Oral Presentations

Pre-operative urine list – a MDT solution which benefits everyone!

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**Introduction & Objectives:** Many elective urological procedures require pre-operative urine MCS. Co-ordinating this is time consuming and is usually carried out by rotating junior doctors. This can lead to lack of meaningful clinical exposure/work satisfaction, burnout, late cancellations, excessive overtime, and undertreatment/overtreatment with antibiotics. We implemented a six-month-trial utilising a clinical pharmacist to see if we could improve management of our urine list.

**Methods:** A clinical pharmacist (0.5 FTE) was recruited to co-ordinate and review pre-operative urine and blood tests. A pre-operative urine flow chart was designed and introduced to aid clarity. Operative cancellation rates, urology resident overtime and other outcome measures were also recorded. A survey was undertaken for opinion on the new service from members of the MDT team as well as patients.

**Results:** There was a 33% relative risk reduction in operative cancellations due to urinary tract infections, since the implementation of the pharmacy service when compared to same period in 2021. There was also a reduction of overtime by urology residents resulting in a saving of $16,624. Among the 28 MDT respondents of the survey, 86% either strongly agree or agree that the pharmacist should continue to perform this role versus 7% who prefer doctors. All either strongly agree or agree that the pharmacist has improved the overall service efficiency. Only 12% of patients indicated that they would prefer to speak to a doctor. This service was financially self-funded from activity unit generation (Queensland Weighted Activity Unit).

**Conclusions:** The implementation of a urology pharmacist offers administrative, clinical and financial benefits towards improving peri-operative urological service. This model is self-sufficient, reduces junior doctor workload and would be easily applicable to other urology units.

**FDA warning on Finasteride: What should urologists know?**

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**Introduction & Objectives:** Finasteride is a synthetic 4-azasteroid compound that inhibits type II and III 5-alpha-reductase (5-AR) isoenzymes. Regular use reduces prostatic and serum dihydrotestosterone (DHT) by 90% and 70%, respectively. In the prostate, finasteride reduces cellular hyperplasia implicated in Benign Prostatic Hyperplasia (BPH), while in the skin, it acts as an active androgen attributed to Androgenic Alopecia (AGA).

Amid patient reports of Suicidal Ideation (SI), the Post Finasteride Syndrome (PFS) advocacy group have petitioned for the past five years to either stop selling the drug or advertise stronger warnings. In August 2022, the FDA added SI and behaviour to the adverse effects (AE) listed for finasteride. France’s National Agency for the Safety of Medicines and Health Products also released product information in July 2022, which includes “suicidal thoughts that could lead to suicide”. Here we provide a systematic review of the literature on the psychological side effects of 5-alpha-reductase inhibitors to provide an opinion to help guide the treating Urologist.

**Methods:** To establish the SI risk associated with finasteride and the implications for its prescription in Urology, a modified PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) search. MEDLINE and EMBASE were searched with keywords related to “Finasteride”, “Dutasteride”, “5-alpha-reductase inhibitor”, and “suicide” in combination. Inclusion criteria were all English language articles in peer-reviewed electronic publications from January 2000-current. Full-text articles were retrieved, evaluated, and included in the final analysis.

**Results:** A total of 854 articles were identified, 113 abstracts were reviewed, and 38 articles were included in the review. Most of the current evidence is obtained from Dermatology literature, suggesting that 5-AR inhibitor users developed a higher rate of depressive symptoms. Given the lack of comprehensive, randomised studies, the causal link between Finasteride and SI remains unclear. AGA may be associated with low self-esteem, poor body image and depression. Suicide rates are already high in young men with AGA, who are likely the most emotionally affected as it is critical to their self-image.

**Conclusion:** Urologists prescribing 5-alpha-reductase inhibitors should be aware of the recent addition of suicide and SI risk. A mental health (MH) screen should be performed, and appropriate resources provided to patients commencing treatment. Furthermore, a review should be arranged with their general practitioner to assess new onset MH or SI symptoms. Dose titration adjustments or discontinuation of the medication in these circumstances may be appropriate. Further research
is required to establish causation between Finasteride and SI.

The ABCs of complicated artificial urinary sphincter insertion: The tunical flap technique

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Introduction & Objectives: Urethral sphincter disruption during radical prostatectomy is the most common cause of non-neurogenic stress urinary incontinence (SUI). Artificial urinary sphincter (AUS) insertion remains the standard of care for fit patients with SUI refractory to non-operative interventions. The proximal urethra is a common location for uncomplicated AUS placement. However, previous failed AUS, urethroplasty or pelvic radiotherapy may compromise urethral tissue requiring technique modifications that optimise outcomes.

Methods: This narrated video demonstrates the tunical flap modification for transcorporal AUS implantation via a perineal and penoscrotal approach in patients with prior failed AUS placements secondary to urethral erosion.

Results: The perineal approach begins with a midline incision and dissection of the subcutaneous tissues. The bulbocavernosus muscle is displaced, and the bulbar urethra is mobilised circumferentially. Bracket-shaped flaps on the ventral aspect of the tunica albuginea are raised, mobilised over then sutured over the ventral urethra avoiding urethral compression. The tunica defects are overlaid with a graft which is sutured in place. The AUS cuff is then placed over the reinforced urethra.

In the penoscrotal approach, a horizontal incision is made at the base of the penis. A space is created behind the urethra passing through the dorsal wall of the corpora cavernosa to minimise the risk of erosion. A corporal flap for advancement across the defect is created in the remaining tunica albuginea to permit tight closure. After AUS cuff placement around the reinforced urethra, the additional AUS components are inserted in the standard fashion. Cystoscopic evaluation of device cycling is performed to ensure appropriate device function. An indwelling urinary catheter is placed when the device is deactivated. After haemostasis is achieved, skin incisions are closed in multiple layers of absorbable suture material.

Conclusion: The tunical flap technique for transcorporal AUS insertion provides circumferential reinforcement with tunica albuginea from the corpora cavernosa. Here, we show how this technique provides additional urethral support for compromised urethral tissue to help prevent cuff erosion. The tunical flap preserves the corporal volume and does not limit candidacy for future penile prosthesis implantation.

The diagnostic accuracy of renal MRI in a tertiary Melbourne hospital: A 10-year review

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Introduction & Objectives: Magnetic Resonance Imaging (MRI) of the kidney is an uncommon modality for renal imaging. While Ultrasound (USS) and Computed Tomography (CT) are first choice modalities, MRI can be used in the event of compromised renal function, contrast allergy, or avoiding radiation in pregnant women and children. MRI offers excellent soft tissue contrast to characterise renal abnormalities when other imaging findings are non-diagnostic. Previous studies have revealed that MRI has significantly higher specificity than CT with equivalent sensitivities in the assessment of renal masses. Moreover, MRI may alter the Bosniak classification and ultimately change management.

Despite the superiority of MRI to CT, limitation for its use include high cost, long scan time and reduced availability.

Methods: To investigate the diagnostic accuracy of renal MRIs performed at St Vincent’s Hospital Melbourne (SVHM), we performed a retrospective review of all studies completed between 2012 and 2022. MRIs were correlated with USS and CT, while the diagnosis was confirmed using biopsy and tissue diagnosis.

Results: A total of 52 renal MRIs were conducted at SVHM between January 2012 and March 2022. The average patient age was 64 years. 36 patients (69%) were female and 16 (31%) were males. 24 (46%) and 33 (63%) patients underwent an USS and CT, respectively prior to the MRI while 18 (34%) patients had both. Indications for MRI included indeterminate lesions on CT or USS (n = 15, 28%), assessment of renal mass-vascular involvement (n = 10, 19%), renal mass with a contrast allergy (n = 6, 11%), MRI for a medical indication (n = 5, 9%), renal mass with impaired renal function (n = 2, 4%), recurrent positive cytology with no lesion on alternative imaging (n = 1, 2%), haematuria in a 19-year-old patient (n = 1, 2%) and recurrent ESBL urosepsis in a renal transplant to exclude a microabscess (n = 1, 2%). Of the intermediate lesions (n = 15), prior imaging often showed discordance between the USS and CT or was unable to identify solid versus cystic lesions. In this subset, MRI revealed 7 solid lesions, 2 AML and 6 renal cysts. 5 biopsies taken to follow up these lesions identified 4 (26%)
Comparison of antegrade and retrograde ureteric stenting technique for minimally invasive pyeloplasty in adults: A systematic review and meta-analysis

**Introduction & Objectives:**
Pyeloplasty for PUJ obstruction is the gold standard for surgical repair. Laparoscopic and robot-assisted pyeloplasty have gained popularity in recent times. However, there are currently no reports outlining an optimal approach to stent placement. This review aims to determine whether there are differences in operative time in adult patients with PUJ obstruction who underwent antegrade or retrograde ureteric stent insertion during their minimally invasive pyeloplasty.

**Methods:** A systematic review of English-language literature on adult patients with primary PUJ obstruction who underwent minimally invasive pyeloplasty with antegrade or retrograde stent insertion during the procedure was performed. Studies from 1990 to August 2022 searched via MEDLINE, EMBASE and Cochrane Library were considered. Citation and grey literature search were also performed to identify additional literature. Search terms included pyeloplasty, PUJ obstruction, laparoscopic, robot-assisted, stent, antegrade, retrograde, and associated MeSH and Emtree terms were utilised. Inclusion criteria was adult patients with PUJ obstruction who underwent laparoscopic or robot-assisted pyeloplasty, antegrade or retrograde ureteric stent insertion and peer reviewed articles published in English. Paediatric patients, case reports, review articles, editorials, abstracts, and open procedures were excluded.

Operative time for antegrade and retrograde approaches were extracted from included comparative studies for meta-analysis using StataBEv17. Study heterogeneity and publication bias were also assessed.

**Results:** A total of 26 studies with 1154 patients were included in the systematic review including 5 case series and 21 retrospective reviews. Seven studies were eligible for meta-analysis with either laparoscopic transperitoneal dismembered pyeloplasty \((n = 6)\) or robot-assisted transperitoneal dismembered pyeloplasty \((n = 1)\). Antegrade stenting saves on average 37 min \((95\% \text{ CI: 26.4}−47.66)\) in total operative time (Fig. 1).

**Conclusions:** Antegrade stenting in minimally invasive pyeloplasty performed in adults demonstrates a reduction in total operative time by 37 min on average when compared to retrograde stenting. However, given the small numbers and high heterogeneity, higher-quality studies are required for further evaluation.
histopathological correlation. Statistical analysis involved grouping spectra into clinically relevant categories for modelling. One per cent (1%) of outliers were removed and placed through Principal Component Analysis (PCA) for 99% explained variance. This fed artificial neural network models to train a classification model for the spectral data obtained.

**Results:** A total of 84 specimens were analysed from 30 patients. After histopathological examination, 11 specimens were excluded as they contained either denuded urothelium, prostatic carcinoma, or equivocal neoplasms. Thirty-six (49%) specimens had benign inflammation; the remaining 37 (51%) specimens had cancer. Cancer specimens were divided according to grade: 7 (19%) low-grade (LG), 3 (8%) carcinoma in situ (CIS), and 25 (69%) high-grade (HG). CIS and HG were combined for purposes of analysis. Two-group algorithms distinguished benign vs cancer with an accuracy of 74%, LG vs HG 90%, and HG vs non-HG 74%. A three-group algorithm distinguished benign vs LG vs HG with 74% accuracy.

**Conclusions:** Our preliminary results suggest that NIRS could be an effective technology in assessing BCa grade in an ex-vivo setting. Given its low cost and portability, there is potential for NIRS to be integrated with existing endoscopic instruments and prove to be a valuable tool for future urologists.

**Oligometastatic prostate cancer: Evolving definitions in the era of PSMA PET**

**Introduction & Objectives:** Oligometastatic prostate cancer (OMPC) was first hypothesized in 1995 as an intermediary state between localised disease and widespread metastases. Currently, there are varying definitions including 1, 3 or ≤5 visceral or bone metastasis which may potentially be curable. Traditional definitions of OMPC are based on conventional imaging; however, novel imaging modalities such as Prostate Specific Membrane Antigen Positron Emission Tomography (PSMA PET) have improved diagnostic utility in detecting early metastatic prostate cancer (PCa). Meta-analytical data suggest PSMA PET is sensitive in detecting OMPC in patients with biochemical recurrence. Aggressive management of OMPC as a distinct disease state is at the forefront of improving patient survival of an otherwise poorly prognosticated disease, hence the need for a clear definition. However, a universal definition for oligometastatic (recurrent) PCAs is lacking, with number and location being deliberated. Therefore, we aim to explore definitions of OMPC.

**Methods:** A PubMed literature review was performed using key words: prostate cancer, PSMA PET, metastatic disease, oligometastatic.

**Results:** Varying definitions of OMPC including 1–5 visceral or bone metastasis have been proposed. They can be classified based on biology (de novo vs oligorecurrent vs oligoprogressive), location (visceral vs bone vs both) and volume/risk (low vs high). Historically, diagnosis of nodal metastatic disease requires morphologic criteria (>10 mm); however, this is based on conventional imaging. PSMA has increased expression in the prostate and even greater expression in PCa, hence represents an attractive target for imaging of PCa.

PSMA PET has allowed earlier detection of OMPC as lymph node metastases <10 mm may be identified. Recent systematic reviews and meta-analyses have shown PSMA PET detection rates of OMPC compared to conventional imaging.

**Table 1 Representative historical definition of oligometastatic disease in OMPC**

| Study         | Type          | Sample size (n) | Definition | Location | Imaging modality |
|--------------|---------------|----------------|------------|----------|------------------|
| Tabata et al (2012) | Retrospective | 35             | ≤5         | Bone     | 99mTc-MDP bone scintigraphy |
| Ahmed et al (2012) | Prospective   | 21             | ≤5         | Any      | 11C-Choline PET-CT, MRI, CT or combined |
| Ost et al (2016) | Prospective   | 119            | ≤3         | Any      | 18F-FDG PET-CT or 18F-Choline PET-CT |
| Decaestecker et al (2014) | Prospective | 50             | ≤3         | Bone or LNs | 18F-FDG PET-CT or 18F-Choline PET-CT |
| Berkovic (2013) | Prospective   | 24             | ≤3         | Bone or LNs | 99mTc-MDP bone scintigraphy and 18F-FDG PET-CT or 99mTc-MDP bone scintigraphy and 11C-Choline-CT |

LN, lymph node; Tc, technetium; MDP, methylene diphosphonate; MRI, magnetic resonance imaging; FDG, fluorodeoxyglucose; PET, positron emission tomography; CT, computed tomography.
imaging was significantly higher 
\[ p = 0.005 \] with a positive predictive value of 95.2% and best at pre-PET PSA levels of >0.2 ng/mL. To date, there are no novel definitions of OMPC utilising PSMA PET, highlighting the need for a consensus.

**Conclusions:** The definition of OMPC has evolved with improvement of imaging modalities more specific to PCA. Although OMPC presents a treatment challenge, earlier detection with PSMA PET may enable metastases directed therapy and delay systemic therapy.

**A systematic review on stented vs stentless technique for minimally invasive pyeloplasty in adults**

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**Introduction & Objectives:** Pyeloplasty for PUJ obstruction is the gold standard for surgical repair and laparoscopic and robot-assisted pyeloplasty have gained popularity in recent times. Use of internal stents have been noted to be essential for good drainage and act as a guide for healing tissues. However, ureteric stent us is not without complications. This review aims to explore whether there are differences in outcomes in patients undergoing minimally invasive pyeloplasty with or without a ureteric stent.

**Methods:** A systematic review of English-language literature on patients with PUJ obstruction who underwent minimally invasive pyeloplasty with or without ureteric stent insertion was performed. Studies from 1990 to September 2022 searched via MEDLINE, EMBASE and Cochrane Library were considered. Citation and grey literature search were also performed to identify additional literature. Search terms included pyeloplasty, PUJ obstruction, laparoscopic, robot-assisted, stentless and associated MeSH and EmTree terms were utilised. Evidence synthesis compared operative types, study design, operative time, follow up duration, and overall success.

**Results:** From 196 results, 6 studies met criteria for inclusion. The majority of studies were retrospective reviews (\( n = 5 \)) with one being a prospective comparative study (\( n = 1 \)). A total of 275 patients were identified, 120 stentless and 177 stented procedures with ages ranging from 17–70. The majority of studies were laparoscopic (\( n = 4 \)), transperitoneal (\( n = 4 \)) and dismembered (\( n = 4 \)) approach to pyeloplasty. Operative time ranged from 90–330 min, whilst drain removal ranged from 1–5 days post operation. Operative success, defined as symptom free or obstruction free on post operative Lasix renogram ranged between 88–100% and 89.1–96.9% in the stentless and stented groups, respectively. A total of 9 (7.5%) stentless patients required post operative stent due to prolonged drainage or high drain output. Follow up time ranged from 1–147 months (Table 1).

**Conclusions:** Patients undergoing stentless minimally invasive pyeloplasty appears to have similar outcomes to those undergoing a stented procedure. However, due to small numbers additional high-quality studies are required for further evaluation.

**Table 1 Characteristics of included studies**

| Author, Country | Study design | Sample | Intervention | Age (range) | Lap vs Robot | Operation type | Follow up (months, range) | Success (%) |
|-----------------|--------------|--------|--------------|-------------|-------------|----------------|--------------------------|-------------|
| Shalhav (2007), USA | Retrospective | n = 5 | Stentless (\( n = 5 \)) | 42.8 (33–64) | Lap | Transperitoneal, Dismembered | 18 | 100 |
| Kumar (2010), India | Retrospective | n = 6 | Stentless (\( n = 6 \)) | 27 (20–50) | Lap | Transperitoneal, Dismembered | 40 (6–58) | 100 |
| Bilen (2011), Turkey | Retrospective | n = 48 | Stented (\( n = 21 \)), Stentless (\( n = 27 \)) | 31.8 (16–61) | Lap | Transperitoneal, Dismembered | Stented = 22 (6–36) |
| | | | | | | | | Stentless = 11 (6–16) |
| | | | | | | | | Stentless = 90.4 (Sx-free) |
| | | | | | | | | Stentless = 88.8 (Sx-free) |
| | | | | | | | | Stentless = 94 (Sx free and radiol) |
| | | | | | | | | Stentless = 100 (Sx-free) |
| | | | | | | | | Stentless = 88 (radiol) |
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A drape technique to enable safe ureteropyeloscopy to access the upper urinary tract in patients post-cystectomy with an obliterated ureteric orifice

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Introduction & Objectives: The theoretical risk of tumour seeding that occurs due to fluid leakage into the open abdomen during ureteropyeloscopy post-cystectomy is negated by a unique drape technique performed at our institution. The case was performed on a 72 year old male who was found to have a filling defect in the inferior pole and renal pelvis of the left kidney on CT. Intravenous pyelogram but not MRI in workup prior to his radical cystectomy was staged with both computed tomography (CT) and18F-FDG-PET scans. Those patients were reported on CT. Those patients were referred for CT and18F-FDG-PET for detecting metastasis for the same cohort was 62.5% (95% CI: 35–85%), 83.78% (95% CI: 68–94%), 62.5% (95% CI: 35–85%), and 83.78% (95% CI: 68–94%) respectively. On the other hand, sensitivity, specificity, PPV and NPV of 18F-FDG-PET for detecting metastasis were considered positive in CT scan.

Results: A fungal ball was visualised on ureteropyeloscopy which is the likely cause of the filling defect, which saved this patient from a potential nephroureterectomy for presumed malignancy of the upper urinary tract.

Conclusions: This unique drape technique allows investigation of upper tract via ureteropyeloscopy post-radical cystectomy which minimises the catastrophic risk of tumour seeding into the abdominal cavity in patients who have limited retrograde access due to an obliterated ureteric orifice.

Clinical value of 18F-FDG-PET compared with CT scan in the detection of nodal and distant metastasis in urothelial carcinoma or bladder cancer

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Introduction & Objectives: The presence of lymph node involvement (N) and distant metastasis (M) in patients with invasive bladder cancer is a major determinant of survival and, therefore, a pivotal element in the therapeutic management.

Method: A retrospective review of 76 patients with bladder cancer who were staged with both computed tomography (CT) and18F-FDG-PET scans. Between 2015 and 2020, both imaging modalities being performed within an interval of eight weeks. 75% (57/76) of patients had formal pelvic lymph node (LN) dissection, or biopsy of lesions suspicious for metastases.18F-FDG-PET reports for positive sites were qualitative depending on SUV Max (nodes with SUVmax >4 at any size, SUV >2 for lymph nodes >8 mm, or any SUV if the lymph node was >10 mm on axial images). On the other hand, enlarged LN by RECIST criteria 1.1 (>10 mm) and other qualitative findings suggesting metastasis were considered positive in CT scan.

Results: Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of CT and 18F-FDG-PET were calculated as compared to final histopathology results from LN dissection or biopsies obtained.

Bladder cancer in Ireland following COVID-19: Are patients presenting with more aggressive disease?

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Introduction & Objectives: The COVID-19 pandemic has resulted in delays in the treatment of patients with urological malignancies. The
management of bladder cancer (BC) in particular poses a significant challenge given the recurrent nature of the disease and the intense follow-up regime required for many cases. The aim of this study was to evaluate potential changes in the presentation and operative management of BC in our hospital following the pandemic.

Methods: This is a retrospective cohort study. Potential BC cases were identified through the histopathology database between March 2019 and February 2021. Details were obtained on patient demographics, procedure type such as biopsy, resection or excision, grade and stage of BC. Cases were divided into two groups: period one (pre-COVID between March 2019 and February 2020) and period two (post-COVID between March 2020 and February 2021).

Results: A total of 207 procedures for confirmed BC were performed during the study period, 126 in period one and 81 in period two. New cases accounted for 52.4% (n = 66) and 53.1% (n = 43) of cases during periods one and two respectively. There was a higher rate of invasive disease (43.2% vs 26.2%) as well as high grade disease (47.4% vs 35.8%) in period two than in period one.

Conclusions: Fewer BC procedures were performed in the COVID period. The higher rate of more advanced stage and grade of disease seen in period two suggests patients are presenting later. This should be considered when allocating resources in the management of non-COVID related diseases. Further studies are needed to assess the long-term impact of COVID-19 on bladder cancer outcome.

**Self-reported pain assessment during transperineal prostate biopsy under local anaesthetic alone versus combined nitrous oxide 'Entonox' and local anaesthetic**

**Introduction:** Transperineal prostate biopsy (TP) biopsy under local anaesthetic (LA) in the clinic setting is an accurate method of diagnosing prostate cancer. However, this procedure can be uncomfortable or intolerable. Nitrous oxide inhalation (Entonox) is used regularly in the clinic setting to increase tolerability of procedures, there are no published data on its use in TP biopsy. We aimed to investigate if using Entonox reduced the pain of the procedure.

**Method:** Transperineal prostate biopsies were performed under LA in the outpatient clinic setting in a standard fashion by all clinicians. On sporadic clinic days, Entonox became available, and patients on those days were given Entonox in addition to standard LA.

**Results:** 54 patients underwent TP biopsy and completed the full pain questionnaire. 45 patients were administered only LA. 9 patients were administered combined LA and Entonox. These results are summarised in Table 1.

There was no statistically significant difference in the pain scores when analysed. No patients in either group were admitted to hospital or experienced infection or urinary retention within 30 days of biopsy. In the patients having Entonox, there was no delay to discharge from the clinic nor any reported significant symptoms from the Entonox.

**Conclusions:** Administration of Entonox in conjunction with LA for TP biopsy of the prostate resulted in improved self-reported pain scores during the procedure, without an increase in complication rates. Though this study included only small numbers of patients, it is the first series to show a benefit in pain scores when utilising Entonox in the setting of TP biopsy under LA. With these promising results, we are undertaking a larger trial to confirm this result.

**Holmium laser safety- preconceived impressions**

**Background:** Since its introduction over two decades ago the surgical laser has served in lithotripsy of urinary calculi, resection of bladder tumours, bladder neck incisions and...
A retrospective evaluation of video urodynamic studies in terms of upper urinary tract protection for adult spina bifida patients

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Aim: Majority of literature on spina bifida patients focuses on paediatric population. Renal function often deteriorates into adulthood – mainly urological management is to preserve renal function and maintain continence. Low-pressure stored urine, effective bladder emptying, and prevention of upper urinary tract reflux and infections are required to reach these goals. It’s been previously accepted that in patients with neurogenic bladder, that detrusor leak point pressure (DLPP) greater than 40 cmH2O can put at risk of upper urinary tract damage. We postulate that spina bifida patients have vesicoureteric reflux (VUR) at a lower pressure than 40 cmH2O, as such we either should lower the DLPP cut off or use video urodynamics to assess for reflux.

Method: A single institution retrospective analysis was done of all urodynamic studies performed in the last five years between 2017 and 2022. All patients with a history of spina bifida were included. Urodynamic parameters including bladder capacity, detrusor filling and voiding pressures, DLPP, presence of reflux on fluoroscopy were analysed. Medical history including treatments provided were collected from electronic medical records. This study was in concordance with ethics approval from the Western Sydney Local Health District HREC.

Results: Fifteen patients with spina bifida were included in the study, with a combined total of 30 urodynamic studies. The mean age was 33.9 (20–49), there were 7 men and 8 women. Eight patients were already performing CISC, two had a SPC and one patient with IDC. The mean bladder capacity was 253.53mLs (70–586). Six patients had VUR identified on video fluoroscopy with a mean DLPP of 28.5 cmH2O (18–49). Four of these patients had bilateral VUR, two had unilateral VUR. Two patients had grade 4 VUR, one patient had grade 3, and the rest had grade 1. The mean creatinine in those with VUR was 73.2 μmol/L (26–109), whereas in those without VUR was 52.4 μmol/L (26–79). Only one of the patients with VUR had DLPP greater than 40cmH2O. Five out of nine patients without VUR had recordable DLPP, the mean of this was 53.8 cmH2O (30–99). Total of eleven patients had decreased bladder compliance with mean end filling pressure of 25.75 cmH2O (19–49). Out of these, six patients underwent treatment with Botox and two eventuated with augmentation cystoplasty.

Conclusion: Our study demonstrates that spina bifida patients can have VUR at lower DLPP than 40cmH2O. We also show that patients do not have VUR despite having much higher DLPP than 40cmH2O. Hence, DLPP alone should not be used in decision making on which patients should require more invasive treatment and perhaps video urodynamic findings can be used.
bladder cancer resulting in the development of a standardised approach to imaging and reporting with a scoring system, the Vesical Imaging-Reporting and Data System (VIRADS). However, VIRADS was designed for assessing untreated bladders and does not yet have validated clinical applications. This Pilot study aims to validate VIRADS using mpMRI in our patient population with a view to embarking on a prospective study on the role of VIRADS in pre and post neoadjuvant chemotherapy for muscle invasive transitional cell cancer.

Methods: Patients with a new diagnosis of suspected localised bladder cancer were included in the study. The pilot study aimed to recruit 20 patients to allow familiarity and validation of the existing VIRADS protocol. These patients had lesions identified on imaging such as ultrasound or CT scan or a new lesion identified at flexible cystoscopy. Patients who have had a previous biopsy or resection were excluded from the initial pilot study. All MRI were performed at a single location using a T3 mpMRI scanner. MRI was reported using VIRADS by two independent MRI-experienced radiologists. This allowed the MRI team of radiologists, radiographers, and technicians to familiarise themselves with the standardised mpMRI protocol. Ethics approval was obtained from the Hunter New England Human Research Ethics Committee.

Results: Eleven pre-TURBT patients with suspected bladder lesions have been enrolled with ongoing recruitment. 9 patients have undergone pre-TURBT mpMRI. One patient was unable to proceed due to a vascular stent, the second patient was unable to be scheduled in time for their urgent surgery. Histopathology results have demonstrated transitional cell cancer in all patients. Inter-observer comparison of VI-RADS score, and comparison of reported VI-RADS score with histopathology grade reported at initial TURBT have been assessed.

Conclusions: The role of VI-RADS scoring could potentially expand to indications beyond the initial staging of bladder cancer [16]. Other applications under investigation include bladder cancer surveillance, assessment of neoadjuvant therapies response, and bladder sparing approaches. Our results support ongoing research in our unit to explore the role of mpMRI in other settings.

Focal Irreversible Electroporation as salvage treatment in radio-recurrent prostate cancer: A Prospective Multi-Centre Pilot Study (FIRE Trial)

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Introduction & Objective: To prospectively assess the safety, functional- and oncological-outcomes of irreversible electroporation (IRE) as salvage therapy for radio-recurrent focal prostate cancer in a multicenter setting.

Methods: Men with focal recurrent PCa after external beam radiation or brachytherapy without metastatic disease on staging imaging and co-registration between mpMRI and biopsies were prospectively included in this multicenter trial. Adverse events were reported following CTCAE v5.0. Validated questionnaires were used for patient-reported functional outcomes. Follow-up consisted of 3 monthly prostate specific antigen (PSA) levels, a 6-month mpMRI and standardised transperineal template mapping biopsies at 12-months. Thereafter follow-up was guided by MRI and/or PSMA-PET/CT and PSA. Local recurrence was defined as any ISUP score ≥2 on biopsies.

Results: 37 patients were analysed with a median (interquartile range (IQR)) follow up of 29 (22–43) months. Median age was 71 (53–83), median PSA was 3.5 ng/mL (2.7–6.1). 28 (75.5%) patients harboured intermediate risk and 9 patients (24.5%) high risk PCa. Seven patients (19%) reported self-limiting urgency, frequency, or hematuria (CTCAE grade 1–2). Seven patients (19%) developed a grade 3 AE; urethral sludge requiring transurethral resection. At 12 months post treatment 93% of patients remained continent and erectile function sufficient for intercourse deteriorated from 35% to 15% (4/27). Local control was achieved in 29 patients (78%) and 27 patients (73%) were clear of local and systemic disease. Four (11%) patients had local recurrence only. Six (16%) patients developed metastatic disease with a median time to metastasis of 8 months.

Conclusion: The FIRE trial shows that salvage IRE after failed radiation therapy for localised PCa is safe with minimal toxicity, and promising functional and oncological outcomes. Salvage IRE can offer a possible solution for notoriously difficult to manage radio recurrent prostate tumours.
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Introduction & Objectives: PSA screening and multi parametric MRI are widely used to identify patients with suspected prostate cancer who may benefit from prostate biopsy. Biopsies are typically performed on patients with PIRADs scores 3–5; however, up to 17% of patients with PIRADs scores of 1–2 will harbour clinically significant cancers that would remain undiagnosed using these criteria, while up to 80% of patients with PIRADs 3 do not have clinically significant cancers. Hence there is a requirement for additional tests better able to guide a decision to proceed to prostate biopsy.

MiCheck® Prostate has high sensitivity for detection of clinically significant prostate cancer in an Australian population. MiCheck® Prostate showed sensitivity of 92% and specificity of 39% for detection of clinically significant prostate cancer in the overall patient population. The AUC for MiCheck® Prostate was significantly higher than PSA (0.71 vs 0.58, p = 0.03).

When used post MRI, MiCheck® Prostate showed sensitivity of 94% and specificity of 39% for detection of clinically significant prostate cancer in the overal patient population. The AUC for MiCheck® Prostate was significantly higher than PSA (0.79 vs 0.58, p < 0.0001). In 49 patients with PIRADs score of 3 or lower, MiCheck® Prostate showed sensitivity of 92% and specificity of 68%, with 89% sensitivity and 64% specificity in the PIRADs 3 subgroup.

Conclusions: The current study demonstrates MiCheck® Prostate has high sensitivity for detection of significant prostate cancer in an Australian population. MiCheck® Prostate has high sensitivity for detection of clinically significant cancer when used in both the pre-MRI and post-MRI settings and has high sensitivity in the PIRADs 1–3 subgroup of patients. MiCheck® Prostate provides additional information to urologists and patients in the decision to proceed to prostate biopsy with patients suspected of having prostate cancer.

Varicoceles and Iliac vein compression: Understanding aetiology and treatment failure

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Introduction & Objectives: The aetiology of varicoceles is thought to be related to incompetence of the gonadal vein from various causes. The current theories do not completely explain all the issues that are a feature of varicoceles such as laterality (high incidence of left sided varicoceles), recurrence and treatment failure. Recurrence rates following varicoceles repair range from 0.6–35% depending on technique. Epidemiological studies have shown that significant Left Common Iliac Vein Compression (LCIVC) ≥25% occurs in 22–35% of the general population. This is the largest study to examine the incidence of significant LCIVC or May-Thurner Syndrome (MTS) in men with a varicocele. The objective of this study was to compare the incidence and severity of LCIVC in men with a varicocele with the published incidence of LCIVC in asymptomatic men and document the incidence of left gonadal incompetence on duplex ultrasound to provide a possible explanation for varicocele treatment failure. The null hypothesis is that there is no difference in the incidence of LCIVC between men with a varicocele and asymptomatic men.

Methods: Men presenting at our practice with a varicocele were enrolled into this study. Ethics approval was obtained. All participants underwent a Duplex Ultrasound of the pelvic veins. The degree of LCIVC if present, was calculated and grouped into ≥25% (significant compression) and ≥50% (severe compression) as is convention in the vascular literature. The results were compared to a vascular epidemiological study of 272 asymptomatic men Cheng et al (2017) by Chi-squared analyses. Degree of compression was analysed for association with Grade of varicocele by Kruskal-Wallis ANOVA test. Left gonadal vein incompetence, size and direction of flow within the internal
iliac vein was analysed to provide understanding of potential treatment failure mechanisms.

**Results:** 80 men with varicoceles completed the investigations. Mean age of the cohort was 39.5 years (Range 12–74 years). In this study group, 91.2% men had a LCIVC ≥25% (73/80) compared to the expected incidence in asymptomatic men of 29.4% (80/272) [χ² = 96.2; p < 0.001]. The study group was further divided into men with LCIVC ≥50% (Severe compression) and showed that 67.5% (54/80) had LCIVC ≥50% compared to the expected incidence in asymptomatic men of 6.9% (19/272) [χ² = 137; p < 0.0001]. There was no significant correlation between WHO varicocele grade and degree of compression (Kruskal-Wallis one-way ANOVA H = 3.26, p = 0.196). Only 23% of men had incompetent gonadal veins (19/80). 16% of men with varicoceles had retrograde flow through the left internal iliac vein. 8.8% (7/80) men presented with recurrent varicocele and all had severe LCIVC. The average size of the gonadal vein in our cohort was 4.1 mm (0.4–8.7 mm).

**Conclusions:** Men with varicoceles have a significantly higher incidence of LCIVC ≥25% (significant compression) and LCIVC ≥50% (severe compression) than asymptomatic men. With only 23% of men demonstrating gonadal vein incompetence, a separate source of varicocele formation should be investigated. Increased pelvic venous pressure from LCIVC can lead to retrograde flow through the left internal iliac vein. Pelvic venous anatomy shows significant collaterals between all pelvic veins. The high incidence of LCIVC in men with a varicocele suggests that a varicocele is an “escape” vessel for increased pelvic venous pressure. The majority of men in our cohort did not have a demonstrable incompetent gonadal vein (23%), or a dilated gonadal vein (>8 mm). This would make embolization difficult, and ligation unlikely to provide long term benefit if there was a separate pelvic feeding vessel. Severe LCIVC is associated with an increased risk of DVT formation and pelvic venous congestion. Men with varicoceles have a high incidence of LCIVC and should be further investigated with a pelvic duplex ultrasound, with referral for vascular surgical consultation if there is severe LCIVC or symptoms. 75% (60/80) of our cohort just required monitoring and DVT information. 8% (7/80) underwent iliac vein stenting for severe compression and symptoms. There is no association between grade of varicocele and degree of LCIVC as it depends on which and how many collaterals open in response to increased pelvic venous pressure with the varicocele being only one potential outcome. All men presenting with recurrent varicocele after embolization had severe LCIVC. These findings have implications for rethinking the aetiology, investigation and treatment algorithm for varicoceles. Limitations include comparison of our study cohort to a published study group rather than a matched control group. Although these results are significant, larger studies are needed to confirm these findings.

**A randomised, controlled trial on the role of PDE5i drug for penile rehabilitation in Peyronie’s disease surgery:**

**Clinical outcomes and patient satisfaction rate following penile plication surgery**

**Introduction & Objective:** Oral phosphodiesterase type 5 inhibitor (PDE5i) has been accepted as the standard of care in penile rehabilitation following radical prostatectomy. It improves regular penile blood flow and prevents corporal hypoxia to encourage the return of natural spontaneous erection and avoids the loss in penile size. Penile reconstructive surgery for Peyronie’s disease (PD) can be associated with unique complications including altered glans sensation and erectile dysfunction (ED). This randomized, controlled trial examines the effect of PDE5i to prevent or minimize these unique complications.

**Methods:** Following local ethics approval, 80 males were randomised to receive “normal care” (NC) vs early PDE5i use following penile plication surgery (within 24 hours postoperatively). An independent third-party survey with objective measurement of penile glans sensation (thermal and pressure thresholds), sexual function score (based on the International Index of Erectile Function, IIEF-15 questionnaire) and overall patient satisfaction rates (on a 5-point scale) was conducted and compared on 1, 3, 6 and 12 months postoperatively.

**Results:** There was no significant difference in patient demographics between the 2 groups and no intraoperative complication was documented. There was no difference in the penile bruising (Clavien Dindo grade 1) between NC and PDE5i groups (18 vs. 19, p > 0.05). Males in the PDE5i group reported higher sexual function scores on IIEF-15 (p < 0.05) compared to NC, with no significant sensory change in the glans penis detected between the 2 groups (p > 0.05). The overall patient satisfaction rate (rated 4 or 5) was
higher in the PDE5i compared to the NC groups (93% vs. 70%; p < 0.05).

