Moderated Poster Session IV: General/Endourology/Stones
Thursday, September 29, 2016
3:15 – 5:00 pm

P54
An analysis of industry effects on prescriber behavior: Degarelix and denosumab

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Background: The influence of financial ties to pharmaceutical companies remains controversial. We aimed to assess a potential relationship between pharmaceutical payments and prescription patterns for degarelix and denosumab.

Methods: Medicare Provider Utilization and Payment Data: Physician and Other Supplier Public Use File (Medicare B) data containing 2012 claims compared to OpenPayments (Sunshine Act) data for the second half of 2013. Urologists and medical oncologists who billed Medicare for degarelix or denosumab were cross-referenced in both databases and payments were aggregated into a consolidated dataset. Adjusted beneficiary count and total Medicare reimbursement were compared according to receipt of Sunshine payment, and an association between Sunshine payment amount and total Medicare reimbursement was also assessed.

Results: Of the 160 prescribers of degarelix and 1507 prescribers of denosumab, 91 (57%) and 854 (57%) received Sunshine payment, respectively. Degarelix prescribers who received Sunshine payment had higher median total Medicare reimbursement ($13 257 vs. $9554; p=0.01). Denosumab prescribers who received Sunshine payment had both higher median adjusted beneficiary count (55 vs. 50, p & lt; 0.001) and median total Medicare reimbursement ($69 620 vs. $60 732, p & lt; 0.001). On multivariable analysis, both receipt of Sunshine payment (adjusted median difference $5844, 95% CI $937–$10 749) and oncology specialty (adjusted median difference $34 380, 95% CI $26 715–$42 045) were independently associated with total Medicare reimbursement for denosumab.

Conclusions: In the case of degarelix and denosumab, there is a weak association between pharmaceutical company payments on prescribers' prescription behavior patterns.

P54. Table 1. Characteristics of the study population stratified by receipt of Sunshine payment for degarelix and denosumab

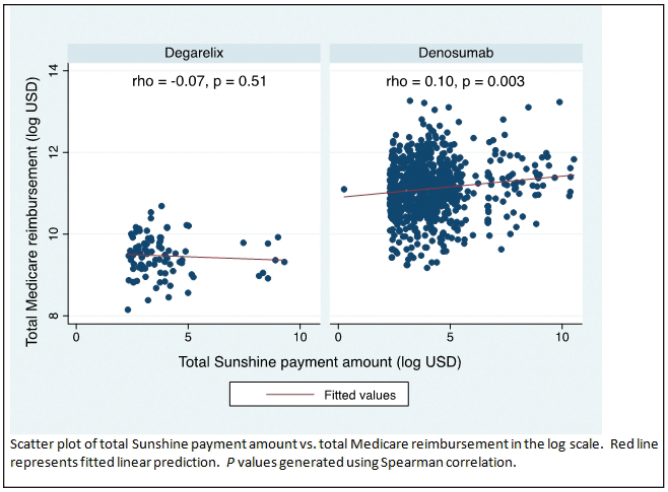
	Degarelix			Denosumab		
Characteristics	**No Sunshine payment (n=69)**	**Sunshine payment (n=91)**	**P value***	**No Sunshine payment (n=653)**	**Sunshine payment (n=854)**	**P value**
Specialty (%) Urology Oncology	62 (90) 7 (10)	91 (100) 0 (0)	--	93 (14) 560 (86)	78 (9) 776 (89)	0.002
Adjusted beneficiary count, median (IQR)	36 (23–62)	52 (29–79)	0.051	50 (31–74)	55 (38–79)	<0.001
Total Medicare reimbursement, USD, median (IQR)	9554 (7507–14 291)	13 257 (9398–17 772)	0.01	60 732 (37 182–92 577)	69 620 (44 281–99 272)	<0.001

IQR: interquartile range; USD: United States dollars.
*P values determined using Chi-square test for categorical variables and Wilcoxan rank-sum tests for continuous variables.

P54. Table 2. Median regression analysis examining predictors of total Medicare payment

	Univariable analysis		Multivariable analysis*	
Variable	**Predicted median difference (95% CI)**	**P value***	**Adjusted median difference (95% CI)**	**P value**
Sunshine		0.001		0.02
No	Reference		Reference	
Yes	8912 (3702–14 121)		5844 (937–10 749)	
Specialty		<0.001		<0.001
Urologist	Reference		Reference	
Oncologist	36 649 (29 131–44 167)		34 380 (26 715–42 045)	

*P values are computed using the Wald test. The multivariable model included receipt of Sunshine payment and prescriber specialty.



Scatter plot of total Sunshine payment amount vs. total Medicare reimbursement in the log scale. Red line represents fitted linear prediction. *P* values generated using Spearman correlation.

P54. Fig. 1. Relationship between total Sunshine payment amont and total Medicare reimbursement for degarelix and denosumab.

P55

The light at the end of the scope: The history of Electro Surgical Instruments Co and the mignon lamp

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Background: Prior to the development of the mignon small light bulb, endoscopes struggled to gain traction in the medical field. The first endoscopes were expensive, cumbersome due to the extensive and complicated water cooling systems of early models, and provided poor visualization. The mignon lightbulb was a small inexpensive interchangeable lightbulb that screwed in to the end of the endoscope allowing significant improvement in visualization.

Methods: Literature review was performed on topics related to the development and impact of the mignon lamp within urology. This included review of textbook chapters, original product catalogues, and peer-reviewed articles on Pubmed.

Results: Thomas Alva Edison introduced the light bulb in 1879. He is also responsible for introducing the screw cap for easy changes of light bulbs. At this time, cystoscopy commonly used open platinum incandescent filaments requiring extensive cooling mechanisms to make medical use safe. The rapid spread of Edison's light bulb technology did not spare the medical field. Within a few months of its introduction, Dr. Henry Koch, a urologist and Charles Preston, an electrician, from Rochester, NY, modified the Edison bulb to a smaller size and amperage suitable for medical devices and the mignon lamp was born. The first urologic use of the mignon lamp came in 1883, when David Newman of Glasgow attached a mignon bulb to the end of a cystoscope. Three years later, German urologist Maximillian Nitze and Austrian instrument manufacturer Josef Leiter, introduced the cystoscopes incorporating the new technology. Electro Surgical Instruments Co., founded in 1896 by Koch, Preston, and Maier, marketed the mignon bulb as a "cold" lamp allowing contact with body tissue without the potential for burns and ulcerations when the switch was made from carbon to metal filaments in 1905. Electro Surgical Instruments Co. although founded by a urologist, also produced light bulbs for vaginal speculums, rectal speculums, esophagoscopes, bronchoscopes, and rhinoscopes.

