Results: A total of 43 patients underwent SMP and data was collected prospectively. Ninety one percent of patients (90.6%, 42/43) had < 20 mm. It is associated with low levels of blood loss, short operative time, high rate of tubeless procedures and short length of stay.

The iodine allergy myth: what is safe, contra-indicated and alternative options for retrograde pyelography
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Introduction and Objectives: Retrograde pyelography is commonly performed to visualize the renal collecting system in diagnostic and therapeutic urological procedures. Urologists most commonly employ iodine based non-ionic radiocontrast agents. There are cases of anaphylactoid reactions to iodine during urological interventions which has led to concerns regarding its use in patients with potential allergies. We reviewed the evidence basis for contrast allergy and highlight alternative options for clinical use.

Methods: A literature review was conducted using databases including PubMed and Google Scholar with search terms ‘gadolinium’, ‘gadobutrol’, ‘pyelogram’, ‘urology’, and retrograde pyelography.’ In addition, a search for papers involving ‘iodine,’ ‘allergy,’ and ‘contrast’ was conducted. A clinical case with a documented allergy is used to highlight the alternatives options.

Results: There is a common misconception that allergy to iodine or seafood is a contraindication to the use of radiocontrast. However, studies have shown that the risk of a reaction to radiocontrast in these patients is similar to patients with other food allergies or asthma. Surprisingly, even previous reactions to radiocontrast do not increase the risk of a severe reaction. Gadolinium based contrast has been shown to be useful in retrograde pyelography, but with older formulations such as gadoteridol.

We present a case of an infected, obstructed patient requiring urgent intervention whose case was delayed due to concerns about contrast allergy and ultimately managed with gadobutrol. We highlight the images obtained during retrograde pyelograms due to its lower attenuation compared to iodinated contrast.

Conclusions: Urologists need to be aware of what is a ‘true anaphylactic risk’ with contrast agents. Gadolinium is an effective, alternative contrast media that should be available in theatres and used if a patient describes a severe reaction to previous iodinated contrast. The evidence highlights that is not necessary in patients with reactions to seafood or iodine.

Ball-tip versus flat-tip fibers: is there a difference in operative outcome for laser lithotripsy?
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Introduction and Objectives: To compare the operative outcomes in patients undergoing laser lithotripsy using a ball-tip versus flat-tip laser fibre.

Methods: A prospective comparative study was performed comparing the usage of ball-tip (Boston Scientific TracTip™) to flat-tip (Boston Scientific, LightTrail™) laser fibres for patients undergoing lithotripsy for renal tract calculi at the Canberra Hospital, using the Boston Scientific
Auriga XL. Operative outcomes analysed included operative time, laser fibre damage, and the number of laser pulses used, as well as 30-days complication rates and the need for follow up relook pyeloscopy. In addition, we examined the ability of the fibres to pass down disposable flexed ureteroscope, post-operatively. Data were analysed using SPSS 24.0.

Results: Sixty-seven patients were included in our prospective study with a mean age of 54.3 years, 36% of patients were female. The average number of stones treated per patient were 2.6 with a mean burden of 16.8 mm. Sixty one percent of the cases contained lower pole renal calculus. There were no significant difference between patient demographics or stone characteristics between the two groups. There was a significant difference in laser fibre damage incidence (p = 0.008) with a larger degree of burn back length in the flat-tip fibre group (p = 0.02). The burn back length in the ball-tip fibre group was 0.4 mm (range 0–6 mm) compared to 1.6 mm (range 0–2.2 mm) in the flat-tip fibre group. There were no statistical significance in operative outcome or complications in both groups. We noted a tendency of difficult flexed ureteroscope insertion of the flat-tip fibres with a statistical significant rate of fibre breakage (p = 0.03).

Conclusions: The ball-tip laser fibre was more robust and results in less fibre damage during laser lithotripsy without compromising operative outcomes for patients.

Transurethral resection of a massive infected ureterocele: a video case demonstration

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Introduction and Objectives: To describe our technique of managing a massive, infected ureterocele with transurethral resection using a high definition video case demonstration.

Methods: A 49-year-old man presented with urinary retention, dysuria and fevers. An indwelling catheter was placed, and the patient was commenced on intravenous antibiotics. Urine cultures grew a pan-sensitive Escherichia coli. A computed tomography scan (Figure 1) showed a complete renal duplex system with a massive 10 cm ureterocele (black arrows) within the bladder (white arrows) obstructing the upper pole renal moiety (white arrowhead) and ectopic ureter (*). The patient recovered well and had a successful trial of void 2 days post-op.

Conclusions: We describe an endoscopic management technique for a massive infected ureterocele.

Bigger is better when it comes to holmium:YAG laser lithotripsy

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Introduction and Objectives: Holmium: YAG laser lithotripsy is the cornerstone of the management of urolithiasis. Newer
laser machines offer higher power as well as more adjustability in frequency, power, and pulse duration. Despite this it is unclear if these factors translate into clinical benefits.

The aim of this study was to compare the performance of a new 60W holmium:YAG laser with an older holmium:YAG 30W laser. The primary outcome was the rate of relook ureteropyeloscopy (RLU). The secondary outcome was operative time.

**Methods:** A retrospective cohort study was performed. All consecutive patients presenting for their index retrograde intrarenal surgery and laser lithotripsy between February 2016 and January 2017, and February 2018 to October 2018 were included. Patients with a stone burden > 30 mm, encrusted stent, cystine stones, or undergoing a concurrent procedure were excluded. Data on patient demographics, stone size, location, burden, and composition, management techniques used including the laser machine, length of stay, length of surgery, and need for RLU were collected. Variables important in the management of urolithiasis were compared between the two laser groups.

**Results:** A total of 153 patients underwent management during the study period, 13 patients were excluded. 92 patients underwent treatment with 30W laser and 48 with the 60W laser. There was no difference between the two groups when comparing age, gender, primary ureteropyeloscopy rate, location of calculi, number of calculi, stone burden, stent indwelling time, stone composition, rate of registrar performed procedures, type of ureteroscope used, use of an access sheath, use of a basket device, fibre size, or operative time. When comparing the 30W group to the 60W group there were differences in the rate of stones sent for analysis (71.7% vs 55.1%, p = 0.047), rate of dusting technique (40% vs 57.1%, p = 0.055), and rate of RLU (18.7% vs 4.1%, p = 0.005). When using the 60W laser the absolute risk reduction for RLU was 0.14, giving a number needed to treat of 7.

**Conclusions:** In the management of urolithiasis with retrograde intrarenal surgery, a newer and higher powered holmium:YAG laser machine leads to a reduction in the number patients who require relook ureteropyeloscopy. This provides support for investment in new holmium:YAG laser machines by health care services.

**Mirabegron Plus Tolterodine Versus Tamsulosin Plus Tolterodine for stent related symptoms – A prospective randomized study for patient reported outcomes**

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**Introduction & Objectives:** Placement of a ureteral stent is a common urological intervention. It has been more than 3 decades since the first description of a cystoscopically placed temporary ureteral stent. Now with wide spread use side effects and patient morbidity associated with stents have been identified as major problems. Currently, there is a wide variety of medical treatments to relieve irritative bladder symptoms due to double J stent. Assessment of symptoms due to stents and their impact on daily life is best performed using patient self-report techniques, which measure subjective quality of life objectively.

**Methods:** A randomized comparative study was performed on patients who underwent DJ stenting during specified study period for various indications where patients were divided in two groups.

Group one (30 patients) received Mirabegron 25 mg Plus Tolterodine 2 mg and Group 2 (30 patients) received Tamsulosin 0.4 mg Plus Tolterodine 2 mg. Patients who underwent bilateral stenting and or stent replacement were excluded along with those not proficient in English to understand the Ureteral Stent Symptom Questionnaire (USSQ). These patients were followed up weekly for three weeks with Visual analogue pain scale and USSQ.

**Results:** All patients tolerated the drugs without any major complication and could take the therapy for at least three weeks. Need to continue the medication beyond three weeks was as per primary physician’s discretion. Most common symptoms difference by this cohort of patients were as follows – irritative voiding symptoms including frequency (50–60%), urgency (57–60%), dysuria (40%), incomplete emptying (76%), flank (19–32%) and suprapubic pain (30%), and hematuria (25%). Group one showed significantly better improvement in pain and over all health related questions in week two and three. There was no statistically significant difference in patient reported outcomes in either of the groups. For Week three group 2 patients showed improvement in voiding symptoms. No statistically significant difference in groups was seen in questions related to sexual matters and work performance.

**Conclusions:** Both Mirabegron Plus Tolterodine Versus Tamsulosin Plus Tolterodine are well tolerated drug therapy for stent related LUTS and other symptoms. Tamsulosin Plus Tolterodine has better effect on voiding symptoms in this patient groups. Both combination therapy are equally efficacious in treating sexual issues and work performance in patients with DJ stent in situ.

‘To leave no stone untumed’ – a ureteric stone protocol to improve patient outcomes and hospital system

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**Introduction and Objectives:** A current problem in Queensland across different regional departments of Urology has been the increase in the burden of disease and the aging population on the health care system. With increased number of referrals for early and urgent reviews, public hospital stakeholders have found difficulty in satisfying the increased demand and providing timely medical care.

A specific problem which has been identified at Gold Coast University Hospital (GCUH) was that patient coming through the emergency department (ED) with ureteric calculi who were managed conservatively were then waiting considerably longer than the recommended 6 weeks for follow up and treatment, or some lost to follow up. This was multifactorial, and secondary to – increased category 1 waitlists, patient’s poor health literacy and unaware of the need for follow up, patients coming to outpatients without a follow up scan (creating a further booking) and general poor urology knowledge. The attempt of the stones protocol to reduce wait times, improve patient ownership of health and improve the efficiency of the hospital system.

**Methods:** A preliminary Stones Protocol was created at Gold Coast University Hospital. Patients would be called by a
urology registrar 2 weeks after ED presentation, then liaised with the booking and radiology departments to create timely outpatient bookings with a scan booked by the urology team. The plan was implemented in September 2018.

Results: In this model to monitor effects of stones protocol, results were tabulated to monitor the trend of category 1 referrals at GCUH. In August there were 135 ‘unbooked’ category 1 patients, and in November there is 8. In August, approximately 70% of referrals were placed in the ‘long wait’ category, and that figure has decreased to 40% in November (graphs available).

Subjectively, patient questionnaires post operatively suggested that patients appreciated the increase in knowledge, and felt they had more empowered with their health decision making. The general feedback from the bookings team, radiology team, outpatients and emergency have been positive – as more structure meant less patients were likely to be missed.

Conclusions: Over a short period, the stones protocol at GCUH decreased wait times significantly and increased the likelihood of patients receiving more appropriately timed care. A short phone call made a huge difference to others. Further improvements can be made to continue to improve efficiency in large tertiary hospitals, and with increased demand, protocols implemented by medical officers such as this may be the answer.

Theme: Functional & Female Urology

The use of Botulinum Toxin A in the treatment of primary bladder neck obstruction

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Introduction and Objectives: Primary bladder neck obstruction (PBNO) is a rare non-neurogenic condition that manifests as BOO in the absence of BPH or Genitourinary prolapse. Treatment varies from pharmacotherapy to surgery. This case series reports on the efficacy of transurethral Botulinum Toxin A (BTXA) to treat PBNO.

Methods: Retrospective data was collected and analysed from May 2011 to 2017 over two centres. All patients diagnosed with PBNO who underwent transurethral injection of BTXA were examined. We reviewed clinical records of premorbid patients, preoperative video urodynamic studies (VUDS), pressure-flow urodynamic studies (UDS), cystoscopy and urethral sphincter electromyography (UEMG), operation notes, and post procedure responses.

Results: A total of 13 patients with the diagnosis of PBNO underwent cystoscopy and injection of BTXA during this period. The median age was 42 years old (range 28–77). Preoperatively, 41.6% (5/12) patients had chronic urinary retention requiring catheterisation, 4 of these performed intermittent self-catheterisation and one requiring suprapubic catheter. 69.2% (9/13) patients had tried oral pharmacotherapy prior to their procedure. 91.6% (11/12) patients had not had any prior urological procedures. 69.2% (9/13) were diagnosed with PBNO on VUDS, 23.0% (3/13) on UDS alone and 1 patient with UEMG.

All patients underwent initial injection of 100 units of BTXA to the bladder neck and/or detrusor muscle. 75% (9 of 12) had improvement in symptoms, 1 patient was lost to follow up. 6 of 9 patients responded with a 10-point Likert scale questionnaire for overall subjective improvement, the median score for improvement was 8.

8 patients had more than one cycle of BTXA treatment, 4 went on to have 3 cycles, 2 had 4 cycles, and 2 had 5 cycles. The median wait time between the 1st and 2nd cycle was 7 months (2–22 months), and between the 2nd and 3rd cycle was 9.2 months (6–21 months). 3 patients progressed to have definitive bilateral bladder neck incision.

Conclusions: BTXA appears effective in the treatment of PBNO in patients who are refractory or intolerant to oral pharmacotherapies. It may be a useful prognostic tool prior to definitive bladder neck incision or for those unfit for surgery, however further studies are required to investigate this.

Is treatment of asymptomatic bacteriuria before intravesical Botulinum Toxin A really necessary?

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Introduction and Objectives: Intravesical Botulinum Toxin A is used to treat detrusor overactivity (DO). The reported rate of post procedure urinary tract infection (UTI) is between 1.5–50%. Many patients receiving intravesical Botulinum Toxin A are catheter dependent and the rate of bacterial colonisation is high.

Routine pre procedure urine cultures are tested for most urological patients.

With antibiotic resistance on the rise the scope of this review is to assess the need for treatment of mixed or positive urine cultures in the absence of clinical symptoms to avoid post procedure infective complications.

Methods: We performed a retrospective analysis of patient data from electronic records in two different health care facilities in Melbourne. Hospital protocols and surgeon preferences were noted with regards to pre procedure treatment and prophylaxis. The number of post procedure UTIs was obtained from post operative telephone consults.

Results: In 2017 38 patients underwent treatment with intravesical Botulinum Toxin A. 29 were female and 9 male with a median age of 52.5 (19–83) years. 20 patients have neurological disorders (NDO), the remaining 18 suffer from IDO. With the exception of one all neuropsychiatric patients received 200 U of Botox, the others 100 U administered in 20 ml of normal saline injected to 20 detrusor sites.

All patients submitted pre-operative urine for culture. 11 (28%) were negative, of the remaining 27 samples 18 (67%) were mixed growths and the remaining 9 grew a specific catheter-associated organism. All positive MSU results at EH despite absence of clinical symptoms were treated with a one-week course of antibiotics. One procedure was cancelled for symptomatic UTI. At RMH asymptomatic bacteriuria (60%) was not treated.
Table 1: Pre procedure urine culture results

| n | n | % |
|---|---|---|
| IDO | 18 | 48% |
| NDO | 20 | 52% |
| Negative MSU | 11 | 28% |
| Mixed MSU | 18 | 48% |
| Positive MSU | 8 | 21% |
| Positive MSU (asymptomatic) | 1 | 3% |

All patients received prophylactic Cefazolin or Ciprofloxacin as per hospital protocol.

Post procedure two patients were symptomatic of UTI. One of these patients had received a pre-operative course of antibiotics.

Conclusions: In this small study two patients (5%) developed post procedure UTI. Neither was confirmed by repeat MSU prior to commencing treatment. There was no difference between the pre-treated and untreated group. To limit antibiotic use and avoid resistance we feel it is safe not to treat asymptomatic bacteriuria prior to injecting Botulinum Toxin A. Further data are necessary to confirm our findings and a prospective study is being carried out this year.

Postprostatectomy incontinence and its relation to physical activity and fatigue

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Introduction and Objectives: Post-radical prostatectomy urinary incontinence is common and distressing. While many variables affect its degree, the roles of increased physical activity and pelvic floor muscle fatigue have not been clearly defined in the literature. Pad numbers and weights alone may be unreliable estimates of incontinence especially in more sedentary or active patients.

We sought to determine whether a correlation exists between the degree of urinary incontinence and:

1. The amount of physical activity, and/or
2. Progressive pelvic floor muscle fatigue.

Methods: This prospective cohort study was ethics approved. Patients with post-prostatectomy incontinence greater than 12 months were recruited.

A Fitbit Flex 2 (Fitbit, Inc., USA) was worn continuously for 7 days to measure the number of steps taken as a surrogate for physical activity. Pads were collected and weighed in three 4-hourly blocks during the day (0900–2000) and one block overnight (2200–0800). Subsequent blocks during the day were used to represent progressive pelvic floor muscle fatigue.

Results: 8 participants were recruited with data analysed from 5 (2 currently undergoing collection, 1 excluded due to data failure).

Statistically significant correlations (see Table) were found between physical activity (number of steps) and incontinence (pad weights) in 3 out of 5 participants (patients 1 to 3) who had the largest degree of incontinence. The correlation was stronger with worsening incontinence. There was no correlation in patients with less incontinence (<20 ml/4-h) (patients 4 and 5).

No correlation between fatigue (time period) and incontinence (ml) was found, even when corrected for amount of physical activity.

Conclusions: This is the first study to use wearable technology to correlate activity with incontinence. It demonstrates a significant correlation, especially as the degree of incontinence worsens.

Clinicians can use this readily available data to standardise pad weights. Pad weights that take physical activity into account could better differentiate patients suited for specific incontinence procedures (such as slings vs sphincters). They will also allow surgical treatments to be compared more accurately.

Surprisingly, despite often being reported by patients, pad weights did not increase as the day progressed. This may indicate that pelvic floor fatigue plays less of a role than previously assumed.

Preoperative functional ultrasound imaging of the pelvic floor: correlation with early continence outcomes post radical prostatectomy

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Introduction and Objectives: Multiple studies have demonstrated that a shorter membranous urethral length (MUL) is
associated with a higher risk of incontinence post radical prostatectomy (RP). Our previous functional imaging studies have demonstrated that transperineal ultrasound (TPUS) can be utilised to assess the male pelvic floor and urethra at rest and during physical activity. The aims of this study are to investigate changes in MUL at rest and during pelvic floor contraction (PFC) using TPUS and correlate with early continence 3 months post RP.

