

## Poster Session 3: Stones and Endourology June 29, 2015, 0715-0845

### MP-03.01

#### **A single dose of intraoperative antibiotics is sufficient to prevent urinary tract infection during ureteroscopy**

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**Introduction and Objectives:** AUA Best Practice Guidelines for ureteroscopic stone treatment recommend antibiotics coverage for less than 24 hours after the procedure. The purpose of this study was to evaluate if the rate of post-operative urinary tract infection (UTI) differed in patients receiving a single dose of antibiotics pre-operatively compared to those patients who also received post-operative antibiotics.

**Methods:** A retrospective review was performed of consecutive patients at two institutions, University of British Columbia and Massachusetts General Hospital, Harvard. All patients were given a single dose of antibiotics prior to ureteroscopic stone treatment. A subset of patients were also given post-operative antibiotics ranging in time and selection of antibiotic. Patients who displayed symptoms of infection had a urine culture performed for speciation and antibiotic sensitivity.

**Results:** Eighty one patients underwent ureteroscopy for renal calculi. Patients with pre and post operative antibiotics were compared to those receiving only pre-operative antibiotics. Eight (9.9%) patients in total (2 from pre-operative antibiotic and 6 from the pre and post-operative antibiotic group,  $P=0.219$ ) developed UTI's in the post-operative period. Surgical factors such as ureteral access sheath, bilateral procedures, use of basket or laser was not associated with rates of infection or whether the surgeon prescribed post-operative antibiotics. Risk factors such as pre-operative stenting, nephrostomy tubes, and foley catheters did not differ between groups or predispose patients to post operative infections.

**Conclusions:** Our data suggests that post-operative antibiotics do not decrease infection rates following ureteroscopic stone treatment, even among patients with risk factors for infection. A single pre operative dose is sufficient.

### MP-03.02

#### **Predictors of fluoroscopy time during percutaneous nephrolithotomy: Impact of postgraduate urology trainees and S.T.O.N.E. nephrolithotomy score**

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**Objectives:** To determine predictors of Fluoroscopy Time (FT) during Percutaneous Nephrolithotomy (PCNL) and assess the impact of urology Post-Graduate Trainees (PGTs) and S.T.O.N.E. Nephrolithotomy Score.

**Methods:** A prospective review of patients undergoing PCNL between 2010 and 2013 at a tertiary health care centre was performed. Patients' demographics, stone characteristics, including S.T.O.N.E. Nephrolithotomy Score, and operative data were compared among PGTs. Predictors of FT were determined using univariate and multivariate models.

**Results:** A total of 103 PCNLs were assisted by 10 PGTs from Post-Graduate Years (PGY) 4 and 5 [37 (35.9%) and 66 (64.1%) cases, respectively]. Sixty percent of patients were males with a mean age of  $55.2 \pm 1.5$  years and a mean BMI of  $26.4 \pm 0.5$  kg/m<sup>2</sup>. The mean S.T.O.N.E. score was  $7.7 \pm 0.1$ , with tubeless PCNL in 53 (51.5%) cases. The mean FT was  $120 \pm 5$  seconds, mean operative time was  $102 \pm 3.5$  minutes and mean length of hospital stay was

$4.2 \pm 0.34$  days. The overall stone-free rate was 72.8%. PGY-5 trainees used significantly less FT than PGY-4 trainees ( $115 \pm 6$  vs.  $130 \pm 7$  sec;  $p=0.04$ ). FT significantly correlated with the number of involved calyces ( $r=0.24$ ,  $p=0.02$ ), number of punctures ( $r=0.6$ ,  $p=0.01$ ), number of tracts ( $r=0.4$ ;  $p=0.01$ ), and operative time ( $r=0.4$ ,  $p=0.01$ ). In addition, cases with estimated blood loss (EBL)  $<250$  mL were associated with significantly less FT than those with blood loss  $>250$  mL ( $109 \pm 5.1$  vs.  $148.2 \pm 10.9$  sec;  $p=0.001$ ). On multivariate analysis, the number of punctures, EBL and operative time were found to be independent predictors for FT. However, there was no correlation of FT with S.T.O.N.E. Nephrolithotomy Score ( $r=0.16$ ;  $p=0.1$ ). **Conclusions:** Fluoroscopy Time significantly increased with lower PGY level, higher number of punctures and tracts, more EBL, and longer operative time. However, the number of punctures, EBL and operative time were the only independent predictors of prolonged FT during PCNL.

### MP-03.03

#### **Which is better? Guy's vs. S.T.O.N.E. Nephrolithotomy Scoring Systems in predicting stone-free status post-Percutaneous Nephrolithotomy**

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**Introduction and Objectives:** Both Guy's (GSS) and S.T.O.N.E. Nephrolithotomy Scoring Systems have been recently validated as predictors of stone-free status post-Percutaneous Nephrolithotomy (PCNL). Therefore, the aim of the present study was to compare the accuracy of the GSS and S.T.O.N.E. scoring systems in predicting PCNL outcomes.

**Methods:** After obtaining ethics approval, medical records of patients undergoing PCNL between 2009 and 2013 at a tertiary stone referral centre were retrospectively reviewed. GSS and S.T.O.N.E. Nephrolithotomy scores were calculated. Logistic regression analysis and ROC curves were generated to compare accuracy of each scoring system.

**Results:** A total of 185 PCNLs were reviewed. Mean patient age was  $55.2 \pm 14$  years with mean body mass index of  $27.8 \pm 6.2$  kg/m<sup>2</sup> and mean operative time of  $98.7 \pm 34.2$  minutes. The overall stone-free rate was 71.9% with complication rate of 16.2%. When compared with patients with residual fragments, stone-free patients had significantly lower Guy's Score ( $2.7$  vs.  $2$ ;  $p<0.001$ ) and S.T.O.N.E. Nephrolithotomy score ( $8.3$  vs.  $7.4$ ;  $p=0.004$ ). Logistic regression analysis showed that both GSS and S.T.O.N.E. Nephrolithotomy Scoring Systems were significantly associated with stone-free status, (OR=0.4, [95%CI 0.2-0.5];  $p<0.001$ ) and (OR=0.7, [95%CI 0.5-0.8];  $p=0.001$ ), respectively. Furthermore, both scoring systems were significantly associated estimated blood loss ( $p=0.01$  and  $p=0.005$ ). There was good correlation between both scoring systems and operative time ( $r=0.3$ ,  $p<0.001$  and  $r=0.4$ ,  $p<0.001$ ) and length of hospital stay ( $r=0.2$ ,  $p=0.001$  and  $r=0.3$ ,  $p<0.001$ ). However, there were no significant associations between both scoring systems and post-operative complications ( $p=0.7$  and  $p=0.6$ ). The ROC curve revealed that the GSS is more accurate than the S.T.O.N.E. Nephrolithotomy score as a predictor of post-PCNL stone-free status (AUC=0.75 [95% CI 0.7-0.8 vs. AUC=0.63 [95% CI 0.54-0.72]), respectively.

**Conclusions:** Although both scoring systems are suboptimal in prediction of stone-free rates post-PCNL, the Guy's Scoring System seems to be more accurate than the S.T.O.N.E. Nephrolithotomy Scoring System. Other factors not included in the current scoring systems may be involved in predicting stone-free rates post-PCNL.

### MP-03.04

#### Leisure time physical activity, smoking and risk of recent symptomatic urolithiasis

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**Introduction and Objectives:** Urolithiasis is a recurrent condition. Although prolonged bed rest can contribute to stone formation, it remains unclear how physical activity affects urolithiasis. The aim of this study was to explore relationships between Leisure Time Physical Activity (LTPA) and other lifestyle factors associated with recent symptomatic urolithiasis ( $\leq 6$  months).

**Methods:** Surveys were administered to a convenience sample of patients attending urology clinics and queried stone history, smoking, diet and supplements. The International Physical Activity Questionnaire assessed LTPA for walking (WALK), moderate (MOD) and vigorous (VIG) activity. Regression analysis was used to identify associations between risk factors and recent symptomatic urolithiasis.

