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Independent learning program for GPs

Unit 487 October 2012

Urology

The Royal Australian College of General Practitioners

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The five domains of general practice
Communication skills and the patient-doctor relationship
Applied professional knowledge and skills
Population health and the context of general practice
Professional and ethical role
Organisational and legal dimensions

The Royal Australian College of General Practitioners

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This unit of *check* looks at some common and serious urological problems presenting in general practice. Clinical scenarios in relation to lower urinary tract symptoms, urinary incontinence, ureteric colic, erectile dysfunction, macroscopic haematuria and a renal mass are presented.

Urological problems are a concern for many individuals, some who are reluctant to discuss their problems. It is important to be open to these concerns and approach the consultation with sensitivity.

The authors of this unit bring years of clinical experience to this topic. The authors of this unit are:

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The authors would like to acknowledge the contribution of Kay Talbot in coordinating this unit. Talbot RN BAppSc, Cert Continence Mgt, Prostate Care Nurse, Dip Mgt Cert IV Health Administration is a practice nurse and manager at Australian Urology Associates.

The learning objectives of this unit are to:

- display increased confidence in assessing and individualising treatment for men with lower urinary tract symptoms suggestive of benign prostatic hypertrophy
- display increased confidence in clinically assessing and discussing treatment options with women who have urinary incontinence
- recognise the value of patient completion of a bladder diary to help assess urinary symptoms such as frequency, urgency and incontinence
- thoroughly assess patients who present with symptoms that could suggest a urothelial or renal cell carcinoma and refer to a urological surgeon in a timely manner
- appropriately manage patients with ureteric colic based on severity of pain, presence of complications, and on size and location of urinary stone(s)
- understand the importance of assessing patients who present with erectile dysfunction for associated conditions such as ischaemic heart disease and obstructive sleep apnoea.

We hope that this unit of *check* will help you manage patients who present with urological problems in general practice.

Kind regards,

Catherine Dodgshun MBBS, DRANZCOG, FRACGP

Medical Editor, *check* Program

GUIDE TO ABBREVIATIONS AND ACRONYMS IN THIS UNIT OF *CHECK*

BMI	body mass index	OAB	overactive bladder	SUI	stress urinary incontinence
BPH	benign prostatic hypertrophy	OAB dry	overactive bladder without urge incontinence	TCC	transitional cell carcinoma
CIS	carcinoma in situ	OAB wet	overactive bladder with urge incontinence	TUMT	transurethral microwave thermotherapy
CKD	chronic kidney disease	OUI	overflow urinary incontinence	TUNA	transurethral needle ablation
CT	computerised tomography	PBS	Pharmaceutical Benefits Scheme	TURP	transurethral resection of the prostate
CT-KUB	CT of the kidneys, ureters and bladder	PDE5	phosphodiesterase type 5	UA	uric acid
DRE	digital rectal examination	PN	partial nephrectomy	UEC	urea, electrolytes and creatinine
ED	erectile dysfunction	PSA	prostate-specific antigen	UTI	urinary tract infection
ESWL	extracorporeal shock wave lithotripsy	PUJ	pelvi-ureteric junction	UUI	urge urinary incontinence
FBE	full blood examination	Q	Q wave on an electrocardiograph	VUJ	vesico-ureteric junction
IV	intravenous	T	T wave on an electrocardiograph		
LUTS	lower urinary tract symptoms	RCC	renal cell carcinoma		
MSU	midstream urine	RFA	radio-frequency ablation		
MUI	mixed urinary incontinence	RN	radical nephrectomy		

CASE 1

JUSTIN PRESENTS WITH LOWER URINARY TRACT SYMPTOMS

Justin, aged 65 years, presents with a 2-year history of lower urinary tract symptoms (LUTS) including slow stream, hesitancy, nocturia (three times per night), daytime frequency and urgency. Justin has no significant past medical history, has had no previous operations and takes no medications. His father underwent a transurethral resection of the prostate (TURP) at 70 years of age.

QUESTION 1

What further information would you like to know? What examination would you perform and what would you be looking for?

QUESTION 2

What investigations would you request?

FURTHER INFORMATION

Justin is bothered by his symptoms. He does not usually drink fluids after 9 pm at night, his caffeine intake consists of one cup of coffee a day and he does not drink alcohol. He says that his father had a benignly enlarged prostate with no evidence of cancer.

You examine Justin. His digital rectal examination (DRE) demonstrates a mild to moderately enlarged prostate with no features that suggest malignancy. His bladder is not palpable abdominally. Urinalysis, urea, electrolytes and creatinine (UEC) are normal and his prostate-specific antigen (PSA) is 1.6. Justin has no neurological signs in his perineum or lower limbs. Urinary tract ultrasound confirms the presence of a moderately enlarged prostate (40 cc prostate) and reveals minimal residual volume of urine following micturition.

QUESTION 3

What is the likely diagnosis? What are the other causes of LUTS in men?

FURTHER INFORMATION

Justin wants to know if there are any specific causes for his enlarged prostate, and if there is anything he can do to prevent worsening of his symptoms.

QUESTION 4

What would you say to Justin?

QUESTION 5

What are the potential complications of Justin's prostate condition?

QUESTION 6

List the potential treatment options for Justin.

QUESTION 7

Are there any 'natural' or herbal remedies that might improve Justin's LUTS?

FURTHER INFORMATION

You discuss the treatment options available with Justin. He says he prefers to try medical therapy.

QUESTION 8

How do you determine which medication is most appropriate for Justin?

FURTHER INFORMATION

You prescribe tamsulosin. He returns to see you in 4 months reporting improvement in his urinary flow and a reduction in nocturia to once per night. However, he tells you he does not wish to take medication on a long-term basis.

QUESTION 9

What are the potential surgical treatment options for Justin?

CASE 1 ANSWERS

ANSWER 1

It is important to ask Justin:

- how severe his symptoms are
- whether his symptoms are bothering him, or whether he is seeking reassurance that there is no serious underlying condition such as cancer
- whether his symptoms are deteriorating
- about the volume, timing (for example, prior to bed) and type (in particular, alcohol and caffeine) of his fluid intake

It is important to perform the following examination, consisting of:

- abdominal palpation, looking for a distended bladder
- a DRE, assessing the size of prostate and for any features that suggest malignancy such as a nodule, asymmetry or hard consistency, and to evaluate anal sphincter tone
- examination of the penis, checking for a tight phimosis or narrow meatus
- neurological examination of the perineum and lower limbs, checking for evidence of a neurological condition that could cause a neurogenic bladder.

ANSWER 2

Note that older male patients with mild non-bothersome LUTS do not usually require any investigations. However, the following additional investigations should be requested in patients such as Justin with moderate or severe LUTS:[1]

- urinalysis, and midstream urine (MSU) for microscopy and culture if urinalysis is positive. This helps exclude a urinary tract infection (UTI) and detects haematuria that may suggest other pathology such as carcinoma
- fasting glucose to exclude diabetes
- UEC, as renal impairment is often asymptomatic
- PSA – after discussion with the patient about the purpose of the test
- urinary tract ultrasound. Although many guidelines do not recommend routinely requesting a urinary tract ultrasound, it is relatively inexpensive, involves no radiation and is useful because it:
  - estimates prostate size (normal is <25 cc)[2]
  - estimates residual volume (>100 ml may require further investigation)[3]
  - excludes bilateral hydronephrosis due to chronic retention
  - excludes bladder stones and larger bladder tumours.

FEEDBACK

Other tools or investigations frequently requested by urologists include:

- a bladder diary, which is a record of all urinary output (including times and volumes of urine passed) and fluid intake over a specified period of time such as 24 hours. This is the most suitable way to determine if patients have polyuria (output of >3000 ml of urine over 24hrs)[4] or nocturnal polyuria (>33% of urine output overnight)[4]
- a urinary flow rate where a slow maximum flow (<10 ml/second) frequently implies obstruction
- a urodynamic study, which is a measure of bladder pressure and flow. This is requested rarely in patients with LUTS unless neurological pathology is suspected or the clinical picture is atypical.

