* 2017; Nov 14. Epub ahead of print.

Farber NJ, Davis RB, Grimsby GM, Shinder B, Cannon GM Jr, Jacobs MA, Ost MC, Schneck FX, Stephany HA, Gargollo PC, Dwyer ME. Bowel Preparation Prior to Reconstructive Urologic Surgery in Pediatric Myelomeningocele Patients. *Can J Urol.* 2017; 24(5): 9038-9042.

Cannon GM, Ost MC. Robot-Assisted Laparoscopic Extravesical Ureteral Reimplantation for Primary Vesicoureteral Reflux in Children. *J Urol.* 2017; 197(6): 1379-1381.

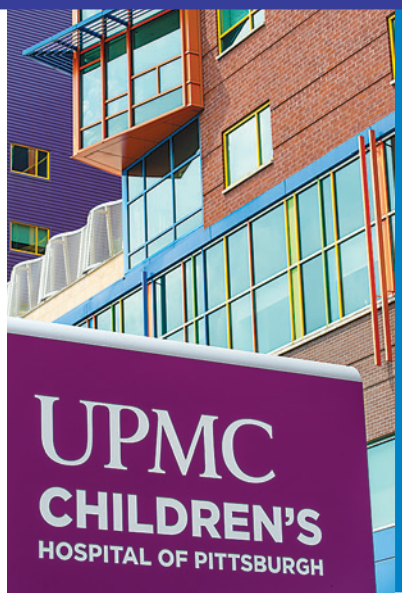
Hugar SB, Kadow BT, Davis A, Ranganathan S, Reyes-Mugica M, Schneck FX, Picarsic J. Pediatric Testicular Hemangioma in a 10-Year Old: A Rare Entity That May Mimic Malignancy With Appraisal of the Literature. *Urology.* 2018; Jan 3. Epub ahead of print.

Chaudhry R, Theisen KM, Dangle PP, Schneck FX. Congenital Aphallia: Novel Use of Acellular Dermal Matrix During Scrotal Flap Phalloplasty. *Urology.* 2017; 105: 167-170.

Chaudhry R, Theisen KM, Dangle PP, Schneck FX. Percutaneous Stone Surgery in Spina Bifida Patients — Are Stone-Free Rates Worth the Risk? *J Endourol.* 2017 Apr; 31(S1): S81-S86. Epub ahead of print.

Dangle PP, Lee A, Chaudhry R, Schneck FX. Surgical Complications Following Early Genitourinary Reconstructive Surgery for Congenital Adrenal Hyperplasia-Interim Analysis at 6 Years. *Urology.* 2017; 101: 111-115.

UPMC Children's Hospital of Pittsburgh is affiliated with the University of Pittsburgh School of Medicine and nationally ranked in nine clinical specialties by *U.S. News & World Report*.



About UPMC Children's Hospital of Pittsburgh

Regionally, nationally, and globally, UPMC Children's Hospital of Pittsburgh is a leader in the treatment of childhood conditions and diseases, a pioneer in the development of new and improved therapies, and a top educator of the next generation of pediatricians and pediatric subspecialists. With generous community support, UPMC Children's Hospital has fulfilled this mission since its founding in 1890. UPMC Children's is recognized consistently for its clinical, research, educational, and advocacy-related accomplishments, including ranking 13th among children's hospitals and schools of medicine in funding for pediatric research provided by the National Institutes of Health (FY2017).