**Results:** Out of 167 patients with a mean (SD) age of 56.7 (14.3) years and BMI of 27.3 (5.3) kg/m<sup>2</sup>, 62% were male, 78% white and 34% reported recent symptomatic stones. There were no significant differences between patients with and without symptomatic urolithiasis in terms of age, sex, race, BMI, or dietary risk factors. Only 33% of patients met physical activity guidelines with 24% and 18% reporting adequate MOD and VIG, respectively. LTPA did not differ significantly between patients with and without stones. In symptomatic stone formers, MOD ( $\rho=0.28$ ), VIG ( $\rho=0.37$ ) and total LTPA ( $\rho=0.33$ ) were positively associated with water intake ( $p<0.05$ ), though no relationships were evident in non-stone formers. Those with recent symptomatic urolithiasis were more likely to smoke (21% vs. 7%,  $p=0.021$ ). After controlling for sex, diet and LTPA, recent symptomatic stone formers had 5.6 times the odds (95% CI: 1.6-19.4) of smoking.

**Conclusions:** Most urology patients do not appear to meet physical activity guidelines. Current smoking was a potent predictor of recent symptomatic stones. Urolithiasis patients need to be routinely screened for smoking status and referred for cessation assistance.

### MP-03.05

#### Distal ureteroscopy with conscious sedation for ureteric calculi: 10 year experience

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**Introduction and Objectives:** Distal ureteroscopy for urolithiasis extraction is a common procedure that is generally preformed with spinal or general anesthesia. We retrospectively reviewed all distal ureteroscopy preformed for ureteric stone extraction with conscious sedation at our institution over a ten year period to determine its efficacy and safety.

**Methods:** A retrospective chart review was preformed of all distal ureteroscopy preformed for calculus removal from April 2004 to April 2014. Patient characteristics, analgesic requirement, tolerability, procedure time, stone size and composition, method of stone extraction, success rate and complications were collected. Fishers exact test and unpaired t-test were used for data analysis.

**Results:** Three hundred and thirty one procedures were preformed between April 2004 and April 2014. Mean age was 53.84 years old (median, 54; range, 17-88) with 164 males (50.5%) and 157 females (49.5%). We had a success rate of 97% with 10 complications reported. Two patients had a Clavien classification of Grade 3a with the remainder Grade 1. Mean procedure time was 25 minutes (median, 24; range, 3-65). Mean analgesics requirement was 189µg of fentanyl (median, 200; range, 50-400) and 4mg of midazolam (median, 3; range, 0-8). 268 patients (80.9%) tolerated the procedure well with only 7 having poor tolerability (2%). The most common stone composition was calcium oxalate monohydrate. When comparing females to males, females were found to require less fentanyl ( $p = 0.0001$ ), midazolam ( $p = 0.0001$ ) and

found the procedure more tolerable ( $p = 0.0231$ ). When calculi greater than 5mm were compared those less than 5mm, there was no statistically significant difference in success rate, procedure time, analgesic requirement, tolerability, or complications.

**Conclusion:** Various different analgesic options exist with distal ureteroscopy for urolithiasis extraction. Using conscious sedation is safe and efficacious. To our knowledge this is the first report to show that stones larger than 5mm can be safely and effectively treated with the use of conscious sedation during this procedure.

### MP-03.06

#### 'Electronic Stent Register': Future solution for forgotten stent

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**Introduction:** JJ stent insertion is a common urological procedure worldwide. The majority of patients have their stents removed or replaced within the requisite timeframe; however, a minority are lost to follow up. Forgotten stents are posing a significant pecuniary burden on the NHS. We carried out an audit to assess efficacy and efficiency of an electronic stent register in minimizing forgotten stents.

**Methodology:** Retrospective data collection from January 1st 2014 to March 31st 2014. We compared the patient entries in the theatre log books of three separate theatres with the electronic stent register. We re-audited it from 1st August to 31st October to close the loop and to assess the change in practice.

**Results:** 67 stents were inserted, 11 of which were performed as an emergency procedure. Majority of these cases; 50 (75%); were recorded on stent register while 17 cases were missed. Main reasons of missed stents were untrained surgeons in using electronic stent register and antegrade stent insertion by radiologist who do not have access to electronic stent register. All of the missed stents cases were either removed or replaced urgently uneventfully. None of the missed stents cases suffered any major morbidity. During the re-audit time period 105 stents inserted, there was an improvement noted on electronic stent register entry (89, 85%). 16 patients were not entered because they had stent insertions in radiology department but they were booked for TCI of removal/ further ureteroscopic procedure.

**Conclusion:** We concluded that an electronic stent register is helpful for follow up which will prevent the possible complications and cost. We also introduced robust teaching sessions for new trainees in updating stent register. We are also in touch with IT department to update our stent register as per BAUS stent register. Where regular reminders are generated and posted to the responsible person, which have reduced complications regarding forgotten stent.

### MP-03.07

#### Mean and standard deviation of Hounsfield units on pre-operative computed tomography allow confident prediction of urinary stone composition

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**Introduction and Objectives:** The chemical composition of a urinary stone may influence its management. Previous attempts at identifying stone composition based on mean Hounsfield Units (HU) on computed tomography (CT) have had varied success. We aimed to evaluate the additional use of the standard deviation of HU (HUsD) to more accurately predict stone composition in a large multi-center population.

**Methods:** We identified patients from two centers that had undergone urinary stone treatment between 2006 and 2013. The availability of chemical stone analysis and a CT were essential inclusion criteria. HU and HUsD of the stones were compared with ANOVA. ROC analysis with Area under the curve (AUC) and Youden index calculation were performed.

**Results:** All necessary data was available for 466 patients. Major component was Calcium Oxalate Monohydrate (COM) in 193, Uric acid (UA)

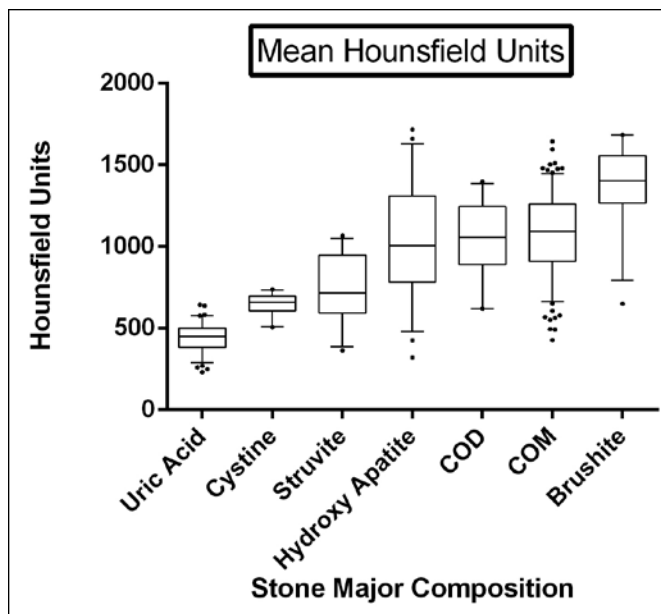


Fig. 1. MP-03.07.

in 90, Apatite (A) in 58, Struvite (S) in 35, Brushite (B) in 27, Cystine (C) in 25 and CO dihydrate (COD) in 22 of the patients. UA stones had significantly lower and B stones significantly higher HUM than any other stone composition. COM, COD and A could not be differentiated by HUM or HUSd. Although C and S stones have a similar HUM, HUSd was significantly different. UA and C stones both have similarly low HUSd, but are significantly different from all other stone types (Graph 1&2). HUM has relatively good predictive accuracy for UA, C, COM, and B stones (AUC= 0.975, 0.724, 0.743, and 0.882 respectively) with cutoff HUM values <588, <738, >763, and >1235 respectively. HUSd has the most predictive accuracy for UA (AUC = 0.866) and C stones (AUC = 0.763) with cutoff HUSd values of <68 and <88 respectively (Fig. 1, Fig. 2). Combining HUM and HUSd cutoffs increases the positive predictive value for most stone types.

**Conclusions:** Both mean and standard deviation of HU may help predict stone composition. This is the first report of CT data aiding in the prediction of Brushite stones. The HUSd allows differentiation of Cystine and Struvite stones. COM cannot be differentiated from COD or Apatite.