Conclusions: The mignon lamp, developed by a urologist and Electro Surgical Instruments Co, revolutionized endoscopy not only for urology, but for many surgical disciplines. For the first time, endoscopic visualization of the bladder became accessible to the average urologist. Endoscopic illumination using mignon light bulbs was not improved upon until the advent of the rod lens system in the second half of the twentieth century.

P56

Clinical phenotyping does not differentiate Hunner's lesion subtype of interstitial cystitis/bladder pain syndrome (IC/BPS): A relook at the role of cystoscopy

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Background: Identification of Hunner's lesions in interstitial cystitis/bladder pain syndrome (IC/BPS) patients presents an opportunity for objective classification into those with Hunner's lesion IC/BPS (classic IC) and those with non-Hunner's lesion BPS. While currently a diagnosis of Hunner's lesion IC/BPS requires cystoscopy, limited data exists suggesting that these subtypes can be distinguished without endoscopic examination based on the degree of bladder-focused centricity and infrequent association with generalized pain conditions.

Methods: Patients from a prospective, single-center database of IC/BPS patients who had documented cystoscopic findings were categorized as those with Hunner's lesion IC/BPS and non-Hunner's lesion BPS. Their demographics, pain and symptom scores, voiding symptoms, presence of IBS, and clinical UPOINT scoring were comparatively analyzed.

Results: A total of 469 patients were reviewed. Of those, 359 had documented local anesthetic cystoscopic findings; 44 (12.3%) with Hunner's lesion IC/BPS and 315 (87.7%) with non-Hunner's BPS. Patients with Hunner's lesions were older (p=0.004), had greater urinary frequency (p=0.013), more nocturia (p=0.0004) and higher ICSI scores (p=0.017). Prevalence of Hunner's lesions was significantly higher in those <50 years old (7.8%) compared to those aged 50 and older (14.9%; p=0.0095). There was no difference in number of UPOINT phenotype domains reported, overall UPOINT scores or prevalence of IBS between the groups.

Conclusions: A subtype of IC with Hunner's lesions has worse bladder-centric symptoms, but did not have a distinct bladder-centric phenotype. Given the management implications of distinguishing classic IC from non-Hunner's lesion BPS, we recommend cystoscopy with local anesthesia for patients diagnosed with IC/BPS.

P57

A rectal swab-guided prophylaxis program on the incidence of infectious complications following transrectal ultrasound-guided prostate biopsy and fiducial marker placement

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Background: Transrectal ultrasound-guided prostate biopsy (TRUSBX) and fiducial marker placement (TRUSFM) are noted sources of infectious complications. While data describing the risk of post-TRUSFM infection are lacking, there is an abundance of evidence describing the increasing rate of post-TRUSBX infectious complications. Particularly significant is the rising incidence of more serious infections such as sepsis and urinary tract infections (UTIs), which are associated with a high degree of morbidity and cost. Recent evidence links this to a concomitant rise in prevalence of flouroquinolone resistant (FQR) organisms and suggests that use of empirical prophylaxis needs reevaluation. This study aims to make a case for adopting a rectal swab (RS) guided prophylaxis by showcasing the effectiveness and feasibility of implementing such a protocol in a large private practice with multiple locations. Additionally, we will be able to better describe the risk of infection associated with TRUSFM.

Methods: From January 1, 2011 through May 30, 2015, we observed the difference in rates of infectious sequelae post-TRUSBX and post-TRUSFM in men who received RS-guided prophylaxis vs. empirical prophylaxis with fluoroquinolones per AUA guidelines. RS specimens were collected from patients using a BBL culture swab and plated on selective media containing ciprofloxacin to identify FQR. Standard FQ prophylaxis was prescribed to patients showing FQ sensitivity and patients with cultures positive for FQR organisms received targeted prophylaxis based on further susceptibility testing.

Results: 5084 men underwent 1106 TRUSFM and 5843 TRUSBX. The prophylactic regimen was prescribed empirically for 2296 TRUSBXs and 404 TRUSFMs; of these 83 (3.61%) and 21 (5.20%) resulted in infec-

tious complications respectively. A RS-guided prophylactic regimen was used for 3547 TRUSBXs and 707 TRUSFMs; of these 27 (0.76%) and 7 (1.00%) resulted in infection. 4248 RS were performed and cultured on 3294 men. Of these, 472 (11.2%) of the rectal swabs were positive, and 393 men (11.9%) were found to have at least one FQR organism. Of the FQR organisms identified (96.27% being *E. coli*) 83.7% were multidrug resistant and 37.5% possessed co-resistances to at least five other antimicrobials. Co-resistance rates for specific antimicrobials were as high as 70% (ampicillin).
Conclusions: The considerably lower infection rates observed in men receiving RS-guided prophylaxis along with the significant prevalence of FQR displays the advantage of adopting the practice of a rectal swab program. Additionally, the high prevalence of multidrug resistance suggests that alternative methods such as augmented or multidrug prophylaxis regimens that are commonly empirically prescribed would likely have limited success.