**Conclusion:** Early use of PDE5i, as part of postoperative penile rehabilitation, appears to improve sexual function and overall patient satisfaction rate following penile plication surgery for PD.

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**A randomized placebo-controlled D-Health Trial on vitamin D supplementation and erectile dysfunction: Can vitamin D improve erectile function?**

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**Introduction & Objective:** Epidemiological data have shown that vitamin D deficiency can be associated with cardiovascular diseases and male sexual dysfunction. However, the exact clinical effect of vitamin D supplementation in males with erectile dysfunction (ED) remains unclear due to various confounding variables such as the multifactorial nature of ED and the paucity of strong evidence from interventional studies. This randomised placebo-controlled multi-centre clinical trial examines if vitamin D supplementation will minimise ED and/or improve erectile function (EF).

**Methods:** The D-Health Trial prospectively recruited Australians aged 60-84 years between January 2014 and May 2015 and participants were randomly assigned to receive supplementation with 60,000 IU of vitamin D or placebo per month for up to 5 years. The EF outcome was collected at the end of the third year of follow-up. A log-binomial regression analysis was performed to examine the effect of vitamin D on the prevalence of ED overall and within sub-groups.

**Results:** Of the 11,530 males enrolled in the D-Health trial, 8,920 (77.4%) completed the question on ED. The was a difference detected in the mean serum 25-hydroxy vitamin D concentration between the placebo and vitamin D group at the 3-year review (76 nmol/L; standard deviation (SD) 24.94 vs 106 nmol/L; SD 26.76). The prevalence of ED was 58.8% and 59.0% in the vitamin D and placebo groups, respectively (prevalence ratio 1.00, 95% CI 0.97, 1.03). While the predicted baseline vitamin D level <50 nmol/L was associated with an increased risk of ED (age-adjusted PR 1.09; 95% CI 1.05, 1.13), this association was attenuated after adjusting for physical activity (APR 1.03, 95% CI 0.99, 1.07). In contrast, higher education levels and increased physical activity were both associated with reduced risk of ED. Furthermore, subgroup analyses showed vitamin D supplementation did not positively improve EF.

**Conclusion:** Vitamin D supplementation over a 3-year period did not improve the EF in men who were largely vitamin D replete.

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**Contemporary use of radical prostatectomy and pelvic lymphadenectomy across Australia**

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**Introduction & Objectives:** Radical prostatectomy is the most common treatment for intermediate and high-risk localised prostate cancer according to the Prostate Cancer Outcomes Registry of Australia and New Zealand (PCOR-ANZ). Previous data up to 2016 suggested that total RPs performed in Australia increased to a peak in 2009 before decreasing through to 2016 due to lower RP rates in men aged less than 65, despite the advancement and accessibility of robotic surgery. However, RP rates in men aged 75–84 were rising. Many changes in practice have occurred since 2016, including increased use of active surveillance, mpMRI and PSMA PET/CT. Therefore, the aim of this study was to assess trends in the use of RP and pelvic lymphadenectomy (PLND) since 2016, with the hypothesis that RP rates continue to increase in older men and use of PLND has declined.

**Methods:** Medicare Benefits Schedule (MBS) Item Statistics Reports were obtained retrospectively per financial year from 2016 to 2021 for RP both with (Item no. 37211) and without PLND (Item no. 37210) for men aged 45 to 84. Data were stratified per year by age group and state/territory and described according to population within each age group and state/territory as reported by the Australian Bureau of Statistics. No ethics approval was required for publicly available data. Proportions were reported according to the relevant analysis and calculated in Excel.

**Results:** Total RPs performed between 2016 and 2022 increased by approximately 31%. This was driven predominantly by a 55% increase in the rate of RPs performed in men aged 75–84. RPs in men less than 65 did not continue to decrease, with all other age groups showing stable RP rates with a change of less than 5%. WA performed the most RPs per capita each year and showed the greatest increase in RP rate. SA, QLD and NSW showed more modest increases, while Victoria’s rates were relatively unchanged. Use of PLND, relative to RP without PLND, continued to decline overall (49% decrease from 2016–2022) and in most states/territories, with NSW performing most PLND per 100 000 people.

**Conclusions:** Overall RP rates have increased since 2016, mostly driven by the continued increased in treatment of PCa with RP in men aged 75–84 years. The use of PLND has continued to decline. These treatment trends are not reported in the PCOR-ANZ report, but are important for patients and clinicians. Further research into use of complementary imaging (MRI, PSMA PET) and other investigations, as well as patient...
perceptions of treatment that influence management is required.

Feasibility of ethical surgical training using simulation and 3D printed synthetic organs

**Introduction & Objectives:** It is no longer necessary to rely on live animal models for robotic surgical training. We used 3D printing technology and injection moulding to produce realistic hydrogel synthetic organs for robotic surgery training. These synthetic organ models were a key pillar in a multi-step robotic surgery curriculum. The first phase included an online learning program that is the first robotic surgery course endorsed by the Royal Australasian College of Surgeons designed specifically for this synthetic organ program. This course included access to a catalogue of live 3D video accessible through virtual reality headsets. Participants then proceeded to virtual reality simulation training, dry lab exercises and human factors training in preparation for procedural training on hydrogel organs and then finally live human surgery. Here we present our results from the urological series of synthetic organ robotic procedures.

**Methods:** Three synthetic organ models were fabricated for this study; an anatomically correct insufflatable anterior abdominal wall for robotic port placement, a robot assisted partial nephrectomy model and a robot assisted radical prostatectomy model. These models were fabricated using 3D digital models segmented from real patient CT images using computer aided-design software. These models were uploaded to 3D printers to generate negative moulds which were injected with polyvinyl alcohol, a low-cost hydrogel. These positive casts were put through a series of freeze thaw cycles to achieve a range of tissue consistencies and stiffnesses. These casts were then layered in anatomically correct positions to create advanced multi-step procedural models with clinically relevant objective surgical performance metrics. Metrics included blood loss, nerve injury measured by digital strain gauges, positive cancer margins using chemical fluorescence, anastomotic leak tests, operative time and video skill assessments. These models were vacuum sealed and used within 6 months of fabrication.

**Results:** Sixteen surgeons performed robotic surgery on 5 synthetic abdomens, 10 hydrogel partial nephrectomies and 20 radical prostatectomies. Participants ranged in experience from robot novice to experts who had performed over 1000 robotic procedures. The clinically relevant performance metrics described in the methods were recorded and the global evaluative assessment tool for robotic surgery was used to assess performance on video review. Preliminary validity assessments demonstrated face, content, construct, concurrent and predictive validity.

**Conclusions:** We have demonstrated the feasibility and preliminary educational validity of realistic synthetic human organ models for urological robotic surgery. These surgical models are scalable and offer a viable alternative to live animal surgery without the cost, ethical and accessibility drawbacks associated with animal training.

The role of localised prostate cancer treatment in renal transplant patients: A systematic review

**Introduction & Objectives:** Prostate cancer remains the second most common cancer in men with the majority of these cancers being classified as localised low to intermediate risk. Its prevalence is increasing in the renal transplant population due to the increasing number of patients with chronic kidney disease and prostate cancer screening programs. The impact of long-term immunosuppression on prostate cancer is controversial with uncertainty about cancer treatment type and timing. The aim of this study is to systematically review and critically appraise all treatment options for localised prostate cancer in renal transplant candidates and recipients.

**Methods:** A systematic review was conducted adhering to PRISMA guidelines. Searches were performed in the Cochrane Library, Embase, Medline, the Transplant Library and Trip database for studies published up to August 2022.

**Results:** A total of 59 studies were identified describing 460 patients. All studies were either retrospective non-randomised comparative or case series/reports. The vast majority of studies were focused on prostate cancer after renal transplantation. Overall, 396 (86%) patients underwent surgery, 62 (13%) patients underwent
radiation therapy or brachytherapy, 1 patient underwent focal therapy (High intensity frequency ultrasound) and 1 patient was placed on active surveillance. The mean age was 61 years old, mean PSA level at diagnosis was 9.5 ng/mL and mean follow-up time was 29 months. The majority of patients had low risk disease with 227 patients having Gleason 6 prostate cancer (49%), followed by 193 Gleason 7 patients (42%). All prostate cancer mortality cases were in high risk prostate cancer (> = Gleason 8). The overall and cancer specific survival results were similar (>90%) between surgery and radiotherapy at 1 and 3 years.

**Conclusions:** Localised prostate cancer treatment in renal transplant patients should be risk stratified. Surgery and radiation treatment for localised prostate cancer in renal transplant patients appears equally efficacious. Given the limitations of this study, future research should concentrate on developing a multicentre RCT with long-term registry follow-up.

**GRADE Recommendations**

| Recommendation | Certainty rating |
|----------------|-----------------|
| The timing of localised prostate cancer treatment in renal transplant patients should be determined by risk stratification e.g. grading, use of nomogram. | Low |
| List patients for renal transplantation with a diagnosis of low and favourable intermediate risk prostate cancer without additional delay | Low |
| Unfavourable intermediate risk and high risk prostate cancer should be treated prior to renal transplantation. | Low |
| Surgery and radiotherapy have equal oncological efficacy in localised prostate cancer treatment in renal transplant patients. There are growing data on active surveillance and focal therapy. | Low |
| Prostate cancer treatment in renal transplant patients should be conducted in a dedicated tertiary level transplant hospital. | Low |

**A novel method to assess female voiding dysfunction: Is transpubic voiding sonography a reliable assessment of functional voiding in asymptomatic females?**

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**Introduction & Objectives:** Most diagnostic tests for voiding dysfunction are static in nature and urodynamic test can be intrusive. This unique study with concurrent uroflowmetry and ultrasound real-time imaging on voiding parameters evaluates the inter and intra tester reliability of functional voiding in asymptomatic women.

**Methods:** Following University of Queensland ethics approval (2021/HE000137), 34 healthy women consented to participate in two sessions and were scanned by 2 independent sonographers over a 2 day-period. Both sonographers were blinded to each other’s measurements. Normative measurements of the bladder volume, bladder neck displacement, urethral diameter changes and urethral movement during pelvic floor muscle activation were obtained. A curve array (1–5 MHz) ultrasound transducer was placed in a longitudinal plane transpubic through the long axis of the fibrocartilaginous symphysis joint (SP) to measure these variables and electronic recording of the duration of void was recorded. The recorded ultrasound video was replayed and still images taken at start, max void and end void were printed and measurable data obtained and compared.

**Results:** All participants complete the study and there was no reported adverse event. The mean age was 34.5 (standard deviation, SD 9.4) years old while the BMI was 24.2 kg/m² (SD 4.9). The static bladder neck displacement angle provides a constant point during and after voiding. The mean and median fixed landmark, SP length were 38.5 mm and 38.6 mm. There was no significant difference detected in the measurements by both sonographers (p = 0.60) and linear regression between the mean and difference was also non-significant (p = 0.88).

Similarly, the mean values for urethral diameter during voiding and urethral movement during pelvic floor activation i.e., contraction angle were 5.2 mm (SD 2.0) and 94.5° (SD 18).

**Conclusions:** This study showed that transpubic voiding sonography is consistent and reproducible diagnostic test with good intra and inter tester measure reliability, and could be utilised to provide an alternative, non-invasive real-time method of female functional voiding assessment.

**Safety and feasibility of day case holmium laser enucleation of prostate within the Australian Public Health System**

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**Introduction:** Transtelephal resection of the prostate (TURP) is the most common operation for benign prostatic hyperplasia (BPH) with around 12 000 cases performed per year nationwide in Australia. While TURP has been very successful, it is still associated with small but significant risks. Early mortality rates range from 0.1% to 0.25% and complications include haemorrhage (transfusion rate 0.4%), clot retention (2%) and urinary tract infection (1.7%).
This morbidity can result in delayed discharge and increased hospital readmission, and can cause substantial distress to the patient. TURP is associated with an average length of stay between 3 to 4 days. Holmium laser enucleation of the prostate (HoLEP) provides an alternative procedure for management of BPH which has shown to have equivalent, if not improved outcomes when compared with TURP.

Immediate complications were lower in HoLEP patients, requiring no blood transfusions compared with TURP.

**Materials and Methods:** This study commenced recruitment in July 2022 after institutional review and ethical approval. It is a pilot study that prospectively included patients presenting for HoLEP at Western Health with prostate volumes between 60 cc to 120 cc, ASA scores ≤3 and not on any blood thinner medications. These patients were consented towards a day case HoLEP pathway at Western Health. HoLEP was performed using the en bloc technique with early apical release that has been previously described in literature. Patients were discharged following assessment by the operating surgeon and met predetermined discharge criteria. Factors contributing to day-case success were identified.

**Results:** We have interim results after recruiting 7 patients to the day case HoLEP pathway at Western Health.

Median age was 71 years (62 to 86); mean PSA was 5.2 ng/mL (1.6–12.5); mean prostate volume was 98 cc (78–115); mean volume of enucleated tissue was 87.3 cc (62.5–97.8). Mean operative time was 100 min (75–130). 6 out of the 7 patients went home on POD0 as day case procedures. One patient stayed overnight due to ongoing need for continuous bladder irrigation and went home on POD1. All patients had successful trial of voids on POD2. The 30-day readmission/representation to ED rate was zero. We hope to present the final results of our pilot study with data on 25 consecutive day case HoLEPs at Western Health.

**Conclusions:** Based on interim results from our pilot study, we believe that a day case pathway for HoLEP is safe and feasible.

**Mesh-free surgical management of apical pelvic organ prolapse: A comparative study of vaginal sacrospinous fixation v robot assisted suture hysteropexy**

**Methods:** A prospective clinical audit of 115 women with apical POP who underwent SuH (n = 61) or SSF (n = 54) by a single surgeon. Demographic data including age, parity, previous POP surgery were recorded. A pre-operative (preop) pelvic floor (PF) questionnaire was used to identify prevalence of bladder, bowel and vaginal symptoms. POP-Q was recorded at surgery and at post-operative (postop) reviews. The absolute change in POP-Q scores were recorded as objective measures of PF support. Other postop metrics used include the presence of vaginal bulge, need for repeat POP surgery (reop) and subjective improvement in symptoms based on a patient-reported outcome measures (PROMs) survey.

**Results:** Baseline demographics were similar (Table 1). Mean time from surgery was 736 (SuH) and 565 days (SSF). Difference in postop C points was not significant (SuH: median – 8 (IQR 2), SSF: median -7 cm (IQR 2), p = 0.279). Procedure success rates (postop C point <0) were not different (SuH 90.2%, SSF 92.5%, p = 0.92). Reop rates for apical recurrence were SSF 1.9%, SuH 6.6%, p = 0.21; univariate odds ratio 0.26 [95% CI 0.03 to 2.43]. Univariate analysis for reop found that age, parity and surgery type were not predictors of reoperation (p = 0.26, p = 0.92, p = 0.78). The most
common postop AE was urinary tract infection (SuH 10.2%, SSF 10.5%).

Conclusions: SuH and SSF are safe and effective mesh-free techniques for management of apical POP based on objective improvements in POP-Q score and PROMs.

PSA testing: How can we improve GP understanding of the interpretation and management of raised PSA levels in the community

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Introduction & Objectives: The understanding of when to use PSA testing and how to interpret its results is changing, and GPs are at the frontline of investigating and referring men with prostate cancer. Resources that GPs commonly use and are endorsed by the RACGP, including the ‘Guidelines for preventative activities and general practice’ (or otherwise known as the red book), are bare on the information they provide, and are not in line with the guidelines endorsed by the NHMRC and the Prostate Cancer Foundation of Australia on PSA testing. Additionally, major pathology providers within NSW use age adjusted guidelines, which are not congruent with the recommendations provided by the PCFA guidelines on PSA testing. This survey-based study aims to understand how GPs interpret the results they are provided, and the resources they use to do so, to improve the utilisation and correct use of the PSA test.

Methods: An anonymized online survey was designed to assess the understanding of various sections of the PCFA guidelines and distributed to Sydney based GPs via email. The results were collated on REDcap (Research Electronic Data Capture) and then quantitatively assessed to identify areas of weakness in the understanding and utilisation of PSA testing.

Results: Since the survey was distributed on 13/09/2022, there have been 14 responses, and many more are expected over the coming months, with re-recruitment emails planning to be sent. Only 43% of responders indicated they were aware of the PCFA guidelines on PSA testing. When asked what guidelines they used to inform their use of PSA testing, 29% used the PCFA guidelines, 71% the GP red book, 29% used online resources such as uptodate or BMJ best practice, and 1% used international guidelines such as those provided by the AUA and EAU. Regarding interpretation of PSA, 100% of GPs reported using the age adjusted cutoff reported by the laboratory rather than 3 ng/mL recommended by the PCFA.

Additionally, 21% of GPs who received elevated PSA results would refer to a urologist only in the presence of additional factors including PSA velocity or whether the patient was symptomatic. Regarding the volume of PSA testing, 21% reported an increase in their use of PSA in the last 10 years, 50% reported no change, while 29% reported a decrease in their use of PSA.

Conclusions: There is a poor understanding of recent national guidelines for PSA testing which have been endorsed by the NHMRC, the peak body for medical research in Australia. Additionally, there is inappropriate interpretation of PSA using age adjusted cutoff which is being propagated by NSW based pathology services in their reports, leading to delayed diagnosis of prostate cancer.

The use of intravesical hyaluronic acid for the treatment of BK virus haemorrhagic cystitis

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Introduction & Objectives: The treatment of haemorrhagic cystitis secondary to BK virus remains an area in which there is a dearth of evidence. Recent systematic reviews have identified that off-label use of intravesical hyaluronic acid could be considered as has a favourable side effect profile. We aim to present a

### Table 1 Demographics

| Characteristic | Hysteropexy, N = 61<sup>1</sup> | SSF, N = 54<sup>1</sup> | p-value<sup>2</sup> |
|---------------|-------------------------------|------------------------|-----------------|
| **Age**       | 64 (58, 71)                   | 72 (69, 77)            | <0.001         |
| **Parity**    | 2.00 (2.00, 3.00)             | 2.00 (2.00, 2.50)      | 0.028          |
| Previous POP surgery |                       |                        |                |
| No            | 54 (90%)                      | 42 (78%)               | 0.074          |
| Yes           | 6 (10%)                       | 12 (22%)               |                |
| Previous mesh |                               |                        |                |
| No            | 57 (95%)                      | 50 (93%)               | 0.7            |
| Yes           | 3 (5.0%)                      | 4 (7.4%)               |                |
| Bladder symptoms |                                 |                        |                |
| No            | 4 (6.6%)                      | 3 (5.6%)               | >0.9           |
| Yes           | 57 (93%)                      | 51 (94%)               |                |
| Bowel symptoms |                               |                        |                |
| No            | 33 (54%)                      | 35 (66%)               | 0.2            |
| Yes           | 28 (46%)                      | 18 (34%)               |                |
| Vaginal prolapse symptoms |                           |                        |                |
| No            | 8 (13%)                       | 11 (21%)               | 0.3            |
| Yes           | 53 (87%)                      | 41 (79%)               |                |

<sup>1</sup>Median (IQR: interquartile range); n (%).
<sup>2</sup>Wilcoxon rank sum test; Pearson’s Chi-squared test; Fisher’s exact test.
case series of the use of intravesical hyaluronic acid, in the form of iAluRil, for the treatment of BK virus associated haemorrhagic cystitis.

**Methods:** A retrospective analysis of all intravesical iAluRil administrations was carried out from the period of January 2020 until July 2022. Four cases of haemorrhagic cystitis with proven BK virus were included and their electronic medical records were reviewed to assess their response to treatment as well as any adverse effects of treatment.

**Results:** A total of four patients were identified during the study period. All were given a 1 g in 50 mL preparation of iAluRil instilled into the bladder. It was then held at least for 30 min before allowing the patient to void. The protocol for treatment involved weekly instillations for 4 weeks (induction phase), following by fortnightly for a total of 6 treatments, although one patient received 8 treatments. All four patients initially received intravenous cidofovir, which remains the most studied therapy for BK virus haemorrhagic cystitis and were referred for iAluRil after failing to respond to cidofovir. The case series had a 50% success rate, with two patients having complete resolution of haematuria, and two patients having ongoing haematuria with clots. Regarding side effects, the two patients with ongoing haematuria reported increased urinary frequency and urgency, and occasional suprapubic discomfort. The two patients with improvement in their symptoms reported no ongoing urinary symptoms after resolution of symptoms and completion of iAluRil therapy.

**Conclusions:** This series demonstrates that iAluRil is safe for use in BK virus associated haemorrhagic cystitis, and can be efficacious in the treatment of haematuria.

**Impact of urodynamic study findings on long term management in patients with post radical prostatectomy incontinence**

**Introduction & Objectives:** Although urinary incontinence after radical prostatectomy has largely been attributed to intrinsic sphincter deficiency (ISD), previous studies have shown a significant prevalence of detrusor overactivity (DO) (25–63%). In the current context of increasing treatment options for overactive bladder and male stress urinary incontinence (SUI), we evaluated the impact of urodynamic study findings on subsequent management in cohort of patients with post radical prostatectomy incontinence.

**Methods:** 145 men (age range 50–87, median 69) underwent urodynamics for PPI between 2011 and 2015 and the management plan was changed as a result of urodynamic findings in 32% of patients (47/145). We reviewed the long-term outcomes in this subset of patient at an average of 8 years (range 7-11 yrs) post urodynamics.

**Results:** Of the 47 patients, 13 patients had combined storage and sphincter dysfunction as a cause for the incontinence and subsequently underwent a continence procedure: 8 patients had an AUS placed, 2 had ileal conduit diversion, and 1 patient had bulking agent. 34 patients were found to have bladder dysfunction alone and of these patients: 11 patients were managed initially with botox and only 4 patients remain on regular botox injections at follow up and 22 patients were managed initially with medications and only 2 remained on medication at follow up. 13 patients (38%) had developed other more significant comorbidities or died. 8 patients were lost to follow up.

**Conclusions:** Urodynamics is important in the assessment of PPI in the contemporary setting to guide appropriate patient management and avoid unnecessary incontinence surgery. Our data suggest that a significant proportion of PPI patients have bladder dysfunction alone and will not benefit or require surgical treatment even in the long term. 38% of these patients at an average of 8 years were no longer fit for any medical treatment of incontinence.
rectal side effects. In appropriately selected patients, focal therapy holds promise as an approach that minimises the burden of these adverse effects without compromising oncological control. This study describes the initial patient-reported outcome measures following focal LDR brachytherapy for low-intermediate risk prostate cancer.

**Methods:** Patients enrolled in an ongoing, prospective, multi-centre clinical registry of focal LDR brachytherapy for low-intermediate risk prostate cancer from September 2019 (LIBERATE Clinical Registry, Icon Cancer Centre), with a minimum of 12 months of follow-up, were included in this study. Serial validated questionnaires (International Prostate Symptom Score [IPSS], International Index of Erectile Function [IIEF-5], Expanded Prostate Cancer Index Composite [EPIC] Bowel Assessment) were provided to patients at baseline, six weeks, six months, and 12 months post-implant.

**Results:** Twenty-five, 24, and 21 patients responded to IPSS, EPIC Bowel Assessment, and IIEF-5 questionnaires respectively over 12 months following implant. At baseline, the cohort had a median IPSS of 9 (IQR 3–12), increasing by a median +5.5 (IQR +1.25 – +8.75) at six weeks post-implant. At 12 months post-implant, a median change in IPSS of +0.5 (IQR -1 – +3.5) was observed, with 12 (48.0%) patients demonstrating unchanged or improved IPSS. The remaining 13 patients increased in IPSS by a median 4 (IQR 2–5.5) points. The median EPIC Bowel Assessment score was 96.4 (IQR 87.5–98.2) at baseline, changing by −2.7 (IQR -12.5 – 0.0) at six weeks post-implant and −0.9 (IQR -7.6 – +1.8) at 12 months post-implant. Twelve (50.0%) patients had unchanged or improved scores on the EPIC Bowel Assessment at 12 months post-implant. Excluding these patients, the median score of the remaining cases decreased by 9.82 (IQR 6.70–28.6). A median IIEF-5 score of 18 (IQR 10–20) was observed at baseline, decreasing by 2 (IQR −6 – 0) at six weeks post-implant, and 2 (IQR -6 – +1) at 12 months post-implant. Seven (33.3%) patients had unchanged IIEF-5 scores at 12 months post-implant, and the remaining 14 patients showed a median increase by 4.5 (IQR 2.3–7.5) points.

**Conclusions:** These results from the LIBERATE Clinical Registry suggest that focal LDR brachytherapy in low-intermediate risk prostate cancer is a well-tolerated intervention, with minimal change to patient-reported bladder, bowel, and erectile function at 12 months post-implant.

**TURP catheter protocol: Facilitating earlier discharge**

**DR WILLIAM HARRISON**

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**Introduction & Objectives:** TURP is a common urological procedure to alleviate bladder outlet obstruction in men, however requires considerable post-operative nursing care. Given the large workload and reduced staffing in the hospital, a delay in TOV initiation and subsequent delay in discharge was noted. In consultation with surgical nursing staff, a post TURP protocol was developed. When clinically indicated this included:

- CBI removed day one post-operatively
- Midnight TOV if urine clear or rose
- If concern from nursing or urology team, review day two and removal of IDC on ward round

This study sought to determine whether this protocol reduced length of hospital stay and facilitated earlier discharge. The secondary outcome was difference in complications or readmission rates.

**Methods:** The study was conducted in a regional hospital setting with specialist urology care. Prospective data were collected on all patients undergoing TURP within the first six months of initiating the intervention. Data were compared to retrospective data of the same timeline in 2021. Age, BMI, ASA, operation time, resected tissue, length of stay, complications and readmissions were recorded. Values were compared utilising a statistic software package.

**Results:** Homogeneity existed between the two groups except in the case of BMI. Intervention length of stay averaged 61.25 h. Non-intervention group length of stage average 65.25 h. There was no significant difference between the two groups. The intervention group had three post operative complications and two readmissions. Non-intervention had five post operative complications and five readmissions.

**Conclusions:** A clinically significant difference in length of stay (four hours) was determined in this study which would facilitate earlier discharge and improve hospital flow.

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**Table 1** Comparison table of results demonstrating measurable outcomes and p-values between TURP in 2021 and 2022

| Measurement                  | TURP 2021 | TURP 2022 | p value |
|------------------------------|-----------|-----------|---------|
| Age (years)                  | 76.6 (56–93) | 73 (54–86) | 0.069   |
| BMI (kg/m²)                  | 28.9 (17–44) | 26.1 (15–39) | 0.024   |
| ASA                          | 2.7 (2–4) | 2.5 (1–4) | 0.096   |
| Operating time (mins)        | 86.5 (40–225) | 76.75 (22–186) | 0.069   |
| Resected Tissue (g)          | 20.6 (2–74) | 24.2 (1–94) | 0.789   |
| Complications postoperatively | 5         | 3         | N/A     |
| Readmissions postoperatively | 5         | 2         | N/A     |
| Length of stay (hrs)         | 65.25 (31.25–123.00) | 61.25 (46–126.75) | 0.535   |
There was no impact on complications or readmission rates. This study highlights how a simple protocol can impact the discharge of a patient post TURP.

Quality of life in ureteroscopy for stone disease may benefit from primary ureteroscopy

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Introduction & Objectives: Ureteric stents are an integral component of safe endoscopic stone management, but are themselves associated with side effects. In particular, stent irritation can significantly impact quality of life (QOL). Stent related pain, haematuria and urinary symptoms can limit ability to work or carry out daily activities, and result in additional medication use and healthcare presentations. Primary or unstented URS is an alternative for patients presenting with ureteric calculi in the absence of concurrent infection, and can reduce both stent dwell time and total number of procedures. There is little existing research directly comparing the impact of primary versus pre-stented URS on patient’s QOL. Our aim is to compare self-reported symptoms, impact on daily activities, medication use and additional health care encounters in patients undergoing primary versus presented URS.

Methods: Non-systematic review of existing literature was conducted. Following ethical approval, a patient questionnaire was developed consisting of ten questions with a binary yes/no answer regarding the presence of stent irritation symptoms, impact on daily activities, healthcare encounters and medication use, with each ‘yes’ answer reflecting a negative impact on QOL, that is a higher score correlating with poorer QOL. This was administered to patients prior to URS and at postoperative stent removal. Responses were scored and analysed in subgroups by pre-URS stent status.

Results: Non-systematic literature review did not identify any pre-existing publications directly comparing QOL in patients undergoing primary versus delayed URS. At time of submission 65 questionnaires were completed. Results are summarised by the table:

|                      | Mean QOL score | Median QOL score | Pain | Urinary frequency | Haematuria | Cancelled work or other activities | Saw GP | ED Presentation | Admit | Analgesia | Other med | Antibiotics |
|----------------------|----------------|------------------|------|------------------|------------|-----------------------------------|--------|----------------|-------|------------|-----------|-------------|
| Prior to URS          |                |                  |      |                  |            |                                   |        |                |       |            |           |             |
| Pre-stented (37)      | 5.4            | 5                | 76%  | 86%              | 78%        | 51%                               | 59%    | 38%            | 14%   | 68%        | 14%       | 32%         |
| Primary (17)          | 4.8            | 5                | 82%  | 71%              | 41%        | 64%                               | 76%    | 47%            | 24%   | 71%        | 24%       | 6%          |
| Pre-stent removal     |                |                  |      |                  |            |                                   |        |                |       |            |           |             |
| Pre- (5)              | 2.75           | 2.5              | 40%  | 80%              | 40%        | 20%                               | 40%    | 20%            | 0%    | 60%        | 0%        | 0%          |
| Primary (7)           | 5.14           | 4                | 43%  | 71%              | 29%        | 57%                               | 71%    | 43%            | 57%   | 43%        | 43%       | 57%         |

Conclusions: Impaired quality of life is a common complaint in patients undergoing treatment for stone disease. Preliminary results suggest that in regard to stent related symptom, pre-URS quality of life is non inferior and potentially superior in patients undergoing primary URS as compared to pre-stented URS. Further analysis is required to reach statistical significance & enable safety profile and cost effectiveness analysis. If confirmed that primary URS is safe, cost effective, and improves quality of life for patients, the aim should be to make this the standard of care for suitable patients in the public health system.

Effect of plasma allyamine polymerisation on immune response to degradable nanostructured surgical constructs for pelvic organ prolapse

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Introduction & Objectives: There is a critical need to discover novel transvaginal grafts for the treatment of Pelvic Organ Prolapse (POP), that are safe, surgically efficacious, and congruent with host native tissue. Nanostructured poly-L-lactide-co-e-caprolactone (PLCL) grafts are made from a biocompatible, elastic and flexible polymer that is well matched to the nanoarchitecture of vaginal tissue. Plasma-polymerisation is a surface modification technique where various organic monomers are introduced into a plasma discharge zone and converted into reactive fragments such that polymer thin films (100 Å–1 μm) are deposited. Previous studies assessing the effect of plasma polymerisation with allyamine have demonstrated significant improvements in cell adhesion, proliferation, and overall biocompatibility of graft. This
study is the first to assess the effect of plasma allyamine polymerisation on the biological compatibility and immune response to degradable nanostructured PLCL implants for applications in female pelvic medicine and reconstructive surgery.

Methods: PLCL polymer (10%w/w) was electrospun at 18 kV to form uniform nanofibers and assessed for fibre diameter, pore size, hydrophilicity and biomechanical properties. PLCL meshes of diameter 3x2 cm were sterilised followed by the glow discharge deposition of an ultrathin layer of plasma polymerisation with an allylamine monomer (Aldrich, 98% purity). Multiparous ewes with demonstrated vaginal wall weakness underwent posterior colporrhaphy by trained surgeons in three groups; freshly coated PLCL (n = 5), coating with delayed implantation of by 30 days PLCL (n = 4) and uncoated PLCL grafts (n = 4). Post-operative POP-Q measurements were taken and vaginal tissue harvested at the post-mortem time points of 30 days. Histology, immunohistochemistry, immunofluorescent microscopy, and scanning electron microscopy were used to assess mesh integration, host foreign body response, angiogenesis and ECM formation.

Results: We observed that uncoated mesh appeared to have poorer tissue integration with greater tissue loss, increased acute inflammation and increased number of foreign body giant cell formations (Fig. 1). Contrastingly, coated nanomesh had improved tissue integration, limited tissue loss, less inflammatory infiltration and evidence of neovascularization. Scanning electron microscopy revealed that there was swelling of individual fibres of coated mesh and new collagen fibrils were formed within.

Conclusions: Plasma surface modification is an emerging technology that significantly improves graft response with improved host vaginal tissue integration, neovascularization and foreign body response, with the potential for clinical translation in female pelvic medicine and reconstructive surgery.

Pre-clinical evaluation of immune response to stem cell boosted degradable nanostructured surgical constructs for pelvic organ prolapse

Dr David Hennes, Dr Kallyanashis Paul, Dr Saeedih Darzi, A/Prof Anna Rosamilia, Professor Jerome Werkmeister, Professor Caroline Gargett, Dr Shyamani Mukherjee

Abstract: This study applied tissue engineering and stem cell biology to assess the fate and effect of degradable nanostructured poly-L-lactide-co-e-caprolactone (PLCL) surgical constructs, boosted with human endometrial stem/stromal cells (eMSC), in an ovine pre-clinical model of pelvic reconstructive surgery. SUSD2+ eMSC were isolated from human endometrial tissue through fluorescent labelling and magnetic bead sorting, and seeded onto PLCL nanomeshes generated through electrospinning of polymer (10%w/w) at 18 kV. Trained surgeons performed posterior vaginal repair on ewes with demonstrated vaginal wall weakness in three randomised groups; native tissue repair, PLCL mesh, and PLCL mesh with eMSC. Modified POP-Q measurements were taken pre-operatively and prior to explanation times of 7, 30 and 90 days. Histology, immunohistochemistry, immunofluorescent microscopy, and scanning electron microscopy were used to assess eMSC engraftment, tissue integration, host foreign body response, angiogenesis and ECM formation in vaginal explants. Vaginal tissue explants were also compared with vaginal tissue from non-operative controls.

Results: Explanted PLCL grafts had a mean fibril diameter of 485.9 nm and mean pore size of 1.5 microns (Fig. 1),

deficiency in efficacious and safe surgical treatment options. Synthetic non-degradable polypropylene meshes that were previously used in pelvic reconstructive surgery are now widely prohibited due to life-altering adverse events that women suffered, such as mesh erosion and exposure. There is a critical need to generate novel surgical constructs for applications in pelvic reconstructive surgery that are safe, efficacious, and congruent with host native tissue.

Methods: This study applied tissue engineering and stem cell biology to assess the fate and effect of degradable nanostructured poly-L-lactide-co-ε-caprolactone (PLCL) surgical constructs, boosted with human endometrial stem/stromal cells (eMSC), in an ovine pre-clinical model of pelvic reconstructive surgery. SUSD2+ eMSC were isolated from human endometrial tissue through fluorescent labelling and magnetic bead sorting, and seeded onto PLCL nanomeshes generated through electrospinning of polymer (10%w/w) at 18 kV. Trained surgeons performed posterior vaginal repair on ewes with demonstrated vaginal wall weakness in three randomised groups; native tissue repair, PLCL mesh, and PLCL mesh with eMSC. Modified POP-Q measurements were taken pre-operatively and prior to explanation times of 7, 30 and 90 days. Histology, immunohistochemistry, immunofluorescent microscopy, and scanning electron microscopy were used to assess eMSC engraftment, tissue integration, host foreign body response, angiogenesis and ECM formation in vaginal explants. Vaginal tissue explants were also compared with vaginal tissue from non-operative controls.

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making them nanostructured. PLCL vaginal explants with and without eMSC demonstrated excellent mesh-tissue integration, with limited smooth muscle, elastin and collagen metabolism observed in comparison with sham surgery. Scanning electron microscopy demonstrated limited ECM degradation, and improved cellular infiltration of PLCL vaginal implants. Interestingly, eMSCs maintained SUSD2 expression over 90%, even after attaching to PLCL meshes, demonstrating excellent engraftment.

Fig. 1 In-vitro appearance of degradable nanostructured poly-L-lactide-co-ε-caprolactone (PLCL) surgical construct, alone (A) and with eMSC adhered through extension of nanoscale filopodia. Scale bar = 2 μM

Conclusion: Nanofiber PLCL grafts are highly biocompatible novel constructs with huge potential for clinical translation in female pelvic medicine and reconstructive surgery. From a tissue engineering perspective, nanofiber electrospinning can be used to design biomaterials that mimic the matrix, mechanical and cellular properties of host tissue, to potentially improve the tissue microenvironment and reduce the risk of surgical complications.

Sealing the leak: A 10-year multicentre experience managing refractory post retroperitoneal lymph node dissection chylous ascites

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Introduction & Objective: RPLND is an important part of multimodal therapy for node-positive germ cell malignancy. However, due to wide heterogeneity in patient status, disease biology and tumour locations RPLND can be challenging and risky. One such risk is iatrogenic chylous ascites (CA) in up to 8% of cases. Morbidity from intraabdominal chyle extravasation includes delayed wound healing, malnutrition, electrolyte disturbances, and immunosuppression. This morbidity often impairs postoperative recovery and delays subsequent planned oncological management. Limited reliable data exist to describe the management of this complex condition. We describe treatment strategies and propose a management algorithm for refractory post RPLND CA.