Methods: TPUS was performed in 105 men [mean age 64.2 years (range 45.7–78)] as part of functional assessment prior to RP. 2D/3D ultrasound examinations were conducted using a Phillips EPIQ-7 ultrasound machine with C9-2 and X6-1 transducers to measure MUL at rest and during a PFC. Early continence outcome at 3 months post RP was assessed in 80 patients using the Expanded Prostate cancer Index Composite (EPIC) – urinary domain questionnaire and correlated with pelvic floor imaging findings.

Results: The membranous urethra was easily visualized on TPUS and MUL at rest was measurable in all patients with a mean length of 16.1 mm (range 8.7–23.1 mm). During a pelvic floor contraction, MUL was observed to increase in 99% of the patients to a mean length of 19.2 mm (range 11–28.3 mm) (p < 0.05). The mean increase in MUL was 3.3 mm (range 3.0 to 9.9 mm). The mean percentage increase in MUL from baseline was 21.4%.

In patients with poor early continence (>2pads/day), there was a trend towards a smaller increase in MUL during a PFC both in absolute numbers as in percentage change from baseline (p = 0.057 and p = 0.064). The mean change in MUL was 2.8 mm or 18% from baseline in patients using >2pads/day as opposed to a mean change in MUL of 3.6 mm or 25% from baseline in patients using <2pads/day.

Conclusions: TPUS is a reliable method to measure MUL both at rest and during pelvic floor contractions. Using this method we showed that MUL significantly increases during a PFC. Patients with a smaller increase in MUL during PFC appear to have worse early continence outcomes post RP.

TPUS may have a role in preoperative functional assessment of men undergoing RP.

Theme: LUTS/BPH

Assessment of remote results of prostatic artery embolisation in patients with BPH with grave comorbidities and contraindications to endoscopic treatment

Abstract withdrawn

Life without catheter – optimising clinical decision making for trial of void patients

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Introduction and Objectives: Acute urinary retention is a common referral to the urological service. It is a distressing problem that represents a significant public health issue. The majority of cases occur in males and are linked to benign prostate hyperplasia (BPH). Previous large longitudinal studies on BPH have identified old age, severe lower urinary tract symptoms (LUTS), high postvoid residual (PVR), elevated serum PSA and enlarged prostate as risk factors for spontaneous AUR and the need for surgery. Our study aims to define and determine predictors for failure, so futile TOV attempts can be avoided, and patients can be expedited towards early definitive care.

Methods: Patients who underwent a trial of void (TOV) at Western Health between April 2017 and September 2017 were included in this retrospective study. Clinico-pathological data were extracted from medical records and included patient demographics, comorbidities, referral source, presentation history, volume of retention, history of medical therapy for benign prostate enlargement, history of previous transurethral resection of prostate gland and history of recent surgery. Univariate analysis was performed to determine factors that are predictive of failing TOV. Statistical analysis was performed using SPSS.

Results: During the 6 months study period, there were 210 episodes of TOV involving 169 patients. The median age was 71 (IQR 63–80). There was a male preponderance of 94% vs 6% female. 59% of TOV was following recent surgery, of which 87% of these are urological operations. After excluding patients who were catheterized following recent urological surgery, 82 patients remained. The median age of this subgroup was 75.5 (IQR 67–82), with 90% male and 10% female patients. The median volume of retention was 888 ml (IQR 608–1000). 15.9% of these patients had retention related to recent non-urological surgery. The pass rate of TOV for this subgroup was 57.3%. On univariate analysis, we found the following to be risk factors for failing TOV: 1) painless retention (p = 0.041, Fisher’s exact test), 2) retention volumes greater than 700 ml (p = 0.043, Chi-Square Test), 3) history of urethral stricture disease (p = 0.038, Fisher’s exact test). The following variables were not independent predictors of failing TOV in our cohort: α blocker use in men, prostate size, history of neurological disease, history of diabetes mellitus, history of opioid use, history of urinary tract infection in the preceding 2 weeks.

Conclusions: The rate of successful TOV at our local hospital of 57% is largely comparable with international literature. We identified 3 main predictors of failure in our cohort: painless retention, retention volume greater than 700 ml and history of urethral stricture disease. Our results have helped us better define TOV success vs failure. Furthermore, when used alongside other treatment recommendations from previously published literature, our study has assisted us in formulating a robust TOV guideline from the point of triage to definitive care. We hope our follow up

Table 1. Results of prostate artery embolisation

|                      | Mean before | Mean after | % of changes |
|----------------------|-------------|------------|--------------|
| V of prostate (cm³)  | 114.9 ± 6.6 | 85.76 ± 4.8| 25.36        |
| Qmax (ml/s)          | 6.4 ± 0.7   | 10.18 ± 0.8| 59.06        |
| IPSS (score)         | 29.42 ± 0.6 | 14.14 ± 1.4| 51.94        |
| QOL (score)          | 5.86 ± 0.1  | 2.57 ± 0.3 | 56.14        |
Preoperative functional assessment of men undergoing radical prostatectomy: correlation of LUTS and Urodynamic findings

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Introduction and Objectives: Urinary incontinence is a major concern for patients undergoing radical prostatectomy (RP). However, urodynamic studies in patients post RP have demonstrated a range of bladder dysfunctions including detrusor overactivity (DO), impaired bladder filling sensation, low bladder compliance and impaired detrusor contractility. It has been suggested that these changes are the result of bladder denervation during surgery but they may also be related to pre-existing lower urinary tract pathology such as outlet obstruction or ageing. The aim of this study was to assess lower urinary tract symptoms (LUTS) and correlate with pre-operative urodynamic studies in a cohort of men undergoing RP.

Methods: 72 patients underwent multi-channel video-urodynamics with functional pelvic floor ultrasound studies prior to RP. Lower urinary tract symptoms were assessed by IPSS and the voiding-to-storage sub score ratio (IPSS-V/S) and correlated with urodynamic findings.

Results: This pilot study involved 72 men, with a mean age of 63.7 years (range 44.5–77.8). An urodynamic abnormality was noted in 46% of patients. 31% of patients had filling phase abnormalities (DO was detected in 19%, reduced compliance in 18% and 7% had both DO and reduced compliance on urodynamics). Bladder outlet obstruction was found in 18% and a hypocontractile detrusor in 7% of patients.

44% of the patients had moderate to severe LUTS (total IPSS score > 7). Of the patients who presented with LUTS 31% had predominantly voiding symptoms (IPSS-V/S > 1), while 40% had predominantly storage symptoms (IPSS-V/S < 1). Patients with filling abnormalities on urodynamics had a significantly higher IPSS-storage score (p = 0.01) and a significantly lower maximum bladder capacity (p = 0.02). They were generally older (p = 0.06) and more bothered by LUTS (p = 0.07). There was no correlation between the IPSS-V/S score and filling phase abnormalities on urodynamics.

Conclusions: Preexisting OAB is common in patients with prostate cancer presenting for radical prostatectomy, with filling phase abnormalities being detected in almost half of the patients. Identification of significant voiding dysfunction preoperatively may allow better counselling and management of urinary function recovery post radical prostatectomy.

Impact on sexual function of thulium laser resection of the prostate-tangerine technique versus plasmakinetic bipolar resection of the prostate: results of a prospective randomized trial

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Introduction and Objectives: 2 micron (Thulium) laser resection of the prostate-tangerine technique (TmLRP-TT) is a transurethral procedure that uses the 2 micron (Thulium) laser fiber to dissect whole prostatic lobes off of the surgical capsule like to peel a tangerine. The aim of this study was to compare the impact on sexual function of TmLRP and PKRP (plasmakinetic bipolar resection of the prostate) in treating BPH.

Methods: From November 2014 to December 2015, 100 patients with BPH and whose sex life existed were randomized to surgical treatment with TmLRP-TT (52 in group 1) or PKRP (48 in group 2). Patients were preoperatively assessed by scoring subjective symptoms questionnaires. The erectile function of the patient was evaluated according to the International Index of Erectile Function Instrument (IIEF-5) questionnaire. It was determined that ED existed where there was a total score of no more than 21. The ejaculatory function was assessed by the Four-Item Version of Male Sexual Health Questionnaire-Ejaculatory Disease (MSHQ-EjD Short Form). Postoperatively, the IIEF-5 questionnaires assessment and the MSHQ-EjD Short Form were repeated at 12-month follow-up. Besides, International Prostate Symptom Scores (IPSS), quality-of-life scores (QoSs), peak urinary flow rates (Qmax) and post-void residual urine volumes (PVR) were evaluated preoperatively and 12 months after operation.

Results: Both TmLRP-TT and PKRP resulted in a significant improvement in IPSS, QoSs, Qmax and PVR. A total of 27 patients (51.9%) in group 1 and 24 (50%) in group 2 reported various degrees of erectile dysfunction before surgery according to

| IIEF-5 score | Number of patients at baseline (%) | Number of patients at 12 months (%) |
|-------------|-----------------------------------|----------------------------------|
| 5–7 (severe ED) | TmLRP-TT 5 (9.6%) | 0 |
| | PKRP 1 (2.1%) | 1 (2.1%) |
| 8–11 (moderate ED) | TmLRP-TT 4 (7.7%) | 8 (15.4%) |
| | PKRP 5 (10.4%) | 3 (6.3%) |
| 12–16 (mild to moderate ED) | TmLRP-TT 4 (7.7%) | 3 (5.8%) |
| | PKRP 3 (6.3%) | 6 (12.5%) |
| 17–21 (mild ED) | TmLRP-TT 14 (26.9%) | 8 (15.4%) |
| | PKRP 15 (31.3%) | 6 (12.5%) |
| 22–25 (normal) | TmLRP-TT 25 (48.1%) | 33 (63.5%) |
| | PKRP 24 (50%) | 32 (66.7%) |
| Total | 100 | 100 |
the IIEF score. All the 100 patients returned the IIEF questionnaire. 12 months after surgery, the rates of patients reporting ED decreased to 37% in group 1 and 31% in group 2. Erectile functions of 2 patients (3.8%) in group 1 and 7 patients (14.6%) in group 2 were slightly lower according to IIEF scores, but they were also maintained in the 1 year follow-up period. Of note, we observed that some patients’ morning erection improvement. The reason may be that the reductions of nocturia frequency improve the quality of sleep. The ejaculatory volumes were evidently reduced. Of sexually active patients retrograde ejaculation post-operatively was reported 18 of 33(55%) in the TmLRP-TT group and 20 of 31(65%) in the TURP group, that were significantly higher than the percentage at baseline assessment but did not differ significantly within the groups.

Conclusions: Postoperatively both TmLRP-TT and PKRP usually cause more retrograde ejaculation and less ejaculatory volumes, and may improve the occurrence of morning erection in some patients. Comparing to PKRP, the incidence of slight erection function decrease is lower in the TmLRP-TT.

### Theme: Other

#### A systematic review of spontaneous renal haemorrhage in pregnancy

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**Introduction and Objectives:** To conduct a contemporary systematic literature review on Wunderlich syndrome, or spontaneous renal haemorrhage (SRH), among pregnant women to describe contemporary aetiology, investigations, and management patterns.

**Methods:** A systematic review of MEDLINE and CENTRAL in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was performed. All articles, including case reports and case series on SRH published from 2000 to 2016 were included. Full text manuscripts describing SRH among pregnant women were reviewed for clinical parameters which were collated and analyzed.

**Results:** 20 cases of SRH in pregnant women were identified. The median age and gestation were 32.1 years old and 26.5 weeks respectively, with SRH most commonly occurring in the third trimester (9 patients; 45%) and due to renal neoplasm, specifically angiomylipoma (AML; 12 patients; 60%), followed by renal artery aneurysm (RAA; 5 patients; 25%). Surgical intervention (55%) was most commonly used for acute SRH. Fetal demise was not uncommon (15%).

**Conclusions:** SRH in pregnant women is an uncommon but complex urological and obstetric emergency with potentially catastrophic consequences. A multi-disciplinary approach is key to timely diagnosis and appropriate management considering well-being of both mother and child. Pre-emptive diagnosis and intervention may reduce complications.

#### A contemporary review of the changing aetiology and management patterns for spontaneous renal haemorrhage

**Introduction and Objectives:** To conduct a contemporary systematic literature review on Wunderlich syndrome identifying causes and treatment patterns.

**Methods:** A systematic search of CENTRAL and MEDLINE databases was conducted to include literature, including case reports and series on Wunderlich syndrome published between 2000 to 2016. Clinical parameters were reviewed in full text manuscripts and collected with subsequent analysis using univariate methods.

**Results:** There was a total of 102 cases from 79 publications meeting inclusion criteria. Renal neoplasms (56.9%) was the most common broad aetiology of SRH of which angiomylipoma (AML) is most prevalent (74.1%). This is followed by vascular causes of which polycystic nodosa (PAN) (11.8%) was most common.

Proportions of SRH due to malignant neoplasms (specifically renal cell carcinoma, RCC, 6.9%) were reported less than PAN. Patients with AML were more likely to be female and present with macroscopic haematuria than those with vasculitis, while malignant neoplasms were more common in men. Transarterial embolization (TAE) was most commonly used for acute SRH (42.2%) among this contemporary series.

**Conclusions:** Renal neoplasms remain the most common aetiology of SRH, primarily due to AML. This is followed by PAN which has replaced RCC as the second most common cause in acute SRH. Minimally invasive management, such as TAE and conservative/medical treatment, is now preferred to initial surgery.

#### Digital rectal examination in medical student education: can we do it better? A randomised study of simulated model versus teaching with a volunteer

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**Introduction and Objectives:** Digital rectal examination (DRE) is an important skill required of all graduating doctors. It identifies pathological of the prostate as well as colorectal and gynaecological conditions. It is poorly taught in medical schools and the number of DREs performed by medical students by the end of training has fallen to 3–5 in the UK and 2 in Australia.

At the University of Sydney traditional DRE teaching has been composed of lectures and simulation on models. We hypothesised that teaching students DRE on human volunteers would increase their confidence in performing a DRE in the future.

**Methods:** Second year medical students underwent computer generated randomisation into one of two groups. Control: Standard teaching and intervention: Standard teaching plus further tuition with a volunteer. Standard teaching involved a 30-min lecture outlining anatomy, palpable organs, indications, variations in pathology and performing a DRE on a simulation model. The intervention group were then divided into groups of approximately 5 students. They observed a tutor demonstrating a
DRE on a volunteer and each student performed a DRE under supervision. Before and after teaching, both groups completed two 3 question surveys (Table 1). The primary end-point was confidence in performing a DRE, which was the sum of the scores from these 3 questions. This study was approved by the University of Sydney Human Research Ethics Committee (2018/525).

Results: In total 48 students were randomised, 22 to control and 26 to intervention. The groups were well matched prior to teaching DRE. After the DRE teaching, students in the intervention group were more confident in the indications for DRE (p = 0.001), more confident in their technique for performing DRE (p < 0.001) and more confident in their ability to accurately assess findings at DRE (p < 0.001) (Table 1). The primary outcome measure which was overall confidence for performing DRE was significantly better in the intervention group (10 vs 14, p < 0.001).

Conclusions: This study has shown that the use of volunteers for teaching significantly improves student confidence in performing DRE. Whether that translates into an improved ability to detect pathology in the future is beyond the scope of this study. We would recommend medical student DRE teaching which includes volunteers.

Potential adverse events in urology deaths. A review of the Australia and New Zealand Audit of Surgical Mortality data
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Introduction and Objectives: The Australia and New Zealand Audit of Surgical Mortality (ANZASM) reviews all deaths either following an operation or under the care of a surgeon. The operating surgeon completes a surgical case form (SCF) once the death has been reported and an independent first line assessor (FLA) from the same specialty reviews this to assess any potential adverse events, areas of concern or areas of consideration (ACON). If more information is required a second line assessment (SLA) is conducted using the hospital notes. We have assessed the ANZASM data to see how urology compares with the national data set.

Methods: The ANZASM Bi-National Audit System (BAS) database was interrogated for all deaths under the care of a urologist. The highest level of assessment was recorded and any ACON documented. It was also recorded whether the assessor felt that the ACON was responsible for the patient’s death and was preventable. The results were compared with the national dataset to assess whether urology was an outlier.

Results: 1026 completely assessed urology deaths were recorded in BAS between 2009 and 2017. 144 (14.04%) deaths were referred for a SLA. Using the highest assessment available 751 (73.2%) deaths were found to have no issues. Table 1 details the ACON. As an area of consideration is a debatable point, causation and preventability have not been included.

Conclusions: The vast majority of deaths occurring under the care of urological surgeons in Australia and New Zealand are unavoidable and do not raise any concerns when independently reviewed. Compared to the national data, urology is not an outlier. Just over 10% of deaths are associated with adverse events or areas of concern that may have contributed to the patient’s death and are potentially preventable. These cases need to be reviewed in greater detail to assess for lessons to help prevent future deaths.

Surgeons reflections on urology deaths: an opportunity wasted?
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Introduction and Objectives: The Australia and New Zealand Audit of Surgical Mortality data set.
Mortality (ANZASM) reviews of all deaths either following an operation or under the care of a surgeon. It has gradually been introduced to all states and territories since 2010 and has been a mandated part of a surgeon’s continuing professional development since 2012. A unique aspect of the review is the completing surgeon’s ability to reflect on the surgical death and to state with hindsight whether anything should have been done differently. We have reviewed these reflections for the ANZASM urology deaths.

Methods: The ANZASM Bi-National Audit System (BAS) database was interrogated for all deaths under the care of a urologist. The highest level of independent assessment was reviewed to establish whether there were any adverse events, areas of concern or areas of consideration with the cases (ACON). The surgeon completed surgical case form (SCF) was then reviewed to assess concordance with the assessment and whether the surgeon would have done anything differently.

Results: 1026 completely assessed urology deaths were recorded in BAS between 2009 and 2017. Of these 275 (26.8%) were assessed to have at least one ACON. In 137 (49.8%) cases the SCF agreed that there was an AOC. Concordance with the assessment and SCF for the most serious level (adverse event) was 17 of 45 (37.8%). On reflection surgeons would have changed management in 91 (33.1%) of the AOC cases. The concordance for all AOC was 46 of 89 (51.7%) cases between 2009/11, 37 of 90 (41.1%) cases between 2012/14 and 54 of 96 (56.3%) cases between 2015/17.

