

The University of Michigan Department of Urology

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What's New April 20, 2018

Endourology Division Update

8 Items, 20 Minutes

Good morning, all!

Today we hear from Dr. Will Roberts and the Division of Endourology, who have come together to provide us with a comprehensive recap on some of their noteworthy innovations. I'd like to thank all the contributors for taking the time to write such thoughtful and detailed passages for today's edition of What's New, it's clear there is a lot of impressive work being done.

Thanks again to the Endourology Division, and I hope everyone enjoys their weekend!

-Eric Anderson

Dr. Will Roberts

Eighteen months ago while revisiting our mission, the division of Endourology identified three priorities to help align our individual and collective efforts

- Excellent clinical care
- Leaders in Innovation
- Financial success and stability

This edition of What's New focuses on Endourology **Innovation** .

In Wikipedia, **Innovation** is defined simply as a "new idea, device or method".^[1] However, innovation is often also viewed as the application of better [solutions](#) that meet new requirements, unarticulated needs, or existing [market](#) needs.^[2] Such innovation takes place through the provision of more effective [products](#), [processes](#), [services](#), [technologies](#), or [business models](#) ...

Here is a slide that speaks to innovation as a process to maximize the value of a good idea - from a talk I gave frequently several years ago within the context of entrepreneurship.

Ideas & Opportunities

- *Idea (Invention)* – Something new (novel).
- *Innovation* - process of maximizing the impact (value) of an idea or invention

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graph LR; A[Invention] --> B[Innovation]; B --> C[Diffusion];
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- *Opportunity* - a situation where innovation of an idea can increase value.
- *Entrepreneur* – someone who perceives an opportunity and creates the means to pursue this opportunity.

M Urology & Biomedical Engineering

Below we highlight ongoing initiatives (both individual and group efforts) that have arisen from within our divisional clinical, research, and entrepreneurial efforts. Hopefully this What's New will be informative and perhaps even inspire other innovative efforts and initiatives across our department and the footprint of Michigan Medicine.

From Dr. Daw - Chelsea update:



After what was a long and drawn-out period to get a definitive agreement signed between Trinity and Michigan Medicine, we are finally moving forward. The urology service has been assigned ~3 days of OR time per month, primarily on Thursdays (two full days, two half days, and 5th Thursdays when they occur). As a part of initial equipment purchases, a new 120W laser has been installed and trialed by the Chelsea urology group as of last week. This will allow us to seamlessly transition care of even the most complex ureteroscopy cases to Chelsea. It is our goal to also provide care for patients with large renal stones (via PCNL) as well as BPH (via HoLEP) in the near future. To do so, Michigan Medicine has

hired a complement of 4 physician assistants who are currently completing initial training. They will be instrumental in providing day-to-day care to our inpatients. This fall, we will be opening a urology clinic at Chelsea Hospital. This step will further our department's integration with the primary care base currently working at Chelsea and allow us to provide on-site, timely ambulatory urologic care. The office space has been acquired and renovations are underway. It is my hope that as we transition to this new practice location, opportunities for additional growth will present themselves resulting in a larger Michigan Urology footprint at Chelsea Hospital in the not too distant future

From Dr. Ambani - OR26 Equipment Checklist:

A point of frequent frustration is the amount of unnecessary equipment opened during cases and the associated waste. In OR26, Karen does an excellent job with opening only what is necessary, but "non-regular" staff that provide her relief during breaks, after 3pm, and her off days are typically not as careful and/or are unfamiliar with the types of cases we regularly perform in the endoscopic suite. This can lead to wasting of disposables, or unnecessary sterilization of reusables, which will increase the wear and tear and lead to delays, not to mention the waste of money.

In an effort to reduce unnecessary waste in OR26, we are introducing a simple intervention that will hopefully streamline our block days a bit. With the help of Karen, we created this document with a list of commonly used instruments during OR26 block days.