To interrogate CA post RPLND retrospective analysis was conducted from 5 high volume uro-oncology centres across Australia and New Zealand. 86 men were identified who underwent open RPLND for management of metastatic testis cancer. Subsequent diagnosis of CA was defined by elevated triglycerides in paracentesis fluid. Refractory chyle leak was defined as symptomatic CA requiring more than one percutaneous drainage (PD).

Results: Of the 86 cases the main indication for RPLND was post chemotherapy non-seminomatous germ cell tumours (NSGCT). Six (7%) of patients were diagnosed with post RPLND chylous ascites. All patients experienced onset of symptoms at a mean of 7 days post op (4–14 days). All patients were commenced on a short chain fatty acid diet, commenced on octreotide and eventually needed PD for symptom control. Refractory CA was identified in 4 (4.6%) patients who required more than one PD with requiring insertion of an indwelling peritoneal drain. Total parenteral nutrition (TPN) was utilised in 3 cases. Lymphoscintigraphy was used for 2 cases. One patient underwent lymphangiogram and glue embolization under general anaesthetic. A peritoneovenous shunt was implanted for 1 patient. Based on this experience we developed a management algorithm for chyle leak post RPLND (Fig. 1).

Conclusions: Prompt identification and treatment of a CA is essential for optimal surgical outcomes. Refractory CA is associated with high morbidity and requires multimodal management. High volume RPLND centres should have a management protocol for this uncommon complication.

Sealing the leak: A 10-year multicentre experience managing refractory post retroperitoneal lymph node dissection chylous ascites

Sealing the leak: A 10-year multicentre experience managing refractory post retroperitoneal lymph node dissection chylous ascites

Fig. 1 Algorithm for managing chylous ascites post RPLND
Learning the know how to getting the nodes out: Tips and tricks for robotic RPLND

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Introduction & Objectives: Robotic RPLND is an emerging part of multimodal therapy for node-positive germ cell malignancy. Whilst technically challenging, robotic RPLND offers a more precise less invasive surgical management option for removal of tumour positive lymph nodes. The objective of this video is to further explain the feasibility of performing RPLND highlighting tips and tricks for safety and efficiency.

Methods: After obtaining informed consent, we recorded operating theatre footage of Robotic RPLND. We recorded above with high-definition intraoperative videography and the intra-operative footage, after which professional postproduction processing allowed overlayed narrative description of our surgical techniques.

Results: We present top tips on the following techniques:

1. Optimal patient positioning
2. Robot choice
3. Port placement
4. Intraoperative vessel manipulation and repair
5. Optimising dissection template

Conclusions: We present an adaptable series of tips and tricks for robotic RPLND. Open RPLND has remained the gold standard surgical approach, yet with the evolution of Robotic RPLND, this can become the standard of care in high volume cancer centres.

Repeated manual bolus irrigation leads to critical intrarenal pressures during ureteroscopy

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Introduction & Objectives: Raised intrarenal pressures have been associated with ureteroscopy procedures. They have also been inferred to associate with infectious complications. The aim of this study is to characterise the fluctuations and maximal intrarenal pressures produced by manual bolus irrigation used during ureteroscopy.

Methods: During ureteroscopy, a 0.014” Comet II Pressure Guidewire® (Boston Scientific Corporation, Marlborough, Massachusetts, USA) was used for IRP measurement. Routine flexible ureterorenoscopy was undertaken, including manual bolus irrigation when required to maintain vision. These were either as a single manual bolus or a series of manual boluses in quick succession. The baseline IRPs, maximal IRPs, and the difference between the two were calculated.

Results: Preliminary results on 7 procedures in 6 patients were analysed. 17 single manual boluses were observed. The median baseline IRP was 36.5 mmHg (range 23.2–60.8; SD 10.5), the median rise in IRP was 29.4 mmHg (n = 17; range: 3.12–110.4; SD 29.8), and the maximum IRP was 76.0 mmHg (range 32.2–163.9; SD 37.1). Median baseline IRP was 39.3 mmHg (range 28.3–69.5, SD 9.9). After serial manual boluses, the median IRP increased by 72.3 mmHg (range 22.6–242.84, SD 64.6), and the maximum IRP was 114.1 mmHg (range 57.9–303.5, SD 70.6).

Conclusions: Manual bolus irrigation – both single but particularly serial boluses – produces significant rises in IRPs and could logically result in pyelovenous backflow and sepsis. Given 30 mmHg of IRPs have been quoted to cause pyelovenous backflow, the pressure produced by manual bolus irrigation is definitively within this range. Our results suggest that this manoeuvre should be avoided to reduce complications during ureteroscopy.

Intrarenal pressure measurements with a pressure guidewire

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Introduction & Objectives: Raised intrarenal pressure during ureteroscopy and pyeloscopy has been attributed to infectious complications. To study this, majority of human studies to date have examined intrarenal pressure using a nephrostomy. However, this disrupts the continuity of the collecting system with unknown consequences on subsequent pressure measurements. We assess intrarenal pressures in human subjects using pressure guidewire technology that do not disrupt the collecting system.

Material and Methods: Bench side ex-vivo study with animal kidney units sourced from the food chain was completed to validate the Comet II Pressure Guidewire (Boston Scientific Corporation, Marlborough, Massachusetts, United States) against a digital manometer and a column of water. After ethics committee approval, patients undergoing ureteroscopy for urolithiasis were recruited to the present study. During the procedure, the pressure guidewire was used for all pressure measurement. The pressure guidewire was inserted with the pressure sensor positioned in the renal pelvis at the beginning of the procedure. The remainder of the procedures were performed without deviation from
usual, with manipulation including laser lithotripsy, basket extraction, manual irrigation, and flushing. The primary outcome was Infective complications. Secondary outcomes include post operative hypotension, fever, urgent medical team review and intensive care unit/high dependency unit admission. Maximal intrarenal pressures were also recorded.

Results: Preliminary results included

7 patients who underwent 8 procedures (3 with ureteric calculi, 5 with intrarenal calculi). The median age was 58 years and 71.4% were male patients. Of the procedures, 62.5% had pre-operative positive urine culture and was managed with antibiotics. 60% of renal calculi patients and all of ureteric calculi patients had pre-existing ureteric stents. Procedurally, all renal calculi procedures used an access sheath. Laser lithotripsy and basket extraction were performed at the surgeon’s discretion. The mean intrarenal pressure at rest (with wires, access sheath and ureteroscope in situ but prior to manipulation) was 36.3 mmHg. The mean of the maximal intrarenal pressures achieved during manipulation was 106.7 mmHg. One procedure (12.5%) resulted in post-operative fevers and hypotension requiring intensive care unit admission. Another procedure (12.5%) resulted in post-operative hypotension and altered consciousness, requiring an urgent medical review.

Conclusions: Intrarenal pressures are highly susceptible to manipulation during ureteroscopy, increasing from 36.3 mmHg to 106.7 mmHg in our study. These elevated pressures may put patients at risk of infections, as demonstrated by our patient cohort.

Raised intrarenal pressure and mechanisms of infection: Macroscopic studies of an ex vivo animal model

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Introduction & Objectives: Infectious complications and sepsis after pyeloscopy have been attributed to raised intrarenal pressure produced by the procedure. Pyelovenous backflow has been reported as a possible mechanism of ascending infection. However, the urothelium is lined with umbrella cells connected by tight junctions, forming a robust barrier. Thus, the exact mechanism of pathogen passage to the renal parenchyma and the vasculature remains a question. We examine ex vivo animal models and describe some possible mechanisms.

Material and Methods: Lamb kidneys models were sourced for this ex vivo study. The ureter was cannulated with a dual lumen ureteral catheter (Boston Scientific Corporation, Marlborough, Massachusetts, United States). A Comet Pressure Guidewire (Boston Scientific Corporation, Marlborough, Massachusetts, United States) for pressure measurement was inserted through one lumen and left in the renal pelvis, with irrigation fluid flowing through the second lumen. The irrigation fluid used was 0.9% saline modified with a blue pigment to aid visualisation. The kidney models were irrigated for 30 s at intrarenal pressures of 0, 20, 40, 60, 80 and 100 mmHg. At the conclusion of irrigation, the renal units were bivalved and macroscopically examined for location of dye and rupture of any renal calyces.

Results: Preliminary results with 6 renal units were examined. At 0 and 20 mmHg, there was no macroscopic extravasation of blue pigment. At 40 mmHg, blue stain of the renal cortex radiating outwards was seen. At an intrarenal pressure of 60 and 80 mmHg, rupture of the renal calyces was seen with blue staining of the associated renal cortex in a wedge shape manner.

Conclusions: Higher intrarenal pressures of above 40 mmHg demonstrated both cortical staining of blue pigment and calyceal rupture. Thus, both pyelovenous backflow and calyceal rupture may contribute to infectious complications after pyeloscopy.

Microscopic studies of the effect of raised intrarenal pressures: An ex vivo animal model

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Introduction & Objectives: Elevated intrarenal pressures (IRPs) are common during ureteroscopies and may have implications for post operative complications. However, little is known about the microscopic processes that transpire during pathogenesis of infective complications. We aimed to document the histological changes observed in renal units subjected to elevated IRPs and postulate the possible mechanisms of infectious complications after ureteroscopies.

Materials and methods: 21 ex vivo porcine kidney models were used. Each ureter was cannulated with a 10Fr dual lumen ureteric catheter (Boston Scientific Corporation, Marlborough, Massachusetts, United States) with the proximal end at the pelviureteric junction. The distal end of the ureter was secured to form a leak-proof seal around the ureteric catheter. A 0.014" pressure sensing wire (Comet II Pressure Guidewire®, Boston Scientific Corporation, Marlborough, Massachusetts, United States) was inserted through one

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lumen and with the sensor positioned in the renal pelvis for IRP measurement. Undiluted India ink stain (Royal Talens, Apeldoorn, Netherlands) was irrigated through the second lumen. Each renal unit was subjected to India ink Irrigation at target IRPs of 5 mmHg (control), 30 mmHg, 60 mmHg, 90 mmHg, 120 mmHg 150 mmHg and 200 mmHg. 3 renal units subjected to each target IRP. After irrigation, each renal unit was processed by a uropathologist with haematoxylin and eosin, and examined under low and high power magnification.

Results: India ink stain was observed in the collecting ducts at 5 mmHg. Signs of pressure as represented by collecting duct dilatation was first observed at 60 mmHg. Stain was consistently observed in the distal convoluted tubules at ≥60 mmHg, all renal units showed renal cortex involvement. At ≥90 mmHg, stain was observed in venous structures. At 200 mmHg, stain was observed in supportive tissue, peritubular capillaries and glomerular capillaries.

Conclusion: Demonstration of vascular involvement is required for septic complications. This occurred at IRP of ≥90 mmHg in ex vivo procine models.

Comparison of 18-Fluorine PSMA with 68-Gallium PSMA radiotracers in PET/CT imaging of prostate cancer – a systematic review

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Introduction & Objectives: PSMA is a transmembrane glycoprotein involved in the enzymatic process of glutamate release. Contrary to its name, it is physiologically expressed in a number of organs and tissues, including the lacrimal and salivary glands, the kidney, the liver and the gastrointestinal tract. For PCa, >90% of cells express PSMA with higher rates of expression in higher grade disease. Gallium-68 (68Ga) and Fluorine-18 (18F) are the two radioisotopes approved by the FDA in PSMA PET/CT imaging. By far, the 68Ga base radiotracer, [68Ga]-PSMA-11 has been most extensively studied and widely used. However, 18F is theoretically able to offer a higher image resolution owing to its lower end point positron energy and longer half-life. Over the years, a number of 18F based PSMA radiotracers have been synthesised and assessed against [68Ga]-PSMA-11 in terms of the diagnostic performance and the cost of production, including [18F]-PSMA-1007, [18F]DCFPyL, [18F]AIF-PSMA-11, [18F]ihPSMA-7 and [18F]-JK-PSMA-7.

This systematic review aims to compare 68Ga and 18F based PSMA radiotracers with a focus on their imaging characteristics and diagnostic utility in primary and secondary staging of PCa. In addition, the chemical structures of the radiotracers are outlined to provide a molecular basis in the comparison. Production and cost of each tracer is also discussed.

Methods: Search strategy and selection criteria.
The review was performed in a systematic approach through searching on 4 scientific literature databases (MEDLINE, EMBASE, PubMed and Web of Science). The search was done in July 2022 using several keywords, including: “18F-DCFPyL” or “18F-PSMA-1007” or “68Ga-PSMA-HBED-CC” or “68Ga-PSMA-11”; and “PSMA ligand”; and “primary diagnosis” or “biochemical recurrence”; and “prostate cancer”; and “PET/CT” or “Positron emission tomography/computed tomography”.
The studies included must directly compare the diagnostic utility of [18F] PSMA and [68Ga]-PSMA-11 in PET/CT scan in PCa primary staging, restaging or metastatic follow-ups. All types of [18F] based PSMA radiotracers were considered. The types of studies considered include head-to-head analysis, matched-pair comparison, retrospective or prospective observational studies or randomised clinical trials. Both clinical and preclinical studies were selected for the assessment. Case reports, conference proceedings, editorial comments, letters to the editor and review papers were excluded. Only studies published in the last 10 years in the English language were included. The search and selection of the papers were performed by two independent evaluators (S.H. and S.O.) and any discrepancies were resolved by a third evaluator (N.L.).

Quality assessment: Studies were assessed for quality using the Joanna Briggs Institute (JBI) critical appraisal checklist for case control studies. The JBI tool primarily assesses the risk of bias in the following areas: patient selection, exposure measurement, identifying and dealing with confounding factors, selection of statistical analysis (Table 10). The quality of each article was assessed by two independent evaluators (S.H. and S.O.) and any discrepancies were resolved by a third evaluator (N.L.).

Data extraction: The basic information of the study extracted include the study nature and design, year of the study, country where the study was conducted, the indication for the scan, image protocols including the time to acquisition and injection dose, and the sample size. Patient characteristics were extracted when available, including the patient age, pre-scan PSA, Gleason scores and pre-scan treatment. The quantitative data compared include the normal organ distribution (liver, kidney, urinary bladder, bone), the lesion uptake, the lesion delineation accuracy and the lesion detection rate. Confirmation of the scan results by histology or clinical follow-ups and the impact of the scan results on
management were recorded when available. Basic details for the studies included are listed in Tables 1–3.

Results: Using the systematic search strategy, 1475 articles were identified, of which 227 were duplicate records and excluded. Of the remaining 1244 records, 1177 were not relevant to the research question. A further 21 were conference abstracts that could not be quality assessed, and thus were excluded. From the remaining 46 articles, 23 were excluded as they contained duplicate data. This left 23 articles were suitable for assessment; a summary of the search strategy is shown in Fig. 1. Of the 23 studies relevant to the review, data for primary staging were available in three studies, all of which studied [18F]-PSMA-1007. Data for restaging following BCR were available in ten studies, seven of which studied [18F]-PSMA-1007. Two evaluated [18F]DCFPyL. The remaining one studied [18F]-JK-PSMA-7. Four studies reported collective results for primary staging and restaging following BCR, two of which studied [18F]-PSMA-1007. The remaining two evaluated [18F]AIF-PSMA-11 and [18F]rhPSMA-7 respectively. Biodistribution data were available for [18F]-PSMA-1007 and [18F]DCFPyL. Three papers evaluated the intraprostatic delineation of the tracers. Two studies were preclinical studies.

Molecular structure of PSMA: PSMA is a transmembrane protein that contains a binding site on its extracellular domain, the enzymatic pocket S1. It has a high affinity for glutamate and glutamate like chemical moieties (Fig. 2). Therefore, the PSMA radiotracers all contain the Glu-Urea-Lys motif that targets the PSMA enzymatic pocket S1 (Fig. 2). Some of the PSMA radiotracers also target an additional binding site, the hydrophobic accessory pocket S1 (Fig. 3).

Molecular structure of [68Ga]-PSMA-11 (Fig. 4)
Also known as [68Ga]Glu-Urea-Lys (Ahx)-HBED-CC, [68Ga] is bound to the molecule through the HBED-CC metal-chelator. HBED-CC has been proven to be key to the radiotracer as the replacement of which by DOTA chelator led to a much poorer outcome in 68Ga-PSMA PET/CT imaging. In addition, HBED-CC allows cost-effective radiolabelling with 68Ga at ambient temperature.

Results: Of the 37 studies evaluated, six were preclinical studies. Two evaluated [18F]PSMA-1007 against [68Ga]PSMA-11. Different to the simple binding of 68Ga to the HBED-CC chelator, the fluorination process in [18F]DCFPyL is more complex. As a neo-tracer, [18F]-JK-PSMA-7 was developed based on the structure of [18F]DCFPyL. It differs by an additional methoxy group (OMe), aiming to improve the sensitivity of the radiotracer. The JK in the name refers to the institution involved in the development of this tracer.

Molecular structure of [18F]-PSMA-1007 (Fig. 5)
[18F]-PSMA-1007 contains the same Glu-Urea-Lys binding motif as [68Ga]-PSMA-11. Different to the simple binding of 68Ga to the HBED-CC chelator, the fluorination process in [18F]DCFPyL is more complex. As a neo-tracer, [18F]-JK-PSMA-7 was developed based on the structure of [18F]DCFPyL. It differs by an additional methoxy group (OMe), aiming to improve the sensitivity of the radiotracer. The JK in the name refers to the institution involved in the development of this tracer.

Molecular structure of [18F]AIF-PSMA-11 (Fig. 5)
Same as [68Ga]-PSMA-11, [18F]AIF-PSMA-11 also uses the HBED-CC metal-chelator. As HBED-CC could only bind to metals, fluorine-aluminium (AIF) compound was developed to allow this binding between HBED-CC and 18F.

Molecular structure of [18F]-rhPSMA-7 (Fig. 6)
[18F]-rhPSMA-7 is a radiohybrid molecule that comprises of a silicon-fluoride-acceptor (SiFA) building block and a metal-chelator. SiFA allows efficient labelling with fluorine; however, it increases the lipophilicity of the molecule. Therefore, a metal-chelator was incorporated to increase the hydrophilicity. In addition, the metal-chelator can bind 177Lu for therapeutic use in PCa.

Biodistributions (Table 4)
Biodistribution of [18F]-PSMA-1007
A significantly greater liver uptake was observed in [18F]-PSMA-1007 in comparison to [68Ga]PSMA-11. In contrary, significantly lower urinary bladder uptake of [18F]-PSMA-1007 was reported in four studies and lower kidney uptake was reported by one study. Similar fold of difference was observed in the kidney. In addition, one study observed a significantly greater bone uptake in [18F]-PSMA-1007 in comparison to [68Ga]PSMA-11.

Biodistribution of [18F]DCFPyL
In contrary to [18F]-PSMA-1007, [18F]DCFPyL was observed to have a similar biodistribution to [68Ga]PSMA-11 except for a significantly lower kidney uptake. Both liver and urinary bladder uptakes were greater in [18F]DCFPyL but the difference was not significant.

Primary staging by [18F]PSMA-1007 (Table 6)
Three head-to-head comparisons evaluated [18F]PSMA-1007 against [68Ga]PSMA-11 in primary staging of PCa. Overall, [18F]PSMA-1007 was observed to have a higher detection rate for local lesions. Most lesions were verified by histology and proven to be true positives. One false positive detected by 18F was due to chronic prostatitis. The lesion SUV values were reported in two studies, both observed a higher uptake of 18F than 68Ga (Table 5). The discordance did not have impact on the overall staging of the PCa or management of the patients in any of the study.

Restaging following BCR by [18F]PSMA-1007 (Table 7)
Three head-to-head comparisons evaluated [18F]PSMA-1007 against [68Ga]PSMA-11 in secondary staging of PCa following BCR. Similar to the findings in primary staging, two of the studies observed a higher local lesion detection by 18F. Most lesions were verified by histology and proven to be true positives.
to be true positives. The remaining one head-to-head analysis that administered patients with diuretics prior to the scan observed a higher local lesion detection rate by $^{68}$Ga, verified by histology. In addition, the same study reported a false positive detected by $^{18}$F in the vertebrae (SUV 5.1). Marginally higher detection rate by $^{18}$F was also reported by two match-paired comparisons and one observational study. Only one match-paired analysis observed a higher local lesion detection rate and an overall comparable detection rate. None of the match-paired comparisons verified the lesions. Overall, the impact on management was not reported in any of the studies.

**Restaging following BCR by $^{18}$F DCFPyL** (Table 7)

$^{[18F]}$DCFPyL was evaluated against $^{[68Ga]}$PSMA-11 by Dietlein et al. in a head-to-head analysis and a match-paired analysis. $^{[18F]}$DCFPyL was observed to have a greater detection rate consistently. In the match-paired analysis, $^{[18F]}$DCFPyL was observed to have a significantly higher detection rate than $^{[68Ga]}$PSMA-11 when PSA is low. However, few lesions were verified. No clinical impact was reported.

**Restaging following BCR by $^{18}$F - JK-PSMA-7** (Table 7)

$^{[18F]}$-JK-PSMA-7 was evaluated against $^{[68Ga]}$PSMA-11 by Dietlein et al. in one pilot study that included 10 patients who have undergone $^{[68Ga]}$PSMA-11 scan but the results were negative or inconclusive in 5 of the patients. $^{[18F]}$-JK-PSMA-7 was observed to have a higher detection rate. However, only one lesion was verified. Nevertheless, the additional lesion detected by $^{18}$F led to subsequent radiotherapy.

**Collective results for primary staging, secondary staging after BCR and follow-ups of PCa by $^{18}$F PSMA-1007** (Table 8)

Two head-to-head analysis reported collected detection rates for primary staging and restaging after BCR. Similar to the findings reported previously, $^{[18F]}$PSMA-1007 was observed to a higher detection rate for local lesions. Higher equivocal bone lesions detected by $^{18}$F were also reported in both studies. In the Pattison study, most lesions were verified but did not have clinical impact. The Hoberuck study did not verify the lesions but reported consecutive initiation of salvage therapy secondary to the additional lesions detected by $^{18}$F.

**Collective results for primary staging, secondary staging after BCR and follow-ups of PCa by $^{18}$F rhPSMA-7** (Table 8).

$^{[18F]}$rhPSMA-7 was evaluated against $^{[68Ga]}$PSMA-11 in a retrospective match-paired analysis (33 primary staging, 127 restaging after BCR in each group). $^{[18F]}$rhPSMA-7 was observed to have higher detection rate for local lesions and distant lesions but a lower detection rate for LN lesions in comparison to $^{[68Ga]}$PSMA-11. The lesions were not verified. No clinical impact was mentioned.

**Conclusions**

**Overall comparison between $^{18}$F and $^{68}$Ga based PSMA radiotracers**

Overall, $^{18}$F-based PSMA radiotracers was observed to have a marginally higher detection rate and sensitivity. This is likely due to the better image spatial resolution secondary to the lower positron energy of $^{18}$F versus $^{68}$Ga (0.65 vs 1.90 meV) therefore a shorter positron range (Rmax 2.4 mm vs 9.2 mm). In addition, the injection dose of $^{18}$F is higher in all studies due to its greater production yield. The clinical impact of the difference made by $^{18}$F was not mentioned or was shown to be limited in most studies.

Different $^{18}$F based PSMA tracers have some unique features to compare with $^{[68Ga]}$PSMA-11 and they are listed below.

$^{[18F]}$PSMA-1007

The main advantage of $^{[18F]}$PSMA-1007 observed in this review was its greater locoregional lesion detection rate and accuracy in local lesion delineation. This is likely secondary to its predominant hepatobiliary excretion route. In comparison, the predominant urinary excretion of $^{[68Ga]}$PSMA-11 is likely to obscure the local lesions near the prostate. However, decreasing the urinary excretion of $^{[68Ga]}$PSMA-11 through the administration of diuretics is promising in enhancing its performance in this context as a greater local lesion detection rate was observed in $^{[68Ga]}$PSMA-11 in one study that administered patients with diuretics prior to the scan.

One of the pitfalls of $^{[18F]}$PSMA-1007 observed in this review was its greater rates of equivocal bone uptakes, in accordance with its significantly higher physiologic bone uptake observed in one study. However, Armfield et al. proposed that the false positives could be reduced by increasing the cut-point SUVmax of $^{[18F]}$PSMA-1007 to 7.2 in detecting bone lesions. In addition, Hoberuck et al. argued that unspecific bone uptakes rarely represents a diagnostic challenge. The other pitfall of $^{[18F]}$PSMA-1007 observed in the Pattison study was its intense liver uptake obscuring adjacent metastatic lesions. However, the same study also indicated that the lesion was captured by the correlating CT scan and did not lead to a misdiagnosis.

$^{[18F]}$DCFPyL

$^{[18F]}$DCFPyL was observed to have a more similar biodistribution as $^{[68Ga]}$PSMA-11 including a similar bladder uptake [25]. Therefore, $^{[18F]}$DCFPyL
was not observed to have a significantly higher local lesion detection rate. Nevertheless, $[^{18}\text{F}]$ DCFPyL was reported to have an overall higher detection rate, likely contributed by its better image spatial resolution provided by $^{18}\text{F}$.

**Neo $^{18}\text{F}$ Based PSMA tracers**

$[^{18}\text{F}]$JK-PSMA-7, $[^{18}\text{F}]$-rhPSMA-7 and $[^{18}\text{F}]$AlF-PSMA-11 all demonstrated marginally greater detection rates in comparison with $[^{68}\text{Ga}]$PSMA-11. There were additional two preclinical studies comparing $[^{18}\text{F}]$AlF-PSMA-11 with $[^{68}\text{Ga}]$PSMA-11. In both studies, $[^{18}\text{F}]$AlF-PSMA-11 was observed to have limited hepatobiliary and urinary excretions. In the match-paired comparison (1 vs 3 mice in the $^{18}\text{F}$ and $^{68}\text{Ga}$ group), Ioppolo et al observed that $[^{18}\text{F}]$AlF-PSMA-11 had a significant defluorination resulting in abnormally high bone uptake. In contrast, the head-to-head analysis with 10 mice did not find increased bone uptake of $[^{18}\text{F}]$AlF-PSMA-11. Thus, $[^{18}\text{F}]$AlF-PSMA-11 should be further investigated in terms of its stability.

**Production and cost**
The production of $[^{18}\text{F}]$PSMA-1007 was assessed to be cheaper in relation to $[^{68}\text{Ga}]$PSMA-11 in one study assessing the production process, maintenance and waste dismission. In addition, the current production yield of $^{68}\text{Ga}$ is less than $^{18}\text{F}$, resulting in a lower injection dose, which may impact the image resolution.

**Limitations:** This review has several limitations. There were several confounding factors, including the individual variations in the match-paired comparisons, the use of different PET/CT scanners, and different pre-scan voiding status. There was risk of bias outcomes secondary to the lack of histology verifications and lack of studies on the neo $^{18}\text{F}$ based tracers. The scope of the current literatures is limited by the lack of data collection on clinical impacts. Furthermore, due to the scope of this review, the therapeutic use of PSMA radiotracers were not considered. Lastly, the individual studies on $^{68}\text{Ga}$ and $^{18}\text{F}$ based PSMA radiotracers were not included due to the presence of confounding factors.

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**Fig. 1** Summary of the study selection process.

**Fig. 2** Binding between the enzymatic pocket S1’ of PSMA and the Glu-Urea-Lys motif of the PSMA radioligand ($[^{18}\text{F}]$DCFPyL is used an example).

**Fig. 3** PSMA molecular structure demonstrating the enzymatic pocket S1’ and the hydrophobic accessory pocket S1

**Fig. 4** Structural formula of $[^{68}\text{Ga}]$PSMA-11. Structures in blue, black and red represent the Glu-Urea-Lys binding motif, the linker region and the HBED-CC chelator respectively.

**Fig. 5** Structural formulas of $[^{18}\text{F}]$DCFPyL, $[^{18}\text{F}]$JK-PSMA-7, $[^{18}\text{F}]$-PSMA-1007, $[^{18}\text{F}]$AlF-PSMA-11. Structures in blue and red represent the Glu-Urea-Lys binding motif and the $^{18}\text{F}$ carrying molecule respectively.

**Fig. 6** Concept demonstration of $[^{18}\text{F}]$-rhPSMA-7. The molecule can be labelled by one radioactive isotope and one nonradioactive isotope.
### Table 1: Study information (study indication, country, study type and sample size)

| Indication for scan | 18F Radiotracer Type | Study | Country | Study nature & design | Sample size 18F vs 68Ga |
|---------------------|----------------------|-------|---------|-----------------------|------------------------|
| Primary staging     | [18F]PSMA-1007       | Kuten et al., 2020 | Israel | Prospective head-to-head analysis | 16                   |
| Delineation of      | [18F]PSMA-1007       | Draulans et al., 2021 | Belgium | Prospective match-paired analysis | 10 vs 9               |
|                    |                      | Scobioala et al., 2021 | Germany | Retrospective observational | 35                    |
| Restaging after BCR | [18F]PSMA-1007       | Zhang et al., 2022 | China | Retrospective match-paired analysis | 57 vs 12              |
|                    |                      | Rauscher et al., 2020 | Germany | Retrospective match-paired analysis | 102 vs 102            |
|                    |                      | Lengana et al., 2021 | South Africa | Prospective head-to-head analysis | 21                    |
|                    |                      | Ende et al., 2021 | Australia | Retrospective match-paired analysis | 14                    |
|                    |                      | Morawitz et al., 2021 | Germany | Retrospective observational | 23 vs 36              |
|                    |                      | Alberts et al., 2021 | Switzerland | Retrospective match-paired analysis | 122 vs 122            |
|                    |                      | Hoffmann et al., 2022 | Germany | Retrospective match-paired analysis | 128 vs 136            |
|                    | [18F]DCFPyL          | Dietlein et al., 2015 | Switzerland | Retrospective match-paired and head-to-head analysis | Head-to-head: 62 vs 129 |
|                    |                      | Dietlein et al., 2017 | Germany | Retrospective match-paired analysis | 14                    |
|                    |                      | Hammes et al., 2018 | Germany | Retrospective observational | 21                    |
|                    | [18F] -JK-PSMA-7     | Dietlein et al., 2020 | Germany | Retrospective observational | 10                    |
| Primary staging, BCR & metastatic follow-up | [18F]PSMA-1007 | Pattison et al., 2022 | Australia | Prospective head-to-head analysis | 50 (17 primary staging, 33 restaging after BCR) |
|                    |                      | Hoberück et al., 2021 | Germany | Retrospective head-to-head analysis | 46 (10 primary staging, 30 restaging after BCR, 6 follow-ups) |
|                    | [18F]DCFPyL          | Ferreira et al., 2019 | Australia | Retrospective observational | 34                    |
|                    |                      | Jansen et al., 2019 | The Netherlands | Retrospective observational | 50 vs 87              |
|                    | [18F]hPSMA-7         | Kroenke et al., 2021 | Germany | Retrospective match-paired analysis | 33 vs 33 (primary staging), 127 vs 127 (restaging after BCR) |
|                    | [18F] AlF-PSMA-11    | De man et al., 2022 | Belgium | Phase 3 randomised clinical trial | 85 (19 primary staging, 63 restaging after BCR, 3 follow-ups) |
| Biodistribution and radiation dosimetry comparison | [18F]PSMA-1007 | Sharma et al., 2022 | India | Prospective matched-pair comparison | 4 vs 4               |
| Imaging characteristics comparison | [18F]AlF-PSMA-11 | Piron et al., 2020 | Belgium | In vivo and ex vivo head-to-head analysis | 10                    |
| Biodistribution comparison | [18F] AlF-PSMA-11, [18F]PSMA-1007 | Ioppolo et al., 2020 | Australia | In vivo and ex vivo match-pair comparison | 3(18F)PSMA-1007, 1(18F)AlF-PSMA-11 vs 3(18Ga)PSAM-11 |

BCR, biochemical recurrence.

### Table 2: Study information (imaging protocol)

| Citation       | Time to acquisition (minute) 18F vs 68Ga | Injection dose (MBq) | Pre-scan preparation |
|----------------|------------------------------------------|----------------------|----------------------|
| Kuten et al., 2020 | 60 vs 45-80 | NA                    | Drank 500 mL of water and voided |
| Draulans et al., 2021 | 60 vs 60 | NA                    | NA                  |
| Scobioala et al., 2021 | 2.96-3.7 MBq/kg | 325 (40) vs 147 (27) | Voided |
| Zhang et al., 2022 | 120 vs 90 | 318.4 (59.0) vs 128.3 (35.9) | Fasted for at least 4 h |
| Rauscher et al., 2020 | 94 (22) vs 54 (7) | 325 (40) vs 147 (27) | Fasted for at least 4 h |
| Ende et al., 2021 | 109 (25) vs 71 (18) | 3.7 (1.24–8.25) vs 3.6 (2.01–6.3) mCi | Voided |
| Morawitz et al., 2021 | 109 (25) vs 71 (18) | 3.5 MBq/kg vs 2 MBq/kg | 12/14 patients injected with 20 mg furosemide |
| Alberts et al., 2021 | 109 (25) vs 71 (18) | 3.5 MBq/kg vs 2 MBq/kg | 12/14 patients injected with 20 mg furosemide |
| Hoffmann et al., 2022 | 109 (25) vs 71 (18) | 3.5 MBq/kg vs 2 MBq/kg | 12/14 patients injected with 20 mg furosemide |
| Dietlein et al., 2015 | 120 vs 60 | 318.4 (59.0) vs 128.3 (35.9) | Fasted for at least 4 h |
| Dietlein et al., 2017 | 120 vs 60 | 318.4 (59.0) vs 128.3 (35.9) | Fasted for at least 4 h |
| Hammes et al., 2018 | 125 (12) vs 73 (14) | 311 (61) vs 162 (54) | NA                  |
| Dietlein et al., 2020 | 120 vs 60 | 358 (15) vs 141 (30) | Fasted for at least 4 h |
| Pattison et al., 2022 | 120–180 vs 45–60 | 250 vs 100–150 | Drank 500 mL of water and voided |
| Hoberück et al., 2021 | 104 (11) vs 110 (18) | 154 (123–175) vs 149 (111–161) | NA                  |
| Ferreira et al., 2019 | 91 (81.25–123) vs 57 (47–68.75) | 3.6 (0.18) vs 1.6 (0.41) MBq/Kg | NA                  |
Table 2 (continued)

| Citation               | Time to acquisition (minute) $^{18}F$ vs $^{68}Ga$ | Injection dose (MBq) | Pre-scan preparation |
|------------------------|---------------------------------------------------|----------------------|----------------------|
| Jansen et al., 2019    | 120 (117–123) vs 65 (57–74) †                    | 311.2 (301.6–318.8) vs 139.6 (120.2–156.5) † MBq | NA                   |
| Kroenke et al., 2021   | 80 (20) vs 55 (9)                                  | 329 (48) vs 143 (31) MBq | Injected with 40 mg furosemide |
| De man et al., 2022    | 60 (5) immediately, 30 min, 1 h, 2 h             | 2.0 (0.2) MBq/kg      | Fasted for 4 h, injected with frusemide 20-40 mg |
| Sharma et al., 2022    | dynamic scan for 2.5 h                            | 37–111               | NA                   |
| Ioppolo et al., 2020   | 1 h, 2 h, 4 h                                     | 7–20                 | Fasted for 6 h       |

BCR, biochemical recurrence; mean (SD); † median (IQR); ‡ median (range); 
1A second $^{68}Ga$-PSMA-11 scan of the pelvis and lower abdomen was performed 3 h after injection.