Conclusions: The ANZASM review process is an educational tool so that surgeons can learn from patient deaths and modify practice. A surgical death is potentially devastating for both surgical staff and patient families. The vast majority of urology deaths are unavoidable and do not raise any concerns, but we have reviewed those cases were independent concerns have been discovered. Less than half of the ACON discovered by the review process were reported by the operating urologist and in only one third would the urologist have done something different. The slight drop in concordance in the middle reporting period could be explained by the audit becoming mandatory and surgeons not completing the forms appropriately. These results suggest that many urologists do not reflect on patient deaths and may repeat mistakes. Similar reviews will be undertaken with other specialties.

Introduction and Objectives: The Australian and New Zealand Audit of Surgical Mortality (ANZASM) reviews all deaths either following an operation or under the care of a surgeon. The operating surgeon completes a surgical case form (SCF) once the death is reported and this is reviewed by independent assessors, with a case note review utilized when additional information is required. We have analyzed the ANZASM data to provide the largest ever review of urological deaths.

Methods: The ANZASM Bi-National Audit System (BAS) database was interrogated for all deaths under the care of a urologist. Information on patient age, sex, hospital admission site, admission type, hospital type, operation, operative time, hospital mortality, non-operative mortality, cause of death and other factors were recorded in the ANZASM database. The most common primary operations are detailed in Table 2.

Conclusions: Urology deaths appear to have the same proportion of operations as the general data set but are more commonly associated with elective surgery and private hospital admission than the overall ANZASM data. The most common emergency procedures were associated with sepsis and bleeding. We will be further investigating the reasons associated with the elective surgical deaths.

Table 1. Demographics (%) of urology deaths

| Operation                             | Admission type | Hospital type |
|--------------------------------------|----------------|---------------|
|                                       | Yes            | No            | Elective | Emergency | Unspecified | Public   | Private | Unspecified |
|--------------------------------------|----------------|---------------|----------|-----------|-------------|----------|---------|-------------|
|                                    | 826 (79.9)     | 208 (20.1)    | 349 (33.8)| 673 (65)  | 12 (1.2)    | 663 (64.1)| 361 (34.9)| 12 (1.2)    |

Table 2. Most common urology operations recorded in ANZASM database

| Operation | Total |
|-----------|-------|
| Ureteric stent insertion/change | 276 |
| ± ureteroscopy or pyeloscopy | 72 |
| Transurethral resection of bladder tumour | 60 |
| Transurethral resection of prostate | 56 |
| Bladder washout/control | 46 |
| of haemostasis | |
| Cystectomy/cystoprostatectomy | |
| Insertion suprapubic catheter | 31 |

Angioplasty on renal angiomyolipomas – clinical outcomes and follow up in a single centre and in the literature

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Introduction and Objectives: Renal angiomyolipomas (AML) are benign tumours of the kidney that are often asymptomatic. Occasionally they can present with loin symptoms, haematuria and
rarely catastrophic retroperitoneal bleeding. Selective renal artery embolization is commonly offered as a treatment for symptomatic lesions or tumours greater than 4 cm. We aimed to review all patients treated with selective angioembolisation as well as post embolization follow up and imaging. We also present a literature review on the follow up of treated lesions to determine the optimal timing of post-procedure imaging and what defines treatment failure.

Methods: We performed a retrospective review of case notes and imaging of all patients treated with selective renal artery embolisation at our hospital between 2014 and 2018. We then reviewed the literature looking specifically for articles which discussed or reviewed AML follow up after embolisation.

Results: Twelve angioembolisation procedures were carried out on 10 patients (M: F7) during the study period. Mean AML size was 5.5 cm (range 3.9–10.4 cm). All procedures were performed using lipiodol/ alcohol mixture ± embolisation coils. 2 patients required repeat embolisation procedures after follow-up imaging suggested unsuccessful primary procedures. One patient had tuberous sclerosis complex while 9 patients had sporadic AML. A single post embolization complication was documented with a male patient presenting with post embolization syndrome that was managed symptomatically. All had follow up imaging between 3–24 months post embolization with either CT or ultrasound. Varying differences in AML size reduction or stability were observed. The presence of heavily calcified lesions post embolization was identified in 2 patients. The main factor driving re-embolisation was persistence of highly vascular lesions combined with adverse social and geographical factors.

Conclusions: Following selective arterial embolization, the degree of AML reduction may depend on fat content, vascularity and solid component of the tumour as well as the presence of feeding vessels. The literature definition of embolization failure is highly heterogeneous from failure to demonstrate reduction in size to growth less than 2 cm. There is no defined time period for follow up imaging. We propose that imaging should take place after 6 months to accurately assess success of treatment. Re-embolisation or salvage procedures need take into consideration patient factors, symptoms and risk of bleeding.

Scrotal exploration in blunt scrotal trauma, a case-controlled study of patients presenting to a single Australian institution

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Introduction and Objectives: Injuries associated with blunt scrotal trauma are broad and can the required treatment can range from conservative management, to orchidectomy. In cases of testicular rupture, operative repair within 72 h has previously been shown to reduce incidence of primary or interval orchidectomy. Ultrasound is useful for differentiating between cases of blunt scrotal trauma that require urgent surgical exploration and those that can be managed conservatively. We clarified the time frame to surgery and its results for patients with scrotal trauma, suspected having testicular rupture on ultrasound imaging.

Methods: We conducted a retrospective case-controlled study of all patients who underwent scrotal exploration for suspected testicular rupture at Gold Coast University Hospital, Queensland between 1 January 2014 and 31 October 2018. Data extracted included age, mechanism of injury, coexisting injuries, time to presentation, diagnosis with ultrasound, ultrasound characteristics associated suggesting testicular rupture, operative findings, incidence of post operative clinical and ultrasound follow up.

Results: Fifteen patients underwent scrotal exploration during the study period. All had preoperative ultrasound imaging with features of testicular rupture. At operation testicular rupture was found in fourteen cases (93%), while rupture of the epididymis was found in one (7%). Blunt scrotal injuries requiring operation most commonly occurred (n = 7, 46%) whilst participating in sports activities, while motor bike accidents were the single most common mechanism (n = 4, 27%). Two cases of testicular rupture were treated with simple orchidectomy (14%).

Conclusions: Patients undergoing scrotal operation with intention to repair at our institution had good postoperative results, with only two patients undergoing simple orchidectomy for nonviable testis. All except one patient underwent surgery within 72 h of suffering injury, a successful target given its association with increased need for orchidectomy. That this patient suffered significant distracting injuries and required intensive care admission highlights the need for complete tertiary survey to exclude occult testicular injury. While ultrasound was useful in indicating a need for scrotal exploration, it was part of a delay to formal diagnosis. Although no patients in this series suffered more time critical conditions such as coexisting testicular torsion, this possibility should be weighed against the likelihood of benign injuries on a clinical case by case, and surgery should not be delayed if need for exploration & possible repair is suggested clinically.

Burnout amongst urologists in Australia & New Zealand

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Introduction and Objectives: Physician burnout has become a topical issue in the medical field as it has been associated with decreased job satisfaction and performance that can lead to interpersonal issues and adversely impact patient care. Data from the United States have shown that burnout is a significant concern amongst urologists but there has so far been no local data examining this issue. We therefore aimed to characterise the prevalence of burnout amongst urologists in Australia and New Zealand and identify characteristics that may increase the likelihood of experiencing burnout.

Methods: We created an online, self-administered survey that was distributed to consultant-level members of USANZ. We collected information on members’ demographics, lifestyle and work. We assessed burnout using validated two-single item measures that were adapted from the Maslach Burnout Index. Burnout was defined by the presence of emotional exhaustion and/or depersonalization. We conducted a stepwise logistic regression analysis to identify predictors of burnout.

Results: There were 66 complete responses from consultant-level USANZ members of which 20 (30.3%) reported experiencing emotional exhaustion and/or depersonalization and were considered to
exhibit burnout. On multivariable analysis, we could not identify any predictors of burnout. However, on bivariate analysis, taking three or more weeks of vacation was associated with a lower burnout incidence than urologists that only had two or fewer weeks of holiday (23.6% vs 63.6%, p = 0.022). Furthermore, being from a regional area (compared to metropolitan, 18.2% vs 36.4%, p = 0.21), being involved with research (compared to no research, 23.1% vs 40.7%, p = 0.20) are potential protective factors against burnout but these factors did not reach statistical significance possibly because of our limited sample size.

Conclusions: Nearly one in three urologists in Australia and New Zealand report signs of burnout. Despite a detailed survey, we were unable to identify factors contributing to burnout which highlights the complexity of the issue and the need for further research to pinpoint these so that they can be addressed.

Men’s health on the web: an analysis of current resources

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Introduction and Objectives: Men’s health research covers a broad range of topics. Men and women face different barriers to health, with men almost universally having a lower life expectancy than women. Access to high quality information on men’s health topics is potentially an important part of engaging men with medical services. We aim to assess the quality of men’s health resources available on the internet across 4 developed countries using a using a tier-based rating system as well as the World Health Organisation Health on the Net (HON) standards.

Methods: The Google search engine imbedded with the Health on the Net toolbar was used to assess 357 websites across Australia, Canada, America and United Kingdom using the search term ‘men’s health’. The websites were further subdivided into 3 tiers by 2 independent investigators, with tier 1 websites defined as government or health organisation sponsored, tier 2 websites defined as being sponsored by health services such as private clinics and insurance providers, and tier 3 websites being websites that did not meet criteria for the first 2 tiers.

Results: Overall, 28% of websites were rated as tier 1, 26% as tier 2 and 46% as tier 3. The HONcode accreditation was overall 39% of tier 1 websites. The majority of websites reviewed were in the tier 3 category, and 35% of overall websites being non-health or non-medically related.

Conclusions: The lack of ‘relevant’ and HONcode accredited websites relating to men’s health should be appreciated by health care professionals.

Theme: Paediatrics/Reconstruction

The bespoke ileal conduit – keeping up with the obesity epidemic

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Introduction and Objectives: The ileal conduit remains to be the standard method for urinary diversion, having proven its reliability and cost-effectiveness over many years. It is often the surgery of choice over continent urinary diversion methods for patients with comorbidities such as advanced age and obesity. Increased BMI is an independent risk factor for stoma related complications including hernia, necrosis, retraction and stenosis. The thick, shortened mesentery present in the obese patient has been described as a contributory factor. In addition to excessive intra-peritoneal fat, abdominal wall adiposity provides an additional challenge in stoma formation in this patient demographic. We aimed to examine the change over time in descriptive techniques for ileal conduit formation in correlation with rising obesity rates amongst patients undergoing urinary diversion surgery.

Methods: A review of literature dating back to the first described ileal conduit was performed using PubMed, MEDLINE and Cochrane library, as well as extensive review of historical and current surgical textbooks. Descriptive surgical techniques for the formation of an ileal conduit was obtained over a period of seven decades. Described optimal length of ileal segment was included as a key data point. Global data on prevalence of obesity from 1975 to 2016 was obtained from the WHO Global Health Observatory data.

Results: When first described by Bricker in the 1950s, recommended length of ileum for formation of an ileal conduit was 15 cm. Throughout the seven decades since establishment of this procedure, minimal variation to this initial recommendation has been described, despite significant increase in population BMI over that time. Most contemporary surgical texts continue to describe a recommended length ranging from 10–20 cm. Obesity rates between 1975 and 2016 have risen from 3% in men and 6% in women to a dramatic 20% and 23% in respectively. Despite the resultant increased abdominal adiposity there has not been a change in described surgical technique for ileal conduit procedures.

Conclusions: Careful consideration is required when it comes to ileal conduit surgery in the obese population. Application of intra-abdominal measurement techniques from other procedures such as PCNL may assist in identifying the optimal length of ileum to be harvested for conduit creation for each individual patient. Pre-operative imaging, such as routine measurement of abdominal wall thickness, may be used as an adjuvant tool when planning ileal conduit length intra-operatively.

Role of neobladder formation in management of benign refractory bladder conditions: a review of literature

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Introduction and Objectives: Various severe and refractory non-malignant conditions can affect bladder function such that urinary diversion is necessary following failure of conservative measures. We provide a review of current literature and indications for continent urinary diversion in the setting of non-urothelial malignancy
either in form of orthotopic neobladder or continent catheterizable stoma. 

Methods: A review of MEDLINE was conducted to find prospective and retrospective studies using keywords ‘neobladder’, ‘cystectomy’, ‘urinary diversion’, ‘benign’, and ‘non-malignant’.

Results: Data from final review suggests that common benign indications for continent urinary diversion includes: interstitial cystitis/painful bladder syndrome (IC/PBS), radiation/hemorrhagic cystitis, neurogenic bladder, congenital abnormalities such as bladder extrophy. Some rare miscellaneous cases have also been reported.

Conclusions: Given non-malignant bladder conditions are relatively more common in younger population, continent urinary diversion is gaining popularity as the last approach to their management. Careful patient selection and pre-operative educations plays an important role in the overall success of this strategy. Even though performing cystectomy and continent urinary diversion seems like a big undertaking, it can improve quality of life in these patients in the long-term.

Theme: Uro-Oncology/Robotics

Changing trends in surgical management of renal tumours: an Australian retrospective study in the private sector

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Introduction & Objectives: Surgery is considered the standard treatment for localised renal tumours. While radical nephrectomy (RN) has historically been the most commonly utilised approach, international urological guidelines recommend nephron sparing surgery (NSS), such as partial nephrectomy (PN) when able, due to equivalent oncological outcomes and reduced nephron loss and risk of chronic kidney disease (CKD). The NSS landscape across Australia has yet to be described, particularly with increased uptake of robotic-assisted laparoscopic surgery. The aim of this study was to describe contemporary surgical management patterns of renal malignancy in Australia.

Methods: Yearly national claims data according to the Medicare Benefits Schedule on surgical management of renal malignancy in adult Australians between January 2000 to December 2016 was collected. Specific analyses of age and gender according to Australian Bureau of Statistics (ABS) estimates of population were performed.

Results: Between 2000 and 2016, a steady increase in PN was observed (0.87 to 4.16 per 100 000 adult population), while RN remained stable (6.52 to 6.70 per 100 000 adult population). The yearly growth in PN was greater among men (12.9%) compared to women (6.8%). While in all analysed age groups, 25–44, 45–74 and 75–plus, more RN are performed than PN, the PN:RN ratio is increasing. In 2015 and 2016, for the first time, men aged 25–44 received more PN (n = 94) than RN (n = 82).

Conclusions: An increased utilisation of PN is observed across Australia. A preference for PN was most marked among younger male patients. Contributing factors include improved and increased use of cross-sectional imaging, active surveillance of small renal masses and benign lesions as well as use of robotic-assisted and laparoscopic techniques to minimise morbidity. Prospective studies and registry-level data may further define causative relationships and accurately outline patterns of care for renal malignancy in Australia.

Expression of UTX and JMJD3 demethylases in clear cell renal cell carcinoma (ccRCC)

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Introduction & Objectives: Renal cell carcinoma (RCC) is the most widespread and lethal among renal neoplasms, with the predominant subtype being clear cell RCC (ccRCC). Histone H3 lysine 27 (H3K27) demethylases, ubiquitously-transcribed tetratricopeptide repeat, X chromosome (UTX) and jumonji domain-containing protein 3 (JMJD3) are important regulatory factors that modulate gene expression. Abnormal addition of methyl groups (mono-, di-, and tri-) to H3K27 has been implicated in carcinogenesis. The objective of this investigation was to analyse expression patterns of H3K27 demethylases in formalin – fixed paraffin–embedded (FFPE) tissues.

Methods: Thirty-five FFPE samples of ccRCC with paired adjacent normal kidney were selected by a histopathologist after institutional ethical clearance (MCEID NO: 201818-9399). The UTX and JMJD3 protein contents were measured by immunohistochemical analyses which compare tumor tissue with its adjacent normal tissue. Slides were scanned in an Aperio ScanScope XT slide scanning system (AperioTechnologies, USA) at 200× magnification. Analysis was carried out using the Positive Pixel Count v9 algorithm (for total staining intensity) and Nuclear V1 (nuclear staining). Results were analyzed with Student t-test at p < 0.05.

Results: There were 24 males and 11 females with mean age of 58.26 ± 9.3 years. Both demethylases were found to be localized mainly in the nucleus. The overall positive pixel percentage (%PP) and nuclear pixel percentage (%NP) of UTX expression was not significantly different in ccRCC (68.33 ± 14.26; %PP; 24.00 ± 14.03; %NP) compared to adjacent normal kidney (68.50 ± 16.82; %PP; 26.76 ± 16.08; %NP) respectively. There was a trend of lower %PP JMJD3 expression in ccRCC (60.37 ± 18.67; %PP) compared to adjacent normal kidney (67.78 ± 15.15; %PP; p = 0.07). In contrast, the overall %NP of JMJD3 expression was not significantly different between ccRCC (39.24 ± 16.52; %NP) and adjacent normal kidney (41.02 ± 17.31; %NP; p = 0.70).

Conclusions: Using immunohistochemistry, JMJD3 protein was localized to the nucleus and had a trend of lower but non-statistically significant expression in ccRCC compared adjacent normal kidney tissue. There were no significant differences with UTX expression in ccRCC and
paired normal kidney. Thus, JMJD3 protein may be involved in the development of primary ccRCC. The potential role of JMJD3 demethylases as biomarkers in the early diagnosis of RCC needs to be further explored.

**Robotic radical cystectomy with completely intracorporeal urinary diversion in the elderly: a comparative analysis in 188 octogenarians**

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**Introduction and Objectives:** Radical cystectomy (RC) and urinary diversion (UD) for bladder cancer (BC) carries significant morbidity in the elderly. This study aims to compare perioperative outcomes between robot-assisted RC (RRC) with intracorporeal urinary diversion (ICUD) and open RC (ORC) in octogenarians (patients aged ≥80 years).

**Methods:** Between September 2010 to December 2017, 48 and 140 octogenarians underwent RRC and ICUD and ORC, respectively, for localized BC at a single academic cancer center. The primary outcomes were estimated blood loss (EBL), perioperative transfusions (PT), operative time (OT), and length of hospital stay (LOS). Secondary outcomes were 90-day complications, 90-day readmissions, 30-day perioperative mortality, recurrence-free survival (RFS) and overall survival (OS). Kaplan-Meier and Cox regression analyses were used to assess RFS and OS. All statistical analyses were performed using SAS software.