ANSWER 3

The most likely diagnosis in Justin is benign prostatic hypertrophy (BPH) which is a non-cancerous enlargement of the prostate. It is also known as benign prostatic hyperplasia, although this is a histological diagnosis. BPH can cause LUTS by compressing the urethra.

The causes of LUTS in men can broadly be grouped into causes of lower urinary tract obstruction, an overactive bladder (OAB) (a term that describes the symptom syndrome of urinary urgency, usually associated with urinary frequency and nocturia, and that is usually due to detrusor overactivity), bladder irritation, polyura and neurological causes. (Refer to Table 1[5] on page 6 for a summary of the causes of LUTS in men.)

ANSWER 4

You could inform Justin that BPH is essentially a genetic condition (although the specific gene or genes responsible has/have not been identified) and that there is no evidence that environmental factors can modify progression.

Risk factors for developing BPH are: ageing, family history, race (African-Americans have a relatively high incidence) and testosterone.[5,6] BPH only develops if the prostate is exposed to testosterone, but BPH worsens with increasing age despite the decline in testosterone levels that usually occurs.

ANSWER 5

Potential complications of BPH include:[1,4]

- acute urinary retention
- recurrent UTIs
- macroscopic haematuria. It is essential to exclude other causes of macroscopic haematuria such as cancer with appropriate investigations and specialist referral
- chronic urinary retention
- bladder stones
- bilateral hydronephrosis with renal impairment

The development of any of these complications requires referral and often surgical intervention.

Table 1 Causes of lower urinary tract symptoms in men
Lower urinary tract obstruction
• benign prostatic hypertrophy
• prostate cancer
• urethral stricture – idiopathic or following catheter use, transurethral resection of the prostate or urethritis
• phimosis of foreskin (only if severe)
• inability to relax pelvic floor muscles (functional)
• neurological (extrinsic sphincter dyssynergia)
Overactive bladder (usually due to detrusor overactivity)
• idiopathic
• benign prostatic hypertrophy
Bladder irritation
• urinary tract infection
• interstitial/idiopathic cystitis
• bladder stones
Polyuria
• polydipsia (many patients drink excessive fluid without proven benefit)
• diabetes mellitus (if not well controlled)
• congestive cardiac failure
• diabetes insipidus
Nocturnal polyuria
• obstructive sleep apnoea
• peripheral oedema
• diabetes insipidus
• excessive fluid intake prior to bedtime
Neurological conditions
• Parkinson disease
• cerebrovascular accident
• multiple sclerosis
• dementia
Medications* including:
• diuretics
• lithium
• anticholinergics
*Medication not included in cited reference.
Adapted with permission from Wein AJ, Kavoussi LR, Novick AC, Partin AW, Peters CA. Campbell-Walsh urology 10th ed. Elsevier 2012.[5]

ANSWER 6

Potential treatment options for Justin are:[1,4]

- Conservative measures: these measures when used alone without medical or surgical therapy are most appropriate for mild to moderate symptoms that are not sufficiently bothersome to require medical or surgical intervention. However, Justin may benefit from these conservative measures in addition to other therapy. Conservative measures consist of:
  - reassurance that BPH is common and cancer is unlikely to be present
  - reducing fluid intake, especially after 6 pm
  - reducing caffeine and alcohol intake.
- Medical therapy with one of the following medications:
  - alpha blockers such as tamsulosin or prazosin
  - 5 alpha reductase inhibitors such as finasteride or dutasteride
  - combination therapy, consisting of tamsulosin/dutasteride[7]
  - anticholinergics such as oxybutynin (oral or transdermal) or solifenacin.
- Surgical therapy with options such as:
  - TURP: this is still the gold standard[1,4,5]
  - other options such as laser ablation, transurethral needle ablation (TUNA), thermotherapy or open operation.

ANSWER 7

The best available evidence including long-term placebo-controlled trials suggests natural or herbal remedies such as *Serenoa repens* (also known as saw palmetto) are equivalent to placebo in their use for LUTS due to BPH.[8,9]

ANSWER 8

Medical therapy is suitable for many patients with moderate to severe LUTS. Medical therapy is usually not suitable for patients with:[10]

- mild symptoms
- complications of BPH (see *Answer 5*)
- a reluctance to adhere to medication on a long-term basis. Many patients do not like the idea of indefinite medical therapy, especially if they are not taking other medications on a regular basis.

You can determine what medication is most appropriate for Justin based on the severity of his BPH (moderate or severe), cost of the various medications and his opinion regarding potential side effects of medication on sexual function (such as erectile dysfunction and ejaculatory disorders).

In clinical practice, many men with LUTS – due to BPH – who decide on medical therapy are prescribed either tamsulosin or combined tamsulosin/dutasteride. Men who have moderate BPH (as opposed to severe BPH) and those who prefer to avoid sexual side effects of medication are more suited to tamsulosin, if they can afford it. Men with larger prostates and higher residual volumes who are not sexually active and who prefer a less expensive option are more suited to tamsulosin/dutasteride.

The response to medical therapy is variable, and patients often require a trial of therapy in order to determine the extent of improvement of their symptoms and assess for the presence of any side effects.

Medical therapy usually consists of one of the following groups:

- **Alpha blockers**

  Tamsulosin and prazosin are examples. Tamsulosin is usually

preferred to prazosin given its fewer side effects. Tamsulosin has the advantages of a rapid onset of action (usually within a few days), it does not tend to cause erectile dysfunction, and most patients experience an improvement in their symptoms with its use.[11] Among its disadvantages are its non-inclusion on the Pharmaceutical Benefits Scheme (PBS), its failure to stop the progression of BPH and it generally results in less improvement than treatment with a TURP.

- **5 alpha reductase inhibitors (finasteride or dutasteride)**

  These medications have the advantages of reducing prostate size and reducing the rate of BPH progression and therefore the future need for TURP.[11] However, they are not listed on the PBS (with the exception of dutasteride when used in combination with an alpha blocker), they have a slow onset of action (months) and may cause sexual dysfunction.

- Combined alpha blocker/5 alpha reductase inhibitor (tamsulosin/dutasteride)

  This has the advantages of a rapid onset of action, it reduces prostate size and is funded by the PBS. In general, it combines the best of both groups of medications. However, it can lead to side effects of each of its component medications, especially sexual dysfunction. Other disadvantages are that it is usually no more effective than alpha blockers in the presence of a smaller prostate, it reduces the PSA level without changing the prostate cancer risk and it requires a urologist to prescribe it initially on the PBS (as an Authority medication).

- **Anticholinergics**

  Oxybutynin (oral or transdermal) and solifenacin are examples. Oxybutynin has anticholinergic effects, but also has a direct antispasmodic effect on detrusor muscle. These medications may be used as an adjunct to alpha blockers to reduce urinary frequency and urgency.[12] It is best to avoid their use if obstructive symptoms predominate, or a high residual volume of urine is present. Solifenacin is not available on the PBS.

ANSWER 9

Surgical treatment for BPH is indicated when:

- significant complications of BPH occur (see *Answer 5*)
- symptoms are inadequately controlled by medication
- moderate to severe symptoms are present and the patient prefers to avoid long-term medical therapy.

Surgery for BPH usually consists of a TURP, which is still considered the gold standard.[1,4,5] The reasons for this are that a TURP results in:

- a better improvement in LUTS, compared to medical therapy
- a better measured urinary flow rate and lower residual volume than medical therapy
- low rates of significant bleeding and need for transfusion (2.9%)[1]
- low rates of re-operation rate (1–2% per annum)[1]
- A TURP also has the advantages of being minimally invasive, requiring no incision, and it is usually performed under spinal anaesthetic and results in a brief (2-night) hospitalisation.

The disadvantages of a TURP are that it can lead to:

- postoperative urinary frequency, dysuria and haematuria for up to a few weeks
- retrograde ejaculation (this occurs in most patients)
- persistent LUTS in some patients, which is largely due to OAB.