Table 3 Patient Characteristics

| Citation               | Age $^{18}F$ vs $^{68}Ga$ | PSA (ng/mL) $^{18}F$ vs $^{68}Ga$ | Gleason score (N) $^{18}F$ vs $^{68}Ga$ | Treatment prior to imaging $^{18}F$ vs $^{68}Ga$ |
|------------------------|---------------------------|-----------------------------------|-------------------------------------|-------------------------------------|
| Kuten et al., 2020     | 56–74 (range)             | 6.35 (3.5–19) ‡                  | • ≤6: 2                             | NA                                  |
|                        |                           |                                   | • 7: 11                             |                                     |
|                        |                           |                                   | • 8: 3                              |                                     |
|                        |                           |                                   | • >8: 0                             |                                     |
| Draulans et al., 2021  | NA                        | 6.3 (2.1–27.5) vs 10.1 (3.8–24.6) ‡ | • ≤6: 0 vs 0                        | NA                                  |
|                        |                           |                                   | • 7: 5 vs 5                         |                                     |
|                        |                           |                                   | • 8: 1 vs 2                         |                                     |
|                        |                           |                                   | • >8: 4 vs 2                        |                                     |
| Scobioala et al., 2021| 68 (58–77) ±              | 15.4 (0.6–57.9)                  | • ≥6: 11                            | NA                                  |
|                        |                           |                                   | • 7: 20                             |                                     |
|                        |                           |                                   | • 8: 18 vs 4                        |                                     |
|                        |                           |                                   | • >8: 8 vs 0                        |                                     |
| Zhang et al., 2022     | 71 (67–75) vs 72 (68–80) †| 15.00 (7.30–30.58) vs 17.05 (12.47–22.65) † | • ≤6: 11 vs 2                       | NA                                  |
|                        |                           |                                   | • 7: 20                             |                                     |
|                        |                           |                                   | • 8: 18 vs 4                        |                                     |
| Rauscher et al., 2020  | 71 (51–84) ‡             | 0.87 (0.20–13.59) vs 0.91 (0.18–30.00) ‡ | • 6–7: 63 vs 63                      | • RPx: 102 vs 102                    |
|                        |                           |                                   | • 8–10: 39 vs 39                     | • ADT: 24 vs 24                      |
| Lengana et al., 2021   | 68.57 (48–78) ‡           | 2.55 (3.1)                       | • ≤6: 8                             | • RPx: 15                            |
|                        |                           |                                   | • 7: 9                              | • RTx: 4                            |
|                        |                           |                                   | • 8: 2                              | • ADT: 0                            |
|                        |                           |                                   | • >8: 2                             |                                     |
| Ende et al., 2021      | 61.8 (7.1)                | 0.21 (0.15)                      | • ≥6–7: 7                           | • RPx: 14                            |
|                        |                           |                                   | • 8–9: 7                            | • RTx: 2                            |
| Morawitz et al., 2021  | 71 (8.5)                  | 1.96 (1.64)                      | NA                                  | • RPx: 59                            |
| Alberts et al., 2021   | 72 (54–87) vs 71 (52–85) ‡| 2.23 (0.12–518) vs 2.75 (0.2–4513) ‡ | • 7 (5–10) ‡                        | • RPx: 90 vs 92                       |
|                        |                           |                                   | • RTx: 5                            | • ADT: 16 vs 6                       |
|                        |                           |                                   |                                       | • Others: 8 vs 12                     |
|                        |                           |                                   |                                       | • RPx: 84 vs 92                       |
|                        |                           |                                   |                                       | • RTx: 44 vs 44                      |
|                        |                           |                                   |                                       | • ADT: 74 vs 60                      |
| Hoffmann et al., 2022  | 69.3 (8.8) vs 69.2 (8.3)  | 1.6 (0.1–167.1) vs 3.2 (0.1–170) ‡| • ≤6: 9 vs 6                         | • RPx: 59                            |
|                        |                           |                                   | • 7: 63 vs 82                        | • RPx: 90 vs 92                       |
|                        |                           |                                   | • 8: 20 vs 27                        | • RTx: 5 vs 5                        |
|                        |                           |                                   | • >8: 36 vs 21                       | • ADT: 16 vs 6                       |
| Dietlein et al., 2015  | Range: 51–86              | 2.04 (0.17–50) ‡                 | NA                                  | • RPx: 106                            |
| Dietlein et al., 2017  | RPx group: 68.4 (7) vs 70.1 (7.9) | RPx group: 2.7 (3.8) vs 2.5 (2.2)  | • RPx group:                         | • RPx: 85                            |
|                        | RTx group: 71.8 (8.5) vs 72.1 (6.7) | RTx group: 4.1(7.5) vs 8.5 (11.1) | • RPx group:                         | • Salvage RTx after RPx: 16 vs 31    |
|                        |                           |                                   | • RPx group:                         | • ADT: 0                             |
| Dietlein et al., 2020  | 66.5 (8.5)                | NA                               | NA                                  | • RPx: 9                             |
|                        |                           | 0.46–14.9                         | • 6: 1                              | • RTx: 2                             |
|                        |                           |                                   | • 7: 8                              |                                     |
|                        |                           |                                   | • 8: 1                              |                                     |
Table 4 Comparison of normal organ distributions of $^{18}$F-PSMA-1007 and $^{18}$F-DCFPPyL with $^{68}$Ga-PSMA-11 in liver, urinary bladder, kidney and bone

| Type of $^{18}$F PSMA tracer | Summary of results | Organ/tissue | $\text{SUV}_{\text{mean}}/\text{SUV}_{\text{max}}/\text{SUV}_{\text{peak}}$ $^{18}$F vs $^{68}$Ga | Citations |
|-----------------------------|-------------------|--------------|---------------------------------|-------------|
| $^{[18F]}$PSMA-1007         | Significantly greater uptake of $^{18}$F | Liver | 13.0 vs 7.0, $p < 0.001$ | Hober et al., 2021 |
|                             |                   |              | 11.9 vs 4.4, $p < 0.001$    | Pattison et al., 2022 |
|                             |                   |              | 11.82 vs 5.37, $p < 0.0001$ | Ende et al., 2021 |
|                             |                   | bone        | 1.5 (0.5) vs 0.8 (0.4), $p < 0.001$ | Pattison et al., 2022 |
|                             | Significantly lower uptake of $^{18}$F | Urinary bladder | 3 vs 14.8, $p < 0.001$ | Pattison et al., 2022 |
|                             |                   |              | 3.66 vs 25.35, $p < 0.001$ | Kuten et al., 2020 |
|                             |                   |              | 3.46 vs 9.67, $p = 0.0042$ | Ende et al., 2021 |
|                             |                   |              | 2.90 (1.14) vs 7.40 (3.55) | Sharma et al., 2022 |
|                             |                   | Kidney      | 15.18 (1.04) vs 25.89 (7.78) | Sharma et al., 2022 |
| $^{[18F]}$DCFPPyL           | Non-significant greater uptake of $^{18}$F | Liver | 7.5 vs 6.7, $p = 0.001$ | Ferreira et al., 2019 |
|                             |                   |              | 6.2 vs 5.1, $p = 0.049$ | Dietlein et al., 2015 |
|                             | Significantly lower uptake of $^{18}$F | Urinary bladder | 57.3 vs 43.1, $p = 0.033$ | Ferreira et al., 2019 |
|                             |                   |              | 40.0 vs 59.6, $p < 0.001$ | Ferreira et al., 2019 |
|                             | Non-significant lower uptake of $^{18}$F | bone | 0.49 (0.08) vs 0.52 (0.06), $p = 0.03$ | Hammes et al., 2018 |

Mean (SD).
### Table 5: Comparison of lesion uptake of $^{18}$F-PSMA and $^{68}$Ga-PSMA

| (18$^F$)PSMA tracer type | (18$^F$) SUVmax mean (SD) | (68$^Ga$) SUVmax mean (SD) | Significance in difference | Citation |
|--------------------------|---------------------------|---------------------------|---------------------------|----------|
| $^{18}$F-PSMA-1007       | 8.73 (median)             | 6.94 (median)             | $p = 0.002$               | Kuten et al., 2020 |
|                          | 20 (7.7–24.9)†            | 13.7 (7.6–29.4)†          | $p = 0.056^a$             | Pattison et al., 2022 |
|                          | 10.9 (7.0–20)†            | 7.6 (4.4–15.2)†          | $p = 0.028^b$             | Hoberück et al., 2021 |
|                          | 31.5 (median)             | 32.7 (median)             | $p = 0.658$               | Rauscher et al., 2020 |
|                          | 9.4 (2.7–234.4)‡          | 9.9 (5.3–112.5)‡         | $p = 0.816$               | Ende et al., 2021 |
|                          | 5.4 (7.0)                 | 7.0 (10.2)               | $p = 0.469$               | Dietlein et al., 2015 |
| $^{18}$FDCFPPyL          | 14.5                      | 12.2                     | $p = 0.028$               | Kroenke et al., 2021 |
| $^{18}$FrhPSMA-7         | 19.3 (23.8)               | 11.6 (10)                | $p = 0.06^a$              | Rauscher et al., 2020 |
|                          | 28.3 (22.6)               | 18.9 (20.9)              | $p = 0.08^b$              | |

† Median (IQR); ‡ median (range); p values in bold reflect statistical significance.

$^a$Group for primary staging; $^b$, group for restaging after biochemical recurrence.

### Table 6: Comparison of primary staging of PCa between $^{18}$F-PSMA-1007 and $^{68}$Ga-PSMA-11

| Results                                      | Citation |
|----------------------------------------------|----------|
| $^{18}$F detected additional non-dominant local lesions | Kuten et al., 2020 |
| $^{18}$F led to higher local staging         | Pattison et al., 2022 |
| Comparable                                   | Hoberück et al., 2021 |

### Table 7: Comparison of $^{18}$F-PSMA tracers and $^{68}$Ga-PSMA-11 in secondary staging of PCa following BCR

| Type of 18$^F$ PSMA tracers | Results                                                                 | Citation |
|------------------------------|-------------------------------------------------------------------------|----------|
| $^{18}$F-PSMA-1007           | $^{18}$F had a higher detection rate                                     | Hoffmann et al., 2022 |
|                              | $^{18}$F had a higher sensitivity and specificity                       | Alberts et al., 2021 |
|                              | $^{68}$Ga had a higher detection rate for local lesions                 | Morawitz et al., 2021 |
| $^{18}$FDCFPPyL              | $^{18}$F detected additional LN and bone metastasis                     | Pattison et al., 2022 |
|                              | $^{18}$F had a significantly higher detection rate when PSA is low (0.5 ng/mL - 3.5 ng/mL); similar detection rate and sensitivity at greater PSA levels. | Lengana et al., 2021 |
| $^{18}$F-JK-PSMA-7           | $^{18}$F detected additional LN and distant lesions subsequent radiotherapy | Ende et al., 2021 |
|                              |                                                                        | Rauscher et al., 2020 |
|                              |                                                                        | Dietlein et al., 2015 |
|                              |                                                                        | Dietlein et al., 2017 |

PCa, prostate cancer; BCR, biochemical recurrence; LN, lymph node; PSA, prostate specific antigen.

### Table 8: Comparison of $^{18}$F-PSMA and $^{68}$Ga-PSMA in mixed cohort of patients for primary staging of PCa, secondary staging after BCR and follow-ups

| Type of 18$^F$ PSMA tracers | Results                                                                 | Citation |
|------------------------------|-------------------------------------------------------------------------|----------|
| $^{18}$F-PSMA-1007           | $^{18}$F led to more local, LN (proximal to the ureter), visceral lesions (bladder) upstaging; more equivocal bone lesions | Pattison et al., 2022 |
|                              | $^{18}$F detected more local lesions exclusively consequent salvage radiotherapy and ADT; more equivocal bone lesions | Hoberück et al., 2021 |
| $^{18}$F-JIF-PSMA-11         | $^{18}$F led to more upstaging of the mitTNM score                      | De man et al., 2022 |
| $^{18}$FrhPSMA-7             | $^{18}$F had a higher detection rate for local lesions                  | Kroenke et al., 2021 |

PCa, prostate cancer; BCR, biochemical recurrence; LN, lymph node; ADT, androgen deprivation therapy.
Prostate cancer, e-Health and consumer information – global field state and frontiers

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**Introduction & Objectives:** For men with prostate cancer, the internet is an increasingly utilised education, communication, and intervention tool – providing consumer information which is utilised as part of screening, treatment, and support. The purpose of this study is to conduct the first bibliometric analysis of field examining utilisation and impact of e-health and internet-based health information on men with prostate cancer. Research field structure, development and frontiers are explored.

**Methods:** The Web of Science Core Collection of the WOS (Clarivate PLC) was searched without language, date or categorical restriction. The protocol aimed to identify articles which related prostate cancer to internet-based information sources and platforms. Original articles were extracted and analysed concerning their distributions. Quantitative guidance directed investigation of findings from previous studies and trending issues within the field. The WOS, VOSviewer and CiteSpace IV were used for data analysis and mapping. Top national, journal, institutional, and author contributors are summarised.

**Results:** 7897 articles underwent title and abstract review. 305 articles were included in the final analysis. There has been a 185% increase in productivity over the past decade. Articles assessing the utilisation and impact of internet-based information on men with prostate cancer were published by authors from 33 countries. Leading countries by publication were the United States of America (149 articles = 48.85%), England (41 articles = 13.44%),

### Table 10 Quality assessment (Adapted from Joanna Briggs Institute critical appraisal for cohort studies)

| Citation       | Country     | Risk of bias | Were the two groups similar and recruited from the same population? | Were the exposures measured similarly to assign people to both exposed and unexposed groups? | Was the exposure measured in a valid and reliable way? | Were confounding factors identified? | Were strategies to deal with confounding factors stated? | Were the outcomes measured in a valid and reliable way? | Was appropriate statistical analysis used? |
|----------------|-------------|--------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------|-------------------------------------------------|-------------------------------------------------|-----------------------------------------------|
| Kuten et al., 2020 | Israel      | Low          | Yes                                                                 | No                                                                                             | No                                                   | No                                                | Yes                                             | Yes                                             | Yes                                            |
| Draulans et al., 2021 | Belgium    | Low          | Yes                                                                 | No                                                                                             | No                                                   | No                                                | Yes                                             | Yes                                             | Yes                                            |
| Scobioala et al., 2021 | Germany    | Low          | Yes                                                                 | No                                                                                             | No                                                   | No                                                | Yes                                             | Yes                                             | Yes                                            |
| Zhang et al., 2022 | China       | Low          | Yes                                                                 | Yes                                                                                           | No                                                   | No                                                | No                                              | Yes                                             | No                                             |
| Rauscher et al., 2020 | Germany    | Low          | Yes                                                                 | No                                                                                             | Yes                                                  | Yes                                               | No                                              | Yes                                             | No                                             |
| Lengana et al., 2021 | South Africa| Low          | Yes                                                                 | No                                                                                             | No                                                   | No                                                | Yes                                             | Yes                                             | Yes                                            |
| Ende et al., 2021 | Australia   | Low          | Yes                                                                 | No                                                                                             | Yes                                                  | No                                                | Yes                                             | Yes                                             | No                                             |
| Morawitz et al., 2021 | Germany    | Low          | Yes                                                                 | Yes                                                                                           | No                                                   | No                                                | Yes                                             | Yes                                             | Yes                                            |
| Alberts et al., 2021 | Switzerland| Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Hofmann et al., 2022 | Germany    | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Dietlein et al., 2015 | Switzerland| Low          | Yes                                                                 | No                                                                                             | No                                                   | No                                                | Yes                                             | Yes                                             | Yes                                            |
| Dietlein et al., 2017 | Germany    | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Hammes et al., 2018 | Switzerland| Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Dietlein et al., 2020 | Germany    | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Pattison et al., 2022 | Australia  | Low          | Yes                                                                 | No                                                                                             | No                                                   | No                                                | Yes                                             | Yes                                             | Yes                                            |
| Hofer et al., 2021 | Germany     | Low          | Yes                                                                 | No                                                                                             | No                                                   | No                                                | Yes                                             | Yes                                             | No                                             |
| Ferreira et al., 2019 | Australia  | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Jansen et al., 2019 | The Netherlands | Low       | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Koneke et al., 2021 | Germany     | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| De man et al., 2022 | Belgium     | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Sharma et al., 2022 | India       | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Piron et al., 2020 | Belgium     | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
| Ioppolo et al., 2020 | Australia   | Low          | Yes                                                                 | Yes                                                                                           | Yes                                                  | Yes                                               | Yes                                             | Yes                                             | Yes                                            |
Canada (38 articles = 12.50%), Australia (34 articles = 11.15%), and the Netherlands (21 articles = 6.89%). Top contributors by institution were Harvard University (21 articles = 6.89%), University of California (19 = 6.23%) and Dana Farber Cancer Institute (17 = 5.57%). The top ranked Australian institution is the University of Melbourne (10 = 3.28%). Highest ranked authors by productivity were Huber (9 publications), Ihrig (7), and Lawrentschuk (7); whilst author ranking by co-citation were Eysenbach (77 citations), Chambers (59) and Davison (57). Journals which published the highest number of original articles were the Journal of Medical Internet Research (6.57%), Patient Education and Counselling (4.92%), and BJUI (3.61%). Research frontiers are ‘Information quality and diversity’, ‘eHealth literacy’, ‘decision making’, and ‘survivorship and advanced disease’. Social media and mHealth have received high amounts of interest in the past 4 years; however, this is restricted to information quality assessment, website based online support group effects, and development and assessment of mobile application interventions.

**Conclusions:** This analysis provides a comprehensive overview of research related to online health information and investigation of impacts on men with prostate cancer. The study reveals historical development, core research stakeholders and relationships, and an increase in publication activity. This work provides researchers, policy makers, and practitioners a better understanding of online health information research related to prostate cancer. Research should focus on frontiers which represent fundamental gaps in the literature.

### Development and validation of a method for detection of circulating tumour DNA in non-muscle-invasive bladder cancer patients in tissue, blood and urine

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**Aims:** Non-muscle-invasive bladder cancer (NMIBC) poses a burden on healthcare due to its high recurrence rate (40–80%), necessitating long-term surveillance. Cystoscopies are employed annually to monitor for recurrences or progression. Assessment of circulating tumour DNA (ctDNA) in the bloodstream/urine is of interest, as it may introduce a simpler, non-invasive means of detecting tumour presence or absence at surveillance timepoints. Currently, ctDNA assessment mainly relies on next-generation sequencing (NGS), which is expensive and time-consuming. This study aimed to assess whether droplet digital PCR (ddPCR), which is comparatively quick and inexpensive, could reliably detect NMIBC in archived and prospective tumour samples, and compare to corresponding prospective blood and urine samples.

**Methods:** We selected the 10 most common mutations found in NMIBC, based on data from the Memorial Sloan Kettering Cancer Center (MSKCC), that when cumulatively added to a gene panel, each would increase the panel’s capacity to detect cancer in a large proportion of patients with NMIBC. DNA extracted from paraffin-embedded tissue blocks of NMIBC specimens and prospectively collected urine samples was run against the panel of 10 gene mutations using ddPCR to assess for the presence of tumour DNA based on detection of the mutations.

**Results:** The gene panel was validated on 70 archived NMIBC samples, of which 69 possessed at least one of the mutations within our gene panel, conferring a 98.6% detection rate, with a median of 4 (range 0–8) mutations detected per sample. This compares to the predicted 68% detection rate observed in the MSKCC cohort, which used NGS technology. Of the 30 NMIBC patients who were assessed prospectively, 28 were found to have at least one DNA mutation within our gene panel in tissue and in the corresponding urine and/or blood sample at the time of surgical management, and in 11 for whom follow-up urine samples were obtained between 2 and 6 months after TURBT, this was no longer detectable in 10 patients.

**Conclusion:** Our ddPCR technique utilising a 10-gene-panel appears to be highly sensitive, enabling detection of tumour presence in patients with NMIBC. Prospective assessment of blood and urine samples is underway to determine the potential clinical utility of this technique in diagnosis and surveillance of NMIBC.

### An analysis of the treatment and outcomes of all patients diagnosed with upper tract urothelial carcinoma: A single service retrospective analysis to guide a multicentre prospective registry

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**Introduction & Objectives:** Upper tract urothelial carcinoma (UTUC) is a rare but increasingly prevalent cancer in Australia. Australian data on presentation, diagnosis, treatment and outcomes are limited to basic information in generalised cancer registries that offer little insight into practices in Australia. Further data would help guide decision making and evidence-based guideline adherence.
Methods: This study retrospectively analysed data of patients diagnosed with UTUC at a single Victorian health service between 2015 and 2020 utilising a specifically created online registry data collection platform. All patients were followed-up for 2 years after diagnoses for outcome analysis. Results: 75 patients were diagnosed with UTUC in the 5-year data collection period of which 62.7% were male and 37.3% female. Average age was 77.7 years at diagnosis. Median Charlson Comorbidity Index was 4 and ECOG PS 1. Previous bladder cancer was present in 27.4% and UTUC in 4.1%. Symptoms prompted presentation in 61.8% of patients. Diagnostic work-up included CT-IVP (73.6%), urine cytology (51.4%) and endoscopic assessment (72.6%). MDM discussion occurred in 94.7% of patients.

Radical nephroureterectomy (RNU) was performed in 54.6% of patients of which 2.4% underwent neoadjuvant chemotherapy. Pathological staging at RNU was T0 in 4.7% (n = 2), Ta in 34.9% (n = 15), Tis in 7.0% (n = 3), T1 in 9.3% (n = 4), T2 in 11.6% (n = 5), T3 in 25.6% (n = 11) and T4 in 7.0% (n = 3). Adjuvant chemotherapy was utilised in 2.4% of those who underwent RNU. Kidney sparing surgery occurred in 17.3% of patients. Recurrence occurred in 41.9% of patients who underwent radical treatment. Distant metastasis (50%), bladder (28%), local lymph node (22%) and contralateral upper tract (22%) were the common sites of recurrence.

Palliative systemic therapy was utilised in 17.3% of patients. Other palliative interventions included long-term ureteric stenting (20%), permanent nephrostomy (6.8%) and radiotherapy (13.3%). Emergency hospital admission secondary to UTUC complications was required in 22.7% of patients. 35% of all patients who presented with UTUC are deceased at 2 years of follow-up. Of these 85% died from progression of their UTUC.

Active disease was present in 25.6% of those who remained alive.

Conclusions: Outcomes of patients with UTUC are often poor. An Australian multicentre UTUC registry (ACCEPT-U) has the potential to identify patterns of care, compare outcomes of individual treatment strategies and provide clinician feedback and will begin in 2023.

Rehearsing retrieval; the development of a porcine cadaveric kidney retrieval course

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Introduction & Objectives: Organ retrieval, perfusion and preservation are key elements of the donation and transplantation pathway. The retrieval operation is challenging, both emotionally and technically due to physiological and anatomical variations and/or pre-existing conditions of the donors. Retrieval teams are usually comprised of registrars or fellows who retrieve organs from deceased donors on behalf of transplant centres. The level of skill of retrieval team members will have significant bearing on organ quality and impact graft outcomes. Due to the importance of high-quality retrieval, it is often not appropriate for junior trainees to practice on actual deceased donors which poses challenges for training.

Our aim was to simulate organ retrieval using animal models to ensure transplant fellows and registrars are well equipped with the knowledge and skills of abdominal organ retrieval before they take on this role in the field.

Methods: A highly experienced faculty of transplant surgeons, coordinators and anaesthetists developed a porcine cadaveric kidney retrieval course in conjunction with the Royal College of Surgeons in Ireland (RCSI). The course was designed for trainees in transplant and urology, nursing staff who specialise in transplant and transplant co-ordinators.

Results: Our educational video demonstrates the key steps to deceased donor kidney retrieval including laparotomy and sternotomy, accessing the retroperitoneum, isolating the ureters, aortic cannulation and perfusion, IVC venting, removal of kidneys and back table preparation.

As seen in the video, the course was held over 1 day and divided into 2 sections. Kidney preservation techniques, physiology of brainstem death and ethical considerations in transplantation were discussed in the morning session. This was followed by small group practical sessions where kidneys were retrieved form a fresh, heparinised porcine cadaver using the same standardised techniques one would perform on a human. Following the removal of the kidneys delegates were then shown how to prepare the kidneys on the back table and correctly attach them to the life port perfusion circuit machine to ensure preservation and safe transfer. Surgeon to trainee ratio was 1:4.

Conclusions: Kidney retrieval for transplantation using a porcine cadaver represents a novel, exciting, safe, stress-free and reproducible training opportunity in organ harvesting for trainees prior to encountering a deceased donor. Apart from surgical technique, how to manage a retrieval in a good and humane way with respect for the donor and their family was heavily emphasised throughout the day. Personal stories shared by senior faculty of mistakes made and lessons learnt over the years at retrievals were very useful for those embarking on a career in transplantation.
Does timing of local anaesthetic administration for flexible cystoscopy matter? A randomised controlled trial

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Introduction & Objectives: Lidocaine gel is commonly administered prior to flexible cystoscopy (FC) due to its lubricating, anaesthetic and antiseptic properties. However, studies have failed to show a benefit in reducing post-operative symptoms compared with plain lubricants. The aim of this study is to investigate whether administration of lidocaine gel both before and after cystoscopy can reduce post procedure symptoms. We hypothesise that lidocaine gel is diluted by irrigation fluid during cystoscopy thereby limiting its efficacy.

Methods: In this single blinded randomised controlled trial, patients were randomised 1:1 to receive lidocaine gel pre and post FC (treatment) or lidocaine gel pre FC only (control). All participants completed validated symptom and quality of life questionnaires prior to cystoscopy, day 2 and day 7 post cystoscopy.

Results: Fifty patients were enrolled in the study. The mean age was 62 ± 15.4 (72% male, 36/50). There were no significant differences in baseline characteristics between the study arms. On day 2 assessment post FC, patients in the treatment arm experienced less frequency (4% vs 28%, p = 0.02), urgency (16% vs 24%, p = 0.48) and dysuria (52% vs 56%, p = 0.77) but more suprapubic discomfort (20% vs 12%, p = 0.44) than the control group. Patients in the control arm were more likely to present to their family physician with suspected infection post FC (16% vs 4%, p = 0.16).

Conclusion: Initial study results suggest that post-operative lidocaine gel may limit the exacerbation of some urinary symptoms following FC.

Introduction & Objectives: Indocyanine green (ICG) is being used more frequently with more indications in urological surgery. ICG is a water-soluble molecule that can be administered intravenously and has a half life of 150–190 s which can be seen as green under a fluorescent light. This allows for intraoperative visual assessment of the anatomy of concern using either the FireFly setting on a Robot or a hand held Spy-Phi camera for open surgery. We present our video experience of five separate surgical indications for its use, with a video narrative explaining some tricks and tips.

Methods: A variety of videos of five separate indications for ICG use in urology were assessed and condensed into an appropriate video clearly and quickly detailing its clinical use.

Results: The five indications we use ICG for are; selective clamping for robot assisted partial nephrectomy (IV ICG), robot assisted groin lymph node dissection for penile cancer (ICG given around the penile lesion), robotic, laparoscopic and open major pelvic surgery (joint cases with colorectal, gynae-onc and sarcoma) to aid identification of the ureters (ICG injected up the ureteric catheters), open cytoreductive and pelvic exenteration surgery to identify healthy ureter prior to ureteric reimplantation or uretero-ileal anastomosis (IV ICG), the final case is to aid in the identification of the sentinel node for penile cancer for men undergoing a Sentinel lymph node biopsy (ICG injected up the ureteric catheters), open cytoreductive and pelvic exenteration surgery to identify healthy ureter prior to ureteric reimplantation or uretero-ileal anastomosis (IV ICG), the final case is to aid in the identification of the sentinel node for penile cancer for men undergoing a Sentinel lymph node biopsy (ICG injected around the penile lesion, and performed concurrently with Tc injection prior also).

Conclusion: ICG aids in correction identification of important anatomical structures and given further details on the healthy blood supply, which is imperative for cancer and reconstructive outcomes. Although its use is not standard practice yet, our videos highlight the clinical use and its potential to aid urologists doing complex surgery.
Female urethroplasty – outcomes & technical considerations

Background: Female urethroplasty is a relatively uncommon procedure even for the experienced reconstructive urologist. Female urethral stricture disease is an underreported and under-diagnosed problem. Published literature is limited to case reports with relatively small case series. There is no established preferred technique for female urethroplasty; however, most published techniques appear to have low recurrence rates. Revision urethroplasty in females is an even rarer entity requiring careful surgical planning and approach.

Methods: We present a case series of female urethroplasties performed by a single surgeon over a five-year period. All patients underwent pre- and post-operative uroflow assessment. Stricture characteristics including location, calibre and length were defined pre-operatively via urethrogram and endoscopic assessment.

Results: Five patients underwent six urethroplasties. One patient required a re-do urethroplasty. The majority of strictures were distal (n = 4) and near-obliterative (n = 4). Two patients had completely oblitative strictures and were dependent on suprapubic catheters. Three patients had undergone numerous urethral dilatation procedures prior to referral for consideration of urethroplasty. One patient had previous attempted repair at a different center 2 years prior. Lichen sclerosis was the most common aetiology affecting 4 patients in this series. Two had iatrogenic injuries leading to stricture disease. Three patients had ventral buccal mucosa graft urethroplasty, one had a double-face. One patient had a Martias flap urethroplasty with a primary repair. The average pre-op QMax was 8 mL/s. The average QMax at time of catheter removal was 32 mL/s. At 12 months follow up 75% were satisfied with their flow and functional outcome. No patient reported incontinence following urethroplasty. One patient reported a urinary tract infection post catheter removal. One patient had recurrence of their urethral stricture and required a re-do urethroplasty wherein a dorsal approach was used.

Conclusion: Female urethroplasty is an uncommonly performed procedure due to the relative rarity of female urethral stricture disease. Current EUA guidelines advocate for urethroplasty where minimally invasive approaches have failed. Female urethroplasty generally has good functional outcomes with the majority of patients satisfied with their flow at 12 months. No post urethroplasty incontinence was reported.

Is a 0% infection rate possible with inflatable penile prosthesis placement? The ten-year results of the Minimally Invasive No-Touch (MINT) technique

Background: Female urethroplasty generally has invasive approaches. Current exclusion criteria for the MINT technique include a history of penile fracture, previous surgical procedures including urethroplasty, a history of infection, diabetes mellitus, obesity, and smoking. Known complications include infection, extrusion, erosion, infection, and deep vein thrombosis.

Methods: We present a single surgeon series of female urethroplasties performed by a single surgeon over a five-year period. All patients underwent pre- and post-operative uroflow assessment.

Results: Five patients underwent six urethroplasties. One patient required a re-do urethroplasty. The majority of strictures were distal (n = 4) and near-obliterative (n = 4). Two patients had completely oblitative strictures and were dependent on suprapubic catheters. Three patients had undergone numerous urethral dilatation procedures prior to referral for consideration of urethroplasty. One patient had previous attempted repair at a different center 2 years prior. Lichen sclerosis was the most common aetiology affecting 4 patients in this series. Two had iatrogenic injuries leading to stricture disease. Three patients had ventral buccal mucosa graft urethroplasty, one had a double-face. One patient had a Martias flap urethroplasty with a primary repair. The average pre-op QMax was 8 mL/s. The average QMax at time of catheter removal was 32 mL/s. At 12 months follow up 75% were satisfied with their flow and functional outcome. No patient reported incontinence following urethroplasty. One patient reported a urinary tract infection post catheter removal. One patient had recurrence of their urethral stricture and required a re-do urethroplasty wherein a dorsal approach was used.

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eight non-infectious related adjunctive procedures or revisions were performed on 57 (12.5%) patients: 17 mechanical failures, 5 cosmetic, 12 pump relocations, 17 glanssieves, 9 cylinder herniation/malposition, 4 reservoir herniations and 4 distal erosions. There were no infections in patients who did not have intraoperative complications or subsequent ancillary surgeries. Infected IPPs requiring salvage or explant were seen in four (0.9%) patients who had uncomplicated primary surgery. Of the four infected IPPs, three were due to intraoperative distal perforation and one was due to prolonged primary surgery (intraoperative iliac vein injury and repair).

Conclusion: The long-term data on the MINT technique for IPP insertion continue to demonstrate the safety of this technique. In this large cohort, there was a 0% infection rate in 388 patients who had an IPP placed via the MINT technique and did not have intraoperative complications or additional postoperative procedures. The intraoperative surgical complication rate was 2.4% and the revision rate was 12.5%.

WATIP: A pilot study of water irrigation post TURBT for preventing recurrence of NMIBC

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Methods: WATIP is a prospective single arm pilot study of patients undergoing TURBT for suspected bladder tumour. The exclusion criteria were: history of hyponatraemia, severe congestive heart failure, renal failure and pregnancy. Water was used for irrigation during TURBT and for 3 or more hours after (to enable daycase management when appropriate). Participants were clinically monitored for adverse events and bloods including Na, Hb and LDH were tested within 24 h. Feasibility was defined as completion of planned treatment in at least 90% of participants, and safety was defined as adverse events graded 3 or higher by Common Terminology Criteria (CTCAE) version 5 in no more than 10%. Recurrence was defined by cystoscopic or histological diagnosis of NMIBC during surveillance.

Results: Between May 2019 to Nov 2021, 30 patients (Median age 67 years, 25 males) were enrolled. Median tumour size was 16 mm, 23 (77%) were NMIBC. Twenty-nine (97%) underwent the planned irrigation, with median post-operative duration of 3.0 (range 0–6) hours. The only adverse event noted was grade 2, being clot retention requiring irrigation. There were no statistically significant differences in pre- and post-TURBT serum sodium or haemoglobin. Of the 22 patients with NMIBC who had undergone 3 to 12 month surveillance cystoscopy, 13 (59%) remained free of recurrence.

Conclusion: Water irrigation during and for 3 h following TURBT appears to be a feasible and safe intervention. Recurrence rates at 12 months appear reasonable, and merit comparative assessment against single-dose chemotherapy in future randomised controlled trials.

Assessing the patient and tumour characteristics in older patients (70 years or older) undergoing transperineal prostate biopsies at a large Victorian tertiary centre

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Introduction & Objectives: EAU guidelines recommend PSA screening only in men with a life expectancy of 10 years and does not recommend routine testing in men ≥70 years of age. With a mean life expectancy of 84 years, many men in their 70s have a life expectancy of >10 years in Australia. Given the higher rates of higher grade prostate cancers detected in older patients, we investigated the patient and tumour characteristics of men ≥70 or older undergoing transperineal biopsy (TPB) at our institution.

Methods: All patients aged 70 years old and above who underwent TPB for a raised PSA between 1st January 2019 and 1st July 2022 at a large tertiary centre were identified. Data obtained included patient Charlson Comorbidity Index (CCI), pre-operative PSA, Multiparametric prostate MRI (mpMRI), histopathological findings and subsequent intervention.

Results: 201 patients underwent TPB. The median age was 75 years (73–77) and 63.2% patients had a CCI of ≤4 translating to at least an estimated 53% 10-year survival. The median pre-biopsy serum PSA level was 9.55 ng/mL (7.19–13.5). Overall, 164 (81.6%) patients were diagnosed with prostate cancer and 126 (62.7%) were clinically significant disease (ISUP ≥2). Of the patients with cancer, 46 (28.0%), 22 (13.4%), 29 (17.6%) and 29 (17.6%) patients had ISUP grade 2, 3, 4, and 5 disease respectively. 161 (80.1%) had an mpMRI Prostate prior
to biopsy. Of these, 129 (80.1%) had mpMRI with 112 (86.8%) of these lesions being prostate cancer and 90 (69.8%) having clinically significant disease. Of the 16 patients with PI-RADS 2/3 lesions and raised PSA, only 7 (43.8%) had clinically significant cancer on biopsy. Of 126 patients with clinically significant cancer, 90 (71.4%) were treated with curative intent (Radiotherapy or Surgery). Only two out of 13 (15.4%) patients over 80 years old underwent treatment with curative intent. 14 patients had metastatic disease identified on staging at presentation; 11 (5.5%) had bony metastases and three (1.5%) had solid organ metastases.

Conclusions: Majority of patients ≥70 years of age undergoing TPB at our institution were relatively non-morbid. A large proportion of these patients were diagnosed with clinically significant prostate cancers and lead to active treatments. mpMRI can help guide the need for TPB in appropriately selected older patients with ≥10-year life expectancy who are likely to benefit from curative therapy for prostate cancer.

Evaluation of targeted fusion transperineal prostate biopsy and the future role in prostate cancer detection

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Introduction & Objectives: The landscape of prostate cancer diagnosis is evolving. Targeted software fusion is emerging as a technique that allows a more controlled approach to tissue sampling with greater accuracy. The aim of this study was to evaluate the accuracy of a targeted software fusion (TSF) technique to detect prostate cancer (PCa) at transperineal prostate biopsy (TPB).

Methods: At a single institution, patients with clinical suspicion for PCa referred for TPB (March 2015 and August 2022) were retrospectively included. Pre-biopsy imaging included either a multiparametric MRI (mpMRI) or 18F-DCFPy PET/CT. Lesions were contoured by a Radiation Oncologist and imported into prostate mapping software. During TPB, contoured sets were fused with ultrasound images using a fusion software module. Targeted biopsies were followed by standard systematic biopsy.

Results: Of 108 men included, median age was 66 years (range 45–78) and median pre-biopsy PSA was 6.45 (SD ± 7.8). 102 patients had mpMRI and 6 had 18F-PET/CT. The median prostate size was 49 cc (IQR 34–78). Grade of MRI lesions targeted were PI-RADS 2 (n = 2), PI-RADS 3 (n = 15), PI-RADS 4 (n = 60) and PI-RADS 5 (n = 25). The median number of positive targeted cores per person was 9 and the median number of positive targeted cores was 3 with a median length of 12 mm (IQR 8–15). The median number of positive systematic cores was 4.

10 (9.3%) patients only had positive cores on systematic biopsy with a median core length of 1 mm. 6 (60%) had clinically significant PCa. The median percentage of positive systematic cores with a negative TSF to sampled systematic cores was 12.8% compared to 33.3% of TSF cores were positive to sampled targeted cores. 4 patients (3.7%) only had positive cores of TSF lesions with 3 (75%) being ISUP 1 PCa and a median core length of 14 mm. 19 (17.6%) patients had a previous negative biopsy. All 19 (100%) had a positive TSF lesion. 14 (73.7%) had clinically significant PCa.

Conclusions: Software targeted fusion biopsy has a high detection rate of clinically significant prostate cancer. It may offer an efficient and accurate approach to detection of prostate cancer.

Can PSMA-PET enhance patient selection for focal therapy for prostate cancer?

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Introduction & Objectives: Focal therapy (FT) is a developing treatment option for localised prostate cancer with potential to reduce side effects associated with traditional curative therapies. Therefore, patient selection is critical for the success of FT. We aimed to evaluate the utility of the Delphi FT criteria in an Australian radical prostatectomy (RP) series and if the addition of PSMA-PET can allow for better patient selection for FT.

Methods: Patients who underwent a preoperative mpMRI, 68Ga-PSMA PET, systematic transperineal prostate (TP) biopsy and subsequent radical prostatectomy (RP) at a single institution between 2015 to 2021 were included. FT selection criteria were based on the international Delphi consensus project in 2017 which included: clinically localised cancer to a single favourable lesion, PSA ≤10 ng/ml, cancer foci <1.5 ml or <3 ml localised to one hemi-gland and histological confirmation of ISUP ≤3 cancer.
Results: Of 202 patients who underwent RP, 171 patients had ISUP \( \leq 3 \) on TP biopsy. 82 patients met the Delphi FT criteria prior to RP. The median age was 68.3, with a median PSA of 5.7. Prostate cancer grading at TP biopsy were ISUP 1 (\( n = 2 \)), ISUP 2 (\( n = 45 \)) and ISUP 3 (\( n = 35 \)). 54 patients (65.9%) had cT2 disease, 27 patients (32.9%) had cT3a and one (1.2%) patient had cT3b disease. Of these 82 patients, 50 (61%) had concordant tumour characteristics pre-operatively and on final RP histopathology. Of the 32/82 (39%) patients who had discordant tumour characteristics at biopsy and RP, 19 (59.4%) had \( > 3 \) ml index tumour volume, 9 (28.1%) had bilateral hemi-gland involvement, 4 (12.5%) had discordant tumour locations compared to preoperative MRI and TP biopsy, and 7 (8.5%) had upgrading of disease on RP histology.