### MP-03.08

#### The effect of stone prevention counseling at the initial consultation on 24-hour urine collection results ("clinic effect")

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**Introduction and Objectives:** 24-hour urine collections are integral to long-term management of patients with recurrent urolithiasis and identifying treatable metabolic risks for urolithiasis (stone prevention). At our institution, patients bring a 24-hour urine collection to the initial assessment for extracorporeal shockwave lithotripsy (SWL); they are then given general dietary advice and brochures about stone prevention before knowing the initial 24-hour urine results. Our objective was to determine if there are differences in 24-hour urine parameters between the first 2 consecutive samples collected if stone prevention counseling did or did not occur at the time of the initial 24-hour collection, reflecting a possible "clinic effect".

**Methods:** We reviewed data for 24-hour urine collections for two groups of new patients: ones who had stone prevention counseling at the time of the initial 24-hour collection and ones who did not. Patients were

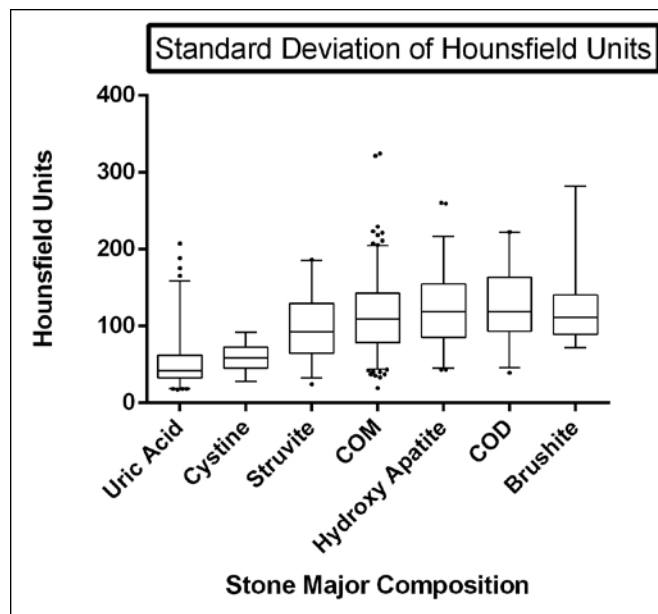


Fig. 2. MP-03.07.

included if they had at least two complete collections, not more than 6 months apart. The rates of abnormal 24-hour urine collection parameters (e.g. low urine volume, hypercalciuria, hypocitraturia, hyperoxaluria) were determined by comparing the percentage of normal and abnormal results between the two samples.

**Results:** 79 patients had counseling at initial presentation and 146 did not. Baseline urinary lithogenic risk factors were similar in both groups. There was a significant improvement in the urine volume in the repeated samples in both groups ( $P < 0.01$ ). The rate of abnormal oxalate and citrate levels in patients who had counseling decreased in the repeated collections but did not reach statistical significance ( $P = 0.064$  and  $0.052$  respectively); this change was not seen in patients who did not get stone prevention counseling.

**Conclusions:** First 24-hour urine collections prior to counseling are important to pick up some abnormalities such as low fluid intake or hyperoxaluria that could be missed in the second sample due to the "clinic effect". Improvements in the 24-hour urine parameters can be noticed even after simple general dietary advice at the initial consultation prior to the results of the 24-hour urine parameters are known.

### MP-03.09

#### Perinephric fat distribution and anatomical considerations when performing percutaneous nephrolithotomy in obese patients

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**Introduction and Objectives:** Knowledge of renal and retroperitoneal anatomy is essential to performing percutaneous nephrolithotomy (PCNL) with minimal patient morbidity. The kidneys are oblique in reference to the sagittal, coronal, and axial planes of the body with the lower pole more anterior and freely mobile, accounting for the difficulty in puncture as the lower pole may move away from the needle and dilators during PCNL. Our objective is to study the difference in the distribution of perinephric fat and its impact on the skin – calyx length and renal angle during PCNL in obese patients.

**Methods:** We reviewed 38 consecutive abdominal CT scans done at our institution with 76 kidneys included. We performed several measurements in relation to the anatomy of the kidneys including: Renal Angle, upper pole to skin (UPS), lower pole to skin (LPS), upper pole to muscle (UPM)

- representing the upper pole perinephric fat - and lower pole to muscle (LPM). We excluded patients with missing demographic data such as body mass index (BMI) or any abnormality on CT that would change the position of the kidney in the retroperitoneum such as large renal cysts.

**Results:** The mean BMI was  $27.5 \pm 7.5$ . The UPS distance was significantly higher in the obese patients ( $BMI > 30$ ) compared to the non-obese ( $82.5 \pm 21.9$ ,  $56.8 \pm 11$ ;  $P$  value  $< 0.01$ ), the same was noticed in the LPS distance ( $134.4 \pm 37.6$ ,  $93.3 \pm 18.2$ ;  $P$  value  $< 0.01$ ). The perinephric fat distribution measured by the UPM and LPM were both significantly higher in the obese population ( $P$  value  $< 0.01$  for both) but the obese patient had significantly more fat surrounding the lower pole ( $P$  value =  $0.011$ ), which caused the lower pole to shift more anterior in the obese population changing the renal angle from  $22.2 \pm 8$  to  $30.6 \pm 9.7$  on the sagittal access ( $P$  value  $< 0.01$ ).

**Conclusion:** There is a significant change in the perinephric fat distribution in the obese patients which is more pronounced in the lower pole making lower pole access longer and at a more difficult angle in these patients. This supports our recommendation for an upper pole approach in the obese patient.

### MP-03.10

#### Changing patient position can eliminate arrhythmia developing during shock wave lithotripsy (SWL)

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**Introduction and Objectives:** SWL has a low complication rate. While serious side effects are rare arrhythmias such as ventricular tachycardia may occur and require cessation of treatment. The etiology of these arrhythmias is poorly understood, but is most likely related to the relative position of the stone and the heart. This study examines the effect of rotating the patient 15 to 20 degrees when an arrhythmia occurs.

**Methods:** 1369 patients were prospectively evaluated for arrhythmias during SWL. The initial patient position was dependent on the location of the stone and the size of the patient. Stones on either side may be treated with the patient flat supine. More frequently, the patients are rotated about 15 degrees with the opposite side to the stone elevated. With stones on the right the patient would be right posterior oblique (RPO) and for left sided stones left posterior oblique (LPO). If a sustained arrhythmia developed, treatment was held for 2 minutes and then recommenced. If the arrhythmia returned, as occurred in all 20 patients, the patient was rotated to the flat, RPO or LPO position, angling the shock wave away from the heart.

**Results:** 20 patients developed significant arrhythmias during SWL. Arrhythmias occurred more frequently in patients with a lower BMI ( $P < 0.01$ ) and in those with right-sided stones ( $P = 0.035$ ). After rotation no further arrhythmias were seen in 13 patients. Gated ESWL was only needed in only 3 of the 20 patients after changing their position.

**Conclusions:** Changing the position of the patient by rotating the patient by 15 to 20 degrees may eliminate arrhythmias that develop during SWL allowing the continuation of the SWL treatment without the need to perform a gated SWL.

### MP-03.11

#### Ambulatory bilateral tubeless PCNL: Is it safe and feasible?

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**Introduction and Objectives:** Bilateral tubeless percutaneous nephrolithotomy (PCNL) has been reported to be safe and effective in select patients. Although outpatient PCNL has been recently been shown to be safe and effective in a series of 50 patients, it requires further study before urologists embrace same day discharge following PCNL. The objective of this study is to report our early experience in performing bilateral PCNL on a completely outpatient basis, assessing its safety.

**Methods:** A review of all outpatient tubeless PCNL cases between March 2007 and May 2014 at a single Canadian centre was performed, including collection of preoperative, intraoperative and postoperative data. Strict preoperative, intraoperative and postoperative criteria were used in the selection of candidates for outpatient bilateral PCNL: no intraoperative complications including significant bleeding or collecting system perforation; postoperative hemodynamic stability; adequate pain control; reliable patient with supportive family.