**Results:** Both groups were comparable with regards to age, sex, BMI, ASA score, comorbidity, clinical stage, pathological stage, carcinoma in-situ, lymphovascular invasion, soft-tissue margins and chemotherapy status. The study included patients prior to the implementation of ERAS in 2012. Overall, median OT, EBL, and LOS were 312 min, 400 ml, and 7 days respectively, comparing favorably to large contemporary RC series in octogenarians. An ileal conduit UD was more likely in RRC patients (73% vs 94%, p < 0.01). RRC was associated with significantly lower EBL (225 vs 450 ml, p = 0.02) and PTs (31% vs 51%, p < 0.01) and longer OT (396 vs 300 min, p < 0.01; Table 1). Complications and readmissions within 90 days, and perioperative mortality were similar between groups. Gastrointestinal complications were less likely in the RRC group (6% vs 25%, p < 0.01). RRC was an independent predictor of reduced EBL (β estimate −272 ml, p < 0.01) and need for PT (OR 0.47, p = 0.04) on multivariable regression analysis controlling for age, preoperative hemoglobin and neoadjuvant chemotherapy status. There were no differences in RFS (p = 0.58) and OS (p = 0.60) between groups after a median follow-up of 14 months.

**Conclusions:** RRC with ICUD is safe and feasible in octogenarians with localized BC. Compared to ORC, RRC and ICUD is associated with reduced EBL, PTs and gastrointestinal complications with equivalence in other perioperative measures.

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**Australian trends in urinary diversion over the past 20 years**

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**Introduction and Objectives:** Continent or incontinent urinary diversion is primarily performed following radical cystectomy for management of bladder cancer. Incontinent, ileal conduit was previously the gold-standard diversion technique; however, over the past 25 years there has been a significant shift towards orthotopic neobladder formation. There is increasing evidence that neobladders improve quality of life. Despite this, the uptake has been highly variable. The aim of this study was to investigate the trends in urinary diversion.
diversion in Australia over the past 20 years, correlate with patient demographics and compare with international data.

Methods: A retrospective analysis of Medicare Australia data was performed using the relevant Medicare Benefits Schedule procedure codes over the past 20 years. Included diversion procedures were ureterocutaneous, ureterocolonic, intestinal conduit and continent reservoir. Only procedures performed under the MBS were included, therefore procedures performed in public hospitals or under the Department of Veterans’ Affairs National Treatment account were not captured. Patients aged <15 years were excluded.

Results: Over the past two decades there were 7166 urinary diversion procedures subsidised by Medicare Australia. The median age group for urinary diversions was 65–74 years old and 71.8% were male. Intestinal conduit accounted for the majority of urinary diversion procedures (84.9%), followed by continent reservoirs (11.8%). Ureterocolonic (2.9%) and ureterocutaneous (0.4%) accounted for small proportions. The absolute numbers of urinary diversion procedures increased over the past 20 years but the proportion of different methods remained constant. The rates of continent reservoir urinary diversion were significantly higher in men and people aged 55 years old (p < 0.001 for both). Over the course of the study, the proportion of people aged greater than 75 undergoing urinary diversion increased significantly (p < 0.001). The proportion of continent reservoir diversions remained unchanged in the majority of states with the exception of a decrease in NSW and ACT and an increase in WA (Table 1).

Conclusions: In contrast to major international academic institutions, the proportion of continent reservoir urinary diversions performed in Australia has not changed over the past two decades. Intestinal conduit remains the most common urinary diversion procedure.

Table 1. Number of continent reservoir diversions compared to other diversion types stratified by state and comparing 1998–2007 to 2008–2017

| State  | Reservoirs, n (%) | Other diversions, n (%) | Reservoirs, n (%) | Other diversions, n (%) | p-Value |
|--------|------------------|------------------------|------------------|------------------------|---------|
| NSW    | 164 (16.8)       | 810 (83.2)             | 187 (12.0)       | 1376 (88.0)            | <0.001* |
| VIC    | 67 (9.8)         | 619 (90.2)             | 127 (10.6)       | 1067 (89.4)            | 0.55    |
| QLD    | 39 (7.6)         | 471 (92.4)             | 62 (9.1)         | 617 (90.9)             | 0.36    |
| SA     | 25 (8.5)         | 269 (91.5)             | 36 (9.4)         | 347 (90.6)             | 0.69    |
| WA     | 26 (12.3)        | 186 (87.7)             | 83 (23.2)        | 275 (76.8)             | <0.01*  |
| TAS    | 2 (2.2)          | 87 (97.8)              | 3 (2.9)          | 99 (97.1)              | 0.76    |
| ACT    | 17 (41.5)        | 24 (58.5)              | 1 (2.3)          | 42 (97.7)              | <0.001* |
| NT     | 0 (0.0)          | 9 (100.0)              | 4 (13.8)         | 25 (86.2)              | 0.24    |
| Australia | 340 (12.1)   | 2475 (87.9)            | 503 (11.6)       | 3848 (88.4)            | 0.51    |

A systematic review of peri-operative mortality associated with radical nephrectomy compared with partial nephrectomy

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Introduction and Objectives: Renal surgery for suspected renal cancer is a heterogeneous entity. Whilst mortality for all nephrectomy operations, including nephrectomy for non-cancerous conditions is estimated at less than 1%, there is a paucity of data to verify this specific figure. In patients undergoing complex renal surgery this rate is likely to be higher, especially in patients undergoing procedures involving exploration of the vena cava. Partial nephrectomy is perceived to have a higher risk of operative complications, but is often utilised for lesions of lower complexity and in a younger cohort of patients.

We aim to identify and compare the peri-operative, in-hospital mortality rate of patients with suspected renal malignancy undergoing radical or partial nephrectomy reported in the literature.

Methods: We undertook comprehensive literature search of EMBASE and MEDLINE databases from 1990 to 2018 using search terms nephrectomy, partial nephrectomy, periperaative mortality, hospital mortality and death. Initial results provided 2451 studies. Study inclusion criteria included all studies including mortality data for patients undergoing nephrectomy or partial nephrectomy. Exclusion criteria included non-English studies, articles that did not report mortality data as raw numbers and studies which did not report out of hospital deaths. Studies were not included in the analysis of women or those undergoing nephrectomy for non-cancerous conditions. A systematic review was performed using Comprehensive Meta Analysis Version 3.3.070.

Results: 21 studies reported mortality for radical nephrectomy with total number of patients 307 965. 11 studies looked at partial nephrectomy with total number of patients 138 187. 10 studies had data comparing both radical and partial nephrectomy with total patient numbers of 267 309 and 59 632 respectively. 7 studies directly reported on patients with caval involvement, although there was heterogeneity in defining level of extent, limiting ability to perform meta-regression analysis.

The mean rate of mortality of patients undergoing radical nephrectomy was 1.16% (95% CI 1.12–1.20). Mortality for partial nephrectomy was 0.43% (95% CI 0.30–0.62). In studies comparing partial to total radical nephrectomy mortality was lower in the partial group OR 0.48 (95% CI 0.42–0.55). In patients with tumour thrombus involving the renal vein and vena cava patients with tumour extending to the hepatic vessels or higher had significantly higher mortality than other patients, whilst patients with only renal vein involvement and vena cava extension...
<2 cm had similar mortality to patients with no thrombus.

**Conclusions:** Radical nephrectomy has a higher risk of mortality than partial nephrectomy. Surgery involving the vena cava has a significantly higher risk of mortality if tumour extends >2 cm from insertion of the renal vein.

**A retrospective Australian national audit of nephrectomy, partial nephrectomy and nephroureterectomy 2005–2015**

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**Introduction & Objectives:** Renal surgery is a heterogeneous group of potentially complex operations with a variety of indications and approaches. International literature gives a clear picture regarding the utilisation of the different modalities of renal surgery, in particular the increasing utilisation of partial nephrectomy (PN) in the management of renal cell carcinoma (RCC). The incidence of these procedures in Australia is not well known.

We aim to analyse routinely collected data from patients undergoing nephrectomy, nephroureterectomy or partial nephrectomy (NNUPN) in Australia to establish a clear picture of incidence, indications and application of minimally invasive approach for each modality over the period 2005–2015.

**Methods:** Data was obtained from the Australian Institute of Health and Welfare (AIHW). All patients from 2005 to 2015 undergoing procedures matching MBS/ACHI codes for nephrectomy, partial nephrectomy and nephroureterectomy in Australia were included. Population data was obtained from the Australian Institute of Statistics (AIS) for each state of Australia. Linear regression modelling was used to assess trends over time and binary logistic regression was used to analyse utilisation of minimally invasive approach.

**Results:** During the study period, 38 902 NNUPN were performed in Australia. There were 26 385 radical or partial nephrectomies performed for suspected malignancy, 3058 nephroureterectomy and 4998 simple nephrectomies. The incidence of radical nephrectomy (RN), simple nephrectomy (SN) and nephroureterectomy (NU) was unchanged over the study period. The incidence of PN increased significantly from 2.3 to 5.1/100 000 during the study period (p < 0.001). The percentage of both radical and partial nephrectomy performed utilising a minimal invasive approach increased during the study period (RN 42.04% to 70.26%, p < 0.001; PN 20.26% to 53.71%, p < 0.001).

There were significant differences between the percentage of RN performed via an open approach compared to a minimally invasive approach (p < 0.001), with WA performing 71.3% of RN via minimally invasive approach, QLD 65.5%, NSW 64.5%, VIC 59.6%, TAS 50.9%, ACT 41.8%, SA 40% and NT 30.4%. During the study period, all states increased the utilisation of minimally invasive approaches for RN (p < 0.001).

When looking at the number of renal tumours removed via RN vs PN there was a small statistical difference between states (p < 0.001). The NT, TAS, QLD, SA and WA all had similar percentage of utilisation of PN at 23.3%, 24.2% 25.5%, 25.9% and 26.5% respectively. NSW and VIC had statistically higher utilisation of PN at 31.1% and 31.2%. ACT had the highest percentage of renal tumours removed via PN at 39.5%. The percentage of tumours removed via PN increased over the study period in all states (p < 0.001).

**Conclusions:** Although the total number of NNUPN performed for suspected malignancy in Australia has increased over this study period, the rate of radical nephrectomy, simple nephrectomy and nephroureterectomy has remained consistent. Conversely, there has been an increasing number of partial nephrectomies performed. The application of a minimally invasive approach has increased for radical, simple and partial nephrectomy and as of 2015 is the most common approach for these modalities.

**A retrospective review of post-operative mortality of patients undergoing cystectomy in Australia**

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**Introduction and Objectives:** Cystectomy is a highly specialised and complex operative procedure performed in a cohort of comorbid patients. Recent systematic review performed showed an international in-hospital post-operative mortality rate (POMR) of 2.4%. There have been no national level studies performed in Australia looking at mortality of patients undergoing cystectomy.

**Methods:** We performed retrospective review of in-hospital POMR in Australia between 2005–2015 using de-identified data obtained from the National Hospital Mortality Database (NHMD) via the Australian Institute of Health and Welfare (AIHW). The mortality rate was identified from the data and binary logistic regression was performed to analyse the effect of age, gender, year of operation, elective vs emergency admission and the state/territory where the operation was performed on the mortality rate.

**Results:** There were 6647 cystectomies performed in Australia over the study period with 97 in-hospital deaths. This equates to an average POMR of patients undergoing cystectomy in Australia of 1.60%. There was no significant change in mortality over the study period (p = 0.625) or significant difference in mortality rate between states (p = 0.569). There was statistically significant increase in mortality associated with increased age (p = 0.042) with the highest rate seen in patients aged 80+ years of 5.1%. Patients admitted as emergency cases had significantly higher risk of mortality (3.6% vs 1.3%, p = 0.0003).

**Conclusions:** The POMR of patients undergoing cystectomy in Australia is low and comparable with rates from other countries. There is no difference in the mortality rate between Australian states/territories and the rate has been stable over the 10 year study period. There is a predictable increase in mortality associated with increase in patient age.

**Clinical and pathological factors associated with positive surgical margins in patients undergoing radical prostatectomy from the SA-PCCOC database**

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**Introduction and Objectives:** Positive surgical margins (PSM) are common after radical prostatectomy and are associated with various demographic, operative and pathological variables. We performed a retrospective study of patients from the South Australian Prostate Cancer Clinical Outcomes
Collaborative (SA-PCCOC) to define the risk of a PSM in this cohort of men treated by different urologists in SA hospitals.

**Methods:** We examined the SA-PCCOC database for radical prostatectomy procedures from 1998 to 2016. Men who were node positive, had pT4 or metastatic disease were excluded from the analysis. We used multi-variable Poisson regression analyses to estimate the effect of age at diagnosis, treatment period, PSA, RP grade and stage, number of positive biopsy cores, nerve sparing and surgeon volume on the risk of PSM classified as presence or absence of PSM, PSM location and multiple PSM sites. We also specifically examined the effect of these variables on the risk of an intra-prostatic (pT2) PSM.

**Results:** 2827 men were identified who had undergone radical prostatectomy from 1998 to 2016, and who had a recorded margin status. 797/2827 (28%) men had a positive margin. 82% of positive margins were single site and 18% multiple site. Of 931 PSM sites, 172 (18%) were bladder, 931 PSM sites, 172 (18%) were bladder, 470 (50%) were single site and 18% multiple site. Of 1998 to 2016, and who had a recorded positive biopsy cores, nerve sparing and surgeon volume on the risk of PSM were included. We used multi-variable Poisson regression analyses to estimate the effect of age at diagnosis, treatment period, PSA, RP grade and stage, number of positive biopsy cores, nerve sparing and surgeon volume on the risk of PSM classified as presence or absence of PSM, PSM location and multiple PSM sites. We also specifically examined the effect of these variables on the risk of an intra-prostatic (pT2) PSM.

**Results:** 2827 men were identified who had undergone radical prostatectomy from 1998 to 2016, and who had a recorded margin status. 797/2827 (28%) men had a positive margin. 82% of positive margins were single site and 18% multiple site. Of 931 PSM sites, 172 (18%) were bladder, 289 (31%) were apical and 470 (50%) were ‘other’ (including posterolateral).

Multivariable regression indicated that the risk of any PSM was increased in the presence of pathological Gleason 9–10 disease (incidence rate ratio [IRR] = 1.5, 95% CI 1.0–2.2) and in higher T stage (pT3a IRR = 1.8, 1.5–2.1 and pT3b IRR = 2.3, 1.8–2.9, compared to pT2). Surgeon volume as a continuous variable was associated with a decreased risk of PSM (IRR = 0.95, 0.92–0.99 per 100 cases) for any margin. This reduction was greater for multiple margins (IRR = 0.87), bladder neck (IRR = 0.91) and ‘other’ margins (IRR = 0.93), but was not significant for apical margins (IRR = 0.97, 0.90–1.05).

**Conclusions:** Higher pathological grade and stage are associated with a greater risk of positive surgical margins in the South Australian cohort. PSM rates are within internationally reported parameters.

**Cost analysis: outsourcing radiofrequency ablation for small renal masses**

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**Introduction and Objectives:** Renal cell carcinoma (RCC) accounts for 2–3% of all cancers. With increasing use of Computer Tomography, a large proportion are detected earlier and amenable to focal therapies such as Radiofrequency Ablation (RFA). Our institution is unable to offer image-guided percutaneous ablation (PA) through the public service due to lack of Interventional Radiology (IR) resources. Currently, patients with a small renal mass (SRM) are either actively observed, undergo radical nephrectomy (RN), partial nephrectomy (PN) or referred to another tertiary institution for focal therapy. Recent studies have demonstrated no difference in long-term efficacy between RN, PN and PA treatment of SRMs in selected patients; but with significantly higher rates of morbidity in the surgical treatment groups. Our Urology Multidisciplinary Team (MDT) is supported by an interventional radiologist with Uroradiology specialisation who provides PA for our patients through a private facility and we assessed the cost-effectiveness of our institution outsourcing PA.

The aim of the study was to compare the costs associated with performing nephrectomies (RN, PN) in a public hospital with the costs of performing minimally invasive PA in a private hospital; and to assess the financial impact on the public system of the different treatment options for SRMs.

**Methods:** The cost of performing PA at a large tertiary private hospital for patients with a SRM (<4 cm) between October 2017-October 2018 was calculated and compared to the cost of RN or PN for patients with a SRM between January 2015 to June 2018 at a tertiary public hospital.

**Results:** Twelve patients underwent PA (radiofrequency ablation or microwave ablation); 10 were performed under conscious sedation. A total of 56 RN and PN were performed during the studied period, including 19 patients with a SRM (RN = 15; PN = 4 with the majority (n = 17) performed laparoscopically. Mean size of lesions was similar (surgery = 29.8 mm; RFA = 27.2 mm). The average procedural time was significantly longer with surgery (219.66 min vs 54.75 min). Length of stay was longer with surgery. Cost per admission for surgery was $19,032.66 which was higher than PA costs of $4513 at a private institution. The cost of performing equivalent PA in a public hospital was calculated to be $2784.35, however this would not include staffing costs (doctors, nurses, radiographers etc). Outsourcing of PA was associated with additional Urology and Radiology appointments, MDT meetings, travel for patients and logistical challenges for the treating teams.

**Conclusion:** The cost of outsourcing focal treatment of SRMs with PA to a private hospital appears to be similar to the same service provided in a public hospital. PA is more cost-effective than surgery in carefully selected patients. The additional benefits of providing PA in a public hospital would include more streamlined management and continuity of care for patients. Greater funding for interventional radiology services to provide PA procedures in public hospitals should be considered by health authorities to improve access to less-invasive treatments for SRMs and result in considerable cost-savings for health budgets.

**The current landscape of three-dimensional printing in uro- oncology**

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**Introduction and Objectives:** Despite its invention in 1983 and widespread use in the engineering industry, Three-Dimensional (3D) printing is only starting to become adopted in Medicine and Surgery. Using medical image data acquired as part of gold standard clinical care, 3D anatomical models can be created, which can be 3D printed as an adjunct to surgical planning, simulation, and patient education. In the field of Uro-Oncology, researchers and clinicians have recognised the potential of this exciting new technology and have started integrating it into Urological practice. We review current literature regarding 3D printing and other 3D technologies in the field of Urology.