The addition of PSMA PET revealed PSMA avid lesions in 78/82 cases (95.1%) with a median SUVMax of 4.84 (IQR 3.53–7.5). In the 32 patients who had discordant tumour characteristics at biopsy and RP, 27 (84.4%) had PSMA avid lesions with SUVMax \( \geq 3 \). However, PSMA also identified a second lesion with a SUVMax \( \geq 3 \) in 16 (19.5%) patients who fit the FT criteria, only 5 (31.3%) had bilateral involvement at RP.

Conclusions: A large proportion of patients who met the Delphi FT criteria pre-operatively had discordant tumour characteristics at RP. While PSMA allowed for better characterisation of the index tumours, it also identified non-specific lesions in the prostate. However, low grade uptake may correlate with benign disease and PSMA may be more sensitive to benign foci. Between MRI and biopsy, the accuracy in selecting appropriate patients was 61%. This improved to 69% with PSMA included in the model. More studies are needed to optimise prostate cancer patient selection for FT.

Introduction & Objectives: Prostate cancer is the second most commonly diagnosed cancer among men worldwide. In western countries, preferred method of curative surgery is robot-assisted radical prostatectomy (RARP). One of the most crucial and technically demanding part of RARP is the formation of urethrovesical anastomosis (UVA). A miscalculation could result in urine leak or incontinence. Possible issues encountered during UVA include retractive urethra, discrepancy between calibre of bladder neck (BN) and urethra, and insufficient suture length. We aim to describe different techniques that can be employed to navigate such tricky situations.

Methods: RARP surgeries were performed on the da Vinci Xi Surgical Robot by two consultant urologist. Video recordings were made of techniques employed during challenging UVA. Double armed Quill sutures were used for UVA formation and it is shorted extracorporeally to surgeon’s preference.

Results: Patients at risk of discrepancy between BN and urethra include those with large intravesical median lobes and long anteroposterior length. Insufficient suture length can be prevented by avoiding excess shortening of double armed Quill sutures and taking wider bladder neck bites and narrower urethra bites. If large discrepancy between BN and urethra exist, various reconstruction techniques could be employed. One of which includes bilateral BN reconstruction using separate sutures at 3 and 9 O’clock resulting in a smaller midline BN. Alternatively, a single running suture from either 3 or 9 O’clock of the BN to lateralise a smaller BN opening for UVA. Lastly, an anterior racket technique where the UVA is formed starting from 6 O’clock of the BN, the excess BN is then reconstructed anteriorly.

Conclusions: There are the various techniques available for technically challenging UVA formation.

Comparative assessment of BCG strains during the worldwide shortage: A matched case–control study of tolerability and short-term oncological efficacy

Introduction & Objectives: Worldwide issues with supply of BCG continue to present challenges for management of high-risk non-muscle invasive bladder cancer. Alternative regimes for dose strength, scheduling and strains have been implemented since the cessation of Connaught strain production in 2012. Differences in clinical efficacy, immunogenicity, toxicity, and tolerability have been demonstrated between strains. Our local response to the BCG shortage has been to limit treatment to induction scheduling only from 2018, and then using a more available ONCO-BCG strain from 2020. This study investigates the clinical implications of the change in strain.

Methods: Intravesical BCG naïve patients who received induction treatment at the Central Adelaide Local Health Network with ONCO-BCG (Serum Institute of India; 1–19.2 x 10^8 colony forming units) from 2020 were compared with those who were treated earlier with OncoTICE (Merck, Australia; 2–8 x 10^8 colony forming units). Case-matching was performed to control for disease as classified by
the WHO 2004 histological criteria. Primary outcome measures were tolerability and completeness of induction. Intolerance was defined by the 2020 EAU Guidelines on Bladder Cancer as severe side effects preventing further BCG instillation before completion of treatment. Secondary outcome measures were disease-free survival at 3 months prior to any maintenance therapy, and BCG refractory disease status. Intention to treat analysis was performed.

**Results:** Outcomes for 42 patients treated with ONCO-BCG were compared with 42 patients treated with OncoTICE. There were no significant differences in age or gender between groups. There was a significant difference in the rates of intolerance for ONCO-BCG compared to OncoTICE (7% versus 0%, p = 0.08). Completeness of 6 induction doses was delivered in 79% versus 93% for ONCO-BCG and OncoTICE respectively (p = 0.06). There were no significant differences in disease-free survival (p = 0.50) and BCG-refractory disease (p = 0.72) rates between BCG strains.

**Conclusions:** BCG intolerance rates are comparable between ONCO-BCG and OncoTICE. The strains have similar oncological efficacy at short-term follow up after induction treatment. Longer term follow up is required, including assessment of the ramifications of restricted maintenance BCG.

**Financial toxicity in prostate cancer: When cost affects treatment**

**Introduction & Objectives:** Men with prostate cancer can experience substantial financial costs from tests, treatment, and recovery time away from work. Australian men in rural and regional areas have worse prostate cancer outcomes than those in metropolitan areas. Financial toxicity refers to the burden of financial cost on the well-being of patients and their caregivers. The COMprehensive Score for financial Toxicity (COST-FACIT) questionnaire is a validated tool to measure financial toxicity but its use in the Australian context has been limited. The COST-FACIT questionnaire gives a maximum score of 44 with a higher score indicating less financial toxicity.

The aim of this pilot study is to explore the extent of financial toxicity in men with prostate cancer in a regional population.

**Methods:** An electronic questionnaire was sent to 519 patients identified with prostate cancer between 2017 and 2020 in the Grampians region of Victoria. The questionnaire included the COST-FACIT tool and a separate question on whether cost affected treatment decisions. Statistical analysis was done with SPSS.

**Results:** 65 men returned a completed questionnaire. Their average age was 69 years (range 54–84). The mean COST-FACIT score was 33.5 (SD 7.5) indicating limited overall financial toxicity. Ten respondents reported that financial cost influenced their treatment decision. Those in this subgroup were more likely to have private health insurance and be self-employed and less likely to be retired.

**Conclusions:** We found limited financial toxicity from prostate cancer patients in the Grampians Region as determined by the COST-FACIT tool. Despite this, a subgroup of 10 men reported their financial situation influenced their treatment decision. Increased awareness in the community of the cost of prostate cancer may enable better financial planning in this group. In addition, recognition among clinicians that a patient’s financial situation may influence their treatment decisions may allow early referral for financial assistance and involvement of appropriate social supports.

**Interim results of focal laser ablation for localised prostate cancer using the ProFocal-Rx™ system**

**Introduction & Objectives:** ProFocal-Rx™ (Medlogical Innovations, Sydney, Australia) is a novel method of focal therapy for prostate cancer. It is performed via a transperineal route and can be utilised with an MRI/US fusion targeting platform. We aimed to evaluate the interim outcomes of this novel treatment for localised prostate cancer.

**Methods:** A prospective trial was performed evaluating focal laser ablation for localised prostate cancer using the ProFocal-Rx™ device (Medlogical Innovations, Sydney, Australia) at Nepean Hospital, NSW, Australia. Institutional review board was approved by the Nepean Blue Mountains Human Research Ethics Committee. Inclusion criteria included men with prostate cancer with PSA ≤15 ng/ml, stage ≤T2c, ISUP 2–3, and 1–2 MRI visible lesions concordant with biopsy. An MRI was performed within 72 h of the procedure to evaluate tissue ablation. Patients then had a 3-month follow-up transperineal prostate biopsy to evaluate ablation success.

**Results:** All patients who had undergone their 3 month follow are biopsy are included in this interim non validated analysis. Median age was 69, PSA 6 ng/ml (range 0.7–15)
and MRI lesion volume 0.82 cc (range 0.12–3.76).
All cases were completed as day only procedures and there were no readmissions to hospital. No serious adverse events (Clavien-Dindo 3–5) were identified. Local symptoms made up the majority of adverse events, with 16% of patients reporting haematuria, 11% haematospermia, 11% dysuria and 8% voiding dysfunction. Two patients reported urinary tract infections (5%). No cases of incontinence were identified.

On the 3 months follow-up biopsy 75% of patients had no evidence of significant prostate cancer (≥ISUP 2). 12% of cases proceeded to salvage robotic radical prostatectomy, 2% underwent salvage radiotherapy. Of cases with residual cancer on 3-month biopsy 40% had small volumes of cancer detected and were placed on active surveillance.

Outcomes of patients undergoing salvage robotic prostatectomy were not significantly different compared to our contemporary cohort, with nerve sparing achievable and a median blood loss of 250 ml.

Patient reported functional outcomes were excellent with no significant worsening in quality-of-life scores (SF-12), lower urinary tract symptoms (IPSS, EPIC- urinary domains) or sexual function (SHIM and EPIC-sexual domains) between the pre-op, 3-month or 6-month assessment.

Conclusions: These interim results show that in these selected patients undergoing a major increase in complexity or adverse outcomes appear to have a major increase in functional outcomes are excellent with no worsening in any patient reported outcomes post treatment.

Initial experience of the first inhuman trial of focal laser ablation (ProFocal-Rx®) for localised prostate cancer: Correlation of energy delivery with prostate ablation size

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Introduction & Objectives: ProFocal-Rx™ (Medlogical Innovations, Sydney, Australia) is a novel method of focal therapy for prostate cancer currently undergoing a first in humans clinical trial. The accuracy and consistency of ablations using this technology is suggested to be a major benefit of the system.

This study aimed to derive a relationship between energy input and the amount of tissue ablated using a tissue surrogate and then validate this relationship using MRI data from trial participants.

Methods: A prospective trial is currently being performed evaluating focal laser ablation for localised prostate cancer using the ProFocal-Rx™ device (Medlogical Innovations, Sydney, Australia) at Nepean Hospital, NSW, Australia. Institutional review board was approved by the Nepean-Blue Mountains Human Research Ethics Committee. Following ablation, an MRI performed within 72 h of the procedure allows calculation of ablated volume. Input energy is recorded as part of trial procedure.

Chicken breast has been shown previously to have similar thermal ablation properties to human prostate tissue. Ablations were performed from 4 W to 10 W laser energy, and the resulting volume, input energy and heat removal via pumped cooling were recorded.

Results: The best predictor of ablation size in the tissue surrogate was found to be net energy input. This is derived from net energy administered by the laser less the amount of energy removed using the laser trocar cooling system. This yielded a relationship of a mean of 1.33 µL/Joule (range 1.22–1.37).

Volume of ablations in trial participants were calculated from MRI data. These showed a consistent relationship between energy input and volume of ablation, with a mean of 0.92 µL/Joule of tissue ablated (R² 0.964).

Conclusions: These results suggest that ablation volumes are consistent and predictable based on net energy input. In future, this may allow ablation of different sizes to be used to more precisely ablate lesions and spare adjacent structures.

Robot assisted management of mesh erosion into the urinary bladder following bilateral inguinal hernia repair

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Introduction & Objectives: Despite the changing landscape following the adoption of total transabdominal pre-peritoneal and total extraperitoneal approaches, the use of synthetic mesh in inguinal hernia repair remains a standard of care in adults. Mesh erosion into the urinary bladder is a rare but important complication following inguinal hernia repair with approximately 28 cases identified in the current literature. Patients may present with LUTS, pelvic or perineal pain and haematuria. Patients often require surgical management, which is commonly open or laparoscopic.

Our objective is to demonstrate a robotic approach to excise eroded mesh. To our knowledge this is the first case reported in the literature to
undergo complete robotic-assisted removal of bilateral inguinal hernia mesh with erosion into the bladder.

**Methods:** A modified PRISMA search was conducted across Ovid Medline, Embase and Pubmed for articles from 1994–2022 using search terms: “inguinal hernia”, “mesh”, “erosion” and “bladder”. A total of 28 cases were included. Informed consent was given by the patient and the clinical information was collected.

**Results:** A 39yo female presents with persistent LUTS, urethral and bladder pain. Four months prior, she underwent laparoscopic (transabdominal pre-peritoneal) bilateral inguinal hernia repair, umbilical hernia repair, and ventral hernia repair (Parietex™ mesh and ReliaTack™ fixation), complicated by bladder perforation confirmed on CT cystogram (managed with an indwelling catheter (IDC) for one week). Investigation by another urologist reported normal cystogram and rigid cystoscopy three months post operatively. Reinvestigation at four months with a flexible cystoscopy demonstrated mesh erosion into the left anterior wall of the bladder and abnormal urodynamics (impaired compliance and reduced capacity). The patient desired complete mesh removal and was consented for robotic assisted removal of mesh and bladder repair with video recording. Robotic ports were placed, bowel and omental adhesions divided, and the bladder was dropped from the anterior abdominal wall. The mesh was identified and dissected from the anterior wall of the bladder, and the lower anterior abdominal and pelvic side walls. The area of mesh visible on cystoscopy at the left anterior bladder wall, required dissection through detrusor muscle and subsequent bladder repair. All mesh was removed en-bloc. An IDC was placed and removed at day seven after a cystogram. She recovered well and had improvement in symptoms six weeks post operatively.

**Conclusions:** Mesh erosion into the urinary bladder is a rare complication which may occur following inguinal mesh hernia repair. Patients with inguinal mesh insitu who report lower urinary tract symptoms should be investigated with cystoscopy and can have definitive management robotically with excellent outcomes.

**Robotic assisted suture hysteropexy – a minimally invasive mesh free technique for managing uterine prolapse**

**Introduction & Objectives:** Surgical treatment for uterine pelvic organ prolapse (POP) aims to restore the apical support of the cardinal/ uterosacral ligament complex. There are multiple approaches and techniques for uterosacral ligament suspension including vaginal, robotic/ laparoscopic and mesh procedures. Native tissue vaginal procedures have a high success rate and are favourable from a cost–benefit perspective; however, ureteric injury can occur in up to 5.9% of patients. Sacral colpopexy (SCP) with mesh remains the ‘gold-standard’ procedure for apical prolapse; however, there are growing concerns regarding mesh related complications following the Australian senate inquiry into, and the class action against, trans-vaginal mesh. Currently in Australia, there are no TGA approved mesh implants for SCP. A safe and effective mesh-free alternative is critical.

Here we demonstrate a robotic assisted approach which suspends the uterus from the uterosacral ligament with a bidirectional barbed suture. This avoids the use of synthetic mesh and allows for the identification and preservation of the ureters. It produces excellent restoration of the apical support of the uterus and favourable patient reported outcomes in women with apical POP.

**Methods:** A 68-year-old woman was referred for management of stage three uterovaginal POP and a urethral caruncle, with symptoms including bleeding and vaginal bulge. She was investigated with pelvic ultrasound, flexible cystoscopy and urodynamics which demonstrated mild detrusor overactivity but no occult stress urinary incontinence. Examination under anaesthetic revealed POP–Q + 3,+4,+5/5,3,5,10/0,-1,-2. She requested surgical treatment, uterine preservation and a mesh-free procedure. She was consented to robotic assisted suture hysteropexy (RASuH) with an anterior colporrhaphy, caruncle excision and video recording.

**Results:** The technical steps of the RASuH include: 1. Uterine elevation with a prolene suture; 2. Identification of ureters; 3. Incision of the peritoneum above each uterosacral ligament; 4. Uterus suspended from each uterosacral ligament using a bi-directional barbed suture; 5. Careful inspection of the bowel and ureter. Paramount to this technique is appropriate tension on the bi-directional suture in order to achieve appropriate support of the uterus. There was no post-operative complication at 6 weeks, and she had significant improvement in symptoms.

**Conclusions:** We demonstrate a minimally invasive mesh-free technique to suspend the uterus from the uterosacral ligaments which is both safe and effective. RASuH is an anatomic approach for patients wishing to retain their uterus and have a mesh free procedure. Endoscopy allows for the safe identification of important structures including ureters and bowel due to views which aren’t possible with vaginal surgery.
Hitting the target: Tips and tricks for transperineal targeted biopsy of prostate

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Introduction & Objectives:
Transperineal prostate biopsy (TPB) is superior to TRUS biopsy in detecting clinically significant prostate cancer. Medicare Benefits Schedule (MBS) reimbursement is no longer applicable to TRUS biopsy. Therefore, TPB is set to become the standard of care for prostate cancer diagnosis across Australia.

Methods:
After obtaining informed consent, we recorded operating theatre footage of TPB adapting our institutional expert technique using a biplanar transrectal ultrasound probe (6.5/7.5 MHz - B-K Medical®) with a brachytherapy grid and stepper equipment. Targeted biopsy for multiparametric (mp)MRI and Ga68 prostate-specific membrane antigen positron emission tomography (PSMA PET) lesions were performed using cognitive fusion. We recorded high-definition intraoperative video demonstrations, and a narrative description of techniques was overlayed using professional postproduction digital processing.

Results:
We present top tips on the following techniques:

- Optimal patient positioning, strategies for dealing with difficult pubic bone
  1. Optimal positioning of the TRUS probe, using the endocavity balloon volume, probe contact, dealing with artefacts from faeces, making fine adjustments to needle trajectory

- Performing cognitive fusion of mpMRI and PSMA PET targeted biopsies

- Decision criteria for when to remove the grid and use a free-hand technique

Conclusions:
We present an adaptable series of tips and tricks for TPB, which optimise for mpMRI and PSMA PET cognitive fusion biopsy as well as standard template biopsy.

Estimating the cost of prostate cancer diagnosis, treatment, and follow-up in New Zealand: A modelling study

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Introduction & Objectives: Prostate cancer (PCa) is the most common solid-organ malignancy diagnosed in New Zealand (NZ) and comprised 14% of cancer-related deaths in 2019. The economic costs of diagnosing and treating PCa are significant and of increasing importance, particularly given the projected rise in incidence of PCa. The purpose of this study was to develop a generic model to estimate the current costs of diagnosis, treatment, and follow-up of PCa in NZ. The developed model will be adjusted to assess different PCa detection strategies.

Methods: A Markov model was constructed using National Comprehensive Cancer Network (NCCN) guidelines and clinical expertise. Only pathways relevant to current NZ practice were considered. NZ specific data from the Prostate Cancer Outcomes Registry (PCOR) and NZ Cancer Registry were used to model the patterns of diagnosis and treatment. Background mortality rates were obtained from NZ life tables. Where possible, costs were obtained from the Ministry of Health National Price List. A literature review of previous cost-effectiveness studies was performed to obtain transition probabilities pertaining to disease progression. Preference was given to systematic reviews or meta-analyses applicable to a NZ or Australian population. The evaluation was conducted from a healthcare provider perspective.

Results: A generic base model was established. The cost of treating a cohort of adult NZ men with newly diagnosed PCa, based on the 2019 incidence of new cancer registrations, was estimated using our model. Seventeen health states were included within the model to represent all possible treatment pathways. The estimated cost over 25 years for a cohort of newly diagnosed patients was approximately 140 million NZD (Summarised in Table 1).

| Age at diagnosis | n  | Cumulative cost over 25 years (NZD) | Annual average cost (NZD) |
|------------------|----|-----------------------------------|---------------------------|
| 45               | 20 | 1817379.612                       | 72695.1845                |
| 50               | 147| 5122336.432                       | 204893.457                |
| 55               | 501| 17398648.41                       | 695945.937                |
| 60               | 764| 26328815.44                       | 1053152.62                |
| 65               | 1095| 37291917.27                       | 1491676.69                |
| 70               | 773| 25538976.34                       | 1021559.05                |
| 75               | 453| 14348757.23                       | 573950.28                 |
| 80               | 232| 6895059.28                        | 275722.371                |
| 85               | 195| 5277831.52                        | 211113.261                |
| TOTAL            |    | 140017721.54                      | 5600708.86                |
Conclusions: The present study is the first step in evaluating the costs of PCA diagnosis and treatment specific to the NZ population. This model could be modified to assess cost-effectiveness, using an incremental cost-effectiveness ratio. Furthermore, the model could be adapted to assess the impact of structured screening, particularly in the context of multiparametric magnetic resonance imaging prior to prostate biopsy.

**Do risk calculators incorporating mpMRI improve the prediction of clinically significant prostate cancer at first biopsy? A systematic review**

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**Introduction & Objectives:** Optimising the selection of men for prostate biopsy remains challenging. Several risk calculators (RCs) have been developed for the detection of prostate cancer (PCa) at initial biopsy. The aim of this systematic review was to summarise the available RCs incorporating multiparametric MRI (mpMRI) Prostate Imaging Reporting and Data System (PI-RADS) for prediction of clinically significant PCa in biopsy-naive men.

**Methods:** A systematic search of Ovid (Medline), EMBASE, Scopus and the Cochrane Library was performed. MeSH terms and keywords were combined using Boolean logic operators. Inclusion criteria were: 1) studies developing or validating RCs incorporating PI-RADS with at least two clinical or biochemical markers.

**Table 1 Summary of predictor variables included in each unique risk calculator**

| Reference          | Model name or description | Age | Previous negative biopsy | DRE | PSA | PSAD | 1/1 PSA | Prostate volume | Family history of PCa | PI-RADS | Other |
|--------------------|---------------------------|-----|---------------------------|-----|-----|------|---------|-------------------|----------------------|---------|-------|
| Alberts et al., 2019 | MRI-ERSPC-RC3             | *   | *                         | *   | *   |      | *       | 1-5               | 1-3, 3-5             |         |       |
| Borge-Fernando et al., 2019 | Model for csPCa          | *   | *                         | *   | *   |      |         | (1-2)             | 3, 4-5              |         |       |
| Chae et al., 2022   | Model for csPCa           | *   | *                         | *   | *   |      | *       | (1-2)             | 3, 4-5              |         |       |
| de Nascimento et al., 2021 | mpMRI RPCRC app           | *   | *                         | *   | *   |      | *       | (1-2)             | 3, 4-5              |         |       |
| Distler et al., 2017 | Model for csPCa           | *   | *                         |      |      |      |         |                    |                     |         |       |
| Falagario et al., 2020 | Prostate cancer risk calculator | *   | *                         |      |      |      |         |                    |                     |         |       |
| Falagario et al., 2020 | Prostate cancer risk calculator | *   | *                         |      |      |      |         |                    |                     |         |       |
| Fang et al., 2016   | Model for HG-PCa          | *   | *                         |      |      |      |         |                    |                     |         |       |
| Kim et al., 2017    | PCPRBC + MRI              | *   | *                         |      |      |      |         |                    |                     |         |       |
| Kinnaird et al., 2022 | PCPRC-MRI                |      | *                         | *   |      |      |         |                    |                     |         |       |
| Maggi et al., 2021  | SelectMDx + MRI           |      | *                         | *   |      |      |         |                    |                     |         |       |
| Mehravand et al., 2018 | Model for csPCa          |      | *                         | *   |      |      |         |                    |                     |         |       |
| Niu et al., 2017    | Model for csPCa           |      | *                         | *   |      |      |         |                    |                     |         |       |
| Patel et al., 2022  | Prospective Loyola University MRI (PLUM) model for csPCa in biopsy-naive men |      | *                         | *   |      |      |         |                    |                     |         |       |
| Punnenen et al., 2018 | mpMRI + 4kcore for csPCa |      | *                         | *   |      |      |         |                    |                     |         |       |
| Radlje et al., 2017 | Radlje model for csPCa in biopsy-naive men |      | *                         | *   |      |      |         |                    |                     |         |       |
| Steknjak, 2021     | PI-RADS + PHI + PSAD      | $1$ | *                         |      |      |      | $1$     |                    |                     |         |       |
| Sun et al., 2020    | Full model for csPCa      |      | *                         | *   |      |      |         |                    |                     |         |       |
| Thompson et al., 2016 | Model for csPCa (significant variables included) |      | *                         | *   |      |      |         |                    |                     |         |       |
| van Leeuwen et al., 2017 | Model for csPCa          |      | *                         | *   |      |      |         |                    |                     |         |       |
| Wagsukar et al., 2022 | Model for csPCa          |      | *                         | *   |      |      |         |                    |                     |         |       |
| Wang et al., 2021   | Model for csPCa in men with PI-RADS ≥3 |      | *                         | *   |      |      |         |                    |                     |         |       |
| Zhang, Zeng et al., 2020 | Model for absence of csPCa in men with PI-RADS ≥3 |      | *                         |      |      |      |         |                    |                     |         |       |
| Zhang, Zhu et al., 2020 | Model for csPCa (Model 2) |      | *                         |      |      |      |         |                    |                     |         |       |
| Zhou et al., 2022   | Model for csPCa in men with PI-RADS ≥3 |      | *                         | *   |      |      |         |                    |                     |         |       |

**csPCa = clinically significant prostate cancer; DRE = digital rectal examination; PSAD = prostate specific antigen density; PI-RADS = Prostate Imaging Reporting & Data System; TRUS = transrectal ultrasound scan; mpMRI = multiparametric magnetic resonance imaging; PHI = prostate health index.**

*Categorical variable.

1DRE or TRUS based measurement.

††Part of SelectMDx test.

*Log transformed.

§Log transformed.

¶Part of 4k score test.

**Part of Prostate Health Index test.**
and; 2) the discriminative value was reported. Studies were excluded if; 1) they were risk-grouping studies without a risk model or; 2) an alternative to the PI-RADS scoring system was used. Titles and abstracts were screened by a single author. Full text review and data extraction were conducted by two independent reviewers.

Results: A total of 34 studies were included, comprising 17 retrospective studies and 10 prospective studies. Eight studies had mixed study design. Most studies (n = 21) developed new models, whereas 12 studies validated previously published RCs. A total of 26 unique RCs were identified. The predictive variables included in each RC are summarised in Table 1. The MRI-ERSPC-RC was the most frequently validated model (10 cohorts), followed by the van Leeuwen model in 6 cohorts, and Radtke models in 5 cohorts. Discriminative ability as assessed by area under the curve (AUC) ranged from 0.73 to 0.88 for MRI-based RCs. MRI-naive models had an AUC ranging from 0.60 to 0.84. By comparison, PI-RADS only models had AUCs ranging from 0.63 to 0.69. Clinical net benefit of MRI-based RCs varied. Probability thresholds at which RCs provided net benefit started between 0% to 30%. One study showed net harm across all relevant thresholds using an MRI-based model.

Conclusions: Several risk calculators have been developed which incorporate mpMRI PI-RADS scores; however, few have been externally validated in more than five cohorts. MRI-based RCs appeared to show superior discriminative ability when compared against MRI-naive RCs. Clinical net benefit of RCs was variable.

The learning curve for vesico-vaginal fistula (VVF) repair

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Introduction & Objectives: Learning curves have been demonstrated for many urological procedures but as yet have not been identified and/or calculated for vesico-vaginal fistula repair.

Methods: The 1⁰ 100 women having surgery for VVF under the care of 1 surgeon between January 2002 and March 2019 were reviewed by quartile and in total for; surgical procedure (diversion or VVF closure), route of VVF closure, % of 'true' vaginal closures (assuming only absolute indications such as need for simultaneous ureteric re-implant or closure of associated bowel fistulae into the urinary tract or skin would result in abdominal repair), % anatomical closure at 1⁰ attempt and overall (after additional attempt(s)) closure.

Statistical Analysis was by Fishers Exact Test and Students T-Test. Significance was p < 0.05.

Results: The 100 women had a median age of 50 years (range 22–88). Their outcomes are as detailed in Table 1. There were no significant differences in patient or fistula demographics.

Conclusions: VVF closure rates are excellent in experienced hands. There is a learning curve in VVF repair, which appears to be about 75 cases. Vaginal repair utilisation increases with experience.
Medium to long term outcomes of ventral onlay buccal mucosal graft urethroplasty in women

Introduction & Objectives: Female urethral stricture is rare but increasing in incidence. Urethroplasty for female urethral stricture (FUS) is increasingly popular; however, there is little to guide choice of technique. We report the medium to long-term outcomes of ventral onlay buccal mucosal graft substitution urethroplasty (VOBMGSU) in treating FUS.

Methods: A retrospective review of 46 consecutive women (median age 51.5 years, range 31–71) with urethral stricture having VOBMGSU under the care of a single surgeon since June 2012 and a minimum follow up of 6 months (median 25 months, range 6–96). Data were analysed for stricture recurrence, change in median peak free flow rate (Qmax), median post-void residuals (PVR) and Patient Global Impression of Improvement (PGII) using a 7-point Likert scale. Short and longer-term complications of surgery were noted.

Statistical analysis was performed with the Wilcoxon signed rank test, Students T Test and Mann–Whitney U Test.

Results: At last follow up 42/46 (91.3%) of women were stricture free. Mean Qmax significantly improved from 5.7 ml/s (range 0–13) to 15.5 ml/s (range 4–38) (p < 0.05). Mean PVR significantly reduced from 147mls (range 0–609) to 24 mls (range 0–245) (p < 0.05). Short and longer-term complication rates were low. 4 patients had pre-existing stress urinary incontinence (SUI). 2/42 (4.7%) patients developed mild de novo SUI, which settled with conservative measures by 6 months post urethroplasty. A further patient had their recurrent stricture managed with redo VOBMG but suffered a further recurrence which was managed with a meatalotomy. Median PGII at 12 months post VOBM urethroplasty was 6.5 (4–7) and this was maintained at 36 months post-surgery.

Conclusions: Medium term results in the largest series of VOBMG female urethroplasty to date are excellent with stricture free rates of 91.3%, median PGII of 6.5 and significantly improved Qmax and PVRs.

The importance of retrograde leak point pressure in men with urinary incontinence following prostate cancer treatment

Introduction & Objectives: At our tertiary referral centre we perform video-urodynamics (vUDS) and retrograde leak point pressure (RLPP) tests in men with urinary incontinence following treatment for prostate cancer. Our objective was to determine the incidence of urge urinary incontinence (UUI) and stress urinary incontinence (SUI) in our patient cohort when assessed by vUDS and RLPP to determine the added value (or not) of RLPP.

Methods: We retrospectively reviewed the vUDS studies of 313 consecutive male patients of median age 68 years (IQR 61–73) who presented at our centre with urinary incontinence following treatment for prostate cancer between June 2016 and November 2020. 227 patients presented with isolated symptoms of SUI, 13 patients presented with isolated symptoms of UUI and 74 patients presented with mixed UI symptoms of UUI and SUI. Following vUDS we determined if the patients cause of UI was due to detrusor overactivity (DO) and UUI, urodynamic SUI (uSUI) or a combination of uSUI and UUI. A RLPP test was performed to assess sphincter competence.

Results: DO was demonstrated in 150 (48%) patients (median pressure 45cmH2O IQR 33–63) with subsequent UUI in 104 (33%) patients (median volume leaked 70 ml IQR 25–170). SUI was demonstrated in 144 (46%) patients (median volume leaked 11 ml IQR 5–42), with 62 (20%) of these patients having mixed UI. No UI was demonstrated in 128 (41%) patients. The sphincter closure pressure was compromised (<70cmH2O) in 94% of patients (median pressure 39cmH2O IQR 31–49) and there was no difference between patients with SUI and UUI (median pressure 36cmH2O IQR 29–42 vs. 36cmH2O IQR 29–44, p = 0.51).

Conclusions: Sphincter function measured by RLPP was compromised in 94% of patients whilst UI was only demonstrated in 59% of patients during vUDS (33% had UUI and 46% had SUI). Assessment of sphincter function with a RLPP test allowed for definitive diagnosis of SUI and for the patient to progress to definitive UI management without the need for further time consuming and expensive ambulatory urodynamic assessment.
Right iliac fossa or umbilical stoma for a mitrofanoff – which is the best site?

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**Introduction & Objectives:** The best site for the exit stoma of a Mitrofanoff or Monti channel remains unknown. In children there is evidence that the iliac fossa may be a superior to the umbilicus. We have evaluated the best exit stoma site in adults.

**Methods:** We performed a retrospective review of 176 consecutive adult patients of median age 42 years having Mitrofanoff or Monti channel formation a median of 142 months (range 54–386) previously. We evaluated outcome in terms stoma site revision, channel revision, continued channel use and channel continence for each stoma exit site. Statistical analysis was by Chi Squared analysis and significance was determined as p < 0.05.

**Results:** The 176 patients had a median follow up of 51.5 months (range 2–293) post Mitrofanoff/Monti channel formation surgery. At the time of this review 89 (51%) patients were still using their channels and 77% were continent. Outcomes at last clinic FU are listed in Table 1. 1 stoma exit site could not be determined from the notes and the patient had died during follow up.

**Conclusions:** Site of Mitrofanoff/Monti channel exit stoma does not affect long-term channel usage and continence. Umbilical exit stomas are formed significantly more often than other exit site stomas. There is a significantly lower rate of skin level revision at an umbilical exit site and this may be the best exit site in adults.

| Channel Exit Site | N (%) | Median Age (Range) | Median FU (Range) | In Use of Last FU | Dry at Last FU | Skin Level Revision |
|-------------------|-------|--------------------|-------------------|------------------|--------------|--------------------|
| Umbilicus         | 121*  | 44 (18–73)         | 57* (2–235)       | 90/121 (74%)     | 82/121 (68%) | 66/121* (55%)      |
| Right Iliac Fossa | 50    | 36* (18–66)        | 67.5* (4–293)     | 39/50 (78%)      | 34/50 (68%)  | 36/72 (72%)        |
| Left Iliac Fossa  | 4     | 24 (19–39)         | 282 (228–339)     | 4/4 (100%)       | 4/4 (100%)   | 3/4 (75%)          |

*p < 0.05.

Table 1. There were no significant differences in patient or fistula demographics.

**Conclusions:** TRUS/TVUS and MRI had similar detection rates for urethral extrusion. MRI performed better than TRUS/TVUS in the detection of bladder extrusion. Neither modality could replace cystoscopic evaluation or was reliable in the detection of vaginal exposure. The utility of TRUS/TVUS and MRI in assessing mesh configuration and tissue inflammation is the subject of prospective study.

Diagnostic accuracy of magnetic resonance imaging and transrectal/transvaginal ultrasound for pelvic mesh complications

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**Introduction & Objectives:** Pelvic synthetic mesh implants can be associated with vaginal exposure or extrusion into the urinary or gastrointestinal tract. MRI and transrectal/transvaginal (TRUS/TVUS) ultrasound are commonly used for assessment. However, there is limited evidence regarding the efficacy of these imaging modalities.

**Methods:** A retrospective analysis was performed of women who had surgical removal of continence mesh from 2018 to 2021. MRI and TRUS/TVUS imaging were compared to intra-operative findings to determine the accuracy of imaging detection rate of vaginal exposure, bladder and urethral extrusion.

**Results:** The 100 women had a median age of 50 years (range 22–88). Their outcomes are as detailed in

Fluoroscopic images acquired during video-urodynamics studies can successfully identify urethral diverticulum

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**Introduction & Objectives:** At our centre, patients presenting with suspected urethral diverticulum routinely have pelvic MRI, urethrogram and video-urodynamics (VUDS) to assess bladder function prior to urethral diverticulectomy surgery to aid counselling for surgical outcomes. The aim of this study was to determine if fluoroscopic images acquired during a VUDS could be used to identify patients with suspected urethral diverticulum.

**Methods:** One hundred and forty-four consecutive female patients had urethral diverticulectomy surgery at our at our tertiary referral centre between April 2004 and November 2020 were identified from our prospectively acquired database and reviewed retrospectively. The median age was 46 years (17–77). Twenty-five patients were excluded where urethral diverticulectomy surgery was performed following an MRI and urethrogram without a VUDS.

**Results:** Following VUDS, a urethral diverticulum was clearly identified in
in 89 patients’ (74%) voiding fluoroscopic images. Of the remaining 32 patients, 26 patients were identified with a normal voiding fluoroscopic appearance and 6 patients did not have voiding or post-void fluoroscopic images.

Conclusions: This is the first study to show that fluoroscopic images taken during VUDS identified urethral diverticulum in 74% of patients. A VUDS is a useful tool in the work up of patients requiring urethral diverticulectomy surgery. We were able to identify a urethral diverticulum in three out of four patients.

Machining accuracy in urology diagnostics: A pilot study on the role of machine learning to diagnose penile cancer

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Introduction & Objectives: Penile cancer is a sinister disease diagnosed in approximately 100 men annually in Australia. Early recognition and treatment are paramount to long-term survival. However, many men present with advanced disease due to a lack of awareness, social stigma, and limited access to culturally appropriate care. There is an urgent need to reduce barriers to subspecialist penile cancer care in Australia, especially for men of Aboriginal heritage or low socioeconomic backgrounds. Machine learning combined with smartphone photography has demonstrated a growing utility for diagnosing skin cancer. Recently, a melanoma algorithm using 1500 images achieved a sensitivity of 100%, and specificity was 64.8% vs. 69.9% for experienced clinicians. This project aims to increase awareness, decrease barriers to treatment, and improve Aboriginal men’s survival and quality of life.