P58
Randomized, controlled trial of laser vs. bipolar plasma vaporization treatment of benign prostatic hyperplasia
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Background: It remains unknown how vaporization surgery for benign prostatic hyperplasia
(BPH) fits into the North American medical system. Evolution of competing systems makes it difficult for centers to adopt a single transurethral vaporization system. We compare two technologies to help guide urologists and hospitals in selecting new prostate treatment technologies.
Methods: Patients meeting standardized BPH symptom criteria are randomized into a single-blinded, controlled trial comparing Biolitec Evolve Laser Vaporization to Olympus TURis Plasma Button Vaporization. Primary outcome is cost-effectiveness with secondary outcomes of clinical efficacy, resection time, surgical team satisfaction, and safety. Sixty patients will be randomized to achieve analysis of primary outcome.
Results: Fifty-six patients have been randomized and treated by April 14, 2015 with three-month followup available for 47. Mean age was 71 (68.1–73.7) years, mean preoperative International Prostate Symptom Score (IPSS) 24/35 (22.2–26.8), with mean bother 4.7/6 (4.3–5.2). Mean six- and 12-week IPSS was 12 (9.5–14.8) and 10 (7.1–12.2), respectively. Mean surgeon satisfaction was 22/25 (20.4–23.1). Mean nursing satisfaction was 22/25 (21.3–23.6). Mean surgical time 28 min (24.3–32.8). Two patients were converted to transurethral resection of the prostate (TURP), four patients sought medical care for hematuria, three patients required dilation for urethral or bladder neck stricture, one developed deep vein thrombosis, one a urinary tract infection, and one suffered a thermal bladder injury. All 60 patients have been screened and the last four will be randomized in April 2016 with completion of three-month followup by July 2016 and unblinded analysis completed by August 2016.
Conclusion: Analysis of blinded data with three-month data suggests that while these technologies may achieve a cost savings and appear to provide significant amelioration of lower urinary tract symptoms, there is a definite learning curve in terms of safety considerations. Analysis of the unblinded comparative data in early August will provide insight into the optimal adoption of vaporization technology in North American urologic practice.

P59
Re-examining the role of prophylactic ciprofloxacin prior to transrectal ultrasound-guided prostate biopsies at a tertiary academic teaching hospital
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Background: Transrectal ultrasound guided prostate (TRUS) biopsies are not standardized, particularly with regard to antibiotic prophylaxis. Recently, there has been an increase in resistance to fluoroquinolones, and thus fluoroquinolone-sparing prophylaxis has been encouraged. We performed a retrospective chart analysis of patients who underwent a TRUS biopsy at our tertiary academic teaching hospital to examine infection rates comparing ciprofloxacin to other antibiotic therapies.
Methods: A retrospective chart review was performed between January 2013 and December 2015 of men who underwent TRUS biopsy. A total of 382 charts were reviewed and 311 met inclusion criteria (71 were excluded due to insufficient information). Demographic data, prostate-specific antigen (PSA), prostate sizes on TRUS, and complications, particularly post-TRUS infections (particularly sepsis) within 30 days were ascertained from electronic records.
Results: A total of 311 patients were included. The average age was 64.5±5.4 years. Mean PSA was 7.2±3.4ng/mL and average prostate volume was 42.3±7.1 cc. Approximately 84.9% of patients (264/311) were given ciprofloxacin only prior to TRUS biopsy. The rest of the patients (47/311) were given other prophylactic antibiotics including tobramycin, gentamycin, septra, ampicillin, vancomycin with or without concurrent ciprofloxacin. Overall rate of sepsis within 30 days was 3.22%. The rates of sepsis for ciprofloxacin only and other antibiotic therapies were 3.79 and 0% respectively ($p<0.05$). The majority of those treated with ciprofloxacin who developed bacteremia grew organisms resistant to ciprofloxacin. There were no other serious post-biopsy complications.
Conclusions: At our center, rates of post-TRUS biopsy sepsis in patients receiving ciprofloxacin only compared to other antibiotic regimen with or without concurrent ciprofloxacin was higher. Consideration should be given to using alternative antibiotic regimens, examine local patterns of antibiotic resistant organisms, or perform rectal swabs to identify at risk individuals.

P60
AUA annual census: Assessing urologists' participation in quality reporting measures
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Background: Over the last several years, reimbursement has been increasingly tied to use of quality performance measures due to new initiatives by both the federal government and private insurers to improve care while curbing excess spending. The AUA has been especially active in this area, contributing to the creation of many urology-specific quality measures. Despite this, the number of urologists who are participating in the new quality reporting programs is unclear. This study aims to determine whether urologists are participating in quality reporting programs, and if so, are they altering the scope of their practice based on these measures.
Methods: Participants in the 2015 AUA annual census, collected between May and September 2015, made up of practicing urologists in the US, were asked to complete a series of questions relating to quality measure participation. If they had submitted data to a quality reporting program over the past year, they would answer subsequent questions to determine which quality programs they had participated in and how it had affected their practice.
Results: The overall response rate was 4.7%, with 566 of 11 990 urologists participating in the census. Of the responders, 52.2% had participated in a quality reporting program over the past 12 months, 14.6% did not participate and 33.3% were not aware if they had. Among those who participated in a quality reporting program, many participated in more than one, with 77.1 % submitting to Meaningful Use, 58.1% to CMS PQRS, 15.9% to ACS NSQIP, 14.6% to Accountable Care Organization, 7.7% to AUA AQUA registry and 24.6% to homegrown measures. About

half of participants also used the quality reporting programs to enhance the quality of their practice, with changes to patient care work flow (27.5%), practice patterns (26.0%), performance assessment (25.3%), or changes to financial incentives (18.1%). Only 21.5% of participants in quality reporting measures had not changed any aspect of their practice, with 28.4% unsure if their practice had changed.
Conclusions: Despite increasing emphasis by the government and insurers on quality reporting measures, many urologists are still not participating in these programs. Among the urologists who are participating, most are reporting to more than one program, with half using quality measures to improve their practices. While the specifics of each program and their effect on reimbursement will continue to evolve, the use of quality reporting as a means of improving care in a cost efficient manner is here to stay. As new initiatives are promoted, better ways of promotion and promulgation will need to be addressed.