**Methods:** As per PRISMA guidelines, we performed a literature search including: Web of Science, EMBASE and Cochrane databases. Publications included in this study were limited only to English-language articles, published between 1980 and
Introduction and Objectives: To evaluate and compare the RENAL and Preoperative Aspects and Dimensions Used for an Anatomical (PADUA) classifications in predicting perioperative outcomes following Robot-Assisted Partial Nephrectomy (RAPN) for renal masses of moderate to high complexity.

Methods: We prospectively analysed the clinical and pathologic records of 108 consecutive patients who underwent RAPN for renal tumours from June 2012 to June 2018 at an academic teaching institution in India.

Results: Forty-two tumours were defined as moderately to highly complex using the RENAL nephrometry score (score ≥ 7), while 70 tumours met the moderately to highly complex score (Score ≥ 8) using the PADUA classification.

Both RENAL and PADUA nephrometry scores predict longer ischemia times and renal derangement following RAPN in complex tumours. While the number of tumours meeting complexity criteria differ between the two scores, the RENAL score predicted a difference in trifecta achievement between tumours classified as complex and simple based on a score cut-off of ≥ 7. The PADUA classification of complexity could identify patients at risk for developing persistent renal failure (S. creatinine > 1.3 mg/dl at post-op day 7) following RAPN.

Conclusions: Both RENAL and PADUA classifications are helpful in predicting outcomes following RAPN in complex tumours. PADUA classification of complexity could help identify patients at risk for developing persistent renal failure. RAPN in complex tumours is feasible with near equivalent perioperative and functional outcomes.

68Ga PSMA PET/CT detects lesions ‘invisible’ on multiparametric MRI; single centre comparative analysis with whole gland histopathology as gold standard

Abstract withdrawn

Access to robot assisted laparoscopic radical prostatectomy is associated with socioeconomic advantage

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Introduction and Objectives: Socioeconomic status can be measured based on

Comparison of RENAL and PADUA classification in predicting outcomes following Robot-Assisted Partial Nephrectomy in complex renal masses

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Table 1. Comparison of outcomes following RAPN in complex tumours based on RENAL nephrometry score ≥ 7

| Parameter                          | RENAL score < 7 | RENAL score ≥ 7 | p Value |
|------------------------------------|-----------------|-----------------|---------|
| Mean tumour size, cm (range)       | 3.1 ± 0.85 (1.3–5) | 4.7 ± 1.3 (1.8–8) | <0.001* |
| Mean Warm Ischemia                 | 19.6 ± 3.3 (14–27) | 23.9 ± 3.6 (19–34) | <0.001* |
| Time, min (range)                  | 126.7 ± 42.9 (90–310) | 132.3 ± 52.5 (100–325) | 0.552   |
| Mean operative time, min (range)   | 60.9 ± 7.7 (50–100)  | 66.1 ± 6.8 (55–85)  | <0.001* |
| Mean blood loss, ml (range)        | 118.6 ± 39.8 (50–300) | 133.6 ± 41.1 (90–200) | 0.062   |
| Mean postoperative change in creatinine from baseline, mg/dl | –0.08 ± 0.14 (0 to –0.8) | –0.15 ± 0.15 (0 to –0.6) | 0.015* |
| Mean postoperative change in eGFR from baseline, mg/dl | –6.7 ± 11 (0 to –64.8) | –10.9 ± 11.1 (0 to –40.4) | 0.054   |
| Development of ARF, no. (%)        | 21 (31.8)       | 24 (57.1)       | 0.007*  |
| Persistent ARF, no. (%)            | 7 (10.6)        | 6 (14.3)        | 0.559   |
| New onset CKD, no. (%)             | 3 (4.5)         | 3 (7.1)         | 0.562   |
| Transfusions, no. (%)              | 9 (13.6)        | 7 (16.7)        | 0.452   |
| Trifecta outcome, no. (%)          | 51 (77.3)       | 22 (52.4)       | 0.007*  |
| Median length of stay, days (range)| 3 (2–10)       | 4 (3–15)        | 0.356   |
| Complications, no. (%)             | 12 (18.2)       | 9 (21.4)        | 0.482   |

*p < 0.05 is statistically significant.
Table 2. Comparison of outcomes following RAPN in complex tumours based on PADUA score ≥ 8

| Parameter                          | PADUA score < 8 | PADUA score ≥ 8 | p Value |
|-----------------------------------|-----------------|-----------------|---------|
| Mean tumour size, cm (range)      | 2.7 ± 0.7 (1.3–4.1) | 4.2 ± 1.2 (1.8–8) | <0.001* |
| Mean Warm Ischemia Time, min (range) | 19.4 ± 3.1 (14–27) | 22.3 ± 4.1 (15–34) | <0.001* |
| Mean operative time, min (range)  | 122.2 ± 32.9 (90–240) | 132.5 ± 52.6 (100–325) | 0.278   |
| Mean console time, min (range)    | 61.8 ± 9 (50–100) | 63.5 ± 7 (50–85) | 0.274   |
| Mean blood loss, ml (range)       | 120.1 ± 40.2 (50–250) | 126.7 ± 41.3 (90–300) | 0.426   |
| Mean postoperative change in creatinine from baseline, mg/dl | -0.058 ± 0.11 (0 to -0.6) | -0.135 ± 0.16 (0 to -0.8) | 0.01*   |
| Mean postoperative change in eGFR from baseline, mg/dl | -5 ± 7.94 (0 to -27.4) | -10.14 ± 12.24 (0 to -64.8) | 0.021*  |
| Development of ARF, no. (%)       | 15 (39.5) | 30 (42.9) | 0.773   |
| Persistent ARF, no. (%)           | 1 (2.6) | 12 (17.1) | 0.028*  |
| New onset CKD, no. (%)            | 1 (2.6) | 5 (7.1) | 0.339   |
| Transfusions, no. (%)             | 5 (13.1) | 11 (15.7) | 0.766   |
| Trifecta outcome, no. (%)         | 28 (73.7) | 45 (64.3) | 0.324   |
| Median length of stay, days (range)| 4 (2–10) | 4 (2–15) | 0.808   |
| Complications, no. (%)            | 8 (21.1) | 13 (18.6) | 0.746   |

*p < 0.05 is statistically significant.

Determinants such as income. Though recent evidence demonstrates that robot assisted laparoscopic surgery (RALP) and open radical prostatectomy are equivalent in oncological and functional outcomes at 24 months and that the period off work is equivalent at 6 weeks, the time patients are unable to perform the activities of daily living is not as clear and has not been demonstrated to be equivalent. Extrapolating from other minimally invasive abdominal surgery when compared with open alternatives, the burden of time away from usual activities is significantly reduced with laparoscopic surgery due to the decreased abdominal wall trauma, reduced wound infections and reduced perioperative morbidity, which has lead to laparoscopic surgery becoming the gold standard for many abdominal surgeries.

Methods: The prostate cancer registry is a collection from 11 public and 6 private hospitals capturing men with biopsy confirmed prostate cancer between 2008 and 2011. This data has been compared with data collected and collated from the 2011 census (ABS) to evaluate the access to RALP according socioeconomic status using the socioeconomic indexes for areas (SEIFA) and index of relative socioeconomic advantage and disadvantage (IRSD).

Results: Between 2008 and 2013, 5068 patients who were diagnosed with biopsy confirmed prostate cancer in Victoria were recorded as receiving a treatment modality. Treatment was divided between the modalities with 1177 patients undergoing active surveillance or watchful waiting, 336 patients receiving androgen deprivation therapy, radiation delivered in the form of brachytherapy or external beam therapy was administered in 367 patients and 441 patients respectively and 2747 patients received surgery. Of the men receiving surgery, there was a strong association between men who received a robotic prostatectomy and higher socioeconomic status (p = <0.001).

Conclusions: There is a strong association between socioeconomic advantage and access to robot assisted laparoscopic prostatectomy. Though current evidence suggests equivalence for urinary, sexual and oncological outcomes, the increased burden on patients and families with a longer recovery time and slower return to activities of daily living in being borne by patients from lower socioeconomic backgrounds.

Robotic retroperitoneal lymph node dissection: an initial single centre experience

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Introduction and Objectives: Retroperitoneal lymph node dissection (RPLND) is an important component in the management of metastatic testicular and some para-testicular tumors. Open- RPLND carries a significantly high peri-operative morbidity. With recent developments in new minimally invasive platforms, robotic RPLND (R-RPLND) has been shown to be a viable alternative approach with lower perioperative morbidities. Herein, we report our initial experience with R-RPLND at a single tertiary referral centre.

Methods: Retrospective review of our prospectively collected database was performed of all patient undergoing R-RPLND at our institution. Demographic data, operative parameters, oncological and perioperative outcomes were examined.

Intraoperative as well as 30-day post-operative complications were recorded using Clavien-Dindo classifications.

Results: Three patients underwent R-RPLND from May to August 2018. All three had left sided primary tumors and underwent modified left sided template R-RPLND. Two patients had residual mass post chemohormony (seminoma and non-seminoma, both stage IIc) and one underwent primary R-RPLND for metastatic para-testicular embryonic rhabdomyoscaroma. One patient required prophylactic stenting of the left ureter and one patient had ectopic left kidney with multiple vessels. All patients had nerve sparing procedure. Mean age was 26 (15–38), mean operative time was 300 min (240–360) with mean robot console time of 260 min (220–310) and Mean estimated blood loss was 100 ml (30–300). Mean nodal count was 38 (28–40). Pathology results indicated teratoma; necrosis and embryonal rhabdomyoscarcoma with all surgical margins clear. Mean return of bowel function was 1 day (1–2) and mean length of stay was 2 days (2–4). There were no intraoperative or post-operative complications noted. All patients regained antegrade ejaculation.
within week 6 post op. There were no recurrences with mean follow up of 3 months (2–5).

**Conclusions:** R-RPLND is technically a challenging procedure requiring advanced skills, however it is safe and feasible in selected patients and in a dedicated tertiary centres. The robotic approach offers promising early result with lower perioperative morbidity and length of stay. Larger cohorts and longer follow up is required to demonstrate safety and oncological equivalence to open RPLND.

### Assessing accuracy of multiparametric MRI and prostatic fusion biopsy in small targets – utility of a target, near-target and MRI-negative biopsy schema in 34 patients

**Introduction and Objectives:** Confidence in reliably identifying significant prostate cancer while excluding significant disease depends on excellent mpMRI technique and interpretation, the radiobiology of a given prostate cancer (which may or may not be larger than an MRI abnormality), accurate lesion registration, and accurate biopsy.

A simple schema is proposed that simultaneously assesses these functions into by comparing biopsy core grade and tumour length from target, near-target, and MRI-negative samples in smaller (PIRADS 4) lesions. Accurate mpMRI performance, interpretation, and targeting should yield the highest grade and core length compared to cores taken a nominal 5 mm away from a true-positive malignancy lesion.

**Methods:** A cohort of 34 patients with confirmed true-positive PIRADS 4 lesions (ipsilateral significant cancer on any core) who had target, near-target, and MRI-negative samples taken were prospectively collected data from 111 consecutive patients undergoing prostate biopsy from September 2017 to October 2018. mpMRI studies were all performed by Buderim/Wesley Medical Imaging. Biopsies were performed with the iSRobot Mona Lisa robotic-assisted transperineal fusion biopsy system at Buderim Private Hospital. All cores were submitted separately in individual pots, and pathology was reported at Aquesta Uropathology. Significant cancer was defined as any Gleason pattern 4, or tumour core length >6 mm.

**Results:** Mean patients’ age, PSA and prostatic volume was 64, 5.2, and 38cc (22–237) respectively. Mean target diameter was 8 mm (3–15).

In 91% of cases the target core grade was equal to or higher than near-target cores, and in 79% of cases targeted cores showed the longest tumour length.

A missed target occurred in one case (3%), however the ipsilateral tumour identified on systematic cores was later demonstrated on radical prostatectomy to be MRI-invisible anterior tumour, with the targeted posterior MRI lesion proven benign.

**Conclusions:** In this study of 34 patients with small (PIRADS 4) lesions, targeted robotic-assisted transperineal fusion biopsy cores yielded higher percentage positive cores, grade, and tumour core length than near-target biopsies taken ~5 mm away. A target, near-target, and MRI-negative biopsy schema as a check on mpMRI and biopsy accuracy is transferable to any cognitive or software fusion biopsy system.

### Use of Tc-PSMA SPECT/CT to detect metastatic prostate cancer

**Abstract withdrawn**

### A 18 year analysis of trends of prostatectomy in Australia

**Abstract withdrawn**

|       | Target | Near-target | MRI negative |
|-------|--------|-------------|--------------|
| Av. # cores | 4.5    | 4.5         | 12           |
| % positive cores | 62%   | 33%         | 18%          |
| Av. Max cancer core length (mm) | 8.2    | 3.5         | 2.5          |
| Av. ISUP GG | 2.4    | 1.4         | 1.1          |

**MRI Pro: a global online solution for case-based training in prostate MRI – the initial learner analysis**

**Introduction & Objectives:** The use of prostate MRI in prostate cancer diagnosis is increasing rapidly as high level evidence mounts favouring its diagnostic accuracy over random biopsy. It is now suggested that MRI is used upfront to determine if prostate biopsy is even necessary. As this practice becomes widespread, the demand for prostate MRI globally will be massive. It is therefore imperative that both radiologists and urologists become skilled at reading prostate MRI accurately to avoid missed diagnoses as well as overcalling MRIs that are actually normal. Variation in reporting prostate MRI is high. We hypothesised that the best way to address this unmet need for global scale training in prostate MRI is through a rigorous online program. We developed MRI Pro to fulfil this need. Here we present our initial learner data analysis.

**Methods:** MRI Pro is a proprietary online training program consisting of 300 multiparametric MRI cases all reported to PIRADS v2 standard. Every case has histological verification with a template transperineal biopsy for negative cases or wholemount radical prostatectomy histology for positive cases. After reading each MRI, learners submit their assessment including PIRADS score, number and location of lesions, and stage of disease. Learners are then given instant feedback with the correct answer for rapid learning. The program’s software was deliberately designed to capture granular learner data and a timer was built-in to enable learners to accrue CME points per hour of use. MRI Pro went live online at www.mripio.io in May 2018. A CSV spreadsheet was exported in October 2018 for this initial analysis.

**Results:** 151 learners across the world accessed MRI Pro’s main program of 300 cases between May and October 2018. Of these, 21 learners performed more than 20 cases each (range 21 – all 300) for a total
of 1750 cases with a mean of 84.1 cases per learner. Prior MRI reading experience varied from 0 to >1000 cases. The mean proportion of cases reported correctly by these 21 learners was 62.2% (range 39–74%). Mean concordance between these 21 learners for the first 21 cases of the program (which all of them completed) was 0.74 (range 0.5–0.91 per case). The mean time spent per case was 4.9 min.

**Conclusions:** The online case-based prostate MRI training program, MRI Pro, attracted over 150 learners in its first 5 months of being accessible online. Although preliminary, this initial learner data analysis supports the need for such a program with learners who completed more than 20 cases on the program reading the MRI cases correctly only 62.2% of the time. It also supports the reporting variation found in other studies with the concordance rate of 0.74. We will report on a further analysis, including improvement in diagnostic accuracy of learners whilst on this program, as our dataset increases.

**Thoraco-abdominal nephrectomy – sounds morbid, but is it?**

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**Introduction and Objectives:** Urologists have been early adopters of laparoscopic and robotic surgical techniques. Despite proven advantages to minimally invasive techniques – in particular reduced postoperative pain and length of stay (LOS), there remain a proportion of pathologies that require open surgical management due to disease characteristics that render them unsuitable for laparoscopic or robotic intervention.

Very large renal tumours or renal cell carcinomas (RCC) invading the IVC are one such pathology. Our objective was examine morbidity and length of stay associated with open thoraco-abdominal nephrectomy at our institution.

**Methods:** From 2012, details of patients undergoing a thoraco-abdominal nephrectomy at our institution have been entered into a dedicated prospective database, with patient and admission characteristics (age, gender, comorbidities, length of stay, post-operative complications, transfusion, post-operative analgesic requirements) compared with tumour features (histological type, grade and size) and operative details (operative time, estimated blood loss, margins).

**Results:** Between 2012 and 2018, 12 patients underwent thoraco-abdominal nephrectomy at our institution. Mean tumour maximal dimension was 132 mm (range 60–230 mm). Histology confirmed ten RCCs, one 285 mm oncocytoma and one 110 mm angiomyolipoma. Of the RCC, there were two Fuhrman grade 2, four Fuhrman grade 3, one ISUP grade 2, one ISUP grade 4 and one Chromophobe. Clear margins were achieved in all patients.

Operative time ranged between 250 and 430 min with a mean of 348.5 and median of 369.5. Estimated Blood Loss (EBL) data was available for eight patients, with a range 20–2300 ml, mean of 589 ml and median of 262.5 ml. Only one patient (115 mm ISUP grade 4 RCC with 2300 ml EBL) required transfusion with 5 units RBC transfused intraoperatively.

Patients ranged in age between 25 and 76, with a mean of 59 and median of 64.5. Charlson Comorbidity Index¹ (CCI)[a] at admission ranged between 2 and 6 with a mean of 3.75 and median of 4. LOS ranged between three and nine days with mean six and median 6.5, with documented inpatient postoperative complications included one pneumothorax requiring chest drain insertion (Clavien-Dindo² Grade 3a) and two patients that were treated with antibiotics for presumed respiratory infection (Clavien-Dindo² Grade 2). All but one patient remain alive at time of writing.

**Conclusions:** Despite the perception of open thoraco-abdominal nephrectomy to be a particularly high morbidity procedure, at our institution we observed an average length of stay of six days and few postoperative complications despite high comorbidity scores on admission. Consequently we conclude that with appropriate patient selection, open thoraco-abdominal nephrectomy remains a valuable contemporary management option.