OPEN FOR NEXT CASE

WIRES

- Straight Stiff Glidewire (\$48.02)
- Angled Stiff Glidewire (\$48.02)
- Straight Sensor wire (\$43.76)
- Angled Sensor wire (\$43.76)
- PTFE wire (\$11.80)
- Amplatz Super Stiff wire (\$26.24)
- Other _____

URETERAL CATHETERS

- 6Fr ureteral catheter (white) (\$11.07)
- 5Fr ureteral catheter (yellow) (\$11.44)
- Other _____

URETERAL DILATORS

- 8/10F dilator (\$50.84)
- Lieberman (\$41.57)
- UroMax Balloon (____F) (\$233.70)

ACCESS SHEATHS

- 11/13F Navigator (46cm) (\$113.16)
- 11/13F Navigator (36cm) (\$113.16)
- 13/15F Navigator (46cm) (\$113.16)
- 13/15F Navigator (36cm) (\$113.16)

CONTRAST

- Contray
- Isovue

URETEROSCOPE

- Fiberoptic Flexible URS
- Lithovue (\$1500.00)
- Semirigid

BASKET

- 1.9F ZeroTip Basket (\$205.00)
- 1.9F Dakota Basket (\$210.00)
- 1.5F NCircle (\$218.25)
- Other _____

URS IRRIGATION

- Uroseal (\$20.00)
- Urolek (\$14.76)

STENT

- Type
- Percuflex (JJ) (\$80.00)
- Silhouette (\$290.00)
- Polaris (\$151.70)
- Other _____
- Size
- 6 x 24
- 6 x 26
- 6 x 28
- Other _____

RESECTOSCOPE

- Bipolar
- Monopolar
- Bipolar Loop (\$482.85)
- Monopolar Loop (\$88.82)
- Bipolar Button (\$504.60)
- Rollerball (\$482.85)

BLADDER BIOPSY

- Cold cup forceps
- Rigid biopsy forceps
- Bugbee

OTHER

Prices are written next to the instruments. This will be enlarged, laminated and hung in 26 with a dry erase marker. On block days or for any days where the same surgeon is doing

multiple cases in OR26, the process would be that at the conclusion of a case, you go to this and mark off what you would like opened for the next case. If it is not checked, it will not be opened. No need to mark off what to "have available," since almost everything is nearby in OR26. Our hope is that this will reduce the amount of unused equipment sitting on our tables at the end of the case that either goes in the trash or to sterile processing.

Also from Dr. Ambani - Ureteroscopy Post-op Pain Control Pathway:

With the current emphasis on minimizing opioid prescription, our division has reflected on our own practices and is looking for ways to curtail the harmful effects of narcotics in our ureteroscopy patients. Anecdotally, many of us have experience with non-narcotic pain management after URS with some success, so we looked to formalize this as a division. We have created a new pathway for patients who undergo ureteroscopy to replace opioid pain medication with ketorolac. Patients must be without a history of peptic ulcers, NSAID allergies, and a creatinine >1.9 . All of these patients will receive extensive education preoperatively about postop pain control, including the new MUSIC ureteral stent patient pamphlet. We will be tracking postop pain prescriptions (via MAPS), ED visits, readmissions, and telephone calls.

From Dr. Kraft:

Given my clinical interest in pediatric urolithiasis and minimally invasive surgery, I've been fortunate to be part of the Endourology Division since Stuart Wolf invited me several years ago. In 2011, I started at Mott with a single flexible ureteroscope, a 20-watt Holmium laser, and no robot. The lap/endo program has matured considerably, with a range of ureteroscopes from the Wolf pediatric semi-rigid to the LithoVue single use flexible, high-watt Holmium laser, and the DaVinci robotic surgical system. We provide the gamut of surgical procedures for stone disease in children including ESWL, ureteroscopy, and PCNL. Our service continues to have the highest robotic surgery volume among all pediatric specialties at Mott. Many of our patients have congenital disorders that predispose them to urolithiasis early on and make surgical intervention challenging. With the collaboration of Julian Wan and the adult Endourology team, we have been able to offer surgical treatment for even the most complex patients. Future endeavors for pediatric endourology at Mott include upgrading our flexible ureteroscopes, incorporating use of stents that limit need for cystoscopic removal (which mandates additional anesthetic exposure in children), and developing a multidisciplinary pediatric kidney stone clinic, already in the works with Chief of Pediatric Nephrology Dr. David Kershaw. Julian and I have also started incorporating dusting into laser cases more routinely with the hope to become one of the lead pediatric centers in this technique.

Research endeavors in pediatric endourology have recently included my interest in reducing ionizing radiation in children, particularly those who may require multiple radiographic studies throughout childhood. Our pediatric urology fellow (and soon to be partner) Courtney Streur and I have been evaluating the effect of the Image Gently

Campaign on CT utilization in pediatric kidney stone formers. Courtney will be presenting our work at the AUA next month.