P61
An update on fluoroquinolones: The emergence of a multisystem toxicity syndrome

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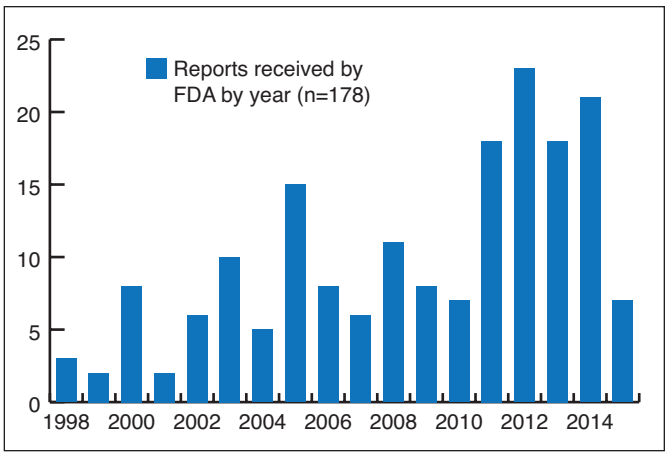
Background: The FDA recently convened a committee meeting to review the risks/benefits of oral fluoroquinolones (FQ). The meeting was prompted by a growing number of cases involving patients suffering from a constellation of symptoms now termed "fluoroquinolone-associated disability" (FQAD). Thirty-five patients testified to a panel of committee members, narrating their accounts of serious and disabling health issues after being prescribed oral FQ. FQAD is defined as previously healthy patients who experienced prolonged and disabling adverse effects in two or more organ systems after being prescribed an oral FQ. This newly recognized syndrome has generated concern and prompted patients and researchers to advocate for stronger quinolone drug labels.
Methods: A literature search was performed to identify previous reports of quinolone-induced multisystem toxicity syndromes. Four primary sources emerged: the recent FDA review, a 45 patient case series from 2001 by a physician who dedicated the majority of his career to FQ toxicity awareness, a more recent case series of four patients, and social media platforms. All sources share a reliance on patient self-reporting, and those cases submitted to the FDA adverse event reporting system (FAERS) are estimated to comprise less than 10% of the total. Patients are more comfortable voicing issues on social media platforms, which provide a real-time barometer, but do not filter out cases with questionable validity. The FDA applied a particularly narrow definition in order exclude uncertain cases.
Results: The FDA identified 1122 FQ disability reports from November 1, 1997 to May 30, 2015; 178 cases qualified as FQAD after applying inclusion and exclusion criteria. Another author estimates there are as many as 45 000 cases of FQ toxicity syndrome in the US. All sources agree the affected population is generally young (mean age 40s–50s), previously healthy and predominantly female. The FDA's analysis revealed average duration of symptoms was 14 months, and the longest duration nine years at the time of the review. Notably, there has been an increase in FQAD reports over the past five years even though FQ prescribing patterns have remained unchanged (see graph).
Conclusions: FQAD has generated concern and prompted patients and researchers to advocate for stronger quinolone drug labels. It does not affect the majority of patients exposed to FQ, but is likely underappreciated and underreported. As providers seeking to heal and avoid harm in our patients, proper education, and diligent prescribing practices are paramount.



P61. Fig. 1.

P62
Giving underactive bladders a second chance: Holep for management of lower urinary tract symptoms in patients with detrusor underactivity

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Background: Lower urinary tract symptoms (LUTS) are a common complaint among aging men. Although non-specific, LUTS in men are classically attributed to bladder outlet obstruction (BOO). However, LUTS can also exist in the presence of detrusor underactivity (DU). Evaluation of the voiding phase in patients with BOO demonstrates high bladder pressures with low flow rates. In contrast, low bladder pressures and low flow rates characterize the voiding phase in patients with DU. Holmium laser enucleation of the prostate (HoLEP) has been shown to be a safe, durable, and effective surgical treatment for BOO secondary to benign prostatic enlargement (BPE) in prostates of any size. Catheterization is the standard treatment for patients with DU and incomplete bladder emptying (ICBE). In our early experience, we have identified a population of patients with DU who have benefited from HoLEP. We compared patients with BOO to those with DU to determine if outcomes post-HoLEP are comparable.
Methods: Our HoLEP database was retrospectively reviewed, identifying 55 patients with preoperative urodynamic studies (UDS) who underwent HoLEP with or without bladder neck incision (BNI). Of these patients, 34 had UDS consistent with DU; defined as a bladder contractility index (BCI) <100. The remaining 21 patients were categorized as having BOO (BCI ≥100). All patients were operated on by a single surgeon, supervising residents from December 2014 to March 2016.
Results: There were no differences in patient demographics, enucleation time, morcellation time, or tissue volume removed between the two groups. Patients without DU were more likely to be on alpha-blockers preoperatively (p=0.03). Patients with DU had higher preoperative PVRs (p=0.01) and were more likely to perform CIC preoperatively (p=0.03). There were no differences in preoperative International Prostate Symptom Score (IPSS), Sexual Health Inventory for Men (SHIM), or maximum flow rate (Qmax) between groups. There were also no differences in postoperative IPSS, SHIM, Qmax or post-void residual (PVR). All patients with DU were able to void after HoLEP. A single patient with DU was still requiring CIC at six months.
Conclusions: Historically, men with DU and ICBE were not offered surgery. Primary treatment options included intermittent catheterization or chronic indwelling catheter. For patients who can Valsalva and stand to void, HoLEP with or without BNI may improve quality of life by allowing them to live catheter free. These findings may also support expanding the indications for HoLEP.

P63

Outcomes after holmium laser enucleation of the prostate in patients 75 years and older

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Background: Increased morbidity and mortality have been observed in elderly patients undergoing major surgery compared to younger patients. Significantly higher postoperative complication rates have been reported in patients over 80 years of age who underwent transurethral resection of the prostate. GreenLight photoselective vaporization prostatectomy was reported to be equally safe and efficacious in patients older or younger than 70. Higher complication and mortality rates have been reported in older patients undergoing radical prostatectomy, with the greatest risk occurring over 75 years. Advances in medical management of benign prostatic enlargement (BPE) have delayed the age at which many patients present for surgical consultation, with an increase in attendant comorbidities and often very large prostates. Few studies elucidate outcomes based on age for the treatment of BPE using holmium laser enucleation of the prostate (HoLEP). We compared patients treated with HoLEP who were younger than 75 years and those 75 years and older to determine if outcomes were different.