Other surgical options include:[5]

- bladder neck incision – this is indicated for smaller prostates. The recurrence rate is higher than for TURP
- open prostatectomy is indicated for huge BPH, but is rarely performed. Note that this is a different operation to radical prostatectomy, which is performed for cancer of the prostate
- laser prostatectomy. Many forms are available – some are thought to be equivalent to a TURP, but they are not yet frequently used in Australia
- transurethral needle ablation (TUNA) – this involves heating the prostate to coagulate tissue. It is less invasive than a TURP, but generally results in less improvement and is not commonly performed in Australia
- transurethral microwave thermotherapy (TUMT) – this is less invasive, but less effective than TURP and is not commonly performed in Australia
- prostatic stents – these have many potential complications including encrustation, irritation and incontinence, and are rarely used.

CASE 2

SANDRA HAS INCONTINENCE

Sandra, aged 48 years, presents with worsening incontinence since she started an exercise and weight loss program 6 months ago. She said she has experienced leakage of urine with coughing, sneezing and exercising since the birth of her two children 18 years ago. She now also reports increased urinary frequency, urgency and leakage of urine en route to the toilet. Her ability to participate in high impact activities, as part of her exercise program, is limited by her incontinence. She is equally bothered by the incontinence en route to the toilet and during high impact activities. She reports that her bowel function is normal and regular. Sandra has regular menstrual periods. She has no past medical or surgical history and takes no medication.

Examination reveals that Sandra is overweight with a body mass index (BMI) of 29 kg/m^2. Pelvic examination reveals stress urinary incontinence and bladder neck hypermobility (excessive movement of the bladder neck) with coughing, poor pelvic floor contraction strength and technique, and no significant bladder or uterine prolapse.

QUESTION 1

What are the most common types of urinary incontinence in women?

QUESTION 2

What are the key features on history that indicate the type of urinary incontinence? What type of urinary incontinence does Sandra have?

QUESTION 3

What investigations would you request for Sandra?

FURTHER INFORMATION

You request an MSU, which is negative, and a bladder ultrasound, which reveals minimal residual volume following micturition. You ask Sandra to complete a bladder diary (see *Figure 1*).

Figure 1. Sandra's bladder diary

Name: Sandra			**Date: 2/10/2012**		
This chart is designed to record urine output. Please measure and record the amount each time you pass urine over a 24-hour period. Please complete three 24-hour periods, which do not need to be consecutive. You should purchase a 500 ml plastic jug for measuring urine output. You are not expected to measure leakage, but please mark how often the leakage is occurring and whether the amount is large (L), moderate (M) or small (S). Please bring your completed chart to your appointment.					
Day 1 – Date: 2/10/2012					
Time	**Amount (mls)**	**Leakage**	**Time**	**Amount (mls)**	**Leakage**
0600	600	S			
0800	350				
0945	400				
1200	400				
1400	650	S			
1530	400				
1715	500				
1930	350				
2115	500				
2300	400				
0115	550	S			
Total volume over 24 hours 5100 ml					
Table provided by author, Karen McKertich					

QUESTION 4

What does Sandra's bladder diary reveal? What is the likely diagnosis in Sandra?

QUESTION 5

What conservative treatments could be advised for OAB?

QUESTION 6

What pharmacological treatment options are available for OAB?

QUESTION 7

What surgical options are available for OAB?

FURTHER INFORMATION

You advise Sandra to reduce her fluid intake, and undertake bladder training and pelvic floor physiotherapy. Her urinary frequency, urgency and urge incontinence resolve. You conclude that she does not require further pharmacological or surgical management for her OAB symptoms. Unfortunately, she continues to have very bothersome stress urinary incontinence (SUI), despite pelvic floor physiotherapy.

QUESTION 8

What are the conservative treatments for SUI?

FURTHER INFORMATION

Despite weight loss and pelvic floor physiotherapy, Sandra continues to be bothered by her SUI. She is keen to consider surgical management for her ongoing SUI.

QUESTION 9

What are the surgical treatment options for SUI?

CASE 2 ANSWERS

ANSWER 1

Urinary incontinence in women can be categorised as:

- SUI (stress urinary incontinence)
- urge urinary incontinence (UUI)
- mixed urinary incontinence (MUI) (a combination of SUI and UUI)
- overflow urinary incontinence (OUI)
- fistula related, or
- functional incontinence.[13]

Table 2. Categories of female urinary incontinence

Category of female urinary incontinence	Cause
Stress urinary incontinence (SUI)	Weakness in the urinary sphincter and/or pelvic floor
Urge urinary incontinence (UUI)	Detrusor overactivity ie. a bladder muscle that contracts involuntarily, usually at low bladder volumes and with little warning
Mixed urinary incontinence	A combination of stress and urge incontinence. It is important to define which symptom is predominant and most bothersome to the patient and treat this symptom first
Overflow urinary incontinence	Occurs when the patient is in chronic urinary retention due to leakage from an overdistended bladder in the setting of either bladder outlet obstruction and/or poor bladder muscle function
Urinary fistula	Fistulous connections can occur between the bladder and vagina, ureter or urethra Obstetric trauma is the most common cause of vesico-vaginal fistula worldwide. In Australia the most common cause of vesico-vaginal fistula is iatrogenic, caused by unidentified bladder injury usually at the time of hysterectomy
Functional incontinence	The involuntary loss of urine caused by either physical limitations such as poor mobility or cognitive disability (such as dementia) that results in an inability to toilet normally

Table modified by Karen McKertich from her article 'Urinary Incontinence-Assessment in women: stress, urge or both?' Australian Family Physician Vol 37,(#3), March 2008.

Table 2 outlines the categories of female incontinence and their causes.

ANSWER 2

Features on history that suggest UUI include loss of urine preceded by a sudden and severe desire to pass urine with loss of urine en route to the toilet. Common triggers include running water, cold weather and inserting the key in the door upon returning home (also known as 'key in the door' urgency).

Features on history that suggest SUI include loss of urine with activities that raise intra-abdominal pressure such as coughing, sneezing, high impact exercise and heavy lifting. The patient can usually predict what activities will cause leakage.

Sandra has mixed urinary incontinence consisting of both urge and stress incontinence.

FEEDBACK

Worrying features that raise the possibility of other bladder or pelvic pathologies and warrant early referral for assessment include:[14,15]

- acute onset of symptoms – in contrast, the usual history in urinary incontinence from a non-serious cause is of a gradual onset of symptoms
- haematuria – either macroscopic or microscopic
- pain – either suprapubic pain or dysuria suggests pelvic or other urinary tract pathology
- obstructive symptoms such as straining to void or a sensation of incomplete bladder emptying
- recurrent UTIs
- neurological symptoms such as new onset paraesthesiae, weakness, back pain or change in bowel habit, which may be associated with a neuropathic bladder.

ANSWER 3

The following investigations should be performed in Sandra:

- MSU for microscopy and culture – all patients with urinary incontinence require an MSU
- some form of assessment of bladder emptying, such as a bladder ultrasound to look at the residual volume of urine following micturition
- A bladder diary – where the patient completes a chart over a specified period of time, like 3 days, recording information such as the volume of urine passed and time it is passed, episodes and degrees of incontinence and fluid intake. This provides invaluable information regarding voiding patterns, bladder capacity and total urine output, the latter of which is usually a reflection of fluid intake.[14,15]

ANSWER 4

Sandra's bladder diary (see *Figure 1*) shows polyuria –she passed a total of 5100 mls of urine in 24 hours. This is likely to be driven by her excessive fluid intake, which was recommended as part of her weight loss program.

The symptom syndrome of urinary urgency (with or without UUI), usually associated with urinary frequency and nocturia, is described as overactive bladder syndrome or OAB.[16] Approximately one third of patients with OAB will experience urge incontinence (OAB wet), with the rest having OAB dry.[16]

OAB is generally due to detrusor overactivity (ie. a bladder muscle that contracts involuntarily, usually at low bladder volumes and with little warning). Sandra has OAB due to detrusor overactivity in the setting of excessive fluid intake.