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**Implication of missed posterolateral tumour on multiparametric MRI for nerve sparing during radical prostatectomy**

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**Introduction and Objectives:** Multiparametric magnetic resonance imaging (mpMRI) has emerged as a key tool in the diagnostic pathway of prostate cancer. Recent evidence has confirmed the accuracy of MRI-targeted biopsy in detecting clinically significant disease, suggesting the potential to omit systematic biopsy cores in the presence of a clearly positive mpMRI. However, presence of tumour in the postero-lateral peripheral zone (PL Pz) of the prostate is an important consideration in the decision to perform a nerve sparing (NS) radical prostatectomy (RP). As such, it is vital to ensure any tumour in PL Pz is visible on mpMRI prior to omitting systematic cores. We aimed to assess the incidence of clinically significant tumour in the PL Pz missed by mpMRI, and the impact of this on positive surgical margins (PSM) at the site of nerve sparing.

**Methods:** From a prospective single-centre database we analysed the records of men who underwent mpMRI and prostate biopsy prior to RP between 2014 and 2018. Men with PIRADS 3–5 lesions on mpMRI were divided into 2 groups. Group A included those men with any MRI lesion in the PL Pz, and Group B included those with no specifically visible lesion in the PL Pz. Clinically significant disease was defined as Gleason Score 4 + 3 = 7 or greater on RP. Mann-Whitney and Fisher’s exact test were used.

**Results:** 412 men underwent RP following mpMRI and prostate biopsy. 385 had PIRADS 3–5 lesions on mpMRI, including 249 (64.7%) in Group A and 136 (35.3%) in Group B. Overall, 29 (7.5%), 151 (39.2%) and 205 (53.3%) had PIRADS 3, 4 and 5 lesions, respectively. There was no significant difference between Groups A and B in mean age (66.4 vs 65.5 years, p = 0.193) or PSAD (0.238 vs 0.237, p = 0.760), 122 (89.7%) of 136 men in Group B had tumour in PL Pz on RP, despite MRI findings, including 49 (36.0%) with clinically significant disease. 123 (90.4%) men in Group B had NS RP. 41 (30.1%) men in Group B had PSM, including 17 (12.5%) who had PSM in the PL Pz. 15 (11.0%) of these men underwent NS RP on the side corresponding to the PSM. 50 (20.1%) men in Group A had a PSM in the PL Pz. There was no significant difference between the rate of PSM in the PL Pz in Group A (20.1%) and Group B (12.5%) (p = 0.068).

**Conclusions:** High rates of clinically significant disease are found in the PL Pz of...
the prostate in men undergoing RP, not specifically visible in the corresponding location on mpMRI. Hence, MRI-targeted only biopsies may risk missing tumours which could influence the decision to perform nerve sparing RP. However, we found no significant difference in PSM between men with and without mpMRI visible lesions in PL Pz.

**Gender-related bladder cancer outcomes in Victoria, Australia**

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**Introduction and Objectives:** To evaluate the epidemiological characteristics and gender difference in bladder cancer (BCa) in Victoria, Australia (VIC) and to examine factors that impact survival.

**Methods:** All histologically proven new BCa diagnosis were identified between January 2007 and December 2016 from the Victorian Cancer Registry. Clinico-pathological variables assessed using univariate analysis. Kaplan-Meier and multivariate Cox proportional hazards regression modelling were used to analyse unadjusted and adjusted disease-specific survival.

**Results:** There was 6200 new diagnosis of BCa, of which 1413 (23%) were female. The peak age at diagnosis was 85 in both genders with a higher proportion of females were 80 years or older at diagnosis compared to males (41% 35.8%, \( p = 0.02 \)). Urothelial cell carcinoma (UCC) was the most common type of BCa (93.5%) with the majority being high-grade at time of diagnosis (75%). There was no difference between the rates of UCC or histological grades between genders. However, the rate of squamous cell carcinoma (SCC) was higher in female (4% vs 0.7%, \( p < 0.01 \)).

An overall mortality rate of 50% was observed in this study. There were higher rates of bladder cancer and overall deaths in females compared to males (\( p < 0.05 \)). On adjusting for age, tumour type and grade, higher rates of bladder cancer-specific mortality and overall mortality were seen in females with UCC compared to males (HR 1.2 95% CI 1.12–1.38, \( p < 0.01 \) and HR 1.1 95% CI 0.83–1.61, \( p = 0.02 \), respectively). There were no differences in survival between the groups for squamous cell carcinoma of the bladder.

**Conclusions:** In VIC, BCa was more prevalent in age ≥85 with the majority being high-grade UCC. This analysis shows poorer survival in VIC women compared to men from bladder cancer, particularly UCC. A possible contributing factor could be delayed diagnosis as observed in age difference at the time of diagnosis. Although SCC was more commonly observed in female, this did not contribute to poorer survival.

**Differences between participants and nonparticipants in a randomised controlled trial – lessons learnt from the engage study of referral for an exercise program in survivors of prostate cancer**

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**Introduction and Objectives:** Randomised controlled trials (RCT) help provide high quality evidence for clinical practice. However, the applicability of their findings may be limited if patients included differ significantly from those who are not in the study. The aim of this study was to compare patients with prostate cancer who did or did not enrol in a prospective RCT.

**Methods:** Patients who had undergone curative treatment for prostate cancer at participating centers (Austin health, Eastern Health, Peter MacCallum Cancer Centre and private urologist rooms) within the preceding 12 months were approached to participate in the ENGAGE trial (randomizing to a prescribed exercise program versus usual care) between June 2011 and June 2013. With ethics approval, data on patients demographic and cancer characteristics were compared between patients who did or did not consent to participate in the trial. Comparisons were carried out using the Chi-square or Mann-Whitney tests as appropriate, with statistical significance ascribed to p-values < 0.05.

**Results:** One-hundred and forty-six (48.7%) of 320 eligible patients who were approached agreed to participate in the trial. Compared to patients who refused, trial patients were of similar age, but had a higher socio-economic index for area, at a median (range) of 885 (1050–1151) compared to 867 (1024–1130), \( p < 0.003 \). They were less likely to have been treated in the public sector (74.0% vs 83.9%, \( p < 0.03 \)), underwent radiotherapy (48.7% vs 60.9%, \( p < 0.03 \)) or had androgen deprivation therapy (28.0% vs 52.4%, \( p < 0.003 \)). There were however, no significant differences in the PSA at diagnosis, clinical stage or biopsy Gleason score distribution.

**Conclusions:** We have found significant differences between patients who participated in this RCT and those who did not. Selection bias of this nature may need to be considered when extrapolating RCT findings to the general population.

**PSMA-PET to detect and localise primary prostate cancer: a single centre retrospective series**

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**Introduction and Objectives:** The initial role of PSMA-PET was to restage recurrent prostate cancer (PCa), and its clinical application has since expanded to primary staging. The next step is to explore the potential for PSMA-PET to localise lesions within the prostate, and predict locoregional extension of disease. This retrospective series examines the ability of PSMA-PET to detect local PCa lesions when compared with multi-parametric MRI (mpMRI), biopsy, and radical prostatectomy (RP) specimens.

**Methods:** A retrospective series of 70 men who underwent PSMA-PET at a single institution for primary staging was identified, with 53 men eligible for analysis. PSMA-PET, mpMRI, biopsy, and RP histopathology reports were analysed and sextant location matching of lesions was performed.

**Results:** mpMRI was performed prior to PSMA-PET in 38 men. 89.5% demonstrated concordance with at least one PSMA-avid lesion and 57.9% showed all lesions to be concordant. In 44 PSMA-avid lesions that correlated with mpMRI lesions, SUVmax was shown to increase with increasing PI-RADS score. Biopsy was performed prior to PSMA-PET in all 53 men, with a total of 90
Introduction and Objectives: Prostate cancer (Pca) is a common cause of morbidity and mortality in New Zealand (NZ) and worldwide. Despite the limitations, Prostate Specific Antigen (PSA) remains the mostly utilized serum marker for the early detection of Pca. Considering the controversy in the validity of PSA as a population-based screening tool, no formal PSA screening program currently exists in NZ. Moreover, the Ministry of Health reports have estimated that less than 20% of NZ men are receiving PSA screening in the community. This study aims to investigate the current PSA testing pattern and define the proportion of men undergoing regular PSA testing for early detection of Pca in NZ.

Methods: This study was conducted in the Northern Cancer Region (NCR) of NZ which represents 35% of the country total population. From January 2018 to December 2017, all men who had a PSA test in a community laboratory were included. Men with a known history of Pca were excluded. The information obtained were participants’ demographics and the dates and numbers of PSA tests performed. Data from Statistics NZ, based on the 2013 census, were used to define the total population estimates.

Results: More than 1.2 million PSA tests were performed in 311,725 men (mean = 3.88 tests per person, SD = 3.6). On average, the age at first test was 55.15 years (SD = 12.3). Eighty – eight percent of all the men, aged 40–79 years in the NCR, had at least one PSA test in the study period. Two thirds of the cohort had two or more PSA tests with mean time between first and last test being 4.7 years (SD 2.7). 68% of all men aged 50–74 years had PSA testing pattern suggestive of regular PSA screening.

Conclusions: PSA testing for Prostate cancer screening purposes, is a common practice in the New Zealand community, despite the absence of a formal population-based screening program.

An analysis of the frequency and pattern of Prostate Specific Antigen testing in New Zealand

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Introduction and Objectives: Scarce data is available on the influence of surgeon experience in Robotic Assisted Partial Nephrectomy (RAPN) outcomes. Our objective is to determine the impact of the learning curve on outcomes in a consecutive series of patients who underwent RAPN by a single surgeon.

Methods: We prospectively collected data on consecutive patients that underwent RAPN performed by a single surgeon previously fellowship-trained. Data were collected on patient (age, gender, BMI, single kidney, comorbidity, lab tests, eGFR), and tumour characteristics (size, stage, PADUA score, cystic component, RCC subtype, Fuhrman grade) and “Surgeon Experience” defined by 3 approaches: (a) cases chronologically numbered (b) cases divided into consecutive groups of 20 and (c) 50 (representing the effect of (a) 1-case increase, (b) 20-case increase, (c) 50-case increase in surgeon experience). The influence of surgeon experience on outcomes (warm ischemia time, estimated blood loss, operation length, complications, positive margin, length of stay (LOS) and Trifecta Outcomes) was investigated with multivariate linear or binary logistic regression analysis adjusting for confounders (Age, ASA, BMI, tumour size, PADUA).

Results: From Sept 2010 to March 2018, 311 RAPN were performed. Median tumour size and PADUA score were 3.1 cm [2.45–4] and 7 [7–8], respectively. A significant increase in tumour complexity was observed along the study period (p < 0.001). Median WIT was 18 m [15–20]. Mean eGFR difference (6-months post-op) was −5.71 ml/min.

There were 3.5% positive margins and 2.6% grade III-IV complications. Trifecta Outcomes (WIT < 20 min, clear margin and no complications) were obtained in 67.9% of patients. Increasing “Surgeon Experience” was associated with better Trifecta Outcomes after adjusting for confounders (OR 1.004 for each case increase in experience, p = 0.027). The favourable effect of Surgeon Experience was observed in WIT (p < 0.001), Operation length (p < 0.001) and LOS (p < 0.001). Analysis of Receiving Operator Curves shows a 150 case-experience cut point seems to better discriminate between patients with or without Trifecta Outcomes.

Conclusions: Increased experience in RAPN is associated with higher rates of ‘Trifecta Outcomes’ even after achieving proficiency levels, highlighting the importance of high-volume surgeons to optimise functional and oncological outcomes.

| Target | Near-target | MRI negative |
|--------|-------------|--------------|
| Av. # cores | 4.5 | 4.5 | 12 |
| % positive cores | 62% | 33% | 18% |
| Av. Max cancer core length (mm) | 8.2 | 3.5 | 2.5 |
| Av. ISUP GG | 2.4 | 1.4 | 1.1 |
Defining biochemical recurrence in prostate cancer with hybrid PSMA PET MRI

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Introduction and Objectives: Biochemical recurrence (BCR) can occur in up to 50% or more of men with high risk prostate cancer previously treated with surgery of curative intent. Detection of locally recurrent or metastatic disease in the presence of BCR after treatment of localised disease at low prostate specific antigen (PSA) may be improved by use of hybrid Prostate Specific Membrane Antigen (PSMA), Positron Emission Tomography (PET) with magnetic resonance imaging (MRI). The clinical utility of this approach has been minimally reported. We sought to report on a large series of hybrid PSMA PET MRI in defining BCR.

Methods: Following Institutional Review Board approval, a retrospective review of all PSMA PET MRI studies between April 2015 and April 2017 within a tertiary referral institution was conducted. Clinical variables, including patient demographics, PSA, previous treatment and histology prior to scan, indication for scan, imaging results, and outcome post imaging were collected prior to statistical analysis.

Results: A total of 300 PSMA PET MRI scans were performed, of which 135 were to investigate BCR. Sixty-four patients had undergone radical prostatectomy with a median PSA of 0.43 ng/ml (Interquartile Range (IQR) = 0.21–1.35), in whom 15 received postoperative external beam radiation therapy (EBRT) while 71 patients had received EBRT alone. From the surgical cohort, 31 patients (48.5%) had a positive scan (median PSA level 1.3 ng/ml, IQR = 0.26–4; Gleason score ≥ 4 + 4 in 17 patients) involving the prostatic bed (n = 6), lymph nodes (n = 18), bone (n = 6), and soft tissue (n = 11), for median serum PSAs of 1.8, 1.35, 1.6 and 0.4 ng/ml, respectively. Median PSA for those with a negative scan was 0.28 ng/ml (IQR = 0.17–0.57), despite 10 patients (30%) with a Gleason score ≥ 4 + 4.

Conclusions: PSMA PET MRI imaging may play an important role in detecting recurrent disease in men with BCR after local treatment. Detection of metastatic lesions with PSMA PET MRI occurs in lower PSA levels than previously quoted figures using the standard of care imaging in the setting of biochemical recurrence.

Localised prostate Cancer Combined Clinic: a prospective mixed methods pilot study of men with localised prostate cancer choosing between robotic prostatectomy and radiotherapy treatment

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Introduction and Objectives: To understand the decision making process in men diagnosed with localised prostate cancer (LPC) who are attending a combined clinic (CC), deciding between robotic prostatectomy and radiotherapy.

Methods: Men diagnosed with clinically significant LPC who were suitable for either robotic assisted radical prostatectomy (RP) or radiotherapy (RT) were eligible for recruitment. Participants attended a CC at a tertiary referral centre (Liverpool Hospital, Sydney), where they consulted a urologist and radiation oncologist regarding treatment options.

A mixed-methods design was used. Initial treatment preferences and final treatment choices were collected via questionnaires. Consultations at the CC were audio-recorded and transcribed verbatim. Consultations were analysed in NVivo using a study-specific coding framework. A sub-set of participants (n = 25) completed semi-structured interviews outlining their beliefs, values and decision-making process. Interviews were thematically analysed.

Results: Forty-one patients who were approached (89%) consented to participate in this study (n = 2 declined; n = 3 non-responders). Patient mean age was 66 years old. Mean pre-op PSA was 9.1. The most prevalent grade was ISUP grade II (47%) followed by ISUP III (19%). Twenty-eight (68%) participants ultimately chose robotic prostatectomy (RP), 12 (29%) chose radiotherapy (RT), and 1 (2%) deferred treatment. Initial treatment preference was recorded in 36 patients. 17 out of 21 (81%) patients with an initial preference ultimately retained their original choice, whilst 4 (19%) patients changing their preference from RP to RT. In the 13 patients who were unsure about treatment before the CC, 8 (62%) subsequently chose RALP, and 5 (38%) chose RT.

Interviews revealed that treatment choice is largely dependent on clinicians’ recommendations and participants did not routinely compare specific side effects of each treatment. In patients who were undecided or changed preference, factors which played a significant role in decision-making included treatment delivery, side effects, age and comorbidities (71% of patients). There was a strong patient belief that robotic prostatectomy provided a more definitive cure (74% of RP patients), whilst older men preferred radiotherapy as it had a perceived lesser impact on lifestyle (66% of RT patients).

Conclusions: Men who already had an initial treatment preference were unlikely to change their ultimate decision following the combined clinic consultation. In undecided patients, tailored discussion focusing on patient and treatment factors contributed to their treatment choice. Early involvement in a combined clinic can benefit the undecided patient in making a balanced and informed decision.
Do hydrogel spacer devices reduce rectal toxicity in the setting of radiotherapy for prostate cancer? – a single-centre cohort study

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Introduction and Objectives: Hydrogel spacer devices are placed between the rectum and prostate to reduce rectal toxicity during radiotherapy treatment for prostate cancer. Previous studies have demonstrated a learning curve for spacer placement, symmetry, and subsequent treatment related toxicity. We examined our single-surgeon series to examine procedural safety, and to observe our learning curve in terms of the distance created between prostate and rectum. We then compared this cohort to a group of men undergoing radiotherapy without a spacer to assess potential reduction in toxicity.

Methods: Retrospective chart review identified all patients undergoing hydrogel spacer insertion in Cairns between January 2015 and March 2018. A similar number of patients undergoing radiotherapy without a spacer device were identified from a prospectively maintained prostate cancer database over a similar period. Device insertion was carried out by trans-perineal injection using trans-rectal ultrasound guidance. The distance between the prostate and rectum was assessed using magnetic resonance imaging (MRI) 2 weeks after insertion by a single observer. Medical records were retrospectively reviewed for procedure-related complications, and early rectal toxicity in both groups was derived from medical notes or hospital admissions.

Results: Hydrogel spacer insertion was performed in 78 patients. Imaging was available for review in 71 men (91%). The mean (±SD) distance created between prostate and anterior rectum was 12.63 ± 3.2 mm. No significant difference in mean prostate-rectum distance was found when analysing the first 30 cases, or the first 10 cases, compared to subsequent cases (p = 0.44 and 0.39 respectively [unpaired t test]). A control group of 77 patients was identified. Of patients with full toxicity data available, 22% of men with a spacer had early rectal toxicity compared to 39% of men in the control group (p = 0.03).

Conclusions: Hydrogel spacer device insertion can be carried out safely in a regional centre. The distance between prostate and rectum was comparable to published series, with no significant learning curve identified. In this cohort, hydrogel spacer placement was associated with reduced rates of rectal toxicity in men undergoing radiation treatment.