Methods: Our HoLEP database was retrospectively reviewed, identifying 87 patients who underwent HoLEP with or without bladder neck incision. Of these patients, 38 were 75 years of age or older and 47 were younger than 75. All patients were operated on by a single surgeon, supervising residents from December 2014 to March 2016. Patients completed International Prostate Symptom Score (IPSS), Quality of Life (QoL) and Sexual Health Inventory for Men (SHIM) questionnaires before surgery and at six weeks (6wk) and six months (6mo) postoperatively.

Results: Preoperative comorbidities, use of medications for BPE and catheter dependence did not differ between groups. Preoperative prostate volume, IPSS, QoL, SHIM, bladder capacity, maximum flow rate (Qmax), detrusor pressure and post-void residual (PVR) were comparable in both groups. Enucleation time, morcellation time, volume of tissue removed, and length of stay were similar. Postoperative IPSS, QoL, SHIM, and PVR did not differ between groups at 6wk and 6mo followup. Mean Qmax at 6mo followup was lower in the older group (age<75: 22.29 ml/sec; age≥75: 8.55 ml/sec). Pre- and postoperative incontinence were similar between groups. There was no difference in the incidence of significant complications (Clavien Grade≥III) at 30 days, which were low.

Conclusions: Traditionally, there has been concern about risks of performing surgery in elderly patients, particularly cardiovascular complications. Our study showed no difference in outcomes between older and younger patients. HoLEP is a safe and effective surgical treatment for BPE in men 75 years and older.

P64

The relationship of physician payments from drug manufacturers to Medicare claims for abiraterone and enzalutamide

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Background: Abiraterone and enzalutamide are both FDA-approved treatments that have been increasingly used for metastatic castration resistant prostate cancer. At the same time, the pharmaceutical companies that developed these oral chemotherapeutic agents have pursued aggressive marketing campaigns that target physicians. We sought to investigate if there is an association between pharmaceutical industry payments to physicians and prescriptions for abiraterone and enzalutamide.

Methods: Using the Open Payments Database from 2014, we determined the number and total dollar amount of payments from industry to each urologist or oncologist who prescribed abiraterone and enzalutamide. These data were merged with the 2013 Medicare Part D Provider and Utilization Data to identify the total claim count (i.e., prescriptions) ascribed to each physician, as well as the total drug cost per prescribing physician. Claim counts and drug costs were compared between prescribers who did and did not receive industry payment using Wilcoxan rank-sum tests. Spearman Rank correlation was used to assess the relationship between industry payments and total claim count for each drug.

Results: Of 1812 physicians who prescribed abiraterone, 615 (34%) received a payment from industry. The median payment amount to prescribers was $0 (IQR $0–$28.26). The number of abiraterone claims and total drug costs were similar between prescribers who did and did not receive industry payment (18 vs. 18; $118 362 vs. $118 246; p=0.94). There was a weak association between industry payment amount and total Medicare claims among abiraterone prescribers (ρ=0.05; p<0.001). Of 701 physicians who prescribed enzalutamide, 289 (41%) received a payment from industry. The median payment amount to prescribers was $0 (IQR $0–$41.83). The number of enzalutamide claims and total drug costs were similar between prescribers who did and did not receive industry payment (15 vs. 16; p=0.41; $119 097 vs. $122 760; p=0.94). There was a weak association between industry payment amount and total claims among enzalutamide prescribers (ρ=0.09; p=0.0145).

Conclusions: Industry payments to prescribers of abiraterone and enzalutamide were common, but of low amount. While this suggests little association between industry payments and physician prescribing behavior for these drugs, continued public reporting of industry payments to physicians will allow for further investigation of this relationship.

P65

Pulsed fluoroscopy safely reduces radiation exposure during ureteroscopy

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Background: Fluoroscopy is a standard procedural component of endourology. Occupational radiation exposure increases the risk of carcinogenesis, cataract formation and harmful genetic effects in a dose-dependent manner. We evaluated the average radiation exposure and complication rate with continuous or pulsed fluoroscopy in ureteroscopy cases for urolithiasis.

Methods: We retrospectively reviewed the operative details of 66 patients who underwent ureteroscopy for urolithiasis performed by two PGY-5 urology residents under the supervision of a single attending at an academic affiliate institution from June 1, 2014 to May 30, 2015. Residents A and B performed ureteroscopy using continuous fluoroscopy (30 frames per second) for 17 and 30 cases, respectively. Resident A then performed 19 consecutive cases using pulsed fluoroscopy (three frames per second). Fluoroscopy time (FT), stone size, stone location, number of procedural components (access sheath placement, stent placement, basketing, lasering, and ureteral dilation), and procedure-related complications were included in our analysis. Differences in FT between Resident A and B were compared using t-test. Correlations between FT and stone size, stone location and number of procedural components were assessed with Spearman rho test. Complication rates were compared using chi-square analysis.

Results: Prior to intervention, there was no difference between average FT per case between Resident A and Resident B (p=0.993). Following intervention, Resident A reduced average fluoroscopy exposure per case compared to pre-intervention (45±33s to 24±20s; p=0.028) and compared to Resident B (p=0.04). Resident B did not show a significant reduction in FT over the course of the study (p=0.309). FT was positively correlated with the number of procedural components (p=0.0001; Spearman coefficient 0.453) and more difficult stone position (p=0.001; Spearman coefficient 0.423). FT was not correlated with stone size or patient gender. There was no statistically significant difference in procedure complexity and complication rate between cases performed by Residents A and B post-intervention or between cases performed by Resident A pre- and post-intervention. The control and intervention groups had four and three complications, respectively, including bleeding and ureteral injury. There was one instance of stent malposition into the ureter in each group.

Conclusions: Ureteroscopy cases using pulsed fluoroscopy had a 47% reduction in FT with a similar complication rate compared to cases using continuous fluoroscopy. Our results suggest that pulsed fluoroscopy may be safely used in place of continuous fluoroscopy to reduce occupational radiation exposure.