Methods: A modified PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) search was conducted using Google images. High-quality colour images of penile lesions in peer-reviewed English language articles with a formal diagnosis discussed within the article were included. Histological confirmation was required for in-situ malignant and invasive malignant lesions. The search terms used were “penile cancer”, “penile squamous cell carcinoma (SCC)”, “penile lesion”, “benign penile lesion”, “penile carcinoma in situ (CIS)”, “penile neoplasm in situ (PeIN)”. Images that fit inclusion criteria were downloaded as JPEG files and categorised as benign, pre-malignant, and penile SCC. Two penile cancer subspecialist urologists independently reviewed all images to confirm categorisation. Ideas deemed clinically inconsistent with expectations from one or both urologists were excluded. Medical imaging software was developed to create a machine learning algorithm to categorise the images independently. Internal validation was conducted to assess the accuracy of the algorithm.

Results: One hundred thirty-six images from 83 articles were included – 65 invasive SCC, 44 malignancy in situ, and 27 benign. Subspecialist urologist agreement on image categorisation was 96%. Internal validation of the algorithm demonstrated a sensitivity of 93% and specificity of 71%.

Conclusions: This is the first study in English literature to identify the role of artificial intelligence in accurately categorising penile lesions. Further image incorporation and validation with clinical images from electronic medical records are underway. An opportunity exists to utilise the algorithm as an education, triage, and referral optimisation tool via a smartphone application. In the future, artificial intelligence may help to lower barriers to accessing subspecialist penile cancer care in Australia.

Salvage prostatectomy following neoadjuvant radioligand therapy: Prospective evidence of surgical difficulty from the luteectomy trial

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Introduction & Objectives: Lutetium-177 attached to prostate-specific membrane antigen (LuPSMA)-617 has proven effective for treating metastatic prostate cancer (PCa). LuTectomy is
Conventional radiotherapy. Here we present a video abstract describing the surgical findings and intraoperative technique for this novel patient population.

**Methods:** Men with high/intermediate-risk (International Society of Urological Pathology (ISUP) Grade 3–5) and/or locoregional (cN1) PCa based on International Society of Urological Pathology (ISUP) standards. All men underwent 68Ga-PSMA positron emission tomography (PET) staging and those with PSMA avidity of SUVmax ≥20 were considered for inclusion. Ten patients received one dose of LuPSMA, and ten received 2 LuPSMA doses in six-week intervals. Standard RARP + PLND was performed six weeks after treatment completion. Experienced uro-oncologists performed all procedures, and videos were centrally reviewed for surgical difficulty and tissue treatment effect.

**Results:** Eight (40%) patients demonstrated visible treatment effects noted by the operative team during RARP and PLND. Central assessment of operative videos assessed five (25%) having increased (level 2) surgical difficulty. The video highlights cases where focal effect from LuPSMA treatment was observed during RARP + PLND. Tips for safe dissection are described, and a comparison is made to the previous experience of salvage prostatectomy following conventional radiotherapy.

**Conclusions:** Salvage prostatectomy following neo-adjuvant radioligand therapy represents a novel operative patient population where focal treatment effects were unique to conventional radiotherapy. Here we demonstrate that experienced uro-oncologists can safely perform salvage prostatectomy following neo-adjuvant LuPSMA therapy with minor adoptions to the traditional RARP + PLND technique. Ongoing follow-up and further studies on a larger, randomised patient population are needed to determine the future role of curative intent neo-adjuvant LuPSMA before prostatectomy.

**Following the firefly: A narrated video case series of indocyanine green enhancedrobot-assisted radical inguinal lymph node dissection for N1 penile cancer**

**Introduction & Objectives:** Metastatic penile squamous cell carcinoma (SCC) is a life-threatening and rare disease. Radical lymph node dissection remains a cornerstone for curative management of node-positive inguinal disease. For men with low-volume N1 disease, open inguinal lymph node dissection (ILND) carries a high risk of long-term morbidity. Minimally invasive robotic ILND has been trialled in high-volume sub-specialist centres to balance oncological control with quality of life. However, identifying inguinal lymph nodes (LN) packets is challenging without manual tactile feedback. Here we present a case series and early experience using Indocyanine Green (ICG) fluorescence to identify inguinal LNs during robotic ILND for low volume N1 penile SCC.

**Methods:** A retrospective review of medical records was performed for ten men with low volume N1 penile SCC who underwent bilateral robotic ILND with a single surgeon. Patients were positioned supine frog legged, and the robot was docked to the groin as per accepted standards, and routine ILND was performed. As suspected inguinal LNs were approached during the dissection, 2 ml of ICG was injected subdermal into the ipsilateral penile base for six men. After approximately 5 min, the fluorescent lens was used to identify lymphatic vessels and LNs. ILND proceeded until all fluorescent tissue was removed. LN counts, the post-operative progress and disease recurrence were assessed.

**Results:** The average operative time was 135 min per groin, and the mean estimated blood loss was 50 mL. There were no intra-operative complications more significant than Clavien-Dindo 3. ICG administration allowed good visualisation of LNs in 6 (75%) groins. ICG visualisation was not adversely affected by previous dynamic sentinel LN biopsy. The average LN yield on formal histopathology for non-ICG groins was eight versus 10 for groins where ICG was used; however, statistical significance was not achieved. One groin recurrence was identified in a non-ICG groin after an average follow-up of 10 months.

**Conclusions:** To our knowledge, this is the first case series to compare the utility of ICG to improve robot ILND for penile SCC. Intraoperative ICG administration was safe and found to...
Penile cancer in younger men - a more aggressive disease?

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**Introduction & Objectives:** Penile cancer (PC) is an uncommon disease with an overall incidence approximately 1/100000 males. The incidence of PC increases with age. PC in men under 45 is very rare with an incidence of 0.02/100,000 males. The incidence of PC is higher in older age groups.

**Methods:** This study included all men diagnosed with PC at our institution from 2016–2021. Two age groups were compared (men 45 and men >45 years). Primary outcomes included overall survival, cancer specific survival and recurrence free survival. Secondary endpoints included histopathological features, stage and disease management.

**Results:** There were 90 patients treated for invasive PC over the study period. The median age at diagnosis was 64 (26–88). There were 12 (13%) aged ≤45 years, 78 (87%) aged >45 years. The majority of men in both groups underwent penile preserving surgery (92% vs 86%, p = 0.52). Younger men were more likely to have nodal involvement at time of diagnosis compared to men >45 (58% vs 19%, p < 0.01). There was no significant difference in tumour subtype, grade, perineural/lymphovascular invasion, p16 status or T stage.

There was no significant difference demonstrated in recurrence free survival or overall survival. Men aged 45 had a worse cancer specific survival (39 months vs Not reached, HR 0.1 (95% CI 0.02–0.85), p = 0.03).

**Conclusion:** There are little published data regarding disease characteristics in younger men. Our series showed younger men were more likely to present with nodal involvement and had a worse cancer specific survival.

**Project impact:** Genital protector simulator testing. Do genital protectors adequately protect players?

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**Introduction & Objectives:** Blunt groin trauma is common in team contact sports and cases have been reported in individual sports as well. This impact can manifest in significant morbidity although these cases are rare. They result from testicular rupture, haematocoele, testicular torsion, haematoma and other spermatic cord injuries. Due to these known risks, it is commonplace in certain sports for protective groin equipment to be worn in order to reduce this risk. In sports such as cricket, groin protectors are widely utilised as a means of reducing injury when facing the ball at high speeds. Both male and female groin protectors are available for purchase in the market currently, but little data are present regarding their use and effectiveness.

Previous testing of genital protectors in laboratory conditions has shown that none of the genital protectors available adequately adhere to the safety standards available. These safety standards may not accurately simulate the game of cricket and therefore we aim to test the genital protectors in a controlled match/training environment. We aim to test genital protectors in an controlled simulated environment which mimics a cricket match/training.

**Methods:** Seven pairs of genital protectors were sourced from the local retail stores. They were tested in an indoor local cricket facility. A cricket bowling ball machine (Bola hard ball machine) was used to bowl the balls at different speeds towards the protectors that were fixed to the stumps on the other side of the net, 25 metres away. This simulates match/training play. Protectors were examined after every strike. The testing was complete once the protector was struck 3 times at each speed. Speeds were recorded at 65/75/85/99 mph. Photos and videos were taken of the process and the genital protectors post impact.
Results: Of the seven protectors that were tested, three did not sustain any damage even at high speeds. Three protectors sustained minor damage whilst one protector sustained moderate damage to the silicone padding used to absorb some of the impact from the ball. The resulted are tabulated below. The samples are non-identifiable.

Table 1 Results of the testing at the Hawthorn Cricket Centre, Victoria

Conclusions: We aimed to show that although all the genital protectors tested in laboratory conditions failed, those results did not accurately match the burden of disease occurring in the game of cricket. The protectors tested here showed mainly minor damage once hit at speeds similar to that being bowled at cricket games. This may be a more accurate reflection of the current injury burden in cricket. Further testing in an outdoor setting would be warranted to adequately assess the function of genital protectors. The weather and outdoor setting may further alter the outcome.

A guide to focal irreversible electroproportion for prostate cancer
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Introduction & Objectives: Focal therapy is an emerging form of prostate cancer treatment which aims to achieve good oncological outcomes whilst sparing men from the morbidities associated with radical treatment. It does so by treating part of the gland which contains cancer whilst leaving intact the surrounding benign tissue. Many types of focal therapy currently exist including but not limited to cryotherapy, irreversible electroproporation and high-intensity focused ultrasound. These differ in terms of the energy source used to ablate cancer tissue. Early data for focal therapy suggest it has the potential to be an effective mode of treatment for carefully selected men. However, this opinion is largely based on retrospective cohort data. Therefore, better designed studies are needed before it can be implemented into routine clinical practice. Nevertheless, the increasing amount of published literature on focal therapy shows that it is becoming more widely available to men with prostate cancer. Focal irreversible electroproporation is a form of focal therapy that utilises pulses of electricity to create pores in the targeted cell membranes and induce apoptosis. The pulses of electricity are delivered between probes placed transperineally to surround the prostate cancer. Currently, there have been 10 clinical studies published on outcomes following focal irreversible electroproporation. They demonstrate a rate of recurrence of around 20% and low rates of erectile dysfunction and urinary incontinence. In this project we seek to demonstrate the technique used at our institute to perform focal irreversible electroproporation. We hope to create awareness of this form of therapy within the Urological community.

Methods: All patients used in this video were appropriately consented to make this video. All videos were filmed at Epworth HealthCare. Video was edited using iMovie.

Results: In this video, we give some background about the current literature surrounding focal IRE. We then present a patient case to describe our technique used in our institute to perform focal IRE using. We include radiographic images, real life video footage and voice recordings.

Conclusions: Focal IRE is an emerging form of focal therapy for prostate cancer which has the potential for good oncological and functional outcomes when performed on carefully selected men. We hope that this video will create awareness of this form of therapy and therefore drive the creation of well-designed studies to optimise its use.

SLAP trial: Shock wave lithotripsy and mechanical percussion therapy for lower pole renal calculi
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Introduction & Objectives: ESWL is a common method for treatment of renal and upper ureteric stones and is non-invasive, requires minimal anaesthesia and has a high level of patient tolerance. There is decreased stone clearance in dependent areas of the kidney such as the lower pole, with reported clearance rates at 44–59%, compared to up to 84% in other areas of the kidney. Mechanical Percussion and Inversion (MPI) has been shown to significantly improve stone clearance post ESWL. In these studies, treatment was administered in clinic by medical staff. This study aims to evaluate whether
Mechanical Percussion and Inversion (MPI) therapy performed at home can improve stone free rates compared with ESWL alone.

**Methods:** We are conducting a prospective single blind randomised control trial, with an estimated sample size of 80 patients. Included patients are greater than 18 years of age with lower pole stone burden ≤10 mm on plain Xray. After standard practice ESWL, patients are randomised to either the control arm or MPI therapy. MPI therapy is self-directed for 10 min a day, three times per week. Both arms have standard follow up at 12 weeks with a plain Xray. Both arms have standard follow up at 12 weeks with a plain Xray.

Patients in observation group will be offered cross over to treatment arm after 12 weeks if ongoing stone burden. Ethics approval was obtained via The Prince Charles Hospital HREC committee. HREC/2022/QPCH/84961.

**Preliminary Results:** 30 patients currently enrolled. 20 have undergone ESWL. 10 patients have been randomised to each arm. 1 control patient has attended follow up, with a residual 2 mm fragment and has been transferred into the treatment arm for 3 months. We expect to be able to report complete data by the meeting in February. We expect to attain the desired sample size by November 2022 and the study to conclude by February 2023.

**Conclusion:** The authors believe MPI can be effectively performed in a home setting without the need for medical supervision and will improve stone clearance rates. Additionally, stone clearance for immediate MPI versus after 3 month observation will be reported.

The main limitation to the study will likely be variability in MPI compliance and administration. Further research is warranted into standardising home MPI protocols.

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**Ductal prostate cancer: An analysis of histological findings compared with MRI and PSMA characteristics**

**Methods:** Radical prostatectomy specimens containing varying proportions of DAC were obtained from a single specialist uropathologist between 2014 and 2021. Clinical variables, histology, pre-operative MRI and PSMA data were then compared. Ethics approval was obtained; HREC: 2021.19.357.

**Results:** DAC was found in 1.5% of radical prostatectomy specimens over this period. (136/8971). 76% (104/136) had both MRI and PSMA pre-operatively, with all patients having at least one imaging modality. Median ductal component was 25%. 59% of patients had Gleason ≥4 + 5 disease. 77% had ≥T3 disease with 25% having seminal vesicle invasion and 4 out of 6 PLNDs demonstrating metastasis. 95.8% of MRI’s (115/120) demonstrated PI RADS 4/5 lesions, and all of these were concordant with prostatectomy histology. 96.7% of PSMA PET lesions were concordant with prostatectomy histology. Median SUV Max was 6.8 (IQR 3.6–12.4). 4 men returned negative PSMA PETs, of which 3 had Gl 4 + 5 disease at prostatectomy.

**Conclusion:** Our study confirms DAC as being an aggressive variant subtype of prostate cancer. Presence of any proportion of DAC is associated with higher Gleason score as well as locally advanced disease.

Both MRI and PSMA show good concordance with prostatectomy histology; however, PSMA missed 3.8% of cancers, of whom 75% had high grade disease. Low SUV Max was seen in patients with high proportion of DAC and may suggest PSMA to be unreliable in these patients.

The combination of MRI and PSMA picked up all DAC patients, and further research may be warranted to investigate this potential. Similarly there is a paucity of literature comparing FDG PET with PSMA in DAC primary staging.

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**Emergency urology performed by general surgeons: A systematic review**

**Methods:** PubMed, Embase and Web of Science were searched to August 11th 2022 for observational reporting outcomes after emergency urology surgery performed by a general surgeon or general surgical trainee.

**Results:** 19 studies were included. The authors believe that wide variation in patient outcomes after emergency urology surgery performed by a general surgeon or general surgical trainee.

**Conclusion:** Further study is warranted into standardising home MPI protocols.
Bias checklist) were performed in duplicate by two reviewers. Data on setting, operation undertaken, mortality rates and complication were extracted by two reviewers, with disputes settled by a separate reviewer. Meta-analysis was unable to be performed due to heterogeneity. This study is registered with PROSPERO, CRD42022356423.

**Results:** From 1272 records, 20 retrospective observational studies were included, covering a total sample of 2374 operations. Three studies were from Australia, and the remaining sixteen were from other countries. Most common operations performed were ureteric stent insertion, pyelo-and urolithotomy, prostatectomy, nephrostomy and suprapubic catheterisation. Mortality rate at latest follow-up was poorly reported ranging from 0 to 7.10%. Rural and remote hospitals without a urologist were the most common settings for more emergency urology performed by a general surgeon.

**Conclusions:** This is the first systematic review that synthesises the literature to characterise patient outcomes after emergency urology operations performed by a general surgeon. This study’s findings will benefit rural and remote Australian settings, alongside military and humanitarian environments.

**Organ transplant in men with low-risk prostate cancer under surveillance: Coexistence or contraindication? A systematic review**

**Introduction:** Prostate cancer (PCa) has generally been accepted as a contraindication to solid organ transplant to prevent cancer progression or acceleration in an immunocompromised host. Candidates for organ transplant with low risk PCa are channelled into radical treatments to become eligible recipients. These men would otherwise be suitable for active surveillance (AS) and avoid potential treatment harms. In the setting of end stage disease, withholding organ transplant presents a greater mortality risk to the patient than low risk malignancy. We aim to provide an updated review of oncological outcomes for men on AS who undergo solid organ transplant.

**Methodology:** We perform a systematic review of the current literature for solid organ transplant patients with low risk, low volume PCa and highlight the oncological outcomes. Exclusion criteria was applied.

**Results:** Initial search of major databases revealed 30 articles. Exclusion and inclusion criteria were applied. 2 articles were included in the review with N = 753 transplanted patients(1, 2). N = 476 were diagnosed with ISUP1 PCa. Overall mortality (OM) was 3–4 years shorter for transplant recipients compared to a matched cohort of men without transplant (8.5 vs 12.5 years, p = 0.003). Prostate Cancer Specific mortality (PCSM) demonstrated no difference in both studies between transplanted men and a matched cohort of non-transplanted men with PCa (HR = 0.88, 95% CI = 0.54–1.45, p = 0.70).

**Conclusion:** We present a systematic review of the current evidence for cancer outcomes in men with low risk PCa who undergo solid organ transplant. There is no difference in PCSM for transplanted versus non-transplanted men with PCa. A blanket rule on treatment of low risk PCa prior to transplantation may not be warranted.

**References**

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**Video tutorial for the diagnosis of radiation induced haemorrhagic prostatitis**

**Introduction & Objectives:** Haematuria is a common mid to late term complication post radiation therapy (RT) for prostate cancer and has typically been attributed to radiation induced cystitis. However, RT can also lead to the more poorly defined phenomenon of haemorrhagic prostatitis. Macroscopic haematuria secondary to radiation induced haemorrhagic prostatitis (RiP) is an increasingly frequent presentation. Some of these patients do not respond to the traditional treatment algorithm prescribed for haemorrhagic cystitis. The accurate endoscopic diagnosis of RiP will aid the urologist in the management of macroscopic haematuria. We aim to provide a video tutorial on the recognition and diagnosis for RiP.

**Methods:** With consent we have narrated endoscopic assessment of a patient who has presented with macroscopic haematuria post radiation therapy for prostate cancer in 2022. The diagnosis was labelled as per a proposed novel classification for RiP.

**Results:** Endoscopic evaluation revealed evidence of vascular changes to the prostate consistent with haemorrhagic prostatitis. The spectrum
of vascular changes seen within the prostate can be described from Grade I to V (Fig. 1). The diagnosis is both clinical and endoscopic. The case presented suffered from Grade III RiP and required repeated manual bladder washout. The diagnosis of RiP allowed for targeted therapy for management of his haematuria.

**Proposed Classification of Radiation induced Haemorrhagic prostatitis**

Fig. 1 Proposed classification for radiation induced haemorrhagic prostatitis

**Conclusions:** We present a video tutorial for the diagnosis of haemorrhagic prostatitis post RT. Current treatment algorithms for haemorrhagic cystitis may not adequately manage these presentations. Accurate evaluation of haemorrhagic prostatitis is required to aid the urologist in treating patients with complications associated with radiotherapy.

**Long-term outcomes following radical nephrectomy with caval tumour thrombectomy and advanced caval reconstruction**

**Introduction & Objectives:** Causal tumour thrombus is seen in 10–25% of renal cell carcinoma (RCC). This study aims to examine perioperative morbidity and oncological outcomes after radical nephrectomy with caval tumour thrombectomy and reconstruction at a Victorian institution.

**Methods:** This was a retrospective review between June 2012 and June 2022 at Austin Health. Categorical variables were reported as number (%) and continuous variables as median [range]. Kaplan–Meier curves were compared using the log-rank test. p-values <0.05 were statistically significant.

**Results:** We identified 28 patients, 17 (60.7%) were male and the median age was 62 years [34–75]. There were 13 (46.4%) level 4 and 4 (14.3%) level 3 tumour thrombus. Twelve (42.9%) patients had metastatic disease at the time of surgery. Operative time was 9.5 h [4–18.8] and 14 (50%) patients underwent cardiopulmonary bypass. One (3.6%) patient died intraoperatively and 5 (17.9%) died in-hospital. Length of stay was 14 days [5–66] and 11 (39.2%) patients experienced Clavien-Dindo III-IV complications. Excluding in-hospital deaths (n = 23), median follow-up was 21 months [1.5–75]. Six (26.0%) patients received adjuvant therapy and cancer recurrence occurred in 6 (26.1%). Overall survival (OS) was 73.9% (n = 12) and recurrence-free survival (RFS) was 60.9% (n = 14).

**Conclusion:** Although radical nephrectomy with caval tumour thrombectomy is associated with significant morbidity and mortality, it remains an effective procedure in the treatment of advanced RCC.

**Autologous fascial sling vs burch colposuspension in the management of stress urinary incontinence: A systematic review**

**Introduction & Objectives:** Stress urinary incontinence (SUI) is a substantial cause of physical, social, and psychological distress, affecting between 4% and 35% of adult all women. With increased hesitancy surrounding the use of synthetic mesh slings, Burch Colposuspension (BC) and Autologous Fascial Sling (AFS) are once again at the forefront of SUI treatment options. The aim of this systematic review is to compare the efficacy of BC and Autologous fascial sling AFS in the treatment of SUI, as well as comparing the complications following each of these procedures.

**Methods:** This systematic review was conducted using PRISMA guidelines and registered with PROSPERO (CRD42022343989). A systematic literature search was conducted in PubMed, Embase, Cochrane and Scopus databases. Inclusion criteria included English language studies where women underwent either BC or AFS. Studies were excluded if BC and AFS was not compared directly, the intervention was not for the treatment of SUI and the study did not use primary data. The risk of bias assessment was conducted using the National Institute of Health study quality assessment tool.

**Results:** A total of 20 papers were included in this review. Overall success rates ranged from 38% to 88.9% for BC and 47% to 92.9% for AFS. All statistically significant results
favoured AFS to be more effective in the treatment of SUI. Retreatment rate for AFS was lower in all reporting studies and this disparity was amplified with time. This is contrasted with AFS having a higher rate of urinary retention, de novo urge incontinence and urinary tract infections. Lower urinary tract injury was more common with BC (6.4% vs 1.7%). There were no significant differences between BC and AFS in relation to wound complications and sexual function.

Conclusions: There are more data to support the efficacy of AFS in the treatment of SUI; however, this comes with the cost of increased rates of voiding complications. There is insufficient evidence to determine the degree of differences between the procedures. With advancements in BC and AFS technique and resurgence in popularity of these procedures, new studies are required to accurately reflect contemporary standards in the surgical treatment of SUI.

Equality, diversity and inclusion extends to more than who’s on the panel: Assessing the speakers and prominent roles at two Urological Conferences 2022

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Introduction: Increasing Equality, Diversity and Inclusion (EDI) in healthcare and Urology has been a topic of discussion (e.g. male dominated panels: ‘manels’) and opportunity for reflection within organisations. The EAU EDI task force (April 2022) estimated 17% female membership and that at the EAU Congress women presented <20% of all posters, chaired <10% of scientific sessions and < 12% of faculty. BAUS has instigated an EDI task force and action plan for Widening Participation; and estimates a female membership of 30%.

Aim: to ascertain and compare the proportion of prominent roles held by women at the BAUS and EUA 2022 meetings. In addition, Caucasian/non-Caucasian descriptors were assigned in an attempt to evaluate diversity.

Methods: The gender of those holding prominent roles (speaker, chair, moderator, faculty) was assessed for both EAU22 and BAUS22 via the Congress App ‘Speakers’ section and programmes. Abstract presenters and were excluded as no profile was assigned to them.

Gender was attributed to those who had photographs on the Congress App or online and/or gendered title. Ethnicity could only be arbitrarily assessed as to Caucasian/non-Caucasian based on photograph. A limitation of this project was not ascertaining the speakers preferred identity/ethnicity. Nationality was assessed based on the profile as submitted by the speaker.

Results: EAU22 listed 919 ‘Speakers’ of which 123 (13%) were female; other roles included: Chair: 39 (4%), moderator: 20, panelist: 14, discussant: 8, faculty: 8; many were assigned more than one role (total of 367). 94 (76%) were doctors/surgeons, the remainder were researchers, allied health workers, or patient advocates/caregivers. 56 (31%) of the BAUS22 speakers (n = 180) were female, of whom 95% were doctors/surgeons; other roles included: Chair: 20 (11%), panelist: 9. At EAU, ‘Speakers’ were 75% Caucasian (n = 690), 23% non-Caucasian (n = 208), and 2% unknown (n = 21); only 2% non-Caucasian women (n = 17) were listed as speakers. At BAUS, ‘Speakers’ were 53% Caucasian (n = 95), 43% non-Caucasian (n = 77), and 8 had unknown ethnicity (4%).

EUA ‘Speakers’ represented 56 countries; 14 only had Caucasian representatives. 32 countries had no female representation; for those that did, they accounted for 13–56%; of note: UK: 26%, Australia: 33%.

Conclusions: This project represents an overview of EDI at two...
Setting up a multi-disciplinary Klinefelter syndrome clinic – lessons learnt and shared
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Introduction: Klinefelter Syndrome (KFS) is commonly associated with male infertility; however, there are wider medical and psychological sequelae to this diagnosis needing a holistic approach. A multi-disciplinary clinic (MDT), accepting National referrals was designed and instigated at our centre in 2019. It enables joint urology and fertility review, endocrine evaluation, pharmacy advice, a psycho-sexual consultation and Patient Liaison meeting. A Young Persons KFS clinic (<21) has been similarly designed. After invitation, the patient cohort have been part of several urology research projects (BSc), which is increasing knowledge on the condition.

Aim: to evaluate progress made and assess KFS clinic satisfaction.

Methods: Review of the Adult KFS clinic data: numbers, waiting time and reason for referral (2019-present); and review of Clinician and patient feedback.

Results: Research projects were reviewed and results summarised.

Results: 15 adult KFS clinics will place between 2019–2022. So far 117 appointments were offered: 98 patients attended (16% Did Not Attend); further data are shown in Table 1.

Conclusion: An MDT approach is important to better manage KFS patients and a purpose designed clinic is recommended. Research can help to inform management of rare diseases.

Table 1 KFS Clinic statistics per year.

| 2019 Number (expected) | 2020 Number (expected) | 2021 Number (expected) | 2022 Number (expected) |
|------------------------|------------------------|------------------------|------------------------|
| No of clinics          | 4                      | 3                      | 4                      | 2 (4)                  |
| No of patients         | 26 (27)                | 24 (30)                | 31 (40)                | 17 (40)                |
| No of patients per clinic | 7                      | 8                      | 8 (10)                 | 8 (10)                 |
| Waiting time (months)  | 4.7                    | 8.1                    | 11.1 (12.0)            | 7.8 (8)                |
| % of referrals from local region | 77%            | 83%                    | 65% (60%)              | 47% (60%)              |
| % infertility referrals | 77%                    | 63%                    | 55% (70%)              | 76% (70%)              |

Overall patient satisfaction of KFS clinic was 97%; Genetic consultation: 98%; Endocrine: 100%; Fertility: 97%; Urology: 100%; and Psychosocial: 100%. Key positive factors were presence of an MDT, access to a patient liaison, patient information sheets and a cohesive approach.

Clinician feedback was positive; all members agreed that the pre- and post-clinic MDT allowed effective discussion of often missed issues (e.g. hormone induction, social issues).

At least 9 papers have been published from the experiences of KFS clinic; 3 are pending. 11 presentations have occurred in 2022; themes of presentation include (1) VTE risk in KFS (2) Gender identity (3) Surgical Sperm Retrieval. These suggest: (1) there is increased risk of VTE for KFS patients receiving testosterone replacement (30% vs 10%, p < 0.001). (2) Gender Dysphoria Survey showed 35% did not identify as male, compared to their birth certificate (92.5% male). (3) Successful surgical sperm retrieval was possible in 7/32 (22%) of KFS clinic patients; younger age increased success: 29.8 yrs vs 36 yrs, p 0.0027. Response to Hormone stimulation (increased T) also increased success (29%) compared to ‘no response’ (0%), but not statistically significant.

Assessing the IDENTIFY calculator in a real-life clinical setting: A retrospective study
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Introduction & Objectives: The IDENTIFY calculator is a recently introduced tool able to generate a predicted risk of urothelial cancer for patients newly referred with haematuria, as well as their risk category. A predicted risk of less than 1% is a very low risk, 1 to 5% is a low risk, 5 to 20% is an intermediate risk and over 20% is a high risk. We wanted to assess how these predicted risks translate in a real-life clinical setting.

Methodology: We retrospectively collected the following information for patients referred to the Eastern Health Haematuria Clinic (EHHC) between April 2022 and September 2022 including their IDENTIFY predicted risk (IPR) for urothelial cancer, if they had urea cytology (UC), a CT intravenous pyelogram (IVP) and a cystoscopy. We stratified these patients according to their IPR and assessed if they did in fact get a diagnosis of urothelial cancer or not. Patients were excluded from the study if they had any history of urological malignancy or if they were wrongly referred.

Results: We collected data for 100 patients who were referred to the EHHC. We included 89 patients in the final study. 29 were stratified to the high-risk group, 34 to the intermediate risk group, 17 to the low-risk group and 9 to the very-low-risk group. In the high-risk group, 76% had UC, 79% had a CT IVP, 86% had a cystoscopy and a total of 6 patients got a diagnosis of urothelial cancer. In the intermediate risk group, 62% had UC, 56% had a CT IVP, 79% had a cystoscopy and 1 patient got a diagnosis of urothelial
understood what needs men have
feature strongly, it is not well
sexual function and mood disorders
clinical trials data. Whilst continence,
cancer are worse than reported in
treatment for localised prostate
that patient reported impacts from
and internationally have identi
reported outcomes studies nationally

**Introduction & Objectives**

Metro North Health, Herston, Australia

MATTHEW J ROBERTS

NAVARATNAM, GRAEME DICKIE, CHARLES LIN,

RACHEL ESLER, JOHN YAXLEY, ANOJAN

NATASHA A ROBERTS, ARIANE MCKINNON,

for localised prostate cancer
Unmet needs for men treated
Men who had

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**Table 1 Summary table of results.**

| Group                  | Average IDENTIFY predicted risk (IPR) | Number of patients who had urine cytology (UC) | Number of patients who had a CT IVP | Number of patients who had a cystoscopy | Number of patients who got a diagnosis of urothelial cancer |
|------------------------|--------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------------|----------------------------------------------------------|
| High risk (IPR >20%)   | 34.7%                                | 29 (33%)                                      | 22 (76%)                          | 23 (79%)                               | 25 (86%)                                                 |
| Intermediate risk (IPR 5-20%) | 10.6%                              | 34 (38%)                                      | 21 (62%)                          | 19 (56%)                               | 27 (79%)                                                 |
| Low risk (IPR <5%)     | 2.6%                                 | 17 (19%)                                      | 15 (88%)                          | 8 (47%)                                | 15 (88%)                                                 |
| Very low risk (IPR <1%)| 0.5%                                 | 9 (10%)                                       | 5 (56%)                           | 3 (33%)                                | 6 (67%)                                                  |
| Total                  | 89 (100%)                            | 63 (71%)                                      | 53 (60%)                          | 73 (82%)                               | 7 (8%)                                                   |

In the low-risk group, 88% had UC, 47% had a CT IVP and 88% had a cystoscopy. In the very-low-risk group, 56% had UC, 33% had a CT IVP and 67% had a cystoscopy. In both lower risk groups, no patient got a diagnosis of urothelial cancer.

**Conclusion:** The IPR did match our clinical findings for the reviewed patients. 21% of patients stratified to the high-risk group did in fact get a diagnosis of urothelial cancer. In addition, the proportion of patients getting a CT IVP correlated with the IPR. This suggests this tool is a suitable adjunct when triaging newly referred haematuric patients and when making clinical decisions such as getting a CT IVP or not. This could lead to reduction in unnecessary radiation and dye exposures as well as for cost for low-risk patients.

**Unmet needs for men treated for localised prostate cancer**

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**Introduction & Objectives:** Patient reported outcomes studies nationally and internationally have identified that patient reported impacts from treatment for localised prostate cancer are worse than reported in clinical trials data. Whilst continence, sexual function and mood disorders feature strongly, it is not well understood what needs men have before and after treatment. We aimed to explore unmet needs for men who have been treated for localised prostate cancer.

**Methods:** This study was conducted in a large public hospital health service in Southeast Queensland. Over a period of three weeks a cross-sectional survey was distributed to all men that had received prostate cancer treatment in the last year. The surveys included demographics, treatments received, time since diagnosis, barriers and enablers to treatment decision making and ongoing care, and the Supportive Care Unmet Needs Survey Short Form 34 (SCNS-SF45). Descriptive statistics and univariate analysis were applied to quantitative findings, a framework approach was applied to qualitative data. Results were then triangulated.

**Results:** 162 men responded to the 390 surveys distributed. 60 (39%) had first line radical prostatectomy, 54 (34%) had radiation therapy. The remaining men reported active surveillance 28 (17%), 12 (7%) hormone treatment, and the remaining reported “no treatment” or “I do not know” (5%). The highest ranked unmet needs across treatment types reported unmet needs relating to mood and feeling out of control. These were followed by unmet needs regarding sexual relationships and worrying about those close to them. Men who had >3 unmet needs reported treatment regret (p = 0.01).

**Conclusions:** By better understanding how to meet the needs of men treated for localised prostate cancer, we may be able to better design supportive care both before and after treatment. Further research can identify whether these interventions can better meet men’s needs and overall treatment, and health service outcomes.

**Predisposing factors of renal impairment in aldosterone producing adenoma after laparoscopic adrenalectomy**

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**Introduction & Objectives:**

Aldosterone Producing Adenoma (APA) caused glomerular hyperfiltration of renal and masked out renal impairment (Fig. 1). The actual renal function would be revealed after being treated by adrenalectomy. The object of this study was identify predisposing factors of renal impairment in APA.

![Fig. 1 Mechanism for renal function adaptation and structural damage in primary aldosteronism, ECV; extracellular fluid volume](image-url)
Methods: Retrospective review included 53 APA patients and 36 Non-APA patients were treated by laparoscopic adrenalectomy between January 2011 – January 2021 at Vajira hospital.

Results: After being treated by laparoscopic adrenalectomy, APA patients were divided into two groups; APA patients with increased Serum Cr and APA patients without increased Serum Cr at 48 h and 6 months postoperatively. The duration of long-standing hypertension and the number of antihypertensive drugs were statistically significant differences between the two groups (p < 0.05) (Table 1).

When using logistic regression analysis, the result revealed that the number of antihypertensive drugs was a predisposing factor of renal impairment in APA after being treated by laparoscopic adrenalectomy (p < 0.05, 95% CI 1.276–5.815) (Table 2).

Serum creatinine of APA group significantly increased when compared with Non-APA group at 48 h and six months postoperatively (p < 0.05) (Table 3 & Fig. 2).

Conclusions: Number of antihypertensive drugs was a predisposing factor of renal impairment in APA after being treated by laparoscopic adrenalectomy. Therefore, a physician should treat promptly and reconsider operative treatment before add new antihypertensive drugs to prevent further renal impairment.
ureteric reimplantation in a centre where the GU and colorectal teams operate jointly on complex cases.

Methods: A review of a prospectively maintained database from Jan 2021 to July 2022 at a tertiary referral institution was performed. Primary endpoints were perioperative morbidity and mortality. Secondary endpoints were GU functional outcomes, renal function and development of a stricture.

Results: From Jan 2021 to July 2022, 21 intraoperative ureteric injuries occurred. Eleven were planned resections, ten were unplanned resections. Sixteen had a psoas hitch reimplant (two performed robotically), four had a boari reimplant (two performed robotically), and one patient had a primary uretero-uretero anastomosis. Four patients developed an anastomotic stricture; all four were undergoing CRS and all had previous pelvic radiation. All 4 were managed with a ureteric stent. One patient had a delayed presentation of a high ureteric injury and underwent a retroperitoneal laparoscopic nephrectomy.

Conclusions: Ureteric injury can occur during major pelvic resections. Patients undergoing CRS, redo surgery and those with previous pelvic radiation are at a higher risk of an anastomotic stricture and is an important aspect to explain to patients during the consent process.

Genitourinary outcomes in patients undergoing total pelvic exenteration in an Australian tertiary centre

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Introduction & Objectives: Total Pelvic Exenteration (TPE) is the standard of care for management of locally advanced and recurrent rectal cancer. This procedure requires multiple specialties coordinating and performing advanced cancer surgery that is known to have high short-term and long-term morbidity, in particular from the urological perspective.

Methods: A review of a prospectively maintained TPE database from July 2016 to July 2021 at a tertiary referral institution was performed. Primary endpoints were perioperative morbidity and mortality. Secondary endpoints were long-term renal function preservation and the incidence of uretero-ileal anastomotic strictures.

Results: From July 2016 to July 2021, 117 TPE with ileal conduit was performed. 74 were male with a mean age of 61 (range 24–85) with a mean length of stay of 25.3 days. 90 were performed for colorectal cancer, 10 for anal cancer, 2 for gynaecological cancer and 2 for genitourinary cancer. 76 patients underwent neoadjuvant radiation. 37 patients also underwent a sacrectomy. 1 patient had a nephrectomy and all underwent an ileal conduit. 8 patients had a urinary leak, 4 were managed conservatively and 3 required a nephrostomy and 1 needed a return to theatre. The long-term stricture rate was 9%. 14 patients developed severe AKI and 21 patients developed urosepsis within 30 days. 30 day mortality was 0.9%.

Conclusions: Our experience with TPE over a medium follow-up period demonstrates urological complication rates consistent with the literature associated with urinary diversion and anastomosis, with low rates of urine leak and ureteric stricture.