**Results:** Forty patients underwent ambulatory PCNL during the study period, of which 4 patients underwent bilateral ambulatory tubeless PCNL. Mean maximum stone diameter was 3.5 cm and 5 of the 8 renal units contained staghorn calculi. All 4 patients were discharged home on the same day with a mean hospital stay of 186 minutes or 3hrs 6min. The mean narcotic requirement was 70.5mg of oral morphine equivalents. Importantly, there were no postoperative complications, emergency room visits, hospital readmissions, ancillary procedures or deaths.

**Conclusions:** This small series represents the largest series of outpatient bilateral PCNL to date. In very carefully selected patients, bilateral PCNL on a completely ambulatory basis appears safe and may be feasible. Further research on outpatient bilateral PCNL is required prior to widespread adoption by urologists.

### MP-03.12

#### Flank percussion in the semi-prone position can relocate stones prior to percutaneous nephrolithotomy or laparoscopic pyeloplasty

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**Introduction:** Stones in remote calyces may be difficult to access. During percutaneous nephrolithotomy (PCNL) or robot assisted laparoscopic pyeloplasty (RPL), renal stones within the calyces require flexible nephroscopy and the use of a nitinol stone basket for removal. During RPL this tends to be complex and time consuming on occasions. In dilated systems, stone may be mobile, as suggested by a rounded shape, making their relocation a possibility. Relocation of calyceal stones to the renal pelvis facilitates and simplifies their extraction. The objective of this study is to describe a technique for manually relocating stones to the renal pelvis prior to PCNL and RPL.

**Methods:** Patients undergoing either PCNL or RPL who were known to have remote calyceal calculi were identified pre-operatively. Under general anesthetic, prior to placing them in the prone position for PCNL, or lateral for RPL, we place the patients on their side with the affected kidney superiorly and rotated 45° anteriorly to position the renal pelvis in a dependent position. This rotation also reduces the effect of the more posterior and medial lie of the upper pole calyces. Manual percussion is then performed over the kidney to dislodge the calyceal stones into the renal pelvis. C-arm fluoroscopy and nephroscopy was then used to confirm movement of all stones out of the calyces into the renal pelvis during PCNL, and flexible nephroscopy alone during RPL.

**Results:** We have now used this technique in 2 patients at the time of RPL and 3 patients at the time of PCNL. All patients had dilated collecting systems with smooth, round or pebble-shaped stones. All of the stones moved into the renal pelvis with this technique (images will be provided with the presentation).

**Conclusions:** Flank percussion in the semi-prone position seems effective in relocating the stones to the renal pelvis, which can simplify the procedure, avoid the need for flexible nephroscopy and save time. However further studies with a larger number of patients are required to confirm this conclusion.

### UP-03.01

#### Ureteric stricture following ureteral access sheaths in the modern era: How rare is it?

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**Introduction and Objectives:** Ureteral access sheaths (UAS) can aid ureteroscopy by facilitating multiple passes of the ureteroscope, maximizing irrigation drainage, and reducing intra-renal pressures. However insertion of the access sheath may induce ureteral ischemia, cause iatrogenic ureteric injury, and could ultimately lead to ureteric stricture. In this study, we aim to evaluate the stricture rate following ureteroscopy both with and without the use of UAS.

**Methods:** We performed a retrospective chart review of consecutive ureteroscopies performed at our center (a tertiary referral center for endourology) between April 2012 and April 2014 to treat ureteric and renal calculi. The primary outcome was the development of new hydronephrosis three months following successful ureteroscopy, not due to an obstructing stone. Patients without follow-up renal ultrasound (US) or CT scan 3 months post-ureteroscopy were excluded. Data on age, sex, size of the stone, location of the stone, stone density, stone-free rate (SFR), time of the procedure, pre-op stenting, post-op stenting, use of the UAS, size of the UAS, length of the UAS, stone analysis, and imaging details were recorded. Baseline and outcome variables were compared with ANOVA and Chi-square analysis where appropriate using SPSS statistical software.

**Results:** 203 patients were eligible. A UAS was used in 121 (59.6%) patients; 103 (85.1%) for renal stones and 18 for proximal ureteric stones. There was no significant difference in baseline or demographic data. None of the patients developed new hydronephrosis or developed a ureteric stricture, and none required endoureterotomy.

**Conclusions:** UAS use during ureteroscopy for renal and ureteric stones is both safe and effective. Even with routine use of 11.5F and 14F UAS, ureteric stricture rates are very low (zero in this series), suggesting that significant ureteric injury is rare with proper technique and case selection.

### UP-03.02

#### Preoperative patient and stone characteristics associated with a prolonged length of hospital stay following tubeless PCNL

Barrett, Keith P.<sup>1</sup>; Ghiculete, Daniela<sup>1</sup>; Ordon, Michael H.<sup>1</sup>; Lee, Jason Y.<sup>1</sup>; Pace, Kenneth T.<sup>1</sup>; Honey, R. John D.<sup>1</sup>

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**Introduction and Objectives:** The adoption of tubeless percutaneous nephrolithotomy (tPCNL) has decreased patient discomfort and length of hospital stay following PCNL. Ambulatory PCNL (hospital stay  $\leq 24$  hours) is now common, but identifying patients who are likely to require longer hospital stays remains a challenge. The objective of this study is to identify preoperative patient and stone characteristics associated with a required of hospital stay beyond post-operative day 1 (POD 1) following tPCNL.

**Methods:** A database of patients undergoing PCNL at our institution between 2011 and 2014 was reviewed, and cases of tubeless PCNL were identified. Length of stay (LOS) was defined as the period from the time operating room entry until the time of discharge. Preoperative variables evaluated included: age, gender, BMI, ASA, hemoglobin, creatinine, bacteriuria, and stone characteristics. Patients were divided into those discharged on POD 1 (Group 1) and those discharged beyond POD 1 (Group 2).

**Results:** 128 cases of tPCNL were identified during the study period. Mean LOS was 37.7 hours (range = 14.0 to 316.4 hours). 100 patients were discharged POD 1 (Group 1 = 78.8%) with a mean LOS of 24.6 hours (SD  $\pm 3.5$  hours), and 28 patients were discharged later than POD 1 (Group 2 = 21.8%) with a mean LOS of 84.5 hours (SD  $\pm 58.3$  hours). Pre-operative patient characteristics associated with a prolonged hospital stay included BMI (27.9  $\pm 4.7$  vs. 30.4  $\pm 7.7$ ,  $p = 0.04$ ), ASA 3 & 4 (47% vs. 67.9%,  $p = 0.05$ ), anemia (27% vs. 53.6%,  $p < 0.01$ ), creatinine (82.6  $\pm 30.2$  vs. 106.3  $\pm 72.9$   $\mu\text{mol/L}$ ,  $p = 0.01$ ), and bacteriuria (10.1% vs. 37.0%,  $p < 0.01$ ). Of the stone characteristics, only stone area was

significantly associated with a prolonged hospital stay 491.4  $\pm 459.4$  vs. 1043.9  $\pm 983.6$  mm<sup>2</sup>,  $p < 0.01$ ).

**Conclusion:** Both preoperative patient and stone characteristics can be used to identify patients likely to require a prolonged hospital stay following tubeless PCNL. This information may be useful in counseling patients and in pre-operative planning.

### UP-03.03

#### A new and simple intraoperative technique to radiographically determine appropriate ureteric stent length

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**Introduction:** It is important to choose the appropriate length of ureteric stent for every patient. Stents that are too long increase stent-related bladder symptoms and patient discomfort, and stents that are too short may migrate. Patient height is often used to choose stent length, but this is not a reliable predictor of ureteric length. The objective of this study is to describe a new and simple intraoperative technique to determine appropriate stent length using fluoroscopic measurements.

**Methods:** The charts of 5 patients who underwent ureteric length measurement and subsequent stent placement were reviewed. During cystoscopy, the tip of the cystoscope was positioned at the ureterovesical junction (UVJ). A metal BB was then affixed with adhesive tape to the skin over the UVJ. At the end of the case, an angiographic catheter with radiopaque markings at 1, 5, 10, 15, 20, and 25cm was used to perform a retrograde pyelogram and its tip positioned at the ureteropelvic junction (UPJ). Ureteric length was determined by measuring the distance from the UPJ to the BB at the UVJ using the catheter markers. A length of stent closest to the measured ureteric length was then placed. Stents were deemed of appropriate length if the proximal coil was in the renal pelvis and the distal coil in the bladder with no excess stent length.