Symptoms and side effects of treatments for non-muscle invasive bladder cancer as reported by patients: a systematic review

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Introduction and Objectives: Symptoms and side effects of individual treatments for non-muscle invasive bladder cancer (NMIBC) are poorly reported. This information is critical when selecting treatments for patients, particularly the elderly, frail or those with pre-existing symptoms. To systematically evaluate the symptoms and side effects reported by patients treated for NMIBC.

Methods: We performed a critical review of six electronic databases AMED, MEDLINE, EMBASE, PsycINFO, Web of Knowledge and Scopus from inception to 04 September 2017. The search strategy comprised terms for NMIBC and treatment symptoms and side effects and only prospective studies were included.

Studies that assessed symptoms, side effects or toxicity associated with therapy for NMIBC in adult patients were included. A narrative synthesis was performed to compare frequency of symptoms reported between therapy options.

Results: A total of 135 studies and 15 600 primary prostate cancers compared to multiparametric MRI?

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Introduction and Objectives: PSMA PET/CT has demonstrated superior sensitivity in detecting prostate cancer metastases compared to traditional staging modalities and seen a high degree of utilisation in the Australian setting. However, there is little data published on the role of PSMA PET/CT in detecting and diagnosing primary prostate cancer. We compared the accuracy of PSMA PET/CT to multiparametric MRI for...
Table 1: Results

| Table 1: Patient Characteristics and Surgical Outcomes | n=311 |
|--------------------------------------------------------|-------|
| **Patient Characteristics**                                      |       |
| Age (median, IQR)                                                | 57(48-64) |
| Male gender                                                     | 63.9% |
| ASA                                                              | 2 (1-2) |
| BMI                                                             | 28.8 (25.31-33) |
| Tumour size                                                      | 3.1 (2.45-8) |
| PADUA                                                            | 7(7-8) |
| Pre-op eGFR                                                      | 78.76 |
| **Surgical Outcomes**                                           |       |
| Mean difference Pre-op – 6 mo Post-op                           | 5.71 |
| EBL                                                             | 150 (100-250) |
| Op Length                                                       | 170 (150-180) |
| LOS                                                             | 3 (2-3) |
| WIT                                                             | 18 (15-20) |
| Conversion to Radical Nephrectomy                               | 1.3% |
| Complication (Clavien III-IV)                                   | 2.6% |
| Positive Margin                                                 | 3.5% |
| Trifecta                                                        | 67.9% |

the detection of clinically significant primary prostate cancer.

**Methods:** A local prospective database (REDCap-Monash) was maintained on patients who underwent MRI in our urology practice from July 2013 to December 2017. All patients who had an MRI for diagnosis of prostate cancer, subsequent transperineal biopsy, and a PSMA PET/CT for initial staging were included, with significant cancer being defined as greater than or equal to Gleason 3 + 4 = 7 (ISUP Grade Group 2).

**Results:** The database contained 2283 patients who underwent prostate MRI. 239 patients subsequently underwent both biopsy and PSMA PET/CT. 202 biopsies (84.5%) showed significant cancer. Of the non-significant cancer cases, 21 (8.8%) revealed Grade Group 1 lesions and 16 (6.7%) were benign. For significant cancers, 189 PSMA PET/CT scans demonstrated local PSMA avidity in the prostate, compared to 174 positive (PIRADS 4 or 5) MRI scans. MRI detected fewer insignificant cancers, but resulted in more false negatives. Overall, sensitivity and specificity for PSMA PET/CT and MRI respectively were 93.6%, 64.9% and 87.1%, 70.3%.

**Conclusions:** In this highly-selected cohort of patients undergoing prostate MRI, transperineal biopsy and PSMA PET/CT for staging as part of clinical practice, PSMA PET/CT outperformed MRI in detecting clinically significant primary prostate cancer. It is proposed that PSMA PET may be used in both diagnosis of primary cancers and staging, although cost-effectiveness in this dual role warrants further investigation. Higher sensitivity achieved by PSMA PET/CT comes at the expense of detecting clinically insignificant disease, evidenced by higher false-positive rates. Furthermore, the soft-tissue resolution and anatomical detail is inferior to MRI.

**Comparison of post chemotherapy retroperitoneal lymph node dissection (PC-RPLND) outcomes from a single high volume UK centre with national registry outcomes**

**Introduction and Objectives:** According to UK national registry figures, 151 open RPLNDs are performed annually for testicular tumours, centralised to 17 specialist centres. The median operation time is 3–4 h, median length of stay is 6 days and transfusion rate 22.5%.

Our centre receives referrals from within our Testis Cancer Supra-Network, as well as complex cases (massive or growing teratomas) and redo RPLNDs referred from centres.

We aimed to review our outcomes and compare them with a 12-month national data registry of this procedure in the UK (BAUS RPLND National Registry) to which all 17 centres contributed.

**Methods:** We analysed the electronic records of all open RPLNDs performed for testicular tumours at our institution under two lead surgeons between July 2012 and October 2018. Indications for surgery, length of stay, transfusion rate, Clavien graded complications and histology. Our second monthly morbidity and mortality audit records were cross-checked for completeness of complication capture. Data were compared to that of the BAUS registry. Chi-squared testing was used to assess for statistical significance between two percentages.

**Results:** Transfusion rates were significantly lower than registry data (p = 0.0107).

**Conclusions:** Despite a greater number of vascular procedures and visceral resections, reflective of the complex caseload at our high-volume centre, our peri-operative outcomes are comparable to that of registry data with low Clavien III+ complication rate. Our transfusion rate is significantly lower than registry figures.

At both our centre and the UK national cohort the histological findings of necrosis/fragmentation was substantially lower than reported in other large series worldwide, possibly reflecting selection criteria for post-chemotherapy surgery.

**An exploration of leptin and leptin receptor protein expressions in clear cell renal cell carcinoma tissue and their association with obesity**

**Introduction and Objectives:** Obesity is a recognized risk factor for renal cell carcinoma (RCC). Studies done to date...
advocate adipokines as players in the development and progression of RCC. There are limited studies on leptin and its receptor in terms of comparing between obese and non-obese in clear cell RCC (ccRCC). Leptin and leptin receptor are adipokines secreted from adipose tissue. They were investigated in obese and non-obese ccRCC patients to compare expression levels and correlate the expression levels with stage, grade and prognosis of ccRCC post-operation.

Methods: Sixty-eight consented ccRCC patients with formalin fixed paraffin embedded (FFPE) blocks of the cancer and paired non-cancer kidney were assessed. The expression of leptin and leptin receptor was determined by immunohistochemistry (IHC) followed by correlation analysis of leptin and leptin receptor with clinicopathological features and prognosis. Obesity was determined using body mass index (BMI). Aperio morphometry was done using a positive pixels score. Protein expression and clinicopathological features were compared using ANOVA. Kaplan Meier was used to assess other adipokines with a big cohort to analyse this factor and to identify a novel biomarker for RCC.

Adiponectin as a prediction marker in renal cell carcinoma – a meta-analysis study

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Introduction and Objectives: Obesity is a risk factor of renal cell carcinoma (RCC) and metabolic imbalance in obesity and RCC can lead to abnormal levels of adipokines, including adiponectin. The objective of this meta-analysis was to evaluate the significance of adiponectin as a marker for detection or prediction for RCC.

Methods: A complete exploration using PubMed, Web of Science (WOS) and CINAHL were performed. Qualified case-control or cohort studies reported circulating adiponectin levels in RCC cases versus controls, RCC T/N/M stages, Fuhrman grades or different RCC subtypes. Statistical analyses were done using RevMan version 5.3 for Windows (The Cochrane Collaboration).

Results: Seven studies with a total of 1942 RCC cases and 2191 controls compared circulating adiponectin levels between RCC cases and controls. These studies were divided into pre-diagnosis, pre-operative and post-operative subgroups with blood for adiponectin analysis taken at these three time points. Adiponectin level was significantly lower in RCC cases compared to controls for the pre-diagnosis (mean difference –0.60 μg/ml, 95% CI –1.06 to –0.14, p = 0.01) and pre-operative (–2.12 μg/ml, 95% CI –3.96 to –0.28, p = 0.02) subgroups. In the post-operative study, adiponectin level was significantly higher in RCC cases compared to controls (1.36 μg/ml, 95% CI 0.77 to 1.95, p < 0.01). RCC cases with different T and N stages did not affect circulating adiponectin levels. Patients without metastasis had a higher but non-statistically significant adiponectin level compared to those with metastasis (1.58 μg/ml, 95% CI –0.32 to 3.47, p = 0.10). There was no significant difference between RCC patients with G1-2 and G3-4 and different subtypes of RCC.

Conclusions: This meta-analysis found that circulating adiponectin is significantly lower in RCC cases compared to controls, in pre-diagnosis and pre-operative phases. Low circulating adiponectin could be a possible predictive or risk factor for RCC.

| ccRCC (mean ± SD) | Adjacent normal kidney (mean ± SD) |
|-------------------|----------------------------------|
| **Leptin**        |                                  |
| Overall positivity pixel % | 30.43 ± 14.90 (n = 67) | 31.30 ± 14.16 (n = 52) |
| Nuclear positivity pixel % | 8.70 ± 8.35 (n = 67) | 7.51 ± 8.01 (n = 52) |
| **Leptin receptor** |                                  |
| Overall positivity pixel % | 15.08 ± 12.57 (n = 67) | 16.60 ± 11.49 (n = 56) |
| Nuclear positivity pixel % | 3.28 ± 3.99 (n = 67) | 2.39 ± 2.36 (n = 56) |
| **Obese (BMI ≥ 25)** |                                  |
| Overall positivity pixel % | 14.90 (n = 67) | 14.65 (n = 39) |
| Nuclear positivity pixel % | 3.60 (n = 39) | 3.41 (n = 28) |
| **Non-Obese (BMI ≤ 24)** |                                  |
| Overall positivity pixel % | 27.45 ± 14.55 (n = 39) | 34.59 ± 14.65 (n = 28) |
| Nuclear positivity pixel % | 8.66 ± 8.14 (n = 39) | 8.74 ± 8.80 (n = 28) |
| **Leptin receptor** |                                  |
| Overall positivity pixel % | 14.92 ± 13.07 (n = 39) | 15.32 ± 12.09 (n = 28) |
| Nuclear positivity pixel % | 3.60 ± 4.38 (n = 39) | 2.86 ± 3.41 (n = 28) |

The survival analysis in leptin and its receptor overall and nuclear expression did not demonstrate any significant differences that linked expression with worse survival prognosis (OS, DSS, RFS).

Table 1. Expression of leptin and leptin receptor

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The Use of 68Ga-PET/CT PSMA in the staging of primary and suspected recurrent renal cell carcinoma

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Introduction and Objectives: The role of 68Ga-PSMA PET/CT in the staging of prostate cancer is well known and is currently undergoing intensive research. Interestingly, PSMA has also been shown to be overexpressed in the neovasculature of renal cell carcinoma (RCC), suggesting there may be a role for the use of 68Ga-PSMA PET/CT in the investigation of RCC. Thus far, there have only been a handful of case reports and case series documenting the use of 68Ga-PSMA PET/CT in the investigation and management decisions of RCC, with only 27 patients in total across 6 studies for both primary staging and restaging of RCC respectively.

Methods: This was a retrospective single institution case series of men who received a 68Ga-PSMA PET/CT scan for staging or restaging of RCC between January 2016 and April 2018 at the Royal Brisbane and Women’s Hospital. Inclusion criteria was all men who received a scan for either (1) primary staging, or (2) restaging of RCC. The primary outcome measure was to identify whether 68Ga-PSMA PET/CT scan changed management compared to decisions made from contemporary CT imaging. Analysis was based on 4 categories;

1 Identification of new disease
2 Refuting disease on contemporary CT imaging
3 Identification of synchronous primaries
4 Concordance with contemporary CT imaging (i.e. no change in management)

Results: 28 68Ga-PSMA PET/CT scans at the RBWH met inclusion criteria. Primary staging scans were performed in 13 patients. 62% of scans performed for primary staging showed PET – avid lesions, with all lesions of clear cell histology on examination of resection sample. 1 patient with non-avid lesion had biopsy-proven papillary RCC. The other 4 lesions were not biopsied and were placed on surveillance. Management was changed in 54% of patients receiving a primary staging scan. Restaging scans were performed in 15 patients. 66% of patients had management changed by results of 68Ga-PET/CT PSMA scans.

Conclusion: This study provides evidence for the potential use of 68Ga-PSMA PET/CT in both primary staging and investigation of recurrent malignancy, with imaging directly changing management in more than half of all patients. Further analysis, both with respect to efficacy and cost-benefit, is required to determine whether there is a role for routine 68Ga-PSMA PET/CT imaging in all patients with suspected RCC or recurrent disease. More importantly, the accuracy for the detection of the various histological variations of RCC needs further clarification with prospective data.

Introduction and Objectives: There has been rapid uptake of multiparametric MRI (mpMRI) in Australia since 2012 for staging of prostate cancer in Australia. Optimal interpretation of the information available on an mpMRI remains a focus of uro-oncological research. There is increasing interest in the use of apparent diffusion co-efficient (ADC) values as a tool for the identification and risk stratification of suspected malignant lesions. This study analyses the relationship between ADC and the Gleason grading of prostate cancer.

Methods: A retrospective study was conducted of all consecutive men presenting to a high volume radiology unit between July 2014 and August 2017 for a mpMRI as investigation of suspected prostate cancer and who had an abnormal PIRADS 3-5 mpMRI lesion and subsequently proceeded to prostate biopsy. The mpMRI ADC value was compared to the biopsy Gleason score and also to the final histology of men who subsequently proceeded to a radical prostatectomy.

The primary outcome measure was to determine the relationships between mpMRI ADC value and biopsy Gleason score. The secondary outcome measures were to determine the relationship between mpMRI ADC value and extracapsular extension, margin status and final Gleason score in men who proceeded to radical prostatectomy.

Results: 838 men in total met inclusion criteria. A PIRADS 3 lesion was identified in 64 men (7.6%), PIRADS 4 lesion in 353 men (42.1%) and PIRADS 5 lesion in 421 men (50.2%). Of these men, only 5 had benign biopsies (1 × PIRADS 3, 2 × PIRADS 4, 2 × PIRADS 5).

Highest grade lesions were predominantly located in the peripheral zone (720 men, 85.9%) followed by transitional zone lesions (101 men, 12.1%) and finally central zone lesions (27 men, 3.2%). As ADC values reduced, the Gleason score on
biopsy and the PIRADS score both increased (Figure 1 for PZ lesions).

609 men from this cohort proceeded through to radical prostatectomy. As ADC values decreased, Gleason score on prostatectomy, as well as the number of men with ECE and positive margins all increased. MRI was generally found to underestimate disease across all prostatic zones, with T3a disease in particular difficult to differentiate from T2 disease.

Conclusions: This study provides evidence for the role of mpMRI in the grading of prostate cancer, with ADC sharing an inverse relationship with Gleason score for significant disease. ECE, positive margin rate and Gleason Score were all inversely related to ADC values, suggesting it may be a useful predictor of severity of disease. However, mpMRI appears to underestimate disease across all prostatic zones particularly when assessing for extracapsular extension.

Patients affected by urologic cancer expect multidisciplinary team (MDT) discussion: a review of patient awareness and expectations in Western Australia

Introduction and Objectives: MDT meetings facilitate communication between health care professionals, ensure clinical accountability and encourage evidence based and standardised practice. In Australia uro-oncological MDT’s are not mandatory and practice is extremely variable. Conversely, in the United Kingdom, all patients diagnosed with a urological cancer are discussed at an MDT. Our objective was to review the attitudes and perspectives of patients whose case was discussed at a uro-oncology MDT facilitated by a tertiary hospital in Perth, Western Australia. This facility is the only hospital in Western Australia where all urological cancer cases, without exception, are discussed at least once at a uro-oncology MDT.

Methods: 60 sequential patients who had their case discussed at a uro-oncology MDT between 01 January to 31 March 2018 were contacted and asked to participate in a phone questionnaire designed to explore perspectives regarding MDT discussion of all uro-oncological cases. This concept was also discussed with the Australian and New Zealand Urogenital and Prostate Cancer Trials Group (ANZUP) Consumer Advisory Panel (CAP).

Results: 50 patients (83%), including of 44 males (88%) and 6 females (12%) with an average age of 60 completed the questionnaire. 10 patients were unable to be contacted. 28 participants (56%) were aware of a uro-oncology MDT. 38 participants (76%) were aware their case was discussed at an MDT. 100% of participants considered it extremely important for hospitals to conduct formal MDT discussions and for all urological cancer cases to be discussed. 49 participants (98%) would prefer to be treated at a hospital where their case would be discussed at an MDT. 48 participants (96%) were happy with the communication they received following the MDT discussion. 41 (82%) participants stated they would be happy to wait up to 1 month for management of their condition if it meant their case would be discussed at an MDT. Members of the CAP similarly expressed the opinion that an MDT discussion is a preferred way of dealing with all oncology cases. CAP members who were cancer patients expressed the opinion that they would all prefer that their case was discussed at an MDT.

Conclusions: The majority of patients expressed extreme satisfaction with the uro-oncology MDT process and communication of results. Despite a significant number of patients not hearing about an MDT before, after appropriate explanation a preference was expressed for having treatment conducted at a hospital where all urological cancer cases were discussed at an MDT. CAP members share the opinion that ‘MDT discussion should be a baseline standard’ for all uro-oncological patients.

10 year outcomes of the first ‘one stop haematuria clinic’ in an Australian public hospital

Introduction and Objectives: Urgent assessment of haematuria is critical to exclude malignancy. The objective of this study is to report the 10 year prospectively collected outcomes from a dedicated one stop haematuria clinic (OSHC) at a tertiary-level public teaching hospital. The configuration of the service has been previously reported.

Methods: All patients assessed in the OSHC between May 2008 and September 2018 were included in the analysis. Outcomes were recorded prospectively and reviewed retrospectively. All patients diagnosed with a urothelial tumour over this period were identified. Gender, age, outcomes following OSHC attendance, diagnoses and wait times were recorded.