Improving post-biopsy waiting times using a stream-lined prostate cancer care pathway in a large volume tertiary centre

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Introduction & Objectives: Covid-19 has caused major delays in cancer care, inducing significant patient anxiety. We assessed the effectiveness of a new, streamlined Prostate Cancer Care Pathway (PCCP) initiated at a large tertiary academic centre to deliver timely care and ensure patient satisfaction.

Methods: All patients undergoing prostate biopsies at our centre were prospectively followed through PCCP and compared to patients immediately pre-PCCP implementation (2022) and Covid-19 lockdowns (2020). Waiting times between cohorts were compared using the Kruskal-Wallis H-test. Patient satisfaction was assessed using the Prostate Cancer Questionnaire for Patients (PCQ-P).

Results: Overall, 90 patients were included. 30 patients went through the PCCP, compared with 30 patients immediately prior to PCCP implementation and 30 patients from 2020 during the Covid-19 pandemic. The median time from biopsy to results after PCCP was 13.0 (IQR 13.0–15.0) days, significantly shorter than during 2020 Covid-19.
lockdowns, 21.0 (18.0–21.0) days, and pre-PCCP, 17.5 (14.8–21.0) days (p < 0.001). Of patients undergoing PCCP, twelve (40.0%) did not have prostate cancer and were discharged, whilst two patients (6.7%) had low-grade cancer and underwent active surveillance. Sixteen patients (53.3%) requiring treatment were streamlined for MDT discussion following imaging studies at a median time of 29.5 (23.5–35.8) days post-biopsy and at consultant Urology and/or Radiation Oncology clinic for treatment discussion at a median of 33.0 (30.0–35.0) days, compared to 51.0 (44.3–66.0) days pre-PCCP and 59.0 (42.0–85.0) days in 2020 (p = 0.008). 87.0% of PCQ-P participants (n = 23) reported waiting time satisfaction for post-biopsy clinic and treatment consultations.

**Conclusions:** Covid-19 caused significant delays in the timely delivery of Prostate Cancer care. Subsequently, implementation of the PCCP reduced waiting times in measured aspects of post-biopsy care. Streamlining available resources using similar pathways can reduce waiting times in cancer care and help alleviate patient anxiety in times of healthcare system strain.

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**Use and accuracy of PrecisionPoint prostate biopsy: Australian Institutional experience**

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**Introduction & Objectives:**

PrecisionPoint (PP) is a transperineal biopsy tool with potential to be performed in outpatient settings under local anaesthesia. We compared the clinically significant cancer detection rate (csCDR) between PP and Template Biopsies at a large tertiary academic centre.

**Methods:** 25 patients undergoing PP biopsies under general anaesthesia at our centre and 37 Template Biopsies during the same period were prospectively evaluated. Operating lists were randomly allocated to either technique performed under general anaesthesia. Histopathology results were used to determine the csCDR of each technique. Patients were followed up with phone calls and post-biopsy clinic notes were noted for any complications of PP biopsies.

**Results:** Patients undergoing PP biopsies and template biopsies had a median age of 63.0 (57.5–70.5) and 68.9 (61.5–74.0) and median pre-operative PSA of 6.0 (4.3–10.2) and 9.2 (5.6–12.2) ng/mL, respectively. PP biopsies had a csCDR of 52.0%, compared to 51.0% for Template biopsies. PP biopsies had a detection rate of 32.0% for ISUP 2 disease and 12.0% for ISUP 4/5 disease, whereas Template biopsies had detection rates for 16.0% for ISUP 2 disease and 32.0% for ISUP 4/5 disease. PP biopsies and Template biopsies had benign prostate detection rates of 36.0% and 30.0%, respectively. Furthermore, PP biopsies detected clinically significant cancer in 66.7% of patients with PIRADS 4/5 lesions on MRI (n = 12), compared to 68.2% for Template biopsies (n = 22). Of all PP biopsies performed, two patients experienced haematuria and one experienced urinary retention.

**Fig. 1 CDR comparison of PP and Template biopsy techniques for various ISUP disease grades**

**Conclusions:** When performed under general anaesthesia, PP and Template biopsies have comparable overall csCDR. The two techniques also have similar sCDR for patients with PIRADS 4/5 lesions. Our pilot data support the transition of transperineal biopsies to outpatient settings under general anaesthesia in the Covid-19 recovery period.

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**Accuracy of MRI to predict muscle invasive bladder cancer prior to cystectomy**

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**Introduction & Objectives:** MRI is being increasingly used world-wide as a useful staging tool in bladder cancer. Current data on the use of MRI in bladder cancer have largely focused on MRI in the pre-TURBT setting, with limited data on accuracy of MRI in predicting muscle invasive bladder cancer (MIBC) prior to cystectomy. We present our experience in the use of MRI for local staging at a high-volume quaternary referral centre for cystectomy.

**Methods:** All cases of radical cystectomy performed at our institution between January 2017 and August 2022 were assessed for pre-operative MRIs. We excluded patients who underwent MRI within six weeks following TURBT and those who underwent benign cystectomy. Clinicopathological and MRI data, including hospital location, reporting methods and use of contrast enhancement were collected retrospectively.

**Results:** During the study period, 453 radical cystectomies were performed for urothelial carcinoma, the vast majority of which were performed robotically (87.2%). We identified 94 cases suitable for inclusion in the study. Their details are summarised in table 1.
MRI was typically performed with contrast enhancement (90%) and the majority were performed at UCH. There was no standardised reporting method, with only one report MRI using VI-RADS. The sensitivity and specificity of MRI to predict MIBC was 73.8% and 76.5%, respectively. MRI could accurately exclude extravesical disease, with high negative predictive values for pT3/T4 tumours. After excluding cases where MRI was performed during neoadjuvant systemic treatment, sensitivity remained similar at 73.2%, but specificity improved to 82.6%. When comparing UCH to other hospitals, sensitivity for MIBC was similar (74.1% vs 73.3%), although specificity was superior (88.5% vs 64%). When comparing time periods (2017–2019 vs 2020–2022), sensitivity did not improve (85.7% vs 67.9%), although specificity improved with time (66.7% vs 80.6%). The use of contrast enhancement did not appear to improve sensitivity (73% vs 80%), although it did improve specificity compared to non-contrast MRI (82.2% vs 33.3%).

Conclusions: MRI is a useful tool for predicting MIBC and excluding extravesical disease prior to cystectomy. MRI performance improves with increasing reporting experience, appropriate timing after systemic treatment, and use of contrast enhancement. However, there is a need for standardised reporting methods in the pre-cystectomy setting.

The LaserSAFE technique: Improving real time assessment of surgical margins during radical prostatectomy with the Histolog scanner

INTRODUCTION & OBJECTIVES: Nerve-sparing (NS) during robotic radical prostatectomy (RARP) is associated with improved postoperative functional outcomes. Standard methods to exclude extraprostatic extension (EPE) and select patients for NS RARP rely on clinical parameters, biopsy histology and multiparametric MRI. However, accurate prediction of EPE remains limited due to variability at each step. Therefore, a considerable proportion of men with EPE undergo inappropriate NS RARP and develop positive surgical margins (PSM), and men without EPE undergo unnecessary wide excision. Frozen section analysis of the posterolateral prostatic surface (NeuroSAFE) gives surgeons real-time histopathological information to guide NS. However, the technique is time-consuming and expensive, and requires expertly trained personnel for successful implementation. Fluorescence confocal microscopy (FCM) imaging is a novel technique developed to analyse fresh ex-vivo tissues in real time with the advantage of minimal personnel requirements and short preparation time. FCM produces digital images similar to H&E staining that can be immediately evaluated by a pathologist on-site or remotely. Preliminary evidence has shown FCM images can demonstrate prostate cancer with equivalent accuracy to frozen section. The aim of this video is to present a standardised procedure to analyse PSM using FCM, the LaserSAFE technique.

METHODS: Prior to robot docking, a GelPort® is placed to facilitate specimen extraction following standard RARP. The specimen is then dipped for 10 s in a photoreactive solution, rinsed using NaCl 0.9% solution and placed in the Histolog scanner®, a purposely built FCM based microscope. The tissue is lightly compressed using a mouldable weight and a preliminary image is obtained. A definitive digital archive image is produced that can be reviewed on-site or be sent to a pathologist through a remote access platform. All images are produced that can be reviewed on-site or be sent to a pathologist through a remote access platform.
stored within the hard drive of the microscope and can be annotated for suspicious lesions. As the objective of this study is only technique standardisation, no clinical decisions are based on the results.

**Results:** The technique has been standardised after 15 procedures. The first image can now be obtained within 5 min after prostate removal using minimal personnel and disposable supplies. Subsequent tissue processing is not affected. Two histopathologists specialised in uro- oncology have been able to identify suspicious lesions and are now confident the images can be used to guide recommendations on NS or further resection if required.

**Conclusions:** The LaserSAFE technique is easy to perform, reproducible and seems to be a promising tool to evaluate real-time PSM during RARP. We are currently designing a trial to formally evaluate its accuracy against the NeuroSAFE technique.

**Techniques for organ-preservation during robotic female cystectomy**

**Methods:** Women being considered for organ-sparing at our institution will undergo an examination under anaesthesia or an MRI bladder to exclude locally invasive cancer. Uterine-sparing is typically avoided in elderly females and those with high risk of uterine involvement. Vaginal-sparing is avoided in muscle-invasive tumours involving the posterior bladder wall or trigone. Dissection usually begins by identifying the ureters bilaterally at the base of the broad ligament on its cranial surface, which are then clamped and divided. A midline peritoneal incision is then made at the uterosacral fold and carried laterally towards the deep ring. A ‘medial’ space is created by development of an avascular plane between the bladder and anterior vaginal wall. Caudal traction on the catheter will identify the bladder neck, marking the distal limit of the dissection. A lateral peritoneal incision is made and the lateral bladder spaces are developed, thus leaving a column of vascular structures between the ‘medial’ and ‘lateral’ spaces. Following division of the medial umbilical ligament, the previously clipped and divided ureter is typically seen. The remaining bladder pedicles and neurovascular bundles are divided sequentially. The bladder is then released from its anterior attachments to expose the DVC and urethra. A distal incision in the anterior vagina is made, and a periurethral cuff of vaginal tissue is excised. This is performed intracorporeally without need for a separate perineal incision. The specimen is placed in a retrieval bag and removed through the vaginal defect, which is then closed. In cases of orthotopic neobladder formation, the bladder is divided at its junction between the bladder neck and urethra, allowing full preservation of the urethra and its supporting structures. The specimen is removed via a Pfannenstiel incision.

**Results:** Between 2017 and 2022, we performed 39 cases of total organ-preservation, with a further seven cases of vaginal-sparing (without uterine-sparing) and four cases of uterine-sparing (without vaginal-sparing). Our oncological outcomes have been presented separately. No complications attributable to organ-sparing were encountered.

**Conclusions:** Organ-sparing in female cystectomy is safe and easy to perform via a robotic approach, as most women do not require an anterior exenteration. It should be offered as an option for most women, especially younger females, who undergo appropriate assessment.

**Robotic male cystectomy with prostate capsule-sparing to preserve erectile function – is this oncologically impotent?**

**Introduction & Objectives:** The robotic approach for cystectomy is the standard of care in the UK, and the need to improve sexual functioning outcomes in men has led to the development of prostate capsule-sparing techniques. Our approach to prostate capsule-sparing also includes preservation of the seminal vesicles, which further minimises trauma to the neurovascular bundles. We describe our experience of this technique at University College Hospital in London.

**Methods:** We reviewed the records of all radical cystectomies performed between January 2017 and August 2022 to identify cases of prostate capsule-sparing. Clinical, pathological and functional data were collected retrospectively. Men were required to have PSA testing prior to surgery and MRI bladder/prostate where possible.

**Results:** During the six-year period, 460 radical cystectomies were
performed at our institution by three high volume robotic surgeons, of which 346 (75%) were male cases. This included 36 men who underwent prostate capsule-sparing cystectomy. Their clinical details are summarised in Table 1.

Overall survival in our cohort was 92% with a median follow-up of 14 months (range 1–55). Median pre-operative PSA was 1.37 ng/ml, and the majority of men (83%) underwent an MRI bladder/prostate pre-operatively.

There were no reported intra-operative or post-operative complications attributable to prostate capsule-sparing. Prostate cancer (PCa) was identified in the specimens of 22% of cases, most of which were Gleason 3 + 3. There were no positive margins reported (either urothelial or PCa). The disease is often low grade and unlikely to require treatment. Longer term follow-up is required in these men to assess their oncological and functional outcomes.

Techniques for preserving erectile function in men undergoing robotic cystoprostatectomy

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Introduction & Objectives: The robotic approach for cystoprostatectomy in men allows for superior vision and controlled dissection in tissue planes not immediately accessible via an open surgery. The increasing need to improve sexual functioning outcomes in men has led to the development of techniques, such as intrafascial nerve-sparing and prostate capsule-sparing. The aim of this video is to describe these surgical techniques in men undergoing robotic cystoprostatectomy.

Methods: Sexually active men undergo PSA testing, MRI bladder/prostate and examination under anaesthesia prior to cystectomy. Pre-operative MRI bladder/prostate (n) 30 (83%).

Erectile Function (n)
- Data available 19
- Normal erections 8
- Use of PDE5I 11

Intracavernosal injections 0
Penile prostheses 0

Conclusions: Our experience suggests that prostate capsule-sparing cystectomy is oncological safe in well selected men who are concerned about erectile function. Although PCa may be identified incidentally in a minority of cases, the disease is often low grade and unlikely to require treatment. Longer term follow-up is required in these men to assess their oncological and functional outcomes.

Table 1

| Pre-operative/Intra-operative | Follow-up |
|------------------------------|-----------|
| Age (median) | 55 (31–69) |
| Cases by age group (n) | Overall survival (%) |
| <50 | 13 |
| 50–59 | 12 |
| 60–69 | 11 |
| Pre-op PSA (median) | 1.37 (0.26–13.3) |
| Indication (n) | PSA (median) |
| Tis/T1 | T0 |
| T2 | T0/Tis/T1 |
| T3 | T2 |
| T4 | T3 |
| Non-functional bladder | T4 |
| Neoadjuvant chemo (n) | N1/2 |
| Pre-operative MRI bladder/prostate (n) | Prostate histology (n) |
| Estimated blood loss ml (mean) | No cancer |
| Console time min (median) | Gleason 6 |
| Urinary diversion (n) | Gleason 7 |
| Ileal conduit | Gleason ≥8 |
| Orthotopic neobladder | Prostate Cancer Follow-up (n) |
| Heterotopic neobladder | Evaluation with MRI |
| Data available 19 | Biopsy 0 |
| Normal erections 8 | Treatment 0 |
| Use of PDE5I 11 | Intracavernosal injections 0 |
| Penile prostheses 0 | 14 months (1–55) |
| Overall survival (%) | 92 |

Abstracts
point. The plane is developed distally and laterally. In men undergoing nerve-sparing, the seminal vesicles and vasa are mobilised and used for retraction. The avascular intrafascial plane between the prostatic capsule and prostatic fascia is identified in the midline. The plane is similarly developed distally and laterally. Robotic cystectomy then proceeds in a standard fashion. Following division of the ureters and bladder pedicles, the prostatic pedicle is approached. In prostate capsule-sparing, the capsule is divided high anterolaterally, preserving the prostatic pedicle and neurovascular bundle in its entirety. Following division of the urethra, the prostate adenoma and bladder are removed, with sparing of the peripheral zone. This also minimises trauma to the external urinary sphincter, promoting early continence in men undergoing orthotopic neobladder formation.

In men undergoing nerve-sparing, the prostatic pedicle is divided high on the base of the prostate, and neurovascular bundle is released high anterolaterally. This replicates an intrafascial nerve-sparing with high release, as performed during robotic prostatectomy. Results: Between January 2017 and August 2022, we performed prostate capsule-sparing in 36 men and we have reported our oncological and functional outcomes separately. A further 33 men have undergone nerve-sparing alone. No positive surgical margins have occurred from either of these techniques. Conclusions: The robotic platform allows for advanced surgical techniques that promote return of erectile function in men undergoing cystoprostatectomy. Prostate capsule-sparing and intrafascial nerve-sparing are both oncologically safe techniques and should be offered in carefully selected sexually active men.

Organ-sparing in female radical cystectomy – how radical do we need to go?

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Introduction & Objectives: Radical cystectomy in females historically includes removal of the uterus, ovaries and anterior vaginal wall. However, removal of the all anterior structures of the female pelvis is not oncologically necessary in the majority of cases. We report our experience in female organ-sparing cystectomy at University College Hospital in London, the highest volume robotic pelvic oncology centre in the United Kingdom.

Methods: Cases of organ-sparing in female cystectomy between January 2017 and August 2022 were identified and retrospective review of medical records was performed. Clinicopathological, oncological and functional data were assessed. Cases were performed via open and robotic approaches during this period.

Results: Between January 2017 and August 2022, 460 radical cystectomies were performed, including 114 (25%) female cases. Of these cases, 51 (45%) females underwent organ-sparing, either total or partial. The details of these cases are summarised in table 1.

Table 1

| Pre-operative/Intra-operative | Follow-up |
|------------------------------|-----------|
| Age (median) 63 (42–85)     | Follow-up (median) 20 months (5–60) |
| Cases by age (n)             | Overall survival (%) 90 |
| 40–49                        | 7          |
| 50–59                        | 15         |
| 60–69                        | 16         |
| >70                          | 13         |
| Indication (n)               | Bladder histology (n) |
| Tis/T1                       | 22         |
| T2                           | 21         |
| T3                           | 6          |
| T4                           | 1          |
| Non-functional bladder       | 1          |
| Organ-sparing (n)            | Pelvic organ prolapse 1 |
| Uterus + ovaries + vagina    | Fistula 1  |
| Uterine + ovaries            | Post-menopausal bleeding 0 |
| Vagina                       | Further gynaec surgery 0 |
| Ovaries                      | Pelvic Recurrence 0 |
| Organ-sparing cases by year %| Nodal 3    |
| 2017                         | Uterus/ovaries 0 |
| 2018                         | Vagina 1    |
| 2019                         |            |
| 2020                         |            |
| 2021                         |            |
| 2022                         |            |
| Urinary diversion (n)        |            |
| Ileal conduit                | 38         |
| Orthotopic neobladder        | 10         |
| Heterotopic neobladder       | 2          |
| Pre-operative MRI bladder (n)| 25         |
| Estimated blood loss ml (mean)| 277       |
| Robotic (n)                  | 46         |
| Console time min (median)    | 300 (195–510) |
Establishment of a medium-throughput drug screening platform in penile cancer tumouroids

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Introduction & objectives: Penile squamous cell carcinoma (SCC) is a rare disease with limited treatment options and poor outcomes. Recently, three-dimensional tumouroid culture models have transformed the in vitro study of cancer. We performed a drug screen to assess the effects of cisplatin, paclitaxel, 5-FU, and mitomycin C (MMC) as single agents, and the synergistic effect of cisplatin, paclitaxel, and 5-FU in combination in established and characterised penile SCC tumouroids.

Methods: Established penile SCC tumouroids were thawed approximately 2 weeks prior to treatment date. Single cell suspension was plated in 96 well plates with 50uL Matrigel® dome to better recapitulate the phenotypic heterogeneity and architectural complexity of the parent tumour. Two days after seeding, chemotherapeutic agents were added for a range of concentrations and combinations using a Tecan D300e Digital Dispenser for drug liquid handling. Tumouroids were treated for 72 h and imaged in brightfield at day 0 and 3. Cell Titre Glo (CTG) 3D was used to determine viability at the endpoint of the experiment at day 7. There were 3 technical replicants of each treatment and control well.

Results: Using tumouroids generated from paired primary tumour and lymph node metastasis (RL773 and DF780), as well as from patients with HPV-positive disease and good survival (NN518) and HPV-negative disease and poor survival (RC181), we performed a single agent testing and progressed to a proof-of-concept drug screen using an automated, medium throughput assay that enabled the use of tumouroids on a larger scale, allowing for the testing of 3 agents in combination. All statistical analysis were performed using GraphPad Prism software (GraphPad, v8.2.1). Data are expressed as mean +/- standard deviation, pooled from a minimum of 3 independent experiments.

Conclusions: We describe the use of previously established penile SCC tumouroids in testing single agents and drug synergy experiments. We did not demonstrate any significant findings; however, as the capability for growing and analysing tumouroids increases, there will be greater consideration of how best to integrate them with other patient-derived models in pre-clinical research and personalised medicine. Whilst several challenges with optimising this platform were encountered, we demonstrate a screen that has the unique advantage of being able to be generated within weeks from fresh operative specimens, a timeframe that has the potential to directly impact patient care.

Clinical photography in urology: How to protect yourself and patients

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Introduction: Clinical photography serves as an adjunct in clinical communication and photography using personal mobile devices (PMD) is becoming embedded in urological practice. Storing and sharing clinical photography on PMD risks confidentiality. We review the topic, outline the issues and present guidelines to help urologists protect themselves and their patients.

Methods: We performed a literature review on the use of clinical photography using PMD and reviewed the current guidelines available, in particular those of the Australian Medical Association.1

Results: The capture, storage and sending of clinical photography using PMD is widespread in Australia and has benefits for clinicians. There are
significant privacy and reputational risks to using PMD for capturing and sharing clinical photographs. Urologists should be aware of the guidelines available, particularly around consent, security and identifiability. We have adapted Australian Medical Association guidelines for surgeons practicing in Australia.

Conclusion: Guidelines are available to help clinicians; however, knowledge of these is lacking and surgery specific guidelines would be helpful. We encourage urologists to be aware of these existing resources to protect themselves and their patients.

A multi-centre retrospective audit of partial nephrectomy in the elderly – an Australian Study

DR VAISNAVI THIRUGNANASUNDRALINGAM1

Introduction & Objectives: Despite its established oncological superiority over alternative treatment modalities for stage 1 renal cell carcinoma, there is ongoing debate as to whether it is an appropriate in the elderly population. Limited life expectancy, pre-existing renal impairment and other co-morbidities may increase the rate of complications associated with partial nephrectomy in the elderly population. There is limited data on the safety and efficacy of partial nephrectomy in patients aged 70 and older. With the increased use of partial nephrectomy in Australia, we aimed to analyse the rates of complications unique to partial nephrectomies for patients aged 70 and older performed by several experienced Australian surgeons.

Methods: Victorian surgeons experienced in partial nephrectomy were invited to submit data on patients aged 70 and older who had undergone elective partial nephrectomy as management of renal cell carcinoma between 1st January 2012 to 31st December 2021. Patient demographics, operative approach and technique and data on perioperative outcomes were collected and analysed. 101 patients have been included in analysis at time of abstract submission.

Results: Intra-operative and post-operative complication rates found with partial nephrectomy in patients aged 70 and older performed by Australian surgeons were comparable to those reported globally. There were post-operative complications reported as Clavien-Dindo Grade 3 or higher in 4.0% of patients, (all were haemorrhage requiring angi-embolization). Trifecta was achieved in 76.2% of the study cohort and the mean reduction in eGFR at 6-months post-op was 5.8 points. Multivariable regression analysis was performed to identify risk factors for post-operative complications, and found that there was no increase in complication rates associated with high risk RENAL scores, older age, higher BMI, greater tumour size, higher co-morbidity index or surgical modality.

Conclusions: This study demonstrated excellent rates of trifecta achievement, renal function preservation and acceptable (and globally comparable) post-operative complication rates in patients aged 70 and older who underwent partial nephrectomy at Australian centres. Advanced age alone should not preclude suitable elderly patients from partial nephrectomy.

Rectal leak test during robotic-assisted and laparoscopic prostatectomy: A time- and cost-effective measure for the conscientious surgeon

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Introduction & Objectives: Robotic-assisted and laparoscopic radical prostatectomy are widely used for the management of prostate cancer. A rare but potentially devastating complication of this operation is rectal injury, which can cause significant morbidity and potential mortality. We describe the technique of rectal insufflation to demonstrate unrecognised rectal injuries at the time of surgery.

Background: Rectal injury occurs in approximately 0.3% of robotic prostatectomy cases, comparable to open prostatectomy (0.5%), and less than laparoscopic RRP (1%). In a series by Wedmied et al, they found that approximately 72.7% were identified at the time of surgery, whereas 27.3% had a delayed presentation. Patients who are identified at the time of surgery can typically undergo a primary closure, and avoid the need for a colostomy. Patients who had a delayed presentation presented with intra-abdominal sepsis, pain, or rectovesical fistula, requiring more complex management with greater associated morbidity and mortality. The routinely performing a rectal leak test is a quick and cost-effective measure to detect unrecognised rectal injuries at the time of surgery. This is a technique regularly employed by colorectal surgeons. In a single surgeon series of 711 patients undergoing laparoscopic (n = 300) and robotic-assisted laparoscopic prostatectomy (n = 411), there were two rectal injuries (0.28%). One of these was recognised immediately; however, one was recognised only during the rectal leak test, allowing for primary closure. Neither patient suffered long term complications related to this.

Technique: Patients are anaesthetized and placed in lithotomy. Prior to prepping and draping, an 18 Fr Foley catheter is inserted approximately 4 cm into the rectum, and the balloon is inflated with 10 mL of normal saline. A 60 mL catheter-tip syringe is then attached to the catheter, and the catheter is taped to the patient’s leg to facilitate the intra-operative test. Once the prostate has been resected and placed in an Endo Catch retrieval bag, the prostate bed is irrigated with saline. The rectum is the insufflated by a theatre staff member, pushing 60 mL of air in via the catheter-tip syringe. The fluid in the pelvis is observed for air bubbles, indicating a
positive test. The insufflation is repeated. If negative, the air is aspirated from the rectum, and irrigation fluid removed from the pelvis. The catheter is removed following undraping at the end of the procedure. The entirety of this protocol takes approximately 86 s (44 s to place the catheter at the beginning of the procedure, 42 s to perform the leak test). The equipment required costs just $AU6.02 per use.

Conclusions: We demonstrate a cost and time effective step in laparoscopic prostatectomy to mitigate a rare but potentially significant complication. Given its simplicity, this step should be incorporated as routine into the conscientious surgeon’s operative management.

Iodinated hydrogel as a tissue fiducial marker for image-guided radiation therapy in bladder cancer

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Introduction & Objectives: Bladder cancer is the fifth leading malignancy globally and its incidence is increasing. Whilst neoadjuvant chemotherapy and radical cystectomy is the gold standard of treatment, chemo-radiotherapy is an excellent organ-sparing treatment option for those unable to undergo a large operation. However, for a small subset of patients with multiple existing comorbidities, targeted radiation therapy to the primary lesion may offer a suitable alternative with improved toxicity and impact on quality of life. In order to perform this treatment, an appropriate fiducial marker is required to ensure accurate targeting of the primary lesion. This is a retrospective study reporting on the safety and feasibility of an iodinated hydrogel tissue fiducial marker (IH TFM) for image guided radiation therapy in the treatment of muscle invasive bladder cancer.

Methods: From September 2015 to July 2017, four patients diagnosed with muscle invasive unifocal urothelial carcinoma bladder cancer were included in the study. Under general anaesthetic, patients underwent cystoscopic injection of IH into their tumour base. Patients subsequently underwent image guided RT. The total prescription was 64.0–66.0Gy in 2.0Gy per fraction. Daily online cone-beam CT matching to IH TFM were performed throughout the course of radiation therapy (RT) to verify the extent of daily treatment shifts. IH volume, its stability and visibility were also evaluated.

Results: The volume of IH TFM remained consistent over the course of bladder radiotherapy. IH TFM match recorded the largest variations in the supero-inferior (SI) and antero-posterior (AP) directions with the largest geometrical shift of 5 mm recorded. If bony landmark was used, a margin of up to 17.4 mm in the AP direction would be required to ensure adequate clinical target volume (CTV) coverage. In this study, we found IH TFM to be well tolerated and feasible, with no major adverse events noted as a result of injection.

Conclusions: This study demonstrates that IH TFM can be safely injected into the bladder mucosa and can be considered as a fiducial marker for bladder cancer.

Urogenital malignancy and cannabis use – a narrative review

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Background: Cannabis is the most commonly used illicit drug world-wide. An increasing number of jurisdictions are legalising cannabis for both medicinal and recreational use. The changing cannabis market has resulted in both an increase in the number of people consuming these compounds, and an increase in the frequency and quantity of cannabis being used. Endogenous and exogenous cannabinoids act on receptors across the entire body including the genitourinary system; however, there is a paucity of understanding of how cannabinoids affect genitourinary malignancy. We aim present a narrative review of the available literature detailing the relationship between cannabis and the incidence, diagnosis and management of urogenital malignancy.

Methods: A comprehensive search was undertaken using the Ovid MEDLINE, Ovid Embase, Cochrane central Register of Controlled Trials (CENTRAL) up to July 2021. Studies included randomised controlled trials, case reports, case series, case control studies and in vitro studies.

Results: The search identified 40 studies in total. Eight described the relationship between cannabis and testicular carcinoma, 20 relating to prostate cancer, five relating to bladder cancer, one relating to penile cancer, and five relating to renal cancer. Results could be divided into two categories: those which examined the risk that cannabis had on the incidence of urogenital malignancy; and those which examined the effect that cannabis has on the diagnosis, treatment and surveillance of urogenital malignancy. Cannabis use has been linked to an increased risk of developing testicular tumours, whilst the evidence for bladder cancer is mixed. There is no apparent increase in risk for prostate cancer, penile cancer or renal cell carcinoma; however, this evidence was based upon very few patient numbers.

Conclusion: Although there appears to be an increased risk of testicular malignancy related to cannabis use, there remains a lack of understanding of the relationship between cannabis...
and genitourinary malignancy. With an expected increase in cannabis use, monitoring for testicular tumour plus efforts to further understand its effects upon the genitourinary tract will aid patients’ diagnosis and management.

Transurethral placement of a ureteric Fogarty catheter to aid intra-operative decision making in robotic-assisted laparoscopic distal ureterectomy and reimplantation

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Introduction & Objectives: Whilst radical nephroureterectomy remains the gold standard for the management of upper tract urothelial carcinoma, in appropriately selected patients, segmental ureterectomy may be a reasonable alternative for nephron-sparing and oncological management of distal ureteric tumours. However, determining where to make the ureteric incision presents a challenge for the operating surgeon. We aim to present a case whereby cystoscopic insertion of a ureteric Fogarty catheter aided demarcation of surgical margin, and a review of the available literature.

Methods: A 56-year-old male with biopsy-proven low grade urothelial carcinoma in his distal right ureter underwent a robotic-assisted laparoscopic distal ureterectomy and ureteric re-implantation. After routine anaesthetic was administered the patient was placed in lithotomy position and underwent cystoscopic insertion of a 5Fr Fogarty balloon catheter just beyond the point of the tumour. 1.5 mL of contrast placed in the balloon and position was checked with image intensifier. The balloon was agitated to determine the field. Once the ureter had occluded and the Fogarty catheter was removed whilst the remainder of the operation was completed.

Results: It is difficult to determine the resection margin for a segmental ureterectomy when lesions are not obvious externally. An alternative have been described to aid identification of the surgical margin involves the insertion of a ureteric catheter. However, whilst this aids in identification of the ureter, it does not improve identification of the tumour margin. There remains no consensus of the best technique to solve this issue. The use of a ureteric Fogarty balloon catheter has been described to aid identification of ureteric strictures in laparoscopic pyeloplasty, and in the management of the distal ureter when performing a bladder cuff during a nephroureterectomy. It is easily placed cystoscopically, and position can be checked with X-ray image intensifier when contrast is placed in the balloon. Its size does not distort local anatomy, and can easily be removed to facilitated the remainder of the operation.

Conclusion: We describe a novel technique for intraoperative management of surgical margins in segmental ureterectomy. When used in a carefully selected patient cohort, this may improve operative management and provide confidence when determining surgical margins.

Why men on active surveillance for prostate cancer have declined sexual function?

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Introduction & Objectives: Active surveillance (AS) aims to reduce overtreatment and minimise the negative side effects of radical therapies (i.e., prostatectomy or radiotherapy) while preserving quality of life. However, a substantial proportion of men can experience a decline in sexual function during AS follow-up. The aim of this study was to identify predictors of declining sexual function among men on AS.

Methods: Men enrolled from 2008 to 2018 in the South Australian Prostate Cancer Clinical Outcomes Collaborative registry—a population-wide prospective clinical registry—were studied. Sexual function outcomes were measured using Expanded Prostate Cancer Index Composite (EPIC-26) at baseline and 12-months post diagnosis. Multivariable regression models adjusted for baseline score and other sociodemographic and clinical factors were applied to identify predictors of sexual function score at 12-months.

Results: A total of 554 men were included. Variables that showed significant association with decline in sexual function score at 12-months were: having two or more biopsies after diagnosis (mean change score (MCS): −16.3, p < 0.001) compared with no biopsy, higher number of positive biopsy cores (MCS: −1.6, p = 0.004), being in older age category (above 70 vs below 60: MCS: −16.7, p < 0.001; 65–70 vs below 60: MCS: −9.7, p = 0.024), having had depression (MCS: −9.0, p = 0.020) and impaired physical function (MCS: −10.0, p = 0.031). Greater socioeconomic advantage (highest vs lowest quintile: MCS: 15.7, p = 0.022) and year of diagnosis (MCS: 2.6 for every year, p < 0.001) were positively associated with 12-months sexual function score. Neither biopsy type, biopsy timing nor PSA velocity were associated with declines in sexual function.
Conclusions: Our findings suggest that multiple factors affected sexual function during AS. Interventions directed towards reducing the number of biopsies through less invasive monitoray approaches, screening for physical and mental wellbeing, and targeted emotional support and counselling services may be helpful for men on AS.

Why does my registrar glow in the dark? Radiation exposure in emergency retrograde fluoroscopy

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Introduction & Objectives: Ureteric stenting is performed to relieve upper urinary tract obstruction, often performed for nephro- urolithiasis. In 2021 34 690 stents were inserted in Australia. The Australian Government’s Australian Radiation Protection and Nuclear Safety Agency have a 20 mSv (20 mGy) dose limit for occupationally exposed workers. Literature demonstrates that lead apron and thyroid shield provides a 98% dose reduction during retrograde endourological procedures. Ureteric stenting requires intra-operative fluoroscopy to demonstrate anatomy, identify obstruction, and ensure appropriate stent placement. A frequent and usually simple procedure, registrars often perform this operation independently throughout their training. A review of radiation dose exposure to proceduralist was performed with subgroup analysis of operator experience, BMI, and stone position. Methods: A retrospective over 2 years at a rural hospital was performed for patients who underwent emergency stent insertion for nephrourolithiasis, with a retrograde pyelogram performed. Outcomes measured included proceduralist experience, location of stone, mGy total dosage, and patient BMI. Analysis was performed in IBM SPSS Version 27. p < 0.05 was considered significant. Results: 100 patients 72% male, mean BMI 30.5, and mean age 59.2 years. 48% procedures were performed by registrar. Mean stone size 7.3 mm with 52% left stones and 54% in proximal ureter, 37% distal, and 14% mid. Mean mGy 17.19 overall, with mean 16.61 mGy by registrar and 17.72 mGy by consultant with no significant mean difference (p = 0.511). No significant difference in mGy found on ureteric position or laterality (p > 0.05). No significant correlation between mGy and BMI (p = 0.056) or stone size (p = 0.682). Conclusions: No significant difference in mGy exposure was identified comparing registrar to consultant experience. Assuming appropriate radiation precautions of 98% reduction, a total 17.19 mGy was used per year not exceeding an individual’s dose limit. Future research will review this institution’s 10 year experience and examine lithotripsy, elective fluoroscopy for malignancy, and correct for confounders such as complicated upper tract anatomy.

Australian trends in management of upper urinary tract stone disease

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Introduction & Objectives: Upper urinary tract stone disease (nephrolithiasis) affects at least 13% of men and 7% of women worldwide and has an Australian annual incidence of 131 per 100 000. Treated previously with percutaneous techniques such as pyelolithotomy, contemporary advancements in technology have seen minimally invasive techniques grow and manage greater complexity of stone disease. This has reduced patient morbidity with significant cost benefit; however, its use has only increased in the public New South Wales (NSW) health system in the past 15 years. The aim of this study is to describe trends in management of nephro- urolithiasis in Australia, and compare to a rural institution in NSW Australia.

Methods: Procedure data cubes from the Australian Institute of Health and Welfare (AIHW) National Hospital Morbidity Database were examined from 2000 to 2021. Procedure codes were categorised to either percutaneous techniques or transurethral endoscopic techniques including pyeloscopy and ureteroscopy. AIHW figures describe cost of open procedure $6062 and endoscopic $2949. Operative data from a rural NSW hospital from 2012–2021 were analysed for comparison.

Results: Percutaneous techniques declined −78.84% from 2000 to 2021 (1758 to 372) with average − 5.09% decrease per year (1758 to 372). Endoscopic techniques increased 473.4% (6036 to 34 610) with average increase of 9.6% per year, and consisted of 98.9% of all procedures performed in 2021. Our institution showed similar average increase in endoscopic techniques of 8.96% per year. Total cost of stone disease increased 4.7 times from 2000 to 2021. In 2021 cost of percutaneous technique was $2 255 064 and endoscopic $102 064 890. Percutaneous nephrolithotomy (PCNL) only saw a − 2.94% decline from 2000–2021.