It is important to exclude bladder or pelvic pathology as the cause of OAB and UUI, before attributing this symptom to detrusor overactivity. The typical history, physical examination and findings on basic investigations such

as MSU, bladder diary and ultrasound, help exclude other pathologies. Patients with worrying features (see *Answer 2*), severe symptoms, symptoms refractory to initial conservative management, and those in whom surgical interventions are being considered require referral and more complex testing with urodynamic studies and/or cystoscopy.[15]

ANSWER 5

Conservative treatments for OAB include:

Fluid management

- instruct the patient to 'only drink when you feel thirsty' and that 'what goes in has to come out'
- fluid restrict if the bladder diary shows an excessive urine output such as >2000 ml in 24 hours (usually driven by excessive fluid intake in the absence of poorly controlled diabetes, renal dysfunction or other metabolic conditions causing polyuria)
- avoid excessive intake of fluids that act as bladder irritants or diuretics such as caffeinated drinks (coffee, tea, cola-type drinks energy drinks) and alcohol
- modify the timing of fluid intake as well as prescription diuretics, especially in relation to sleep.

Bladder training

- establish a baseline with a bladder diary
- establish a voiding interval
- gradually increase the voiding interval in increments such as 2–5 minutes over a prolonged time period aiming to void every 3 hours
- use urge control techniques such as distraction techniques and pelvic floor contraction, as well as other behavioural therapies.

Pelvic floor physiotherapy

- voluntary pelvic floor muscle contraction helps suppress detrusor contraction.[14,15,17]

Maintenance of normal bowel function is generally found to be clinically helpful in the presence of OAB. It is also useful in all types of urinary incontinence.

FEEDBACK

Use of a urology nurse specialist or specialist continence physiotherapist is an invaluable aid in the management of patients with both UUI and SUI. Specialist physiotherapy input ensures patient pelvic floor exercise technique is optimal and individualises patient therapy while at the same time acting as a 'personal trainer' for the bladder.

ANSWER 6

Pharmacological management with anticholinergic medications is effective in reducing urinary urgency, episodes of urge incontinence as well as reducing urinary frequency and increasing voided volumes.[18,19]

The clinical efficacy of the currently available anticholinergic medications is very similar. The main advantage of the newer agents is a more favourable side effect profile with lower rates of dry mouth, constipation and dry eyes compared to immediate release oxybutynin.

The newer generation anticholinergic agents currently available include transdermal oxybutynin, solifenacin, darifenacin and tolterodine.[18,19] Transdermal oxybutynin is available on the PBS for patients who are unable to tolerate oral oxybutynin while solifenacin is not available on the PBS.

ANSWER 7

Surgical management is usually reserved only for those patients with OAB who are refractory to conservative management in combination with anticholinergic therapy. Further assessment with a urodynamic study is mandatory prior to consideration of more invasive treatment options.

Surgical options for treatment of OAB include:

- sacral neuromodulation with an implantable device. This device acts as a 'pacemaker' for the bladder providing chronic electrical stimulation of the S3 nerve root by a minimally invasive procedure. This acts to modulate abnormal reflexes between the bladder, urethral sphincter and pelvic floor muscles as well as having effects on central voiding mechanisms. Patients have an initial trial of the device and 60–70% of patients move to the second stage and have a permanent device implanted[20,21]
- botulinum toxin injections into the bladder with the aid of cystoscope. This causes a temporary chemodenervation lasting between 6–12 months (averaging 9 months) and hence needs to be repeated. Botulinum toxin carries a dose dependent risk of incomplete bladder emptying or urinary retention due to 'over paralysis' of the detrusor and is reversible because the effect wears off.[22]
- augmentation cystoplasty (bladder enlargement with a segment of the patient's bowel) and urinary diversion (for example, with an ileal conduit) are rarely used today and usually reserved for patients with severe neuropathic bladders[23]

ANSWER 8

The conservative treatments of SUI are:

- pelvic floor muscle exercises/training[15] (see *Resources*)
- fluid management[15] (see *Answer 5* as is recommended for OAB)
- weight loss[14,24]

Currently no effective medical therapies are available for SUI.

ANSWER 9

Surgical treatment options available for women who have bothersome SUI, despite conservative measures, include:

- sling surgery[25] – slings can be synthetic or biological. Synthetic slings include retropubic slings, transobturator slings and mini slings. Biological slings include the pubovaginal fascial sling, which is made from the patient's own rectus fascia
- Burch colposuspension[25] – which uses stitches to lift the bladder neck upwards
- bioinjectable agents[26] – which are bulking agents injected at cystoscopy into the soft tissues of the urethra
- other options, such as a female artificial urinary sphincter or implantable balloons placed under the skin next to the bladder, are not commonly used in women.

CASE 3

BRIAN HAS BLOOD IN HIS URINE

Brian, aged 68 years, presents to you following a single episode of macroscopic painless haematuria, which occurred about 1 month ago. He did not come in earlier as it appeared to be a one-off episode, but his daughter insisted he come to see you today.

QUESTION 1

What further information would you like to know?

FURTHER INFORMATION

The episode of haematuria involved blood-stained urine throughout the stream with passage of a few small clots. He has had minor LUTS, which have been present for the past 5 years and not worsening.

Brian smokes 20 cigarettes per day and has done so for the past 40 years. He had a coronary bare metal stent inserted 8 years ago for ischaemic heart disease. He has a past history of hypertension and hyperlipidaemia and takes ramipril 5 mg, simvastatin 40 mg and aspirin 100 mg.

QUESTION 2

What important diagnosis are you most concerned about in Brian and why?

QUESTION 3

What examination would you perform and what would you be looking for?

FURTHER INFORMATION

Brian appears to be in reasonable health, but has smoker's breath and nicotine-staining of his fingers. His abdominal examination is normal with no evidence of organomegaly, no renal masses and no inguinal lymphadenopathy. DRE reveals a mildly enlarged benign-feeling prostate.

QUESTION 4

What investigations would you request and what management would you instigate?

FURTHER INFORMATION

Brian's blood tests are all normal, but his MSU shows microscopic haematuria of non-glomerular origin. His voided urine cytology is normal, but a triphasic computerised tomography (CT) urogram shows a filling defect arising from the right lateral bladder wall. You refer him to a urologist who performs a cystoscopy and transurethral resection of a bladder tumour. The histology shows low grade non-invasive urothelial carcinoma (see *Figure 2*). The urologist books Brian for a check cystoscopy in 3 months. He encourages Brian to quit smoking and requests your assistance.

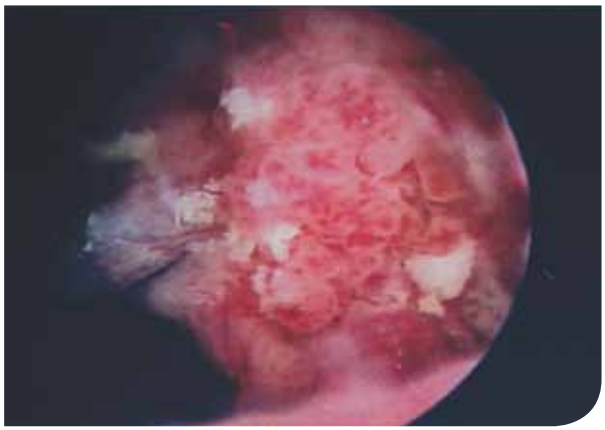

Figure 2. Brian's cystoscopic view of typical papillary fronds of transitional cell carcinoma in the bladder

CASE 3 ANSWERS

ANSWER 1

It is important to ask Brian:

- more details about the episode of haematuria
  - whether the blood was only at the very start or end of the stream, or whether it was mixed in with the urine. Blood only at the very start or end of the stream is most likely from a source distal to the bladder (from the prostate or urethra). Blood throughout the urine stream is more likely to be from a more proximal source (from the kidney, ureters or bladder)
  - whether he passed clots, was lightheaded or lethargic, which are potential indicators of the severity of the bleed
  - whether it was associated with LUTS such as dysuria, urinary frequency, urgency or difficulty voiding, some of which may indicate a UTI or prostatomegaly
- about risk factors for the differential diagnoses
  - smoking, previous pelvic radiotherapy, exposure to industrial chemicals such as those used in the production of dyes, rubbers and textiles (these are risk factors for urothelial carcinoma (transitional cell carcinoma [TCC])
  - family history of kidney cancer as some renal cell carcinomas (RCC) are familial
  - family history of prostate cancer, previous PSA levels (to help estimate the risk of prostate carcinoma)
  - known prostatomegaly – an enlarged prostate is a common source of haematuria, especially if in combination with an antiplatelet agent or anticoagulant
  - known renal disease such as glomerulonephritis
  - previous history of urinary tract stones, as occasionally urinary stones can present without significant pain
- about risk factors for bleeding
  - use of antiplatelet agents such as aspirin, clopidogrel or anticoagulants such as warfarin
  - history of abnormal bleeding, which might suggest a coagulopathy.