P66. Table 1. Cohort demographics	
Sex	
Male, n (%)	14 (53.8)
Female, n (%)	12 (46.2)
Age, years (range)	44 (21–74)
Weight, kg (range)	77.6 (37.5–127)
Body mass index (range)	27.9 (11.9–53.8)
Bladder management, n (%)	
Spontaneous voiding	6 (23)
Clean intermittent catheterization	8 (30.8)
Suprapubic tube or indwelling Foley	11(42.3)
Ileal conduit	1 (3.9)
Positive repeat urine cultures, n (%)	20 (77)

P66
Changing lithogenic trends in patients with neurological derived musculoskeletal deficiencies

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Background: Patients with neurologically derived musculoskeletal deficiencies (NDMD) (e.g., spinal cord injury, spina bifida, etc.) have higher risk for chronic complicated urolithiasis and when compared to the general population show higher rates of recurrence. Recent studies suggest that stone etiology in this population may have shifted from infectious to metabolic. We asses a cohort of NDMD patients attending our stone clinic to identify specific lithogenic risk factors.
Methods: Patients seen in our stone clinic with any type of NDMD and urolithiasis from 2000–2015 who had available 24-hour urine collections were retrospectively reviewed. Demographics, neurological deficiency, bladder management, urine cultures, 24-hour urine and stone parameters were reviewed.
Results: Seventy-eight patients with NDMD and nephrolithiasis were identified. Of these, 26 had both 24-hour urine and stone analysis available. Most common stone type was apatite (53.8%) followed by mixed apatite/oxalate (19.2%) (Table.1). Urinary citrate was significantly lower in patients with apatite stones. Metabolic abnormalities were gender specific. Females were found to have hypocitraturia and low volumes, while males more commonly had hyperoxaluria and hypernatriuria. Positive urine cultures prior to treatment were present in 77%. 85% were urea splitting organisms, most commonly pseudomonas. There were no statistically significant differences in 24-hour urine parameters when analyzed by neurological deficiency or bladder management strategy. However, there were trends toward positive urea-splitting cultures and apatite stones in catheterized patients.
Conclusions: NDMD patients have both metabolic and infectious stones. A high incidence of apatite stones were seen and can possibly be attributed to bacteriuria and elevated pH. Obesity, low volumes, and higher oxalate suggest a metabolic etiology as well. Identifying metabolic risk factors in NDMD patients is important but challenging, mainly due to poor followup and difficult specimen collections.

P66. Table 2. 24-hour urine analysis by main stone composition

		Stone composition				
		Apatite		Oxalate		
		n	%	n	%	P value
Volume/24 hours	Low	11	64.7	7	87.5	0.16
	Normal	6	35.3	1	12.5	
Ca 24-hour	Normal	15	88.2	6	75.0	0.631
	High	2	11.8	2	25.0	
Ox 24-hour	Normal	14	82.4	6	75.0	0.804
	High	3	17.6	2	25.0	
Cit 24-hour	Normal	1	5.9	4	50.0	0.029
	Low	16	94.1	4	50.0	
pH	Normal	1	5.9	1	12.5	0.81
	High	16	94.1	7	87.5	
UA 24-hour	Normal	16	94.1	8	100.0	0.759
	High	1	5.9	0	0.0	
Na 24-hour	Normal	13	76.5	6	75.0	0.853
	High	4	23.5	2	25.0	
K 24-hour	Low	2	11.8	1	12.5	0.963
	Normal	14	82.4	6	75.0	
	High	1	5.9	1	12.5	
P 24-hour	Normal	2	11.8	4	50.0	0.213
	Low	12	70.6	4	50.0	
	High	3	17.6	0	0.0	
Ca 24/kg	Low	11	64.7	7	87.5	0.47
	Normal	5	29.4	1	12.5	
	High	1	5.9	0	0.0	

P67. Table 1	
Gender	
Male	47
Female	56
Age (median)	64 (interquartile range 52–73)
Laterality	
Left	47
Right	50
Bilateral	6
Etiology	
Bladder outlet obstruction	7
Trauma	1
Idiopathic	5
Cancer/extrinsic compression	11
Iatrogenic	2
Ureteropelvic junction obstruction	4
Stone	75
Proximal	16
Mid	9
Distal	50
Size 1–5 mm	46
Size 5–10 mm	21
Size >10 mm	8

P67
Treatment of forniceal rupture: A single-institution experience with conservative management

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Background: Forniceal rupture is a condition of perirenal urinary extravasation often associated with ureteral obstruction. Treatment considerations for this condition have not been standardized, and there is very limited information in the literature regarding clinical practice.

Methods: We retrospectively searched all radiographic records for patients treated at our institution between January 2009 and January 2016 using the terms "forniceal rupture," "fornix rupture," "calyx rupture," or "caliceal rupture," and identified 111 patients. Each patient was followed for two months from presentation. Three patients were excluded for age <18 and five were excluded for incomplete records or a failure to find a history of forniceal rupture in their profiles. We compiled demographic data, etiology, clinical factors at presentation, treatments and outcomes.

Results: One hundred three patients were included for analysis. The median age at presentation was 64 years (IQR 52–73); 47 were male and 56 were female. The etiology of forniceal rupture was most commonly urolithiasis (73%), with cancer being the next most common cause (11%). Regarding specific stone data, most cases were caused by small (1–5 mm) stones in the distal ureter (Table 1). Thirty-two patients (31%) were treated surgically with ureteral stent placement upfront; 27 of those patients were stone patients and most had some clinical factors making them higher risk (Table 2). There was only one operative complication during the study period. Only one patient developed an abscess. Forty-three patients were sent home from the emergency room. Of the patients who were admitted, the average hospital stay was three days (IQR 2–6). For the entire cohort, there were six related readmissions in the study period.

Conclusions: There are very limited data in the literature regarding clinical practice in the treatment of forniceal rupture. There are studies showing favorable outcomes of this condition in institutions with operative intervention rates from 59–99%. Clinical practice at our institution is conservative treatment of forniceal rupture in the absence of infection, kidney failure, or other risk factors with few complications or readmissions.