**Results:** All 5 patients underwent successful radiographic measurement of ureteric length using the new technique. In 4 cases the stent was left to a tether. When the length of stent placed matched the radiographically measured ureteric length, stent length was found to be appropriate in all cases. In 2 cases, stents longer than the radiographically measured ureteric length were placed, and in both cases stent length was not felt to be appropriate due to excess length in the bladder.

**Conclusion:** This study describes a simple intraoperative technique to radiographically determine ureteric length. This technique is helpful in choosing appropriate stent lengths for individual patients.

### UP-03.04

#### Tubeless percutaneous nephrolithotomy with retrograde tethered stent

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**Introduction and Objectives:** The adoption of "tubeless" percutaneous nephrolithotomy (tPCNL) has decreased the morbidity of PCNL by eliminating the need for nephrostomy and nephroureterostomy tubes, in exchange for a ureteric stent. However, the need to perform a cystoscopic procedure to remove this stent remains a source of inconvenience and discomfort for patients. The objective of this study was to present our experience with tPCNL using retrograde stenting with a tether. We compared rates of stent related complications to those of a similar cohort of tPCNL patients in whom an un-tethered stent was placed.

**Methods:** We performed a chart review of 231 patients undergoing tPCNL at our institution between 2011 and 2014. Patients undergoing tPCNL with an un-tethered stent (Group 1) and those with a tethered stent (Group 2) were identified. All tethered stents were placed in a retrograde fashion. Pre-operative and intra-operative variables were compared between the groups. The decision to leave a tethered or un-tethered stent was based on surgeon preference. Post-operative stent complications including premature stent removal (prior to planned f/u at 1 week), emergency room (ER)

visits, adjunctive procedures for renal drainage, and urinary tract infections (UTI) diagnosed in the week following discharge were compared.

**Results:** A total of 239 patients underwent tPCNL during the study period (Group 1 = 38, Group 2 = 193). Pre-operative and intra-operative characteristics were similar between the groups. No premature stent removals occurred in Group 1. In Group 2 there were 13 premature stent removals (6.7%), leading to 6 ER presentations (3.1%), and 1 patient requiring stent replacement (0.5%). UTIs were identified in the week following discharge in 5.3% of Group 1 and 7.3% of Group 2 ( $p = 0.67$ ).

**Conclusions:** tPCNL with a retrograde tethered stent appears to be a safe, with a low risk of stent related complications or need for adjunctive procedures when compared to stents without tethers.

### UP-03.05

#### Percutaneous nephrolithotomy: A cost-effective analysis of tubeless and standard procedures

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**Introduction and Objectives:** Percutaneous nephrolithotomy (PCNL) is the established gold standard for treatment of large renal stones. Traditionally, a nephrostomy tube was left post-operatively to tamponade bleeding along the tract, allow for urinary drainage, and facilitate a second procedure if necessary. In appropriately selected patients, tubeless PCNL has emerged as a safe and effective alternative. The purpose of our study was to assess whether the tubeless method of PCNL is cost-effective when compared to standard PCNL.

**Methods:** A decision tree was constructed to calculate the costs of achieving a complication free-outcome in standard and tubeless PCNL (Fig. 1). A comprehensive literature review was performed to determine the rates of common post-operative complications. Each complication was graded using the validated Revised Clavien classification. Costs of the surgical procedures were obtained from the Ontario Case Costing Initiative and the Ontario Schedule of Benefits. Drug costs were obtained through the Ontario Drug Benefit Formulary. A willingness to pay threshold of \$3000 was used and adopted from drug-eluting stent literature.

**Results:** Tubeless PCNL was more cost-effective than standard PCNL at \$10171.09 with a complication grade of 0.29 compared to \$12673.62 and 0.35. Overall complication rates in the tubeless and standard PCNL groups were 12.8% and 15.6% respectively. Sensitivity analysis demonstrated that tubeless PCNL remained cost effective as long as the cost of the procedure remained below \$12000 and the cost of standard PCNL remained above \$9000.

**Conclusions:** In appropriately selected patients, tubeless PCNL is more cost effective than standard PCNL in achieving a complication free outcome at a WTP of \$3000. A shorter average length of hospitalization and reduced cost of OR supplies among tubeless patients led to lower upfront costs of the primary procedure. Due to comparable complication rates in the two groups, tubeless PCNL remained the more cost-effective option when post-operative events were accounted for.

### UP-03.06

#### Contemporary imaging practice patterns after ureteroscopy for stone disease

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**Introduction and Objectives:** Routine imaging following ureteroscopy for treatment of renal/ureteral calculi continues to be a topic of debate. However, with the increasing focus on healthcare costs and quality, judicious use of diagnostic imaging to optimize outcomes while minimizing resource utilization is a priority. We sought to identify post-ureteroscopy imaging practices amongst experienced urologists.

**Materials and Methods:** A REDcap questionnaire was sent to urologists in North America. The questionnaire surveyed demographic data, clinical volume, and imaging preferences post-ureteroscopy. Additionally, we surveyed the extent to which stone, anatomic, and procedure-related factors influenced these preferences. The likelihood of altering clinical practice and the desire for specific imaging guidelines were also assessed. The Interquartile range (IQR) was utilized as a measure of median consensus, with a lower IQR denoting increased agreement.

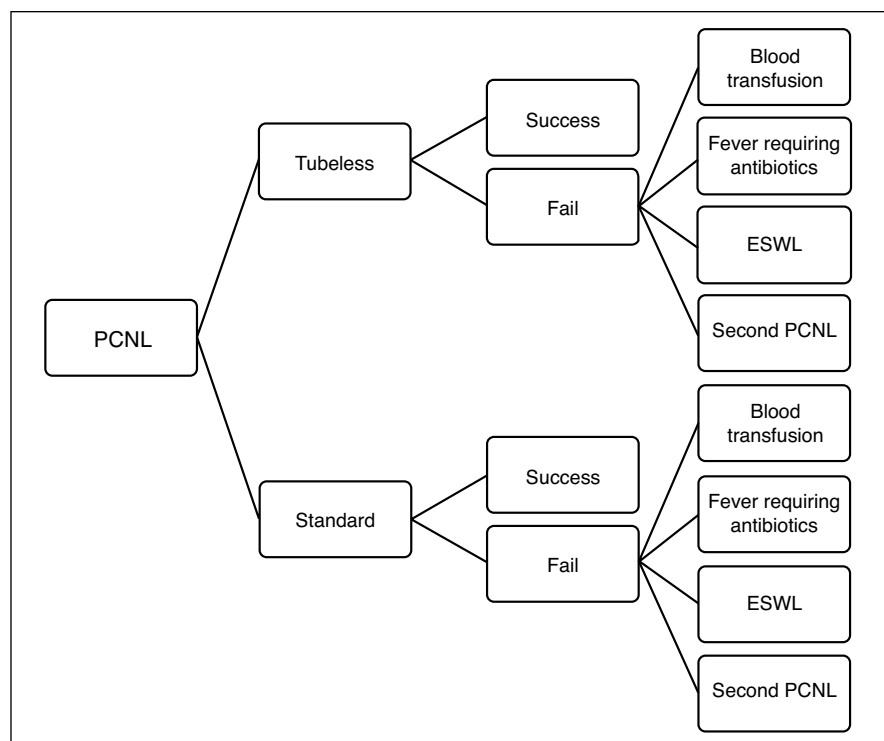


Fig. 1. UP-03.05.



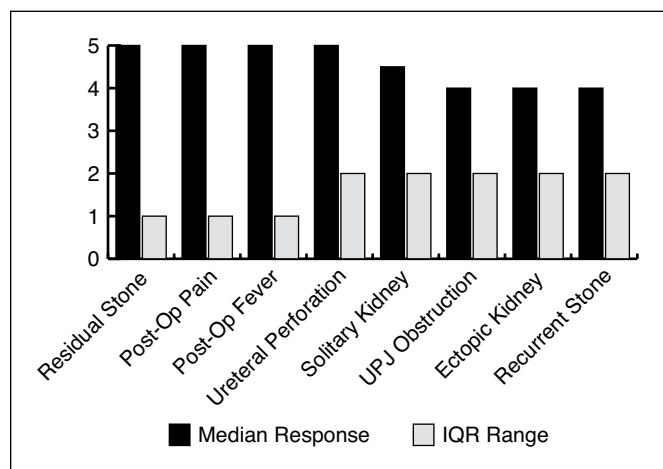


Fig. 1. UP-03.06.