ANSWER 2

The main concern is urothelial carcinoma because Brian has had an unexplained episode of macroscopic haematuria with no associated symptoms to suggest a benign cause. His smoking also represents a significant risk factor for TCC.

FEEDBACK

While most patients are aware that smoking can cause lung cancer and ischaemic heart disease, many remain unaware of its causal effect on bladder cancer. It is by far the most common risk factor for bladder cancer, causing two in three cases in men, and nearly one in three cases in women.[27] The incidence of bladder cancer is also proportional to the number of cigarettes smoked daily and the duration of smoking. Conversely, quitting smoking leads to a rapid drop in the risk of developing bladder cancer, with a reduction of up to 40% after 4 years.[28] It is therefore imperative that smokers – even those already diagnosed with a bladder cancer – be informed of the risk of developing bladder cancer, which can be lethal, or may sometimes require surgical removal of the entire bladder.

ANSWER 3

Physical examination should include:

- general inspection, assessing Brian's general state of health and looking for cachexia or pallor
- abdominal examination, checking for inguinal lymphadenopathy, renal masses or tenderness, or a palpable bladder
- DRE, assessing the size of prostate and for any features that suggest malignancy.

ANSWER 4

Although Brian's haematuria may have been an isolated episode due to a benign cause, cancer must be excluded. He should also be investigated for certain causes of haematuria. These investigations should include the following:

- blood tests such as full blood examination (FBE), UEC, coagulation profile and PSA
- MSU and red blood cell morphology to confirm haematuria and characterise it as glomerular or non-glomerular
- voided urine cytology (three specimens), which should be collected on different days, looking for abnormal cells suspicious of TCC

- imaging – a triphasic CT urogram is the gold standard in imaging for the investigation of macroscopic haematuria.
  The non-contrast phase gives a baseline density of renal parenchyma and may detect stones. The nephrogram phase with early contrast then shows enhancement of renal parenchyma, as well as suspicious renal lesions such as RCC. The delayed contrast phase highlights the urinary collecting system showing any filling defects of the renal pelvis, ureters or bladder, which may signify TCC. In requesting intravenous (IV) contrast, it is important to first determine renal function and diabetic status and assess diabetic medications to avoid precipitating acute renal failure.

  An alternative modality is the urinary tract ultrasound, which should be used for patients without risk factors for TCC because it is less sensitive than CT for urothelial lesions. It is also useful when use of IV contrast is contraindicated. Magnetic resonance imaging is another alternative, but is rarely necessary. However, none of these imaging modalities is sufficiently sensitive to detect small or flat lesions of the bladder, such as urothelial carcinoma in situ (CIS). Therefore, the remaining aspect of Brian's management should be prompt referral to a urologist for further assessment and cystoscopy.[29]

FEEDBACK

TCC most commonly arises in the bladder, but can occur wherever urothelium lines the urinary tract. It can therefore also arise in the renal pelvis, ureters and urethra. It usually presents as macroscopic painless haematuria as the fragile tissue, which is often frond-like, is prone to bleeding. This is especially true when the patient is taking an antiplatelet agent or anticoagulant. Importantly, there may be significant gaps in time between bleeding episodes, so that even a single episode of macroscopic haematuria must be thoroughly assessed.

CASE 4

ANDREW HAS BAD PAIN IN HIS LOIN

Andrew, aged 42 years, is an accountant who presents with a 4-hour history of right loin pain of moderate intensity associated with nausea and urinary frequency. Andrew has been well in the past and has no past or family history of renal stones. He takes no regular medications.

Examination demonstrates an afebrile man with a pulse rate of 88 beats per minute, a blood pressure of 135/85 mmHg and mild right iliac fossa tenderness. There is no evidence of peritonitis. Urinalysis reveals microscopic haematuria. You suspect Andrew has ureteric colic.

QUESTION 1

How would you manage Andrew?

QUESTION 2

What is the most appropriate investigation to confirm the presence of a stone in cases of suspected ureteric colic?

FURTHER INFORMATION

You assess Andrew's level of pain is such that he can be managed without going to hospital at this stage. You prescribe metoclopramide 10 mg, indomethacin 100 mg suppository as an initial dose, tramadol 50 mg two tablets 4 hourly (to a maximum of eight tablets per day) and tamsulosin 400 mcg daily. You advise Andrew to present to the emergency department if the pain fails to settle or increases in severity, and filter his urine in order to obtain a stone for analysis. You request an MSU for microscopy and culture, request blood tests and arrange for a CT of the kidneys, ureters and bladder (CT-KUB).

The results of Andrew's tests are available later that day. His UEC is normal and his CT-KUB demonstrates a 5 mm calculus in the distal right ureter at the vesico-ureteric junction (VUJ) associated with moderate right hydronephrosis. There is also a 5 mm calculus noted in the lower pole of the contralateral left kidney.

Andrew's pain persists so he presents to the emergency department. In hospital he continues to require morphine for 24 hours with no evidence of stone passage.

QUESTION 3

When do patients with ureteric colic require surgical intervention?

QUESTION 4

What surgical treatment is indicated for Andrew?

FURTHER INFORMATION

Andrew wants to know why he has made urinary stones, and whether he could have been doing something wrong that made his body form the stones.

QUESTION 5

What would you say to Andrew about the reason for his urinary stones?

QUESTION 6

Could Andrew modify his diet to reduce the likelihood of further stone formation?

QUESTION 7

What investigations are warranted in Andrew to exclude a cause for stone formation?

QUESTION 8

Does Andrew's asymptomatic left renal stone require intervention?

QUESTION 9

What are the potential treatment options for Andrew's left renal stone?

CASE 4 ANSWERS

ANSWER 1

Patients like Andrew who have ureteric colic may be managed out of hospital provided that:

- the pain can be well controlled with analgesia
- there is no sign of sepsis/fever
- their renal function is normal.

Analgesia should include non-steroidal anti-inflammatory medications as well as stronger codeine-based medications such as codeine phosphate 30 mg, oxycodone or tramadol.[30] Antispasmodics, such as hyoscine, are of no benefit.

Alpha blockers, such as tamsulosin 400 mcg daily, should be used routinely as there is mounting evidence that these medications increase the likelihood of spontaneous stone passage by relaxing the muscles of the lower ureter and VUJ.[31]

Advising increased intake of fluid sounds intuitively helpful, but there is no evidence to suggest it increases the likelihood of stone passage.

Investigations should also be arranged (See *Answer 2* and *Answer 7*).

ANSWER 2

A CT-KUB is the investigation of choice for patients with ureteric colic.[32] A CT-KUB takes a few minutes and does not require IV contrast or utilise high doses of radiation. A CT-KUB generally detects stones in all parts of the urinary system, accurately determines the size of the stones and can demonstrate hydronephrosis due to obstruction. A normal CT-KUB essentially excludes ureteric colic as the cause of loin or abdominal pain and may indicate other pathology

such as an abdominal aortic aneurysm.

A renal ultrasound, a plain X-ray or an intravenous pyelogram should not be routinely used to confirm the presence of a stone in suspected ureteric colic as they are less accurate because they produce more false negatives and positives.

Patients with suspected ureteric colic should also be investigated with a UEC (to check for renal impairment) and an MSU (to confirm the presence of haematuria and exclude a UTI or pyelonephritis).