P67. Table 2. Clinical factors, treatment, and outcomes	
Outcomes	
Discharged from emergency department	43
Related readmission	6
Hospital stay (median days)	3 (interquartile range 2–6)
Complications	1
Abscess	1
Intervention	
Stent	32
Stone + stent	27
Clinical factors	
Fever >38.3	4
Leukocytosis >12	12
Positive urinalysis	8
Cr>1.5	12
Emesis	13

P68
Single pulse-per-second setting significantly reduces fluoroscopy time during ureteroscopy

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Background: Both patients and surgeons are exposed to ionizing radiation during endourologic procedures. Modern C-arms have settings that can be modified to lower radiation exposure, including "low-dose" and pulsed fluoroscopy. The pulsed fluoroscopy rates range from a standard rate of 30 to a single pulse-per-second (pps). We present here the only known series evaluating the effect of 1 pps on fluoroscopy time and surgeon radiation exposure.

Methods: A retrospective review of a single endourologist's operative records was performed over a 12-month period. Adult patients undergoing ureteroscopy were included. At the six-month point, the switch from continuous "low-dose" to 1 pps "low-dose" fluoroscopy was made. Collected data included patient age, gender, body mass index (BMI), aggregate stone burden, stone multiplicity, laterality, laser and ureteral access sheath usage, operative time, fluoroscopy time, rates of failed or staged ureteroscopy and complication rates. Surgeon radiation exposure was measured using 1 dosimeter placed at the torso under the lead apron and 1 dosimeter overlying the chest outside the lead apron. Deep Dose Equivalent (DDE), Lens Dose Equivalent (LDE), and Shallow Dose Equivalent (SDE) were calculated using the EDE1 formula.

Results: A total of 84 and 70 patients underwent ureteroscopy using continuous and 1 pps fluoroscopy, respectively. No significant differences were identified between the two groups with regards to patient age (p=0.96), sex (p=0.26), BMI (p=0.95), stone multiplicity (p=0.31), bilateral ureteroscopy (p=0.07), pre-stenting (p=0.99), staged (p=0.84) or failed ureteroscopy (p=0.99), ureteral access sheath use (p=0.10), or case duration (p=0.54). Patients in the 1 pps cohort had a larger median stone burden (1.3 cm, IQR 0.8–2.0 cm vs.1.8 cm, IQR 0.9–2.8 cm; p=0.04). Median fluoroscopy time was reduced from 77 (IQR 54–115) to 16 seconds (IQR 13–24) using 1 pps (p<0.001). Monthly surgeon radiation exposure was reduced by an average of 64%, from 6.8±8.3 to 1.8±2.7 mRad DDE (p=0.11), 120.6±101.4 to 49.2±66.6 mRad LDE (p=0.10), and 116.2±97.8 to 47.6±64.0 mRad SDE (p=0.11). Complications were rare, without significant difference between the two groups. Image quality was acceptable in all cases using 1 pps fluoroscopy despite a maximal patient

P69. Table 1.

	Magnesium supplementation with food					Magnesium supplementation while fasting				
	Mean initial	Mean final	Mean change	Standard deviation	Range	Mean initial	Mean final	Mean change	Standard deviation	Range
Volume	1.92	2.77	0.85	0.35	0.15–1.20	3.10	3.56	0.46	0.39	-0.01–1.24
Calcium oxalate supersaturation	9.29	3.26	-6.03	1.15	-8.09– -4.09	3.40	2.39	-1.01	1.04	-2.62–0.96
Calcium	194.70	189.75	-4.95	40.49	-84.83–46.48	170.04	158.21	-11.83	49.39	-79.42–84.36
Oxalate	53.85	28.63	-25.23	9.74	-41.55– -7.84	43.15	29.36	-13.78	17.99	-47.53–13.92
Citrate	839.34	1036.86	197.51	188.89	-31.50–572.21	967.82	1094.18	126.36	168.05	-204.70–342.10
Calcium phosphate supersaturation	0.62	0.83	0.21	0.21	0.00–0.63	0.66	0.76	0.10	0.06	-0.02–0.20
pH	5.79	6.41	0.62	0.22	0.22–0.98	6.41	6.84	0.43	0.12	0.22–0.65
Uric acid supersaturation	1.61	0.31	-1.29	0.70	-2.57– -0.15	0.37	0.11	-0.26	0.19	-0.65– -0.03
Uric acid	0.71	0.67	-0.04	0.03	-0.07–0.03	0.68	0.60	-0.09	0.03	-0.13– -0.03
Sodium	141.69	88.25	-53.45	31.53	-113.95– -7.78	159.88	75.41	-84.48	13.67	-106.54– -59.46
Potassium	54.83	77.87	23.04	6.69	9.67–30.00	78.33	106.85	28.52	2.61	23.67–32.59
Magnesium	**90.63**	**131.83**	**41.20**	**13.22**	**22.61–66.79**	**105.38**	**118.86**	**13.48**	**14.25**	**-8.88–39.95**
Phosphorus	0.94	0.82	-0.12	0.22	-0.54–0.18	0.87	0.71	-0.17	0.17	-0.46–0.12
Ammonium	40.36	30.25	-10.12	2.88	-14.85– -4.90	43.44	29.88	-13.57	3.87	-21.28– -9.11
Chloride	141.69	91.95	-49.74	43.00	-127.42–21.05	166.23	93.68	-72.55	18.22	-102.75– -39.80
Sulfur	40.30	44.33	4.04	4.69	-2.48–13.14	36.76	32.89	-3.87	7.37	-14.50–10.30

BMI of 82.2. The only technical compromise noted was increased motion artifact, which was easily avoided by allowing the C-arm to complete motion prior to image acquisition.
Conclusions: Use of single pulse-per-second fluoroscopy significantly reduces fluoroscopy time and lowers surgeon radiation exposure by 64%.