Here's a brief overview from Courtney:

The Image Gently® Campaign was initiated in 2007 to decrease the use of unnecessary ionizing radiation in children, who are at greater risk than adults for radiation-associated malignancies from cumulative exposure and due to the radiosensitive nature of their tissue. As children with kidney stones are particularly at risk of repeated radiation due to the recurrent nature of their disease, they could particularly benefit from this campaign. The AUA Guidelines recommend the use of renal ultrasound for evaluation of pediatric stones except for the rare case when percutaneous nephrolithotomy is planned or the ultrasound is inconclusive. We sought to determine if the use of CT for evaluation of kidney stones decreased after the launch of the campaign. To do this, we used a claims database from one of the largest national insurance providers (Clinformatics DataMart™) to identify all children and adults who were seen at an ambulatory care or emergency department setting for evaluation of a stone between 2001-2015. We determined if the patient had a CT abdomen/pelvis performed during their stone episode (defined as 3 months from their index visit). We then performed a difference-in-difference analysis to compare the quarterly utilization of CT for evaluation of a stone between children and adults before and after the launch of the campaign.

We found that the use of CT for evaluation of a kidney stone was increasing at a parallel rate between children and adults before the launch of the campaign in 2007. Interestingly, it also started decreasing at a parallel rate after the campaign. Therefore, we concluded that there were other factors that were influencing the decision to obtain a CT scan. A literature search demonstrated that the number of manuscripts about the dangers of ionizing radiation from medical imaging increased exponentially over the course of the study. A similar trend was also seen for publications in the lay press such as newspapers, magazines, and blogs. While the Image Gently Campaign may have had some positive impact on decreasing the utilization of CT for evaluation of kidney stones in children, likely the effects seen in this analysis were largely due to an ongoing national conversation and increasing awareness of both providers and patients.

From Dr. Ghani:

Since 2017 we have had extramural funding for a research project studying optimal holmium laser settings for a dusting technique for ureteroscopic stone surgery. Dr Ali Aldoukhi, Research Fellow, joined the Endourology Stone Lab in January 2017 and has been responsible for leading multiple projects investigating renal stone fragmentation, supervised by Drs. Ghani and Roberts. Dr. Aldoukhi has had a very productive fellowship: with three abstracts at the 2017 Annual Engineering and Urology Society Meeting, two flagship abstracts at the 2017 Challenges in Endourology Meeting in Paris, and five abstracts at the 2017 World Congress of Endourology in Vancouver. In 2018, the Stone

Lab presented two papers at the European Association of Urology meeting in Copenhagen and will also be presenting three abstracts at the Annual American Urological Association Meeting. Our research has expanded to include a collaboration with the Department of Chemistry to assess structural stone factors that affect laser lithotripsy. This project will allow for the synthesis of new stone models, with potential commercialization, to be used for the testing of holmium and other ablative technologies. Also, we have received a provisional patent for a device that can be used to hold the stone and clear fragments during laser lithotripsy, and for a method that will help in detecting stone proximity to the laser fiber tip which can be used in automating laser activation.

From Dr. Hollingsworth:

One patient safety issue that we deal with frequently in endourology is the retained ureteral stent. Contemporary data suggest that as many as 12.5% of ureteral stents placed are kept in patients too long. Not only are retained ureteral stents a source of patient morbidity, but they also require, on average, two additional endoscopic procedures for removal. While a variety of solutions have been developed to help urologists keep track of their patients with ureteral stents, adoption has been limited because many require steps outside the normal clinical workflow for their maintenance. Motivated by this, we partnered with Prof. Mark Newman from the School of Information to develop a cloud-based application that is integrated into our electronic health record, allowing us to automatically register all patients who undergo ureteral stent placement in our health system. Moreover, the application follows patients through their postoperative visit to help ensure timely removal. We did a soft rollout of the application in November 2017 and kicked off a pilot test in February 2018 that will wrap up this month. As part of the pilot, we identified 43 consecutive patients who underwent ureteral stenting by someone in our group at either the University Hospital or the Livonia Surgery Center. All patients were successfully captured by our application. Importantly, it detected 15 patients (35%) who did not have return visits scheduled for stent removal that may have otherwise been missed. Currently, we are working with our colleagues in Surgery to extend our platform to other temporary surgical assets.