ANSWER 3

Patients with ureteric colic require surgical intervention when:[33]

- there is evidence of sepsis
- there is significant renal impairment
- the stone is unlikely to pass spontaneously
- the patient has persistent pain.

Sepsis associated with ureteric colic always requires urgent surgical intervention because the infection can become life threatening without drainage of the kidney with a stent or nephrostomy. Renal impairment is usually also an indication for surgical intervention as it suggests the unobstructed contralateral kidney has abnormal baseline function.

The likelihood of spontaneous stone passage depends on:

- stone size – 50% of 5 mm stones will pass, but larger stones are less likely to pass[34]
- stone location – stones in the upper ureter or pelvi-ureteric junction (PUJ) are less likely to pass than VUJ stones
- prior history of capacity to pass small stones.

ANSWER 4

Surgery is indicated in Andrew's case because he has persistent pain due to a urinary stone, which is lodged in the distal right ureter at the VUJ. Surgery for such a stone usually consists of a right ureteroscopy with stone fragmentation using laser and extraction of stone fragments.[35,36] This is generally a day case procedure. A stent is usually left in the ureter for a few days to some weeks to prevent recurrent colic that may occur due to ureteric oedema or bruising, even if the stone is completely extracted. Patients may experience urinary frequency and haematuria (and occasionally pain) from the stent. Stents can be removed as a day case (under local anaesthetic or sedation).

ANSWER 5

The vast majority of urinary stones in our community are idiopathic. You could explain to Andrew that the predisposition to stone formation is most likely genetic. Every individual's body chemistry and urine chemistry is unique and it appears that some people have a particular chemical composition in their urine that is more likely to precipitate and crystalise, thereby causing stones. Individuals who are not intrinsically prone to stones are unlikely to develop stones no matter how dehydrated they get or what they eat. Andrew has done nothing wrong – he is just unlucky.

ANSWER 6

Increasing fluid intake has been proven to reduce (but not eliminate) the chances of further stone formation.[37] Patients should aim for a urine colour that is nearly clear rather than darker yellow – usually a urinary output of 2000 ml per 24 hours is reasonable.

Unfortunately, modifying food intake is of little proven benefit in reducing stone recurrence. It is reasonable to advise a high fibre, low fat diet with low salt intake as this may help somewhat (and has many other proven benefits), but any more specific advice is probably unwarranted in most patients given little evidence of efficacy.

Many patients try to reduce their calcium intake as most stones contain calcium. It has been shown that this, in fact, leads to a higher likelihood of stone formation and can predispose to osteoporosis. Many stones contain oxalate and patients may wish to reduce their oxalate consumption (oxalate is in spinach, rhubarb, nuts and wheat bran), however, this appears to be of questionable benefit in many patients.[38]

Increasing intake of citrus juice may be beneficial as citrate is a stone inhibitor.

ANSWER 7

All patients with urinary stones should undergo basic investigations to exclude the conditions that most commonly cause recurrent stone formation:[33]

- serum calcium – hypercalcaemia is found in 1% of stone formers and is most commonly caused by a parathyroid adenoma
- serum uric acid (UA) – elevated levels may indicate UA stones that can be dissolved (with sodium citrotartrate) or prevented (with allopurinol)
- MSU for microscopy and culture – recurrent UTIs may cause renal stones and stones may cause UTIs
- stone analysis – this may assist in finding a cause.

More complex investigations such as 24-hour urine biochemistry are indicated in a minority of recurrent stone formers. This analysis will help to determine what medical therapy may be used for stone prophylaxis, but there is little point in arranging this unless the patient is seriously considering taking long-term medications such as thiazide diuretics, potassium citrate or allopurinol – and few adhere to such medications on a long-term basis.

ANSWER 8

Asymptomatic stones that are ≤5 mm generally do not require intervention as they may pass spontaneously. Larger stones are less likely to pass and will usually continue to grow with time, and therefore normally require treatment. The larger the stone in the kidney, the more invasive the necessary treatment and the more likely the patient is to have problems such as sepsis, pain and renal damage. Many patients like Andrew who have experienced an episode of ureteric colic, will not accept a risk of developing another episode of pain (at an unpredictable time) and request treatment of asymptomatic stones before they migrate into the ureter and cause obstruction.

ANSWER 9

The treatment options for stones in the renal pelvis or calyces are:[33]

- observation alone – for stones ≤5 mm which may pass, or for patients at high risk of complications from intervention
- extracorporeal shock wave lithotripsy (ESWL) – this uses focused audible sound waves through the skin and muscles to fragment stones. This is generally the least risky procedure, performed as a day case, without the need, for a stent, but has a failure rate of 20–30% and a risk of ureteric colic from fragments[1]
- pyeloscopy and laser – this uses a flexible ureteroscope through the urethra to access the kidney and to fragment stones under vision. This procedure is also a day case with higher success rates than ESWL but usually requires a stent and, therefore, can cause stent irritation and require stent removal at a later date
- percutaneous nephrolithotomy (PCNL) – this is used for larger stones (>2 cm) and requires a puncture through the skin, muscle and renal cortex. It has a high success rate, but higher risks including bleeding and renal damage
- open stone surgery – this is used very rarely.

CASE 5

CHRISTOS IS HAVING DIFFICULTY MAINTAINING HIS ERECTIONS

Christos, aged 57 years, has noticed weakening erections. Christos is a new patient to your practice and seeks your advice as he has heard that you are comfortable in dealing with men's health issues.

QUESTION 1

What is the definition of erectile dysfunction (ED) and how common is it?

QUESTION 2

What further history would you seek from Christos?

FURTHER INFORMATION

Christos has experienced a gradual weakening of his erections over the past 5 years. As a consequence he has recently stopped having sexual intercourse with his wife. He has also noticed a gradual reduction in the frequency and intensity of morning and nocturnal erections over the past 5 years.

While Christos is concerned about the problem and the effect on his relationship, further questioning reveals no symptoms that suggest depression or an underlying anxiety disorder.

Christos has a past history of hypertension, which has been well controlled with lisinopril 5 mg. He also has a past history of hypercholesterolaemia for which he takes atorvastatin 20 mg. Christos is an ex-smoker and drinks one standard drink of alcohol per night.

Examination reveals an overweight man with a BMI of 31 kg/m2. His blood pressure is 130/80 mmHg. Three months ago his total cholesterol level was 4.5 mmol/L.

QUESTION 3

What significant disease can ED be an early indicator of? What other medical condition is associated with ED?

QUESTION 4

What investigations would you request for Christos?

FURTHER INFORMATION

Christos asks if there are any conservative measures that you would advise to prevent worsening of his ED.

QUESTION 5

What would you say to him?

QUESTION 6

What treatment options are potentially available for ED?

QUESTION 7

In what ways do each of the available phosphodiesterase type 5 (PDE5) inhibitors used in Australia differ?

QUESTION 8

What are the side effects of PDE5 inhibitors? If side effects occur initially, will they continue? Do PDE5 inhibitors cause spontaneous erections?

QUESTION 9

What are the contraindications to PDE5 inhibitors?

QUESTION 10

What medications are contraindicated in men using other therapies for ED such as vacuum devices and intracavernosal injections?

FURTHER INFORMATION

Christos embarks on a weight loss program with healthy eating and daily exercise. He decides to trial sildenafil.

QUESTION 11

What follow-up would you advise for Christos?

CASE 5 ANSWERS

ANSWER 1

Erectile dysfunction describes the persistent inability to achieve or maintain a penile erection sufficient for sexual intercourse.[39] ED is very common. The overall prevalence of ED in men aged 40–70 years is approximately 52%. This includes minimal, moderate and complete ED. The likelihood of ED increases with age; it affects about 40% of men aged 40 years and increases to almost 70% in men aged 70 years.[40]

ANSWER 2

Further history to seek from Christos should include sensitively enquiring about the problem and obtaining a sexual history, medical and surgical history, list of current medications and psychosocial history. Details of these factors are summarised in *Table 3*. [41–43]

ANSWER 3

ED has similar risk factors to atherosclerotic disease, and may be an early indicator of ischaemic heart disease. An important component of the initial assessment should include analysis of cardiovascular risk factors (with risk stratification) including examination of blood pressure and assessment of lipid profile and fasting glucose.[44] This is particularly relevant in patients with diabetes, as a study of diabetic men with ED compared to those without ED, found ED to be the most efficient predictor of ischaemic heart disease.[45]

It appears there is an association between ED and obstructive sleep apnoea, with a correlation between the severity of obstructive sleep apnoea and the degree of ED.[46] Basic questions about Christos' quality of sleep, and daytime sleepiness may be useful adjuncts in the assessment of his ED.[46]

ANSWER 4

When considering causes for ED look for serum testosterone and luteinsing hormone (checking for hypogonadism); a test for thyroid function (checking for hypothyroidism or hyperthyroidism); and prolactin level (checking for hyperprolactinemia).