P69
Does the timing of magnesium supplementation affect urinary oxalate levels in patients with nephrolithiasis

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Background: Urinary magnesium has been shown previously to inhibit kidney stone formation in chemical models; however, when applied to in vivo human models, the results have been conflicting. The purpose of this study is to investigate the timing of magnesium supplementation on the inhibitory effect on nephrolithiasis. We hypothesize that if magnesium is taken with meals, more will be absorbed in the small intestine and excreted in the kidney to allow for better inhibitory effect, specifically by reducing oxalate excretion.
Methods: We prospectively enrolled known calcium oxalate stone formers with isolated hyperoxaluria identified on 24-hour stone risk testing. Patients were then randomized to take magnesium supplementation either fasting or with food. An initial 24-hour urine collection was obtained on enrollment and then repeated after seven days of magnesium supplementation to determine the effect on urinary excretion of oxalate. Participants were given a controlled diet during the seven days of intervention which included adequate fluid intake, low oxalate, low salt, moderate animal protein, and normal calcium intake — the standard dietary treatment for hyperoxaluric kidney stone patients.
Results: Seven patients were enrolled with three patients randomized to each arm of magnesium supplementation and one individual excluded due to inability to complete the control diet. Those taking it with food experienced a 25.2 mg/d decrease in their urinary oxalate over the course of seven days as compared to a 13.7 mg/d decrease for those taking magnesium while fasting. There were only modest decreases in calcium oxalate supersaturation and calcium but profound increases in stone protective factors like citrate (Table 1). Secondary endpoints including sodium (decrease 53 mg/d with food vs. 84 mg/d fasting) also showed improvement with little difference between groups.
Conclusions: Those taking magnesium supplementation with food experienced twice the reduction in urinary oxalate as those who took it while fasting. Additionally, secondary endpoints like citrate and sodium showed improvement with modest differences between groups. Our pilot study supports the need for further investigation with a larger sample to establish the significance of these trends. Funded by Northeastern Section Young Investigator Grant.

P70
External lower abdominal pressure to aid semirigid ureteroscopy in the proximal ureter: Opinion of modern-era endourologists: Is it safe and effective?

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Background: In 2005, we described a technique of applying external lower abdominal pressure to allow semirigid ureteroscopy (SURS) above the iliac vessels for treatment of upper ureteral calculi. This has led to attempted treatment of all upper and mid ureteric calculi at our center with SURS. In this study, we surveyed modern-era endourologists about their use of this technique four and eight years following its initial description. Furthermore, we performed a retrospective review of our experience to document the technique's safety and efficacy.
Methods: In 2009, an email survey was circulated to Endourological Society members inquiring about their use of abdominal pressure to aid SURS. Survey results and the reference to the published technique were circulated. In 2013, the survey was re-circulated to those unfamiliar with the technique in 2009. Retrospective chart review included all upper- and mid-ureteric calculi treated with SURS at our center from 2012–2014 with radiologic followup of at least three months postoperatively in order to evaluate stricture formation. Records were reviewed for access difficulties, intraoperative complications, stone clearance, and ureteral strictures.

Results: Two hundred eight-two endourologists responded to the 2009 survey. Fifty-one (18%) regularly used abdominal pressure for SURS. In 2013, re-survey of the 231 urologists who had not used this technique yielded a 43% response rate, with 23 having attempted it and 16 planning to continue to use it. Five hundred nineteen URSs were performed at our center from 2012–2014; 75 were SURSs meeting our criteria. Abdominal pressure to aid access was used in all cases as deemed necessary. In 91% of cases the mid- or upper-ureter was accessed without difficulty. Five (6.7%) conversions to flexible URS were required due to a tortuous or narrow ureter. Two patients (2.7%) were stented due to narrow ureter, and SURS was performed at a later date. One patient (1.3%) suffered ureteric perforation at an impacted stone site. There were no ureteric injuries due to SURS over the iliac vessels or psoas muscle. No patients developed ureteric strictures requiring intervention. Two patients (2.7%) had persistent hydronephrosis at three months, but did not require intervention. The stone clearance rate was 94%.
Conclusions: Eight years after publication of a new technique for using abdominal pressure to aid access to the upper ureter for SURS, only a minority of endourologists have adopted it. At our center this technique continues to be the standard of practice, with excellent success rates and minimal complications.

P71
Evaluation of student athlete kidney stone risk via 24-hour urine collection

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Background: Dehydration is a known risk factor for kidney stone formation. High-caliber athletes who undoubtedly experience prolonged states of dehydration during competition and training do not have an apparent increased risk of stone events. We aimed to determine why athletes do not experience an increased incidence of nephrolithiasis. To do this, we performed a prospective study evaluating urinary risk factors for kidney stone formation in Division I student-athletes versus non-athletes using 24-hour urine collections.
Methods: After IRB and NCAA compliance office approval, 74 student-athletes and 20 non-student-athletes enrolled in the study. Demographics, body mass index, medical and surgical history, medications, and individual sport were recorded. Participants were asked to collect at least one 24-hour urine specimen, with athletes asked to collect more than one at varying time points throughout the athletic season. Athletes were also asked to provide diet and activity logs at the time of collection. Standard stone risk parameters were assessed and compared between athletes and non-athletes.
Results: A total of 34 student-athletes (ages 19–22) and 10 non-student-athletes (age 21) completed the study. Summary of results can be seen in Table 1. The median age of athletes was higher than non-athletes (20 vs. 19 years old). Athletes had significantly lower urinary pH than non-athletes. In addition, athletes excreted significantly higher amounts of urinary magnesium, ammonium, phosphorus, and creatinine. The urine supersaturation of uric acid was significantly higher in athletes than non-athletes. Female athletes excreted more calcium and more creatinine/kg/24hrs than female non-athletes.
Conclusions: Student athletes had a lower urine pH, higher supersaturation of uric acid, and a higher calcium excretion (specifically in female athletes). These risk factors for stone formation in athletes may be offset by higher levels of stone protective factors such as magnesium, which was significantly higher in athletes than non-athletes. Lastly, high muscle mass as seen in athletes may be protective against stone formation or a marker of decreased risk. These findings may potentially explain the lack of increased incidence of nephrolithiasis in athletes. Further study is needed.

P71. Table 1. Subset of differences in 24-hour urine parameters between athletes and non-athletes

Variable	Litholink normal	Athletes	Non-athletes	P value
Volume	>2	1.46	1.33	0.52
pH>2	5.8–6.2	6.32	6.55	0.01
Calcium (F)	<200	219	107	0.04
SSUA	0–1	0.6	0.2	0.02
Phosphorus	<1.2	1.04	0.59	0.02
Ammonium	<60	43	29	0.02
Magnesium	<120	126	87	0.02
Cr/kg/24 hour (F)	15–20	28.5	23	<0.01