**Table 1. UP-03.06. Factors discouraging routine imaging & expectations of future change**

	Routine imaging	Non-routine imaging	p value
Cost of imaging	38 (25%)	93 (55%)	0.0001
Access to imaging	19 (13%)	11 (7%)	0.0610
Radiation hazards	66 (44%)	116 (70%)	0.0001
Accuracy of ultrasound	66 (44%)	96 (57%)	0.0192
Anticipate change of practice	16 (11%)	13 (8%)	0.3918
Guideline importance	94 (62%)	95 (57%)	0.3006

**Results:** Three hundred twenty-two urologists completed the questionnaire. The mean number of years in practice was  $18 \pm 10$ ; 82% of respondents performed more than 5 ureteroscopic stone procedures monthly. Routine postoperative imaging was obtained by 48% of participants as follows: US (47%), KUB (17%), CT (4%), IVP (2%), and KUB + US (30%). Urologists who did not routinely image patients were more concerned about cost (55% vs. 25%,  $p < 0.0001$ ), radiation exposure (69% vs. 44%,  $p < 0.0001$ ), and diagnostic inaccuracy of US (57% vs. 44%,  $p < 0.02$ ) (Table 1). These urologists were also less likely to have completed an Endourology fellowship (7% vs. 23%,  $p < 0.0001$ ). The most compelling predictors of obtaining postoperative imaging were post-op pain and fever (median 5, IQR 1), residual stones (median 5, IQR 1), ureteral perforation (median 5, IQR 2), and presence of a solitary kidney (median 4.5, IQR 2) (Fig. 1).

**Conclusions:** Currently, about 50% of urologists who regularly perform ureteroscopic stone procedures obtain post-op imaging. Imaging preferences were guided by the presence of residual fragments, ureteral perforation, solitary kidney, and postoperative pain or fever.

### UP-03.07

#### Urinary uric acid does not correlate with increased cardiovascular risk and myocardial infarction

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**Introduction and Objective:** Recent studies have shown a correlation with elevated serum uric acid and myocardial infarction (MI) risk, specifically as an indicator of poor prognosis post MI. In addition, studies have demonstrated that adverse cardiovascular events are more common in individuals with nephrolithiasis. However, urine uric acid levels may be elevated even with normal serum uric acid (UA). We sought to identify

an association between urinary uric acid (UUA) levels and cardiovascular risk in our stone population.

**Methods:** 7410 stone patients with available 24h urine UA were stratified into three groups: UUA < 700, UUA 700-1000 and UUA > 1000 (mg/day). Clinical and demographic data at the time of 24h urine and the prevalence of myocardial infarction was identified and compared between the three groups.

**Results:** Patients with elevated UUA were more likely to have hypertension, diabetes, elevated BMI, low HDL and of male gender. There was no statistical difference in the prevalence of MI between groups stratified by UUA level (4.2% vs. 3.8% vs. 5.0%,  $p = 0.5939$ ). When stone patients with MI were matched to stone patients without MI by age, gender, BMI, smoking history, diabetes and hypertension there was no difference in mean UUA (569.2mg vs 544.1mg,  $p = 0.6051$ ) or urine pH levels (5.9 vs 5.9,  $p = 0.7376$ ).

**Conclusion:** In our kidney stone population, elevated UUA is not an independent risk factor for MI, although it is positively associated with cardiovascular risk factors such as male gender, elevated BMI, hypertension, diabetes, and low HDL and may be an indicator of metabolic syndrome.

### UP-03.08

#### Updated economic analysis on ureteric stenting after uncomplicated ureteroscopic laser lithotripsy for urolithiasis: Is stenting necessary?

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**Introduction and Objectives:** Routine ureteral stenting after uncomplicated ureteroscopy and laser lithotripsy (ULL) is debatable. Purported advantages include preventing ureteral obstruction and facilitating stone passage; disadvantages include stent colic, potential stent migration and subsequent cystoscopic stent removal. The purpose of our study is to determine whether stenting after uncomplicated ULL is safe and economically sound.

**Methods:** A decision tree was developed to estimate the costs of ULL with and without stenting in achieving a complication free outcome (CFO) and quality-adjusted life days (QALD) over a one month period. Complications were defined as any unplanned hospital visits within the first four postoperative weeks including emergency room visits, admissions to hospital or surgeries. They were graded according to the validated Revised Clavien classification. Complication rates and utility values were derived from recent literature. Costs of surgical procedures were obtained from the Ontario Case Costing Initiative. Univariate and probabilistic sensitivity analyses were performed to determine the robustness of our model.

**Results:** ULL without stenting was more cost-effective than ULL with stenting in achieving a CFO. ULL with and without stenting cost \$3828 and \$3248 respectively to achieve an overall complication grade of 0.06 and 0.15 ( $p < 0.0001$ ) respectively. Overall postoperative complication rates in the stented versus non-stented groups were 2.6% and 6.5% respectively. ULL with and without stenting generated 25.2 and 26.2 QALDs over one month respectively. Probabilistic sensitivity analysis reinforced ULL without stenting as the most cost-effective strategy at a willingness-to-pay (WTP) threshold of less than \$6000/QALY. ULL without

**Table 1. UP-03.09.**

Parameter	Helical	Control	p value
Number	15	30	—
Age (y)	58.47	52.37	NS
BMI (kg/m <sup>2</sup> )	28.74	27.82	NS
Unscheduled visits	20% (3/15)	20% (6/30)	$p = 1.000$
<b>Analgesic use (morphine equivalent mg)</b>	<b>4.4 ± 7.9</b>	<b>16.75 ± 18.31</b>	<b>**<math>p = 0.0035</math></b>
<b>Visual Analog Scale Score</b>	<b>13.85 ± 13.68</b>	<b>14.29 ± 11.58</b>	<b><math>p = 0.791</math></b>

stenting remained the most dominant strategy in our cost-utility analysis at generating QALDs across all WTP thresholds.

**Conclusions:** After uncomplicated ULL, not stenting was more cost-effective and yielded more QALDs than stenting over a one month period at reasonable WTP thresholds. Our study demonstrated that despite the increased postoperative complication rates associated with non-stented ULL, it was still the preferred treatment strategy after uncomplicated ULL.

### UP-03.09

#### Patients with Helical ureteral stents require significantly less analgesics than control stents

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**Introduction and Objectives:** Ureteral stent symptoms are experienced by patients with stents. Softer materials, adjuvant drugs, drug-eluting stents, and new stent designs have been attempted to reduce stent symptoms. There has not been any clear advantage in any one stent or new technology. The Helical™ stent, a spirally cut stent made of proprietary Percuflex material was designed to conform better to the shape of the ureter and move with the patient. We prospectively sought to compare unscheduled visits, analgesic use and pain scores in patients who received a Percuflex Helical ureteral stent following ureteroscopy compared to a historical control group.

**Methods:** Fifteen (n=15) patients scheduled to undergo ureteroscopy for the treatment of kidney stones were consented for the study. A Percuflex Helical ureteral stent was inserted after successfully treating the urinary stone. The control group consisted of thirty (n=30) patients, from a previous (ketorolac-eluting) ureteral stent study utilizing the same protocol and clinical monitoring forms who received a regular Percuflex ureteral stent. The control patients were age and sex-matched to the study patients. The primary study outcomes were to compare unscheduled visits and the number of pain pills consumed. Secondary outcomes included comparison of Visual Analog Scale pain scores.

**Results:** There were no differences in the gender, age, or stone characteristics (Table 1). Both groups underwent retrograde ureteroscopy using holmium: YAG laser lithotripsy and successful stone fragmentation. There was a significant reduction in the amount of analgesics required in the Helical group compared to controls (p=0.0035) to achieve similar VAS scores. There was no difference in unscheduled visits (20%). Limitations of this study include its small size, non-randomized approach

and control group from a previous study. However, this current study followed the exact protocol of the previous study so that the control group could be adequately compared.