A PSA test, after appropriate counselling, (to help estimate the risk of prostate carcinoma as treatments for prostate carcinoma can worsen ED), FBE and UEC (looking for anaemia as a cause of fatigue, which may be implicated in ED, and chronic renal impairment, which can cause fatigue and may be associated with vascular disease) can also be useful.

Assessment of lipid profile and fasting glucose is also important in order to assess cardiovascular risk (See *Answer 3*).

ANSWER 5

Prevention in deterioration in ED is possible by modifying cardiovascular risk factors, particularly by exercising or losing weight. Losing weight also helps prevent obstructive sleep apnoea, which is associated with ED. [43,47]

Other conservative strategies that may help ED include:

- avoidance of excess alcohol intake
- avoidance of smoking
- consideration of ceasing a medication that may be contributing to ED and replacing it with a different medication
- optimisation of management of diabetes, hypertension and ischaemic heart disease.

Table 3. Important factors in history taking in erectile dysfunction[41–43]

Sexual history, including:[41]
• onset of the problem. Sudden onset in the absence of injury or surgery usually implies a non-organic cause • duration of the problem • presence of erections (nocturnal, early morning, spontaneous) • ability to maintain erections • penetrative ability • last successful sexual intercourse • loss of libido • relationship issues • depression or anxiety
Medical and surgical history, including:[43]
• hypertension • hypercholesterolaemia • ischaemic heart disease • peripheral vascular disease • diabetes • pelvic surgery • pelvic radiotherapy • pelvic trauma
Medications including:[42,43]
• anti-hypertensives (beta blockers, thiazide diuretics, ACE inhibitors) • anti-arrhythmics (amiodarone) • anti-depressants (tricyclic antidepressants, MAOIs, SSRIs) • anxiolytics (benzodiazepenes) • LHRH analogues • anti-convulsants (phenytoin, carbamazepine) • anti-Parkinson medications (levodopa) • statins (atorvastatin)
Social history, including:[43]
• smoking • alcohol consumption
ACE= angiotensin converting enzyme MAOI= monoamine oxidase inhibitor SSRI= selective serotonin reuptake inhibitor LHRH=luteinising hormone releasing hormone
Weider JA. Pocket Guide to Urology.[41] Alblala DM, Morey AF, Gomella LG, Stein JP. Oxford American Handbook of Urology.[42] Leonard G, Gomella M. The 5-minute Urology Consult.[43]

FEEDBACK

It is important to provide Christos with information about ED. This may include informing him that:

- ED is very common
- ED needs to be taken seriously as it may be a marker of vascular disease
- ED is usually due to an organic cause, but is often exacerbated by psychological factors (such as performance anxiety)
- it is possible to experience sexual pleasure without penetrative intercourse
- reducing risk factors will slow down deterioration in erections.

ANSWER 6

Treatment options for ED include:

- **Oral agents (PDE5 inhibitors)**

These include sildenafil, vardenafil and tadalafil. PDE5 inhibitors are usually the first-line treatment option, effective in nearly all patients who still have some spontaneous erections. In general, they have a favourable safety profile. One disadvantage is that they are not funded by the PBS.

- **Intracavernosal injections (alprostadil)**

Intracavernosal injections are usually used when oral agents fail. They have a rapid onset of action (about 5–20 minutes). Patients need to be instructed on how to administer these injections and dose adjustment may be needed.

Some patients experience pain. They rarely cause priapism, curvature or scarring.

- **Vacuum pumps**

Use of a vacuum pump is preferred by some patients who wish to avoid medication. Use of the vacuum pump can give a 'hinged' erection. In general, they are not frequently used.

- **Penile prostheses**

Prostheses can be malleable or inflatable. They are usually used as a last resort and are rarely implanted in the public system due to their cost. They require reasonable dexterity to operate. Failure of the device or infection requiring removal is now uncommon.

- **Psychosexual therapy**

This may benefit some patients and can include cognitive behavioural therapy.

ANSWER 7

The PDE5 inhibitors currently available vary with respect to their onset of action, duration of action and the effect food has on their onset of action. The PDE5 inhibitors available include:[43]

- sildenafil, which has an onset of action of 15–60 minutes if taken on an empty stomach and a duration of action of 4 hours.
- vardenafil, which has an onset of action of 15–60 minutes if taken on an empty stomach and a duration of action of 2–8 hours.
- tadalafil, which has an onset of action of 15–20 minutes and duration of action of 24–36 hours. Tadalafil can be taken with food without delaying its onset of action.

ANSWER 8

Sildenafil, vardenafil and tadalafil can all cause headache, dyspepsia, facial flushing, nasal congestion and dizziness. In addition, sildenafil can cause blurred, blue vision and tadalafil can cause backache and myalgias.

Side effects tend to lessen (and often resolve) after several weeks of use. Patients should be reassured that failure to respond to the first dose of a PDE5 inhibitor does not usually preclude success with further use of the same or another PDE5 inhibitor.

The PDE5 inhibitors do not cause spontaneous erections and sexual stimulation is still required to achieve an erection.

ANSWER 9

Absolute contraindications to the use of PDE5 inhibitors include[48]:

- use of nitrates
- use of alpha blockers (vardenafil and tadalafil only). The interaction may cause pronounced refractory hypotension. Sildenafil should not be used for 4 hours after using an alpha blocker (but can be used after this time)
- recent myocardial infarction, recent stroke, unstable angina, hypotension
- vardenafil should not be taken with some antiarrhythmics (type 1A and type 3 antiarrhythmics that prolong the QT interval such as procainamide, quinidine, sotalol, amiodarone) or in patients with long QT syndrome

Relative contraindications to PDE5 inhibitors include:

- priapism (PDE5 inhibitors very rarely cause priapism)
- retinitis pigmentosa or inherited disorders of retinal phosphodiesterase
- conditions resulting in ventricular outflow obstruction (for example, aortic stenosis). This can increase sensitivity to vasodilators including PDE5 inhibitors.

ANSWER 10

Anticoagulants are contraindicated with vacuum devices, and intracavernosal injections should be used with caution in the presence of anticoagulant use.

ANSWER 11

Follow up for Christos includes:

- enquiring about his response to, and any side effects of, initial therapy including assessing the need for dose titration
- assessing the need for second-line therapy or surgery based on response to dose titration, therapeutic effectiveness, patient satisfaction and side-effect profile[49]
- checking and maintaining control of his cardiovascular risk factors
- encouraging him in continuing to lose weight in order to achieve a normal BMI.

CASE 6

PATRICK HAS A SMALL RENAL MASS

Patrick, aged 75 years, presented to you yesterday following a 2-day history of intermittent sharp right-sided upper abdominal pain associated with nausea. The pain had resolved the day before he consulted you. Patrick has no history suggestive of acid regurgitation, disturbance of bowel function or urinary symptoms.

Patrick has a past history of ischaemic heart disease, type 2 diabetes, hypertension and mild chronic renal impairment. His usual medications are verapamil 180 mg SR daily, glipizide 5 mg three times a day, ramipril 2.5 mg daily, simvastatin 20 mg daily and aspirin 100 mg daily. He has never smoked and drinks the occasional glass of wine.

You suspected biliary colic as the cause for Patrick's symptoms. You requested blood tests, which were normal, and an upper abdominal ultrasound, which revealed cholelithiasis. However, an incidental 3 cm left-sided renal lesion, which is suspected to be solid, was also identified on ultrasound.