Results: A total of 313 patients were seen in the OSHC with non-visible (1025, 34%) and visible haematuria (1988, 66%) during this time period. 314 (10.5%) patients were diagnosed with urothelial carcinoma. 306 (10.2%) had lower tract disease and eight (0.3%) with upper tract disease, comprising of 163 (51.9%) Ta, 14 (4.5%) T1, 70 (22.3%) T1 and 67 (21.3%) T2-4. Urothelial carcinoma was diagnosed more often in males (74.6%), older patients (68.4%, aged over 65) and patients with visible haematuria (90.2%). In all, 52.6% of patients were discharged after a single visit to the OSHC. Analysis is ongoing to quantify delays in diagnosis and treatment of urothelial carcinoma.

Conclusions: The OSHC has served as an effective tool for rapid, streamlined assessment of patients presenting with haematuria and this model of care has been subsequently adopted by numerous public centres across Australia. However, current funding models present barriers to this excellent approach to rapid access diagnostics.

Patterns of clinical utilization of Gallium labelled prostate specific membrane antigen Positron emission tomography Magnetic Resonance Imaging (PSMA PET/ MRI) hybrid imaging in prostate cancer patients

Introduction and Objectives: Positron emission tomography (PET) using prostate
specific membrane antigen (PSMA) has been introduced to improve localized and metastatic prostate cancer detection compared to standard imaging. Hybrid PET/Magnetic Resonance Imaging (MRI) potentially further improves characterization of lesions with complementary information from MRI with added PET avidity. We sought to evaluate the utilization of this novel imaging modality at a tertiary, academic center and assess initial outcomes.

Methods: Following Institutional Review Board approval, a retrospective review of all PSMA PET/MRI scans undertaken at the Princess Alexandra Hospital (PAH) since the introduction of the technology was performed. Imaging data was collected alongside baseline clinical data, prostate specific antigen (PSA), previous histology, previous treatments, indication of scans, requesting clinicians and clinical outcomes.

Results: A total of 300 PSMA PET MRI scans were performed at the PAH from April 2015 to April 2017, with a median age of 68 years and median PSA of 6 ng/ml at the time of scan. Median initial Gleason score was 7. 246 scans were positive for PSA avid disease (82%). Indications for scans included biochemical recurrence (n = 139), pre-operative staging (n = 115), evaluation of systemic treatment response or re-staging (n = 39) and 7 for diagnostic purposes. Urologists requested PSMA PET MRI most frequently with 159 scans, of which 59.7% were for pre-operative staging. Radiation oncologists requested 121 scans, 56% of those were in the setting of biochemical recurrence (BCR). 20 scans were requested by medical oncologists, mainly for BCR. 112 scans were requested by external clinicians to the PAH (56 Urologists, 51 Radiation oncologists and 5 medical oncologist).

Amongst patients with BCR the lowest PSA of a positive scan was 0.02 ng/ml. Conclusions: PSMA PET MRI has had rapid uptake in use since introduction at the PAH. Urologists and radiation oncologists appear to utilize this imaging modality most commonly with Urologists using PSMA PET MRI in the pre-operative setting for a ‘one stop shop’ staging study, whereas radiation oncologists using PSMA PET MRI in the biochemical recurrence setting. Hybrid PET/MRI may be used to stage men locally and systemically with a single scan, with lower radiation for patients and even at PSA levels <1 ng/ml. This modality has the potential to significantly improve prostate cancer staging and allow early identification of recurrent disease.

**Can the use of rectal swabs prevent sepsis from fluoroquinolone resistant E. coli in men undergoing transrectal ultrasound-guided needle prostate biopsy?**

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Introduction and Objectives: Ultrasound guided prostate biopsy remains the gold standard for prostate cancer diagnosis. Current literature identifies an increasing incidence of fluoroquinolone resistant E. coli (QREC) on rectal swabs. We aim to evaluate the use of rectal swabs in detection and management of QREC in patients undergoing transrectal ultrasound guided biopsy (TRUSBx) and it’s cost effectiveness.

Methods: A retrospective study was performed on all men who underwent a TRUSBx from 2012 to 2018 within the Central Coast, New South Wales, Australia. A majority of urologists performed rectal swab pre-TRUSBx. All patients received ciprofloxacin prophylaxis except when QREC was identified, where either transperineal prostate biopsy or meropenem prophylaxis were offered. Results were compared against a contemporary study conducted in Victoria, Australia (Leahy et al. 2015) where ciprofloxacin prophylaxis was used with ertapenem used on an anecdotal basis and no rectal swabs performed.

Sepsis rates, incidence of QREC and cost effectiveness of routine rectal swab were assessed. Fisher’s exact test was used for statistical analysis.

Results: 1668 men underwent TRUSBx; 563 (34%) had pre-TRUSBx rectal swab. Mean age was 67 and mean number of cores taken was 17 (range 2–42). The comparison study included 1977 patients without rectal swab performed, mean number of cores 17 (range 10–22) and age was not reported. Of the 1105 patients who did not have a rectal swab, 8 developed sepsis with 2 of these patients having ciprofloxacin resistant bacteraemia.

QREC positive rectal swabs were found in 23 men: 20 received meropenem prophylaxis; 3 inadvertently received ciprofloxacin and were excluded due to not falling within standard treatment protocol, 2 of which developed sepsis (1 having QREC bacteraemia).

None of the 20 patients with QREC positivity given meropenem prophylaxis developed sepsis. Of the 540 patients with QREC negative rectal swab, 8 developed sepsis. There was no significant difference in sepsis rates between patients with QREC positive swab vs those with negative swab (2/23 [8.7%] vs 8/540 [1.5%]), however there would have been no incidence of sepsis for patients with QREC if they all received appropriate antibioprophylaxis.

After accounting for the 3 excluded patients, there were 17 men that developed sepsis, significantly lower than the comparison study (1.02% vs 3.18% p < 0.01); 4 of those had QREC positive blood and/or urine cultures, significantly lower than the comparison (4/1668 vs 23/1977; p < 0.01).

24 rectal swabs are needed to identify one patient with QREC positivity, a total cost of $3216. The average cost per admission for sepsis was $7819, suggesting routine rectal swab as a cost-effective strategy enabling appropriate antibioprophylaxis to minimise risk of TRUSBx sepsis.

Conclusions: In this study, overall TRUSBx sepsis rates are lower than those in comparable literature. Rectal swab resulted in a change of practice which could reduce sepsis if appropriate antibioprophylaxis was given in the context of QREC positive swab. However, a negative rectal swab does not eliminate the risk of sepsis. We recommend that routine rectal swab is a cost-effective strategy that can be used to guide targeted antibioprophylaxis and minimise preventable sepsis in patients undergoing TRUSBx.

**Examining completeness and agreement of comorbidity data obtained from administrative data, medical records and self-reports by men diagnosed with prostate cancer undergoing radical prostatectomy**

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Introduction and Objectives: The Prostate Cancer Outcomes Registry- Australia
Introduction and Objectives: There is an absence of evidence confirming the oncological superiority of one treatment strategy directly compared to another for localised penile cancer, and treatment decisions depend largely on experience of the treating clinician. Surgical decision making and data set comparisons would be significantly enhanced by consistent, reproducible system that quantitates the pertinent characteristics of localised penile tumours.

Currently, there is no system to characterise penile tumours. We present a structured, reproducible, quantitative scoring system to describe and classify the most surgically relevant features of localised penile cancer.

Methods: A consecutive sample of men undergoing surgery for penile cancer from January 2000 to August 2018 from 8 institutions were included. We defined complex tumours as those that underwent radical penectomy. Multivariable logistic regression analysis were used to identify predictive factors for complex penile tumours. We then used the beta coefficients from this model to develop a complexity score akin to nephrometry complexity score.

Results: A total of 90 patients were eligible for analysis of which 15 (16.7%) underwent radical penectomy. Lesion location and cystoscopy results were found to be predictors of undergoing radical surgery. Lesions located in areas other than the glans were significantly more likely to be complex and undergo radical penectomy [OR 10.02, 95% CI 2.34–55.84]. Patients with a lesion observed on cystoscopy were also more likely to require radical treatment [OR 52.94, 95% CI 3.67–1691.04].

The PEN13 score allocated points for the following clinical characteristics: (P)
studies, human papillomavirus (HPV) profiling and short tandem repeat analysis. **Results:** To date we have established an HPV-negative and HPV-positive PeSCC cell lines. In addition, we have established 8 organoid lines, 6 from primary tumor and 2 from matched LNM. Once characterized, further investigation into the biology, chemo and radio-sensitivity of the lines will be undertaken. **Conclusions:** To our knowledge, these are the first PeSCC organoid models to be established, and the largest panel of PeSCC cell lines currently available.

**Introduction of a structured robotic training program in the Australian public health system: effect on patient outcomes**

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**Introduction and Objectives:** After opening the robotic training institute in the Sydney Local Health District in January 2017, we developed a modular urologic robotic training program which was implemented in February 2018. To guarantee patient safety certain criteria had to be met before the trainee was credentialed to operate on the console. These criteria consisted of the completion of e-learning modules, live case observation and being bedside assistant >10 cases, completion of an advanced robotic skills course including dry lab and wet lab training and a minimal 10 h of simulator training with performance scores ≥90% in designated simulator modules. In this study we assessed the effects of a surgical robotic training program on patient outcomes. **Methods:** Between January 2017 and October 2018 105 patients had a Robot-assisted Radical Prostatectomy (RARP). All data was prospectively collected. We compared clinical and oncological outcomes between 68 patients in which the consultant performed the procedure and 37 patients in which the fellow had operated on the robotic console in a modular approach. Continuous variables were compared using the independent t-test, categorical variables using the χ² [2] test.

| Characteristics (Mean ± SD or N (%)) | Procedure performed by consultant | Procedure performed (partially) by the fellow | p-Value |
|-------------------------------------|-----------------------------------|-----------------------------------------------|---------|
| Age (years)                         | 64.1 ± 8.4                        | 64.5 ± 7.1                                    | 0.821   |
| BMI (kg/m²)                         | 27.2 ± 4.5                        | 27.0 ± 5.4                                    | 0.841   |
| PSA (ng/ml)                         | 7.96 ± 5.6                         | 8.81 ± 7.1                                    | 0.517   |
| ASA                                 |                                   |                                               |         |
| 1                                   | 4 (11.8%)                         | 5 (13.5%)                                     | 0.435   |
| 2                                   | 27 (79.4%)                        | 25 (67.6%)                                    |         |
| >3                                  | 3 (8.8%)                          | 7 (18.9%)                                     |         |
| Gleason score                       |                                   |                                               |         |
| ≤6                                  | 4 (5.9%)                          | 0 (0%)                                        | 0.255   |
| 7                                   | 52 (76.5%)                        | 29 (87.9%)                                    |         |
| ≥8                                  | 12 (17.6%)                        | 4 (12.1%)                                     |         |
| Extraprostatic extension            | 34 (50%)                          | 17 (50%)                                      | 1.000   |
| Seminal vesicle invasion            | 13 (19.1%)                        | 4 (12.1%)                                     | 0.378   |
| Length of stay (days)               | 1.94 ± 2.05                       | 2.05 ± 0.47                                   | 0.509   |
| Positive surgical margins           |                                   |                                               |         |
| Overall                             | 19 (28.4%)                        | 9 (26.5%)                                     | 0.841   |
| pT2 tumors                          | 5 (14.7%)                         | 3 (17.6%)                                     | 0.785   |
| pT3 tumors                          | 14 (42.4%)                        | 6 (35.3%)                                     | 0.626   |
| Blood loss (ml)                     | 246.55 ± 187.65                   | 359.71 ± 216.42                               | 0.032   |
| Transfusion rate                    | 0 (0%)                            | 0 (0%)                                        | 1.000   |
| Leaking cystogram                   | 7 (14.0%)                         | 4 (13.3%)                                     | 0.933   |
| Complication rate                   | 10 (14.7%)                        | 3 (8.1%)                                      | 0.536   |

**Results:** Age, BMI, ASA score preoperative PSA, post-operative Gleason score, extra prostatic extension and seminal vesicle invasion did not differ significantly between the two groups (see table). Complication rate, positive surgical margin rate and leaking on cystogram also did not differ between the two groups. The amount of blood loss was higher when the fellow operated on the console (p = 0.03), but none of the patients in the cohort needed a blood transfusion. **Conclusions:** Patients who had the fellow performing RARP in a modular approach did not have more complications or positive surgical margins. Although a fellow performing parts of the procedure caused more blood loss, this amount can still be considered within the normal range for this procedure. Our structured urologic robotic training program did not influence patient safety.

**Current treatment for low-risk prostate cancer in China: a national network survey**

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**Introduction and Objectives:** The recommendations of multiple guidelines and an increasing number of studies have demonstrated the important role of AS in LRPC. Herein, we aim to analyze the current treatment for low-risk prostate cancer (LRPC) in China. **Methods:** A national questionnaire survey titled “A survey of current treatment of LRPC” was designed and released nationally through the network from July 16 to August 3, 2017.
Results: A total of 1116 valid questionnaires were recovered. The percentages of preferred treatment by active surveillance (AS) or radical prostatectomy (RP) were 29.21% and 45.61%, respectively. A correspondence analysis showed that the physician in charge was more inclined to choose AS than RP. Respondents from different institution types, hospitals with different annual numbers of newly admitted patients with prostate cancer, and with different familiarity with the LRPC definition presented a significant difference in the preferred treatments ($p < 0.05$). Urologists chose AS or not for the following reasons: tumor progression (52.51%), potential medical disputes (42.56%) (i.e., medical disputes from patients or their relatives when urologists choose AS to treat patients with LRPC and the patient has a poor outcome), fear of cancer (41.94%), and surgical risk (39.07%). These reasons were ubiquitous, and there was no significant difference among urologists for these concerns ($p > 0.05$). Personal skills, surgical risk, and tumor progression were the most common factors that influenced whether AS or RP was preferred ($p < 0.05$). Concern about the medical disputes brought about by AS was a key factor for not choosing AS ($p < 0.05$).

Conclusions: LRPC is still dominated by RP in China, followed by AS. Personal skills, surgical risk, and concern about tumor progression were the common factors influencing whether AS or RP was preferred. In addition, medical disputes brought by AS are another key factor for not choosing AS. There will be more Chinese data in the future to guide treatment of LRPC.

Robotic renal autotransplantation: a minimally invasive method of repairing complex renal artery aneurysms

Abstract withdrawn

Table 1. Logistic regression analysis results of whether choosing AS

| Dependent variable | Independent variable | B     | SE   | Ostwald coefficient | p     | Exp (B) | Exp (B) 95% CI |
|-------------------|----------------------|-------|------|---------------------|-------|---------|----------------|
| AS                | Genders              | 0.061 | 0.398| 0.023               | 0.879 | 1.063   | 0.487–2.318   |
|                   | Titles               | 0.048 | 0.077| 0.061               | 0.929 | 1.05    | 0.903–1.220   |
|                   | Hospital types       | 0.144 | 0.096| 0.225               | 0.133 | 0.866   | 0.717–1.045   |
|                   | ANP                  | 0.017 | 0.071| 0.056               | 0.813 | 1.017   | 0.884–1.170   |
|                   | FLD                  | 0.101 | 0.102| 0.986               | 0.321 | 0.904   | 0.740–1.104   |
|                   | Individual skills    | 0.563 | 0.175| 10.388              | 0.001 | 0.57    | 0.404–0.802   |
|                   | Surgical risk        | 0.817 | 0.142| 33.267              | 0.000 | 2.264   | 1.715–2.989   |
|                   | Tumor progression    | 0.334 | 0.144| 5.386               | 0.001 | 0.716   | 0.540–0.949   |
|                   | Medical disputes     | 0.325 | 0.156| 4.327               | 0.038 | 0.722   | 0.532–0.981   |
|                   | Patient loss         | 0.121 | 0.218| 0.305               | 0.581 | 1.128   | 0.735–1.731   |
|                   | Fear of cancer       | 0.26  | 0.15  | 2.998               | 0.083 | 0.771   | 0.574–1.035   |
|                   | Other reasons        | 0.327 | 0.22  | 2.21                | 0.137 | 1.386   | 0.901–2.133   |
|                   | Constant             | 0.379 | 0.521| 0.529               | 0.467 | 0.684   | 0.487–2.318   |

ANP, annual numbers of newly admitted patients with PCa; AS, active surveillance; CI, confidence interval; FLD, familiarity with LRPC definitions.

Table 2. Logistic regression analysis results of whether choosing RP

| Dependent variable | Independent variable | B     | SE   | Ostwald coefficient | p     | Exp (B) | Exp (B) 95% CI |
|-------------------|----------------------|-------|------|---------------------|-------|---------|----------------|
| RP                | Genders              | 0.143 | 0.376| 0.145               | 0.703 | 0.867   | 0.415–1.811   |
|                   | Titles               | 0.193 | 0.073| 7.056               | 0.008 | 1.213   | 1.052–1.398   |
|                   | Hospital types       | 0.003 | 0.09  | 0.001              | 0.976 | 0.997   | 0.835–1.190   |
|                   | ANP                  | 0.033 | 0.067| 0.235               | 0.628 | 0.968   | 0.849–1.104   |
|                   | FLD                  | 0.356 | 0.097| 13.587              | 0.000 | 0.700   | 0.580–0.846   |
|                   | Individual skills    | 0.699 | 0.158| 19.71               | 0.000 | 2.013   | 1.478–2.741   |
|                   | Surgical risk        | 0.995 | 0.139| 50.927              | 0.000 | 0.370   | 0.281–0.486   |
|                   | Tumor progression    | 0.376 | 0.135| 7.753               | 0.005 | 1.456   | 1.118–1.897   |
|                   | Medical disputes     | 0.125 | 0.142| 0.778               | 0.378 | 1.134   | 0.858–1.498   |
|                   | Patient loss         | 0.078 | 0.2   | 0.154               | 0.695 | 1.082   | 0.731–1.600   |
|                   | Fear of cancer       | 0.531 | 0.137| 15.052              | 0    | 1.701   | 1.301–2.224   |
|                   | Other reasons        | 0.651 | 0.23  | 8.029               | 0.005 | 0.522   | 0.332–0.818   |
|                   | Constant             | 0.113 | 0.492| 0.053               | 0.818 | 1.12    | 0.415–1.811   |

ANP, annual numbers of newly admitted patients with PCa; CI, confidence interval; FLD, familiarity with LRPC definitions; RP, radical prostatectomy.