**Conclusions:** Patients who received a Percuflex Helical ureteral stent required significantly less analgesics than those who received a Percuflex stent and both had equivalent pain scores. The spirally cut Helical stent appears to improve patient comfort compared to the regular Percuflex stents.

### UP-03.10

#### Ultra low dose CT-KUB to detect kidney stones with 50% less radiation: Is the plain radiograph obsolete?

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**Introduction and Objectives:** At our institution, Kidney-Ureter-Bladder (KUB) radiographs are performed immediately prior to shockwave lithotripsy (SWL). Conventional low dose CT-KUBs (effective dose of 2.2-3.0 mSv) are only performed if stones are not visible on KUB. Recent advances in CT detector design and image reconstruction algorithms have made sub-millisievert ultra-low dose CT (ULDCT) acquisition feasible, but the diagnostic performance of these exams has not yet been reported. We sought to compare the radiation dose and diagnostic performance of ULDCT to KUB in patients prior to SWL.

**Methods:** Patients enrolled in this study received both a KUB radiograph and an ULDCT prior to SWL. Radiation exposure parameters were recorded and both examinations were read in random order by blinded radiologists to determine the correlation between the two modalities.

**Results:** To date, 51 patients (M:F, 34:17) with a mean age of 56.2 ± 13.8y were enrolled. The effective radiation dose was significantly lower with ULDCT (0.28 ± 0.10 mSv) compared to KUB (0.50 ± 0.10 mSv, p=0.014). The number of stones seen on KUB was 1.59 ± 1.27 vs. 1.92 ± 0.51 for ULDCT (p=0.35). Measurement of stone size was equivalent between ULDCT (6.47 ± 3.34mm) and KUB (6.98 ± 3.41mm, p=0.455). In 3 cases, ULDCT localized ureteral stones that were not visible on KUB. Please see figures for ULDCT compared to standard dose CT (Fig. 1, Fig. 2).

**Conclusions:** Sub-millisievert ULDCT delivers 43% less radiation than a plain KUB radiograph and was equivalent in detecting the number and



Fig. 1. UP-03.10. ULDCT.



Fig. 2. UP-03.10.



size of stones. In some cases, it helped localize stones prior to SWL better than KUB. In future, ULDCT may replace KUB as it delivers less radiation with more information. This study is ongoing.

### UP-03.11

**A prospective randomized study comparing Silodosin and Alfuzosin in management of ureteral fragments after renal SWL**  
Dawod, Tamer<sup>1</sup>; Shabana, Waleed<sup>1</sup>; Telb, Mohamed<sup>1</sup>; Shahin, Ashraf<sup>1</sup>; Eladl, Mahmoud<sup>1</sup>

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**Objective:** To compare the safety and efficacy of Silodosin and Alfuzosin in fragment clearance after successful shock wave lithotripsy (SWL) for renal stones.

**Patient and Methods:** Between September 2013 and June 2014, patients underwent successful SWL (residual fragments of <5 mm) for single renal stone <2 cm were enrolled in this prospective randomized study. Patients were stratified into 3 groups, 31 patients each. Group I received an analgesic anti-inflammatory. Group II with Silodosin 8 mg daily was added, While Alfuzosin 10 mg was prescribed instead. The treatment was continued for 4 weeks. Patients' demographics, stone free rate, need of analgesia and occurrence of complications were recorded and statistically analyzed.

**Results:** Group II and III had significantly higher stone free rates compared to group I, 64.9%, 91.3% and 87.6% respectively ( $p < 0.05$ ). There was a statistically insignificant difference among groups II and III ( $p > 0.05$ ). The need for additional analgesia and incidence of steinstrasse were significantly less in group II than in the other two groups.

**Conclusion:** Both Silodosin and Alfuzosin enhance clearance of stone fragments after SWL for renal stone. Silodosin is better to reduce pain attacks and incidence of steinstrasse.

### UP-03.12

**Safety and efficacy of using the stone cone and N-Trap<sup>®</sup> in ureteroscopic lithotripsy for ureteric stones**

Shabana, Waleed<sup>1</sup>; Dawod, Tamer<sup>1</sup>; Telb, Mohamed<sup>1</sup>; Shahin, Ashraf<sup>1</sup>; Eladl, Mahmoud<sup>1</sup>

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**Introduction and Objectives:** To assess safety and efficacy of using stone cone and the N-Trap<sup>®</sup> to avoid stone retropulsion during ureteroscopic lithotripsy for ureteric stone.

**Material and Methods:** This retrospective comparative study included 439 patients subjected to ureteroscopic lithotripsy for single ureteric stone from February 2011 till January 2014. Diagnosis of unilateral calculus was confirmed by computed tomography in all cases. The patients were divided according to the device used to avoid stone retropulsion during pneumatic lithotripsy into three groups. Group I (n=156) had no instruments used, group II (n=140) in whom the stone cone was applied and group III (n=143) with the N-Trap<sup>®</sup> was used. Patient demographics, stone criteria, operative time and complications as well as success (complete stone disintegration without upward migration) rate were reported and statistically analyzed.

**Results:** The mean  $\pm$  SD of maximal stone length was  $9.8 \pm 1.7$ ,  $10.3 \pm 2.0$  and  $9.7 \pm 1.5$  in groups I, II and III respectively. Use of stone cone or N-Trap<sup>®</sup> did not significantly increase either operative time or complications. Retropulsion rate was 10.2% (16/156), 2.1% (3/140) and 3.4% (4/143) in groups I, II and III respectively with statistically significant difference ( $p > 0.05$ ).

**Conclusions:** The stone cone and N-Trap<sup>®</sup> have high success rate in preventing stone retropulsion during ureteric pneumatic lithotripsy. Both devices do not significantly increase operative time or complications when used cautiously.

### UP-03.13

**Percutaneous renal biopsies: Complications and outcomes in conjunction with R.E.N.A.L nephrotomy score**

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**Introduction and Objectives:** Effectiveness and safety of percutaneous renal biopsies in the management of patients with renal masses has been widely studied. Despite this, the tool has failed to gain widespread acceptance. Our study aims to assess predictors, complications, and outcomes of percutaneous renal biopsies. In addition, the contribution of anatomic complexity using the R.E.N.A.L nephrometry score and skin-to-tumor distance as adjunct variables.

**Methods:** A database was constructed of patients undergoing percutaneous renal biopsies at our institution. Patient age, gender, biopsy results, complications, renal mass size, laterality, and if applicable, final surgical pathology was extracted from patient charts. R.E.N.A.L. nephrometry score was also calculated for each tumor by a senior urology resident and a urology attending. Fishers exact test was used for statistical analysis.

**Results:** From January 2012 to January 2015, a total of 56 patients underwent percutaneous renal biopsies. Mean patient age was 68.2 (45-89) with 40 males and 16 females. Fifty-one (91%) patients had no complications. 2 patients developed a peri-renal hematoma, 1 patient with a peri-tumor hemorrhage and 1 patient developed an abdominal cellulitis. One patient required admission to hospital due to a complication. Of the 56 biopsies, 17 (30%) were insufficient, 6 (11%) demonstrated benign pathology, and 33 (59%) were malignant. Of the 33 malignant biopsies, 19 (58%) of these provided histologic sub-type and 8 (24%) provided Fuhrman grading. With regards to predictors of a diagnostic biopsy, we found no association with R.E.N.A.L. nephrometry score, tumour laterality, skin-to-tumour distance, and tumour size. Within our follow-up period, 18 patients underwent surgery. Fifteen (83%) of these patients had adequate tissue on biopsy with all results demonstrating accurate histology as compared to final surgical pathology.

**Conclusion:** Percutaneous renal biopsies appear to be safe as demonstrated in our cohort with minimal complications. Our study demonstrates that 1/10 patients could potentially avoid surgery with a preoperative biopsy. Further, R.E.N.A.L nephrotomy score provided no additional information in terms of predicting adequate tissue for pathology.

### UP-03.14

**Safety and efficacy of percutaneous nephrolithotomy for the treatment of pediatric renal stones**

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**Introduction:** We present our experience with pediatric PCNL for renal calculi in children under 18 years in Saudi Arabia.