Conclusions: Nephro- urolithiasis shows increasing total number of procedures and subsequently cost, indicative of an increasing disease burden in the Australian population which is reflected in a single rural institution operative caseload. Minimally invasive endoscopic procedures now dominates in the management of stone disease. However PCNL has remained stable, and its role in the management of nephro- urolithiasis in Australia remains necessary and important.
**Just sticking it in: Measuring confidence in catheter insertion**

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**Introduction & Objectives:** Indwelling catheter (IDC) insertion is a commonly performed, simple procedure that may result in avoidable patient harm. There is a wide variation in experience among healthcare professionals. We aimed to assess the differences in frequency and confidence of healthcare professionals in performing IDC insertion.

**Methods:** We conducted a confidential survey at a metropolitan hospital in South West Sydney Local Health District. Data were analysed using a Microsoft Excel and Chi squared tests were utilised for statistical testing.

**Results:** Fifty-three staff members completed the questionnaire including 35 nurses, 14 junior medical officers, 2 registrars and 1 consultant. At the time of the survey, 27 were working in surgical areas and 25 were non-surgical. All medical officers and 94% of nurses performed IDC insertion. There were marked differences in the frequency of IDC insertion among occupations, particularly regarding male and female catheterisation. All nurses had performed IDC insertion on female patients compared to just 17% of doctors. The inverse was true with respect to IDC insertion for male patients, with 45% of nurses and 100% of doctors having experience with this. This reflected the nursing respondents confidence in female and male catheterisation, with 91% being either ‘somewhat confident’ or ‘very confident’ in performing IDC insertion in females compared to just 36% for males (p = 0.00001).

Analysing the medical practitioners, only 76% were confident in performing IDC insertions in female patients compared to 100% for males. There were no significant differences between either surgical, medical or emergency departments in confidence performing IDC insertions (p = 0.19). When assistance is required, 90% of nurses would ask another nurse and 48% would ask a doctor. This was different to doctors, where only 35% would ask a nurse, and 100% would ask a doctor, 82% would ask the urology registrar.

**Conclusions:** In our survey occupational roles were associated with significant differences in prior experience and confidence in performing IDC insertion in men and women. Doctors performed more male catheterisations than nurses and as expected were more confident in the procedure while the reverse was true for nurses and female catheterisation. This potentially reflects the local hospital and ward policies mandating nursing accreditation for female catheterisation compared to optional accreditation for male catheterisation.

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**Utility of magnetic resonance imaging in the diagnosis of penile fractures: A narrative review**

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**Introduction & Objectives:** Penile fractures are an uncommon urological emergency. Occurrences typically occur during sexual activities including intercourse and intentional penile manipulation, where the tunica albuginea is predisposed to injury due to thinning. While the diagnosis of penile fractures is classically established on clinical grounds, close examination and localization of the defect is often limited due to pain. Imaging modalities including ultrasonography, cavernosography and magnetic resonance imaging (MRI) have been used as adjunctive investigations. The objective of this study was to determine the utility of magnetic resonance imaging in diagnosing penile fractures pre-operatively.

**Methods:** We searched PubMed for original studies, case series and case reports relating to the use of MRI in the investigation and diagnosis of penile fractures up to September 2022. Additional texts were sourced from reference lists. Articles were required to be published in English and available as full texts, unless the abstract contained enough detail for data extraction. Exclusion criteria included reports of MRI findings without subsequent surgical exploration for confirmation.

**Results:** From 312 studies, 18 met the inclusion criteria (n = 189). Overall, MRI demonstrated considerable specificity and sensitivity in the diagnosis and exclusion of penile fractures. MRI magnet strength, use of surface coils and protocols varied across the studies included.

Of the 189 cases with positive MRI findings for penile fractures, 184 were confirmed at time of surgical exploration, with a false positive finding in 5 cases. Of 15 MRIs negative for penile fractures that underwent surgical exploration, all 15 were confirmed to be true negatives.

**Conclusions:** The use of MRI in the diagnosis of penile fractures appears to be both specific and sensitive, within the limitations of a small evidence base. Larger studies will be required to confirm these findings and provide support for the use of MRI in localising injury sites to guide surgical repair, as well as avoiding unnecessary explorations in cases of penile fracture mimics.

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**Direct incision repair of penile fractures guided by magnetic resonance imaging**

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**Introduction & Objectives:** Penile fractures represent urological emergencies. They are classically diagnosed on the basis of presenting symptoms and clinical findings. Close examination to determine the site of
tunica defect is often limited by pain. Surgical intervention commonly involves a degloving approach with circumcision to identify the site of injury. A limited but growing body of evidence has demonstrated the accuracy of magnetic resonance imaging in the diagnosis of penile fractures and their location. The objective of this study was to assess the accuracy of a localised surgical incision for penile fractures guided by MRI. Secondary objectives include surgical outcomes, as compared to a similar cohort of patients who underwent degloving approaches following clinical diagnosis.

**Methods:** A retrospective audit was performed of patients undergoing surgical intervention for penile fractures across 2 tertiary Urology centers in the Western Sydney Local Health District between February 2016 and February 2022. Patient demographics, presentation, radiological findings, and surgical outcomes were extracted. Ethics was obtained through Western Sydney Local Health District Human Research Ethics Committee (WSLHD HREC).

**Results:** Within the study period, 21 patients underwent surgical intervention for suspected penile fractures. 10 patients underwent pre-operative MRI, following which 6 patients had surgical repair via direct incision and 4 via degloving approaches. 11 patients underwent degloving approaches following clinical diagnosis only. Mean age was 36.0 (16–60) for the MRI group and 39.81 (32–57) for the clinical diagnosis group. Both groups had predominantly right sided penile injuries (6 in localised incision, and 7 in degloving).

The mean time required to obtain MRI imaging was 2.65 h (0.85–5.37). Time from presentation to intervention was higher in the MRI group at 29.18 h (10–62.8) vs 16.7 h (6.5–39.5). Operative time was lowest in patients undergoing repair via direct incision guided by MRI with a mean time of 1.06 h (0.83–1.5).

Similar operative times were seen in patients undergoing degloving irrespective of MRI (1.63 h for patients with pre-operative MRI, and 1.57 h for patient without). In all 6 patients who underwent direct incisions, a corresponding injury was found at the expected site, and did not require secondary incisions. Median length of stay was 1 day in both groups. No Clavien Dindo 2+ complications occurred.

**Conclusions:** This study suggests that MRI imaging can accurately diagnose the presence and location of penile fractures and accurately guide surgical repair via direct incisions. Acquisition of MRI imaging at 2 tertiary Urology centers occurred on average within 3 h. Time to intervention, however, was noted to be increased. Operative time with direct incisions was lower than degloving approaches.

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**Decade long trends in prostate cancer biopsy grade group within a population-based registry**

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**Introduction & Objectives:** Over the last decade, there have been developments in the prostate cancer (PCa) diagnostic pathway including changes in PSA testing recommendations and advancements in MRI and transperineal prostate biopsy. It is important to understand the current trends of PCa diagnosis in order to optimise treatment of more prevalent disease. Therefore, we aimed to assess changes in diagnosis PCa grade over a decade (2011–2020) at a population level within a clinical quality cancer registry.

**Methods:** Patients diagnosed by prostate biopsy from 2011–2020 were retrieved from the Victorian Prostate Cancer Outcomes Registry, a prospective, state-wide clinical quality registry in Australia. Distributions of each Grade Group (GG) proportion over time were modelled with restricted cubic splines, separately by biopsy technique, age group, and subsequent treatment modality.

**Results:** From 2011–2020, 24308 men were diagnosed with PCa in the registry. The proportion of GG 1 disease declined from 36% to 23% with commensurate rises in GG 2 (31% to 36%), GG 3 (14% to 17%) and GG 5 (9.3% to 14%) disease. This pattern was similar for men diagnosed by TRUS or transperineal biopsy. Patients aged <55 years had the largest absolute reduction in GG 1 PCa from 56% to 35% compared to patients aged 55–64 (41% to 31%), 65–74 (31% to 21%), and ≥75 (12% to 10%). The proportion of prostatectomies performed for patients with GG 1 disease fell from 28% to 7.1% and for primary radiation therapy from 22% to 3.5%.

**Conclusions:** From 2011–2020, there has been a substantial decrease in the proportion of GG 1 PCa diagnosed, particularly in younger men. The percentage of interventional management performed in GG 1
disease has fallen to very low levels. These results reflect the implementation of major changes to diagnostic and treatment guidelines and informs the future allocation of treatment modalities.

Outcomes of intravesical BCG stratified by the new EAU non-muscle invasive bladder cancer prognostic factor risk groups

**Introduction & Objectives:** The most recent update of the EAU guidelines for non-muscle invasive bladder cancer (NMIBC) included a new ‘very high’ risk group for disease progression. Intravesical BCG remains the gold standard therapy for reducing recurrence and progression of NMIBC. However, despite optimal therapy, recurrence and progression occur in 45% and 13.4% of patients respectively. It is recognised that patients with BCG-unresponsive disease who progress to MIBC have poor outcomes even after subsequent radical cystectomy. Therefore, it is critical to identify patients who will not respond to BCG treatment early. We aimed to review the outcomes of intravesical BCG stratified by the new risk groups and evaluate its utility for predicting intravesical BCG response in an Australian setting.

**Methods:** All patients who underwent induction intravesical BCG for NMIBC between January 2018 and January 2022 at a tertiary institution were identified. Data obtained included patient age, tumour diameter, presence of multifocal disease, histopathology findings and EAU NMIBC risk group. Rates of persistent tumour following induction

**BCG, BCG non-responsive disease and progression to MIBC were compared using Pearson’s chi-squared test.**

**Results:** Overall, 136 patients were included in our study. 25 (18.4%) patients had intermediate risk with a median age of 67 and median follow up of 21 months. 91 (66.9%) patients had high risk disease with a median age of 74 years and follow up of 28 months. 20 (14.7%) cases were classified as very high risk with a median age of 77 and follow up of 17 months. A significantly higher proportion of very high-risk patients had BCG-unresponsive disease with 30% (n = 6) compared to 9.9% (n = 9) and 8% (n = 2) of high and intermediate risk group patients respectively (p = 0.038). 5/20 (25%) patients in the very high risk group, 10/91 (11.0%) patients in the high risk group and 2/25 (8%) patients in the intermediate risk group had persistent tumour after induction BCG (p = 0.173). Three (15%) very high risk patients progressed to muscle-invasive disease compared to five (5.5%) high risk patients (p = 0.087). Of the six very high risk BCG-unresponsive patients, overall survival was 33.3% with three patients developing metastatic disease. Two patients are in remission with one patient having undergone a radical cystoprostatectomy and one patient having undergone induction intravesical gemcitabine and docetaxel therapy.

**Conclusions:** Patients in the ‘very high’ EAU NMIBC prognostic factor risk group have poorer response rates to intravesical BCG compared to other risk groups. Considering the comparatively poor prognosis associated with BCG unresponsive NMIBC, our findings support the EAU guideline’s recommendation of discussing upfront radical cystectomy with these patients.

Outcomes, safety and tolerability of intracavitary Jelmyto instillation for low grade upper tract urothelial cancer: The initial Australian experience

**Introduction & Objectives:** Low grade upper tract urothelial cancer (UTUC) is typically initially managed via a kidney-sparing approach such as endoscopic ablation. However, this is associated with a high rate of recurrence with many patients subsequently requiring repeat procedures or radical nephroureterectomy. Chemoablation with mitomycin-containing reverse thermal gel (Jelmyto®) instillation has been demonstrated to have a complete response rate of 59%. We present the first case in Australia of intracavitary Jelmyto® instillation for low grade UTUC.

**Methods:** A patient treated with intracavitary Jelmyto® under the emergency therapeutic protocol at our institution was prospectively reviewed. The treatment protocol was weekly induction instillation of Jelmyto® (16 mg) for six doses via a nephrostomy. Weekly full blood examination, urine function, toxicity and overall outcomes were assessed.

**Results:** The patient was a 56-year-old female with Lynch syndrome who presented with a 7 mm right PUJ lesion in a solitary kidney on CT-IVU in the setting of surveillance following left nephroureterectomy in 2018 for high grade non-invasive UTUC.
Biopsy confirmed low grade non-invasive UTUC. Despite endoscopic ablation and induction intravesical gemcitabine with a ureteric stent in situ, endoscopic reassessment identified evidence of persistent tumour. Given the high rates of ureteric stricture associated with retrograde administration of Jelmyto®, a nephrostomy was placed by interventional radiology two weeks prior to treatment. All six instillations of Jelmyto® were completed. Symptoms reported were pruritus, anorexia, headache, nausea, constipation and fatigue. All symptoms were considered grade 1 as per the Common Terminology Criteria for Adverse Events (CTCAE). There were no significant abnormalities on serum investigations throughout the instillation period. Pyeloscopy and retrograde pyelogram at five weeks post treatment demonstrated complete response with no evidence of ureteric stricture.

Conclusions: Our initial experience with Jelmyto® found it was safe, well tolerated and an effective kidney-sparing treatment for low grade UTUC. Although Jelmyto® has not yet been approved for general use by the TGA, special access can be granted and should be considered in an Australian context for patients with UTUC where radical treatment has a higher morbidity than usual. However, future studies reporting on longer term outcomes following Jelmyto® treatment are required.

Impact on patient and health system of nephrostomy tubes for upper tract obstruction

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Introduction & Objectives: Nephrostomy tubes (NT) are the standard management of some forms of upper urinary tract obstruction, yet little is known on how NT impact daily life, nor their burden on the health system. This study aimed to understand the number of patients in our area with NTs and to assess the impact these patients place on the health system.

Methods: All patients who had either an existing NT or NT inserted within the study period, 1 November 2016 to 31 October 2018 at Christchurch Hospital were included. The patient cohort was obtained from interventional radiology records, which showed all NT insertions and changes within the study period. Patients were excluded if they were only transiently in our area (due to unavailability of follow-up).

Conclusions: There were no significant abnormalities on serum investigations throughout the instillation period. Pyeloscopy and retrograde pyelogram at five weeks post treatment demonstrated complete response with no evidence of ureteric stricture.

Conclusions: Our initial experience with Jelmyto® found it was safe, well tolerated and an effective kidney-sparing treatment for low grade UTUC. Although Jelmyto® has not yet been approved for general use by the TGA, special access can be granted and should be considered in an Australian context for patients with UTUC where radical treatment has a higher morbidity than usual. However, future studies reporting on longer term outcomes following Jelmyto® treatment are required.

| Table 1 | UTIs associated with routine and non-routine short-term changes by indication |
|----------|-------------------------------------------------|
| Indication | Routine change | Non-routine change | All NTs |
| | No UTI | % with UTI | No UTI | % with UTI | Total changes | UTI total N (%) | Total non-routine changes (%) |
| Benign obstruction | 5 | 10 | 67% | 1 | 3 | 75% | 19 | 13 (68%) | 4 (21%) |
| Malignant obstruction | 11 | 4 | 27% | 2 | 1 | 33% | 18 | 5 (28%) | 3 (17%) |
| Other | 1 | 1 | 50% | 0 | 0 | 0% | 3 | 1 (50%) | 1 (33%) |
| Surgical complication | 4 | 6 | 60% | 1 | 6 | 86% | 17 | 12 (71%) | 7 (41%) |
| PUJ configuration | 2 | 2 | 33% | 0 | 2 | 100% | 8 | 4 (50%) | 2 (25%) |
| Stone | 23 | 41 | 64% | 4 | 14 | 78% | 82 | 55 (67%) | 18 (22%) |
| Total | 48 | 64 | 57% | 9 | 26 | 74% | 147 | 90 (61%) | 25 (23%) |
Burkholderia Pseudomallei: The main culprit of prostatic abscesses in the Top End of the Northern Territory?

Dr. Henry Duncan, Dr. Kenneth Du Toit, Dr. Henry Duncan, Dr. Kenneth Du Toit

Introduction & Objectives: A prostate abscess is a complication resulting from the acute infectious process of the prostate, which is uncommon in the modern antibiotic age.

Melioidosis (infection with the gram negative, soil borne, aerobic bacillus Burkholderia Pseudomallei) is a recognized cause of community acquired sepsis in northern Australia and South East Asia. Most infections are asymptomatic, however, in those with risk factors a brisk and overwhelming sepsis can develop. If left untreated, systemic infection with melioidosis has a high mortality rate. In adults, pneumonia is a frequent clinical presentation, but prostatic abscess is also a common manifestation.

Our study aims to investigate the prevalence of Burkholderia Pseudomallei responsible for prostate abscesses and the implication for appropriate management in a tropical setting as compared to more temperate areas in Australia.

Methods: Retrospective electronic database of confirmed cases of prostate abscess at the Royal Darwin Hospital (Northern Territory) over five years (September 2017 to August 2022) was examined via clinical code for prostate abscess. Most of the diagnoses were made via computed topography scan, with some identified on ultrasound. The microbiology of responsible organisms were then identified.

Results: 44 prostate abscesses were confirmed in patients median age 46.2 years (between 18 and 74 yrs) at Royal Darwin Hospital in this time period (September 2017 to August 2022).

20/44 (45%) of these abscesses confirmed Burkholderia pseudomallei as the responsible organism. Other organisms found to be responsible were staphylococcus species 9/44 (20%), E. coli 8/44 (18%), klebsiella 3/44 (7%) and pseudomonas 2/44 (5%).

Conclusions: Prostatic abscess in the tropical setting of the Northern Territory is most commonly due to Burkholderia pseudomallei. Prostatic abscess due to Burkholderia pseudomallei should be considered in the list of differentials in those with clinical signs. Additionally, the microbiology of the prostatic abscess may dictate different treatment approaches.

More needs to be done to inform medical students that flexible training is possible in urology and that urology practice is diverse in order to make urology a more attractive choice of specialty.

Medical student perceptions: Who wants to be a urologist?

Dr. Jessica Wynn, Dr. Briony Norris

Introduction & Objectives: As selection for urology training is highly competitive, it is important that the most suitable and appropriate doctors apply. Perceptions about urology training and practice influence the decision to apply to urology training.

This study looks at the perceptions of Australian medical students towards urology and what influences them to pursue a career in urology.

Methods: An online questionnaire was sent to 111 medical students and included generic statements about urology, presence of a mentor and likelihood of pursuing urology as a specialty in the future. Data analysis was conducted on SPSS.

Results: Seventy-nine responses were received, of which 68 were complete and included in the analysis. Gender distribution was male: female 29:39. Twenty-one students (30.9%) considered urology a likely, possible or neutral choice. Younger age was a predictor of students who might consider urology. Other predictors were perceptions that urology training is flexible, it is important that the selection for urology training is highly competitive, the presence of a mentor and included in the analysis. Gender, stage of clinical training, time spent on urology placement and presence of a mentor were not predictive of students choosing urology as a specialty.

Conclusions: More needs to be done to inform medical students that flexible training is possible in urology and that urology practice is diverse in order to make urology a more attractive choice of specialty.
A comparison of intravesical gemcitabine versus Bacillus Calmette-Guerin for non-muscle invasive bladder cancer

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Introduction & Objectives:
Intravesical Bacille Calmette-Guerin (BCG) following transurethral resection of bladder tumour (TURBT) remains the standard treatment for non-muscle invasive bladder cancers (NMIBC). Adverse effects associated with BCG is common and can negatively impact patient quality of life. The current worldwide shortage of BCG has necessitated rationalisation of its use and has prompted significant interest in alternative agents such as gemcitabine.

Methods: A retrospective analysis of patients with intermediate- and high-risk NMIBC at a single centre from January 2020 to June 2022 was performed. All patients who received weekly intravesical gemcitabine or BCG for 6 weeks following optimal TURBT was included. Patients with a history of BCG-failure were excluded from the analysis. Primary end point was high-grade disease at first check cystoscopy and secondary end point was adverse effects.

Results: 40 patients were included in the analysis. 11 (28%) received gemcitabine and 29 (72%) received BCG with mean age of 72 and 70 respectively. Majority of patients were male with a history of smoking. 8 (73%) patients in the gemcitabine group had EAU-defined intermediate risk disease compared to 7 (24%) in the BCG group, and 3 (27%) had high-risk disease compared to 18 (62%). Reported rates of adverse effects were similar between the two groups with 4 (36%) in the gemcitabine group vs 9 (31%) in BCG group (p = 1). All patients in the gemcitabine group were disease free at first check cystoscopy compared to 6 patients in the BCG group who had persistence of high-grade disease (p = 0.1621).

Conclusions: There was no difference in recurrence at first check cystoscopy or reported toxicity between the two groups. Intravesical BCG remains the standard first-line adjuvant treatment; however, gemcitabine may be a suitable alternative for well selected patients in the current era of BCG shortage. Large prospective trials are needed to further investigate these preliminary findings.

| Table 1 Gemcitabine vs. BCG. |
|-----------------------------|
| Gemcitabine (N = 11) (%) | BCG (N = 29) (%) | p value |
| Age (mean) | 72 | 70 |
| Sex | | | |
| Male | 10 (91) | 25 (86) |
| Female | 1 (9) | 4 (14) |
| Smoking history | | | |
| Yes | 10 (91) | 22 (76) |
| No | 1 (9) | 3 (10) |
| N/A | 0 | 4 (14) |
| High risk occupation | | | |
| Yes | 1 (9) | 0 |
| No | 3 (27) | 7 (24) |
| N/A | 7 (64) | 22 (76) |
| Histological grade | | | |
| LGTa | 2 (18) | 0 |
| HGTa | 9 (82) | 16 (55) |
| HGTh | 0 | 13 (45) |
| Tumour size >3 cm | | | |
| Yes | 5 (45) | 10 (34) |
| No | 6 (55) | 19 (66) |
| Multifocality | | | |
| Single tumour | 3 (27) | 10 (34) |
| Multiple tumours | 8 (73) | 19 (66) |
| Presence of carcinoma in situ | | | |
| Yes | 0 | 13 (45) |
| No | 11 (100) | 16 (55) |
| History of recurrence | | | |
| Yes | 6 (55) | 5 (17) |
| No | 5 (45) | 24 (83) |
| EAU risk stratification | | | |
| Intermediate | 8 (73) | 7 (24) |
| High | 3 (27) | 18 (62) |
| Very high | 0 | 4 (14) |
| Maintenance therapy | | | |
| Yes | 0 | 10 (34) |
| No | 11 (100) | 19 (66) |
| Adverse effect | | | |
| Yes | 4 (36) | 9 (31) |
| Suprapubic pain | 2 (18) | 3 (10) |
| Bladder spasm | 2 (18) | 2 (7) |
| Haematuria | 0 | 1 (3) |
| UTI | 0 | 3 (10) |
| No | 7 (64) | 20 (69) |
| Completed induction | | | |
| Yes | 10 (91) | 26 (90) |
| No | 1 (9) | 3 (10) |
| Persistent disease | | | |
| Yes | 0 | 6 (21) |
| No | 10 (91) | 21 (72) |
| N/A | 1 (9) | 2 (7) |
The treatment landscape of non-metastatic castrate resistant prostate cancer – a 5-year retrospective review

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Introduction & Objectives: The treatment landscape of non-metastatic castrate resistant prostate cancer (nmCRPC) is changing with the development and approval of novel treatments that have demonstrated clinical benefit. However, the incidence of this disease is not well defined in the literature. The aim of this study is to describe the incidence and patterns of treatment of nmCRPC over the last 5 years at a single high-volume Australian health institution.

Methods: From January 2017 to December 2021, 1267 patients underwent a transperineal biopsy of the prostate at Western Health, Melbourne. The methodology used to identify patients with nmCRPC is shown in Fig. 1. The definition of nmCRPC utilised was a rising prostate-specific antigen (PSA) concentration, despite castrate levels of testosterone with ongoing androgen-deprivation therapy or orchidectomy, and no detectable metastases by conventional imaging. Data regarding patterns of treatment for each patient with nmCRPC were retrospectively collected from electronic health records.

Results: From January 2017 to December 2021, 1267 patients underwent a transperineal biopsy of the prostate at Western Health, Melbourne and 718 (57%) were diagnosed with prostate cancer. Within our cohort, 8 patients were identified as having nmCRPC equating to an annual incidence of 1 case per 213 people-year. The median age at the time of prostate biopsy was 70 years (range 66 to 77) and most patients (63%) had a Gleason score 4 + 5 (Table 1). Curative external beam radiotherapy and palliative radiotherapy were administered in 3 (38%) and 4 (50%) patients respectively. All patients received goserelin for androgen deprivation. The median duration from prostate cancer diagnosis to onset of nmCRPC was 19 months (range 15 to 28). The median PSA doubling time was 4.7 months (range 2.8 to 7.5).

Following onset of castrate resistance, 2 patients were commenced on enzalutamide, 1 patient was commenced on darolutamide and 1 patient was commenced on bicalutamide.

Conclusions: The treatment landscape of nmCRPC continues to change and further cohort studies are required to identify men with nmCRPC who benefit from novel treatment approaches.

Table 1

| Variable | nmCRPC (n = 8) |
|----------|---------------|
| Cohort Characteristics | 70 (66–77) |
| Median (Q1-Q3) age at biopsy (years) | 70 (66–77) |
| Median (Q1-Q3) pre-biopsy PSA (ng/mL) | 30.5 (15.1–52.5) |
| PSA density (ng/mL) | 0.78 (0.26–1.51) |
| Clinical T stage | 4 (50) |
| 1 | 3 (38) |
| 2 | 2 (25) |
| 3 | 2 (25) |
| 4 | 1 (12) |
| Biopsy Gleason Score | 1 (12) |
| 3 + 4 | 1 (12) |
| 4 + 3 | 1 (12) |
| 4 + 5 | 5 (63) |
| 5 + 4 | 1 (12) |
| Treatments Received | 1 (12) |
| Laparoscopic radical prostatectomy | 3 (38) |
| Radiotherapy | 4 (50) |
| External beam radiotherapy | 1 (12) |
| Palliative radiotherapy | 1 (12) |
| Number of ADT Agents | 1 (12) |
| 1 | 4 (50) |
| 2 | 3 (38) |
| 3 | 1 (12) |
| Type of ADT | 1 (12) |
| Goserelin | 8 (100) |
| Degarelix | 3 (38) |
| Bicalutamide | 3 (38) |
| Leuprorelin | 1 (12) |
| Castrate Resistance | 19 (15–28) |
| Median (Q1-Q3) duration from prostate cancer diagnosis to onset of nmCRPC (months) | 3 (2) |
| Serum PSA at time of diagnosis of nmCRPC (ng/mL) | 2.7 (0.7–6.8) |
| Median (Q1-Q3) PSA doubling time (months) | 4.7 (2.8–7.5) |
| Treatment after onset of nmCRPC | 2 (25) |
| Enzalutamide | 1 (12) |
| Darolutamide | 1 (12) |
| Bicalutamide | 1 (12) |
| Enrolment in clinical trial | 1 (12) |
| Palliation | 1 (12) |
| Ongoing surveillance | 2 (25) |
| Onset of metastatic disease | 2 (25) |

Fig. 1 Flow chart of methodology used to extract cases of nmCRPC

nMCRPC, non-metastatic castrate resistant prostate cancer; nmCSPC, non-metastatic castrate sensitive prostate cancer.
Metastatic prostate cancer – a 5-year retrospective audit of duration to castration resistance and treatment landscape

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Introduction & Objectives: A small proportion of men with prostate cancer will have metastatic disease at first presentation. Despite therapies that induce castrate levels of testosterone, some of these men will experience a rising PSA, termed metastatic castrate-resistant prostate cancer (mCRPC). The aim of this study is to report the duration from metastatic prostate cancer (mPC) diagnosis to castration resistance and describe the patterns of treatment of mCRPC over the last 5 years at a single high-volume Australian health institution.

Methods: We conducted a retrospective review of all patients who underwent a transperineal biopsy of the prostate at Western Health, Melbourne from January 2017 to December 2021. Patients diagnosed with metastatic prostate cancer, either on presentation or during treatment, were included in this study. Characteristics such as demographics, Gleason score and pre-treatment PSA were collected. Descriptive statistics were used to report patterns of treatment, such as type of androgen deprivation therapy (ADT), radiotherapy and chemotherapy.

Results: We identified 1267 patients who underwent a prostate biopsy and 718 (57%) were diagnosed with prostate cancer, of whom 574 (45%) were followed at Western Health. Within our followed cohort, 47 patients (8%) had mPC, of whom 45 had metastasis at the time of hospital presentation and 2 developed metastasis whilst on ADT. Among those with metastasis at presentation, 19 patients (45%) developed mCRPC within a median duration of 12 months (range 9 to 22) since diagnosis of mPC and commencement of ADT, whilst the other 26 patients (55%) remained castrate-sensitive. Within the mCRPC cohort, the median age at the time of prostate biopsy was 70 years (range 59 to 78) and most patients (58%) had a Gleason score 4 + 5 (Table 1). At least 2 regimens of ADT were administered in 11 patients (58%) prior to onset of castration resistance and the most common agent administered was goserelin (84%), followed by bicalutamide (42%) and degarelix (26%). Following onset of castration resistance, the median PSA doubling time was 1.9 months (range 1.2 to 2.7). Over half (58%) of patients were commenced on enzalutamide, 3 patients (16%) on abiraterone and 2 patients (11%) on docetaxel.

Conclusions: Our study demonstrates that onset of castration resistance in patients with mPC at presentation occurred around 12 months after cancer diagnosis and commencement of ADT. In contemporary practice, patients diagnosed with mCRPC are managed with a range of treatment modalities and this landscape continues to evolve.

Table 1

| Characteristics                      | mCRPC (n = 19) |
|--------------------------------------|---------------|
| Median (Q1-Q3) age at time of prostate cancer diagnosis (years) | 76.0 (40.5–494.5) |
| Median (Q1-Q3) pre-biopsy PSA (ng/mL) | 2.0 (0.8–4.3) |
| Biopsy Gleason Score                 |               |
| 3 + 4                                | 1 (5)         |
| 4 + 3                                | 2 (11)        |
| 4 + 4                                | 1 (5)         |
| 4 + 5                                | 11 (58)       |
| 5 + 4                                | 4 (21)        |
| Treatments Prior to Castration Resistance |       |
| Radiotherapy                         |               |
| Palliative Radiotherapy              | 12 (63)       |
| No Radiotherapy                      | 7 (37)        |
| ADT                                  |               |
| Commenced within 30 days of mPC      | 17 (89)       |
| Not commenced within 30 days of mPC  | 2 (11)        |
| ADT Agent                            |               |
| Goserelin                            | 8 (42)        |
| Bicalutamide                         | 5 (26)        |
| Degarelix                            | 2 (11)        |
| Leuprolein                           | 1 (5)         |
| Cyproterone                          | 1 (5)         |
| Triptorelin                          | 1 (5)         |
| Enzalutamide                         | (ARCHES trial) |
| Number of ADT Agents                 |               |
| 1                                    | 7 (37)        |
| 2                                    | 11 (58)       |
| 3                                    | 0 (0)         |
| 4                                    | 1 (5)         |
| Chemotherapy                         |               |
| Docetaxel                            | 8 (42)        |
| Castration Resistance                |               |
| Median (Q1-Q3) duration from prostate cancer diagnosis to onset of mCRPC (months) | 12 (9–22) |
| Median serum PSA at time of diagnosis of castration resistance (ng/mL) | 10.7 (1.9–26.5) |
| Median (Q1-Q3) PSA doubling time (months) | 1.9 (1.2–2.7) |
| Treatment after onset of mCRPC        |               |
| Enzalutamide                         | 11 (58)       |
| Abiraterone                          | 3 (16)        |
| Docetaxel                            | 2 (11)        |
| Carboplatin                          | 1 (5)         |
| Enrolment in clinical trial          | 1 (5)         |
| Ongoing surveillance                 | 1 (5)         |

mCRPC, metastatic castrate resistant prostate cancer; PSA, prostate-specific antigen; ADT, androgen deprivation therapy; mPC, metastatic prostate cancer.

Proof-of-concept: Assessment of bladder cancer invasion using non-invasive spectroscopy

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Introduction & Objectives: Almost a third of bladder cancer (BCa) presents as muscle invasive cancer. The most important prognostic factor is the stage or depth of invasion, thus techniques...
to accurately and efficiently diagnose stage are pivotal in controlling progression. The current gold standard is cystoscopy and biopsy, which is not only costly and invasive, but do not provide point-of-care diagnosis. Therefore, a rapid and cost-effective diagnostic method could improve prognosis. Near-infrared spectroscopy (NIRS) is well-established in analytical chemistry to evaluate compounds based on vibrations of nuclei. It can be employed as a label-free, non-destructive approach to specimen analysis, producing spectral waveforms that resemble a unique ‘biological fingerprint’. This proof-of-concept study measures spectra from fresh ex-vivo specimens using a portable, low-cost NIRS system, as a crucial step towards in-vivo NIRS cystoscopy.

Methods: Bladder specimens from patients undergoing TURBT, bladder biopsy or cystectomy were analysed with a NIR spectrometer within 10 min from excision. Scan time was 5 s. Specimens were then sent for routine histopathological correlation. Statistical analysis involved grouping spectra into clinically relevant categories for modelling. 1% of outliers were removed and placed through Principal Component Analysis (PCA) for 99% explained variance. This fed artificial neural network models to train a classification model for the spectral data obtained.

Results: NIRS spectra was obtained from 84 specimens from 30 patients. After histopathological examination, 36 (43%) specimens were identified to have urothelial carcinoma. This cancer subgroup was then divided according to stage: 18 (50%) Ta, 6 (17%) T1, 7 (19%) T2, 1 (3%) T3. Two-group algorithms distinguished Ta vs T1-3 with sensitivity 96%, specificity 48%, AUC 0.82. Ta-1 vs T2-3 with sensitivity 99%, specificity 57%, AUC 0.95. A three-group algorithm distinguished Ta vs T1 vs T2-3 with sensitivity 86%, specificity 67%, AUC 0.85.

Fig. 1: The mean NIRS spectra measured for each of the pathological stages used in the three-group algorithm (Ta vs T1 vs T2-3)

Conclusions: Our preliminary results suggest that NIRS could be an effective, rapid, label-free tool for assessing BCa depth of invasion. Given its low cost and portability, there is potential for NIRS to be integrated with existing endoscopic instruments for point-of-care diagnosis and prove to be a valuable tool for future urologists.

Comparing long-term functional outcomes and reoperation rates of holmium laser enucleation of prostate (HoLEP) and greenlight photoselective vapourisation of prostate (GL PVP): A systematic review

Introduction & Objectives: There is a large body of evidence for the short-term safety and efficacy of holmium laser enucleation of prostate (HoLEP) and GreenLight photoselective vapourisation of prostate (GL PVP) for the treatment of BPH. In contrast, the durability of long-term functional outcomes have been less studied. The purpose of this review is to compare long-term (≥ 5 years) functional outcomes and reoperation rates following HoLEP vs GL PVP.

Methods: For this systematic review, MEDLINE, Embase and Cochrane databases were searched from inception to August 2022. Included were randomised controlled trials (RCTs), cohort studies and case series studying HoLEP and/or GL PVP, where functional outcomes and reoperation rates were reported. Studies with less than 5 years follow-up were excluded. Evidence from studies was synthesised as a comparison between two operative techniques across all parameters.

Results: Of 1148 records identified, 21 were eligible, including 2 RCTs, 1 cohort study and 18 case series. 19 studies focused on either HoLEP or GL PVP, whilst 2 case series were comparative studies of the techniques. HoLEP demonstrated durability of outcomes in the long-term and low reoperation rates (0.1–7.6%) with follow-up ranging from 5–12 years. GL PVP also had durable outcomes at 5-year follow-up, but inconclusive evidence for improvements at 10-year follow-up. Operation rates were also higher (3.8–33.3%). This is in keeping with findings of comparison studies, where the HoLEP arm demonstrated greater improvements in all functional parameters except PVR, and lower reoperation rates compared with GL PVP. These findings are limited by significant patient attrition, lack of comparison studies, and lack of long-term data beyond 10 years. The only study examining the 180 W GL PVP model at 5 years showed superior durability to earlier 80 W and 120 W models.

HoLEP: Holmium Laser Enucleation of Prostate; GL PVP: GreenLight Photoselective Vapourisation of Prostate; IPSS: International Prostate Symptom Score; QoL: Quality of Life; Qmax: Peak flow rate; PVR: Post-voiding residual; UI: Urinary incontinence; BNC: Bladder neck contracture; US: Urethral stricture; *Ranges of improvement from baseline for each study.
Conclusions: Current evidence suggests that HoLEP provides significantly greater functional improvements and a lower reoperation rate when compared to the GL PVP 80 W model at 5-year follow-up. The 180 W model is comparable to HoLEP based on limited data at 5 years, but there is a lack of data beyond 10 years for longer-term functional outcomes.

Table 1 Characteristics of studies included

| Technique            | Study designs | Mean follow-up | Functional outcome* | Adverse event* |
|----------------------|--------------|----------------|---------------------|----------------|
|                      |              |                | Mean Δ IPSS | Mean Δ QoL | Mean Δ Qmax | Mean Δ PVR | UI   | BNC | US | Regrowth | Reoperation |
| HoLEP                | 7 case series| 6.36 years     | 58%–86%     | 52%–81%    | 74%–539%   | 53%–96%    | 0.8%–8% | 0%–2.8% | 1.4%–3.3% | 0%–3%     | 0.1%–7.6%  |
| GL PVP (80-120 W models) | 1 RCT 8 case series | 4.51 years | 32%–79% | 35%–81% | 1.4%–172% | 33%–85% | 1–2.1% | 1.2–9.6% | 0%–13% | 0.7%–17% | 4.3%–33.3% |
| GL PVP (180 W model) | 1 cohort study | 4.95 years | 75% | 78% | 235% | 85% | n/a | 1.9% | 0.8% | 1.1% | 3.8% |