**Methods:** All patients undergoing PCNL at our institution between May 2005 and October 2014 were reviewed. Demographics, surgical details and post-operative follow-up information were obtained to identify stone free rates and complications.

**Results:** PCNL was performed in 31 renal units in 24 patients (mean age: 7.6 years). The mean stone diameter was 37 mm (range: 16–55mm). 22(71%) procedure required single puncture and 9(29%) required two tracts. We used subcostal, supracostal and both access in 51.6%, 22.6%, 19.4% respectively in our series. Overall, 20 (64.5%) staghorn stones and 11 (35.5%) single stones were treated. Our stone free rate 80.6% following initial PCNL and 90.3% at three months. ancillary procedure used were URS and SWL. There was significant bleeding encountered in two procedure and required a blood transfusion. One patient developed urosepsis and treated with course of antibiotics. Two patients complicated with hydrothorax, one of them required chest drain.

**Conclusions:** Pediatrics PCNL can be performed safely with minimal morbidity for large stone burden with 91% stone free rate.

### UP-03.15

#### Compliance of cystinuria patients with medical management

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**Purpose:** Cystinuria is an autosomal recessive disorder of dibasic amino acid transport in the kidney that leads to an abundance of cystine in the urine. This molecule is poorly soluble in urine and it is prone to crystallization and stone formation at concentrations above 300 mg /l. patients compliance with Medical treatment inform of increasing urine volumes, alkalinization and thiol medications that decrease the availability of free cystine in urine are the main way to prevent stones recurrence.

**Materials and Methods:** We retrospectively reviewed patients with cystinuria underwent PCNL at King Khalid university hospital in the period between 2006 to 2014. Stone free rate , Medical therapy, stone recurrence rates, compliance with medications and the results of metabolic evaluations via 24-hour urine collections were reviewed.

**Results:** We identified 23 patients there age between 18 months to 67 years. Male represented 74 % of those with cystinuria. Those patients underwent PCNL for 34 renal units. Our stone free rate was 85%. Stone recurrence rate was 72%. Overall compliance with medical recommendations was very poor, none of those patients had recurrence maintained or achieved urine cystine less than 300 mg./l or urine volume more than 2.5 liters per day.

**Conclusions:** Patient's compliance with medical management is the main target for prevention of recurrence in cystineuric patients, patients education and special clinic for cystineuric patients may help in this. Additional investigation is needed to determine the optimal medical therapy for preventing recurrence and regrowth of cystine stones.

### UP-03.16

#### Stone imaging options: Survey on the current practice of endourology society members

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**Objective:** We describe the practice variability of Endourologists in choosing different stone imaging modalities.

**Methods:** An online survey was sent to the Endourology society members by the society administration office. We collected the participants' demographic data on the type, level and country of practice. The survey focused on elucidating the preferred imaging modality for stone disease in different scenarios and testing the knowledge on estimated radiation doses for common stone imaging modalities. Fisher's exact test was utilized as appropriate.

**Results:** In total, 159 urologists from 35 different countries responded. Of the respondents, 92.4% were staff, 66.5% had an academic practice and 98.7% were treating stone disease. Only 69.6% were aware of the local radiation protocol at their institution, while 43% stated that they don't know the International Commission on Radiological protection recommendation for yearly occupational radiation exposure limit.

Tables 1 and 2 show the participants' selections of preferred imaging modalities and estimated radiation doses, respectively.

North American urologists were less likely to select high radiation imaging (CT KUB and CT urography), for follow-up of recurrent stone formers, in comparison to other regions (2.9% vs. 23.6%, P<0.0001), while they were more likely to know the correct estimated dose of 2-film KUB (70.6% vs. 53.9%, P=0.025).

Academic urologists were more likely to know the correct estimated radiation dose of low dose CT KUB (35.2% vs. 20.4%, P=0.045) and had a trend to know the correct estimated dose of CT KUB (28.6% vs. 15.4%, P=0.050) in comparison to non-academic urologists.

**Conclusion:** The results show wide variation in the current practice of Endourologists in imaging stone disease and a significant lack of knowledge

**Table 1. UP-03.16.**

	CTK UB	Low-dose CT KUP (no contrast)	CT urography (with contrast)	X-ray KUB	Renal ultrasound	X-ray KUB and renal ultrasound	Not applicable to me	Total answers
Initial evaluation of patients with renal colic	38.9% n=62	33.9% n=54	3.1% n=5	1.8% n=3	8.1% n=13	13.8% n=22	0	159
Follow-up of patients post shock wave lithotripsy	5% n=8	4.4% n=7	0	44.9% n=71	7.5% n=12	31.6% n=50	6.3% n=10	158
Follow-up of patients post ureteroscopy	3.7% n=6	7.5% n=12	1.2% n=2	29.5% n=47	22.6% n=36	32.7% n=52	2.5% n=4	159
Follow-up of patients post PCNL	13.2% n=21	20.8% n=33	1.2% n=2	25.3% n=40	8.2% n=13	27.8% n=44	3.1% n=5	158
Follow-up of recurrent stone formers	9.5% n=15	14% n=22	5.1% n=8	21.6% n=34	18.4% n=29	31.2% n=49	0	157

Data show the preferred imaging modality in different stone disease scenarios by endourologists.

**Table 2. UP-03.16.**

	1-5 mSV	6-10 mSV	11-15 mSV	16-20 mSV	21-25 mSV	I don't know	Total answers
2-film x-ray KUB	61.1% n=96	5.7% n=9	0	0	0	33.1% n=52	157
Conventional CT KUB (no contrast)	2.5% n=4	24 38	19.6 31	13.2% n=21	5.7% n=9	34.8% n=55	158
Low-dose CT KUB (no contrast)	30.3% n=47	26.4% n=41	5.1% n=8	0	0.6% n=1	37.4% n=58	155

Data show the selected answers by endourologist for the estimated effective radiation doses in (mSV) for different imaging modalities

regarding the radiation doses between the participants. Our results suggest a need for developing stone imaging guidelines and integration of radiation protection protocols in continuous education programs for urologists.

### UP-03.17

#### **In vitro assessment of antilithiatic property of *Terminalia arjuna* on calcium oxalate crystallization and its cytoprotective role on renal epithelial cells**

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**Introduction and Objectives:** Urolithiasis is a multifactorial disease and remains a public health problem around the world. Of all types of renal stones, calcium oxalate (CaOx) is the most common composition formed in the urinary system of the patients with urolithiasis. The present study is aimed at evaluating the antilithiatic properties of the Tris-Cl extract of *Terminalia arjuna* (*T. arjuna*) bark.

**Methods:** The antilithiatic activity of Tris-Cl extract of *T. arjuna* was investigated on nucleation, aggregation and growth of the CaOx crystals as

well as its protective potency was tested on oxalate induced cell injury of NRK-52E renal epithelial cells. Its cytoprotective effect was determined by trypan blue exclusion assay of cell viability. Also, *In vitro* antioxidant activity of Tris-Cl extract of *T. arjuna* bark was also determined using spectrophotometric method.

**Results:** The Tris-Cl extract of *T. arjuna* exhibited inhibition of  $50.5 \pm 3.1$  %,  $43.9 \pm 1.6$  % and  $35.51 \pm 4.1$  % of CaOx crystal nucleation, aggregation and growth at a concentration of 200 µg/ml in a dose-dependent manner respectively. When NRK-52E cells were injured by exposure to 1 mM oxalate for 24 hours, the cell viability was reduced from 100 % to  $39.08 \pm 5.33$  %. The Tris-Cl extract prevented the cells from injury caused by oxalate resulting in increased cell viability from  $44.03 \pm 3.66$  % to  $63.75 \pm 3.26$  % in a dose-dependent manner from 5 µg/ml to 40 µg/ml respectively. Also, the percentage of DPPH free radicals inhibition ranged from 5.14 % at 5 µg/ml to 88.43 % at 100 µg/ml with an  $IC_{50}$  at 51.72 µg/ml.

**Conclusions:** The results indicated that *T. arjuna* is a potential candidate for phytotherapy against urolithiasis as it attains the ability to inhibit nucleation, aggregation and growth of the CaOx crystals and scavenge DPPH free radicals *in vitro* along with a cytoprotective role. This study adds a new vista to the medical management of kidney stones.