QUESTION 1

What are your differential diagnoses for Patrick's renal lesion?

QUESTION 2

What investigation would you request to determine the nature of this lesion?

FURTHER INFORMATION

You request a dedicated CT of the kidneys with IV contrast, informing the radiology facility of Patrick's most recent renal function results. It reveals a 3 cm solid lesion with features suggestive of a RCC.

QUESTION 3

Is there a role for percutaneous biopsy of Patrick's renal lesion to confirm its malignant nature?

QUESTION 4

Comment on the incidence of RCC in recent years.

QUESTION 5

What is the metastatic potential of a small solid RCC of 3 cm?

QUESTION 6

Is treatment required for all small solid renal masses with features on CT that are highly suggestive of RCC?

QUESTION 7

If surgery is contemplated, should Patrick have a radical nephrectomy (RN) or partial nephrectomy (PN)?

QUESTION 8

If a patient decides to have treatment for a RCC, but is not medically fit for surgery, what other option is available?

CASE 6 ANSWERS

ANSWER 1

Differential diagnoses for Patrick's renal lesion include:

- RCC
- benign oncocytoma
- angiomyolipoma
- complicated renal cyst.

Small renal masses are commonly found incidentally, as in Patrick's case. It has been shown that 20–30% of these lesions prove to be benign on histopathological analysis after surgery.[50,51]

ANSWER 2

The most appropriate investigations to request for a suspected renal lesion are: a dedicated Doppler renal ultrasound (to demonstrate whether the renal lesion is solid or cystic) and dedicated CT of the kidneys (to demonstrate the type of solid lesion).

A dedicated specific fine cut triple or quadruple phase CT of the kidneys, looking for enhancement of the lesion is appropriate. A typical RCC or oncocytoma will demonstrate enhancement (higher Hounsfield numbers on CT) in the early arterial and nephrogram phases of the study compared with pre-contrast images, with washout and reduction of enhancement in the delayed phases. An angiomyolipoma will demonstrate fat within the lesion, which is signified by a negative Hounsfield reading on CT within the lesion.
A cystic lesion, which is complicated such as a cyst with haemorrhage within it, does not enhance at all with similar Hounsfield readings throughout all phases of the study.

ANSWER 3

The role of percutaneous biopsy of small solid renal lesions remains a controversial area within urologic oncology. The ability to differentiate benign from malignant disease ranged from 89–96% in a recent series; however, the inconclusive biopsy results ranged from 3–21%. In addition, coexistent RCC can occur in 10–18% of oncocytomas, adding to the potential inaccuracies of a diagnostic biopsy. Therefore, the use of percutaneous biopsy is limited to selected patients only.[52]

ANSWER 4

There have been significant increases in the diagnoses of small renal masses in recent years due to improving imaging techniques. There has been a 52% increase in incidence between 1983 and 2002, with the largest increases being in tumours <4 cm, which have increased in incidence by 244–285% in that time period. These tumours invariably present incidentally without the classic symptoms of haematuria, flank pain or mass.[53]

ANSWER 5

The risks of metastasis of an RCC directly correlates with tumour size in most studies. A recent study suggested that the risk of metastasis in a

lesion ≤3 cm was 0.2%, with no metastases at all in a lesion <2.5 cm. The risk increased to 1.1% with lesions 3–3.9 cm, and up to 16.5% for lesions >7 cm.[50]

ANSWER 6

Active surveillance, with delayed intervention where indicated, of small solid renal masses with features highly suggestive of RCC on CT is a reasonable option that should be discussed with all patients. This is important in those patients with decreased life expectancies or comorbidities that may place the patient at high risk for intervention. There is, however, a risk of cancer progression (1–2% risk of metastases at 5 years) that needs to be openly discussed with patients and if the lesion grows, the opportunity for nephron sparing surgery may be lost.[51] Nonetheless, a recent systematic review found that the risk of metastatic progression did not differ between patients treated with active surveillance and those treated with excision.[54]

ANSWER 7

RN has always been considered the standard of care until recent years, but remains an over-utilised procedure. There is a strong relationship between RN and the subsequent development of chronic kidney disease (CKD). This is compounded in the elderly with comorbid illnesses such as diabetes and hypertension (as seen in Patrick's case) placing patients at risk of CKD.

For small RCCs, the 10-year cancer specific survival rates remain identical for RN and PN, and local recurrence-free survival rates are also identical at 98–99%. However, studies have shown that overall survival is improved in patients with small RCCs undergoing PN, rather than RN. Presumably, this is by reducing the incidence of CKD. In these studies, estimated glomerular filtration rate was a predictor of overall survival and also a predictor of cardiac specific survival rate. Therefore, current guidelines conclude that PN is preferred to maximise patient survival and quality of life.[55] In any individual patient, the advantages of PN need to be weighed against the slightly increased complication rate of the more complex procedure of PN.[56]

ANSWER 8

If a patient decided to have treatment, but is not medically fit for surgery, CT guided percutaneous radio-frequency ablation (RFA) is a technique that can be utilised. It involves placing a percutaneous probe within the lesion under CT guidance and delivering thermal energy to destroy the lesion. The treatment is available at many centres throughout Australia, but studies to date have very short follow-up periods following treatment with RFA, making prediction of long-term prognosis difficult. Studies have shown a local recurrence free survival rate of 87% at 2 years follow-up, which is inferior to surgical excision. While recurrences following RFA may be salvaged by repeat ablation, when this is not possible, surgical salvage can be challenging and PN is often not possible. Nonetheless, it can be a valuable option for those patients at very high risk for surgical intervention.[54]

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RESOURCES FOR DOCTORS

- Andrology Australia is available at www.andrologyaustralia.org and provides clinical summary guides for health professionals on a range of topics such as engaging men in primary care settings, prostate disease and erectile dysfunction.
- Prostate Cancer Foundation of Australia provides information for GPs including a podcast explaining grading and staging of prostate cancer to patients. It is available at www.prostate.org.au.
- Continence Foundation of Australia is available at www.continence.org.au. It provides a directory of continence service providers, continence product suppliers and continence product manufacturers.
- Urological Society of Australia and New Zealand is a professional body for urological surgeons in Australia and New Zealand and is available at www.usanz.org.au. It provides lists of urological surgeons in each state or territory of Australia.

RESOURCES FOR PATIENTS

- Urological Society of Australia and New Zealand is available at www.usanz.org.au and provides facts sheets for patients on conditions such as benign prostatic hypertrophy and urinary incontinence. It also has links to other organisations.
- American Urological Association Foundation has information for patients on a wide range of urological topics available at www.urologyhealth.org including information on benign prostatic hypertrophy, overactive bladder, urinary stones, bladder and kidney cancer, and erectile dysfunction.
- Andrology Australia is available at www.andrologyaustralia.org. It provides fact sheets for patients on male reproductive health and on a variety of conditions such as prostatic enlargement and prostate cancer. Patient booklets on conditions such as erectile dysfunction are also available.
- Cancer Council Victoria provides information and patient support. Its website, which is available at www.cancervic.org.au, has an overview of cancer treatments as well as information on various cancers including bladder cancer. Cancer Council Victoria also runs a helpline for those affected by cancer. The Cancer Council helpline telephone number is 13 11 20.
- Prostate Cancer Foundation of Australia provides information for patients on prostate cancer including its diagnosis and treatment as well as information on support groups. It is available at www.prostate.org.au.
- Australian Prostate Cancer Collaboration provides information on prostate cancer including diagnosis and treatment. It is available at www.prostatehealth.org.au.
- Continence Foundation of Australia is available at www.continence.org.au. It provides information on pelvic floor exercises, a link to physiotherapists who promote pelvic floor training and practical tips on living with incontinence. It provides a national public toilet map and directory of continence service providers, continence product suppliers and continence product manufacturers. It also operates the National Continence Helpline, – telephone: 1800 33 00 66.

Urology

In order to qualify for 6 Category 2 points for the QI&CPD activity associated with this unit:

- read and complete the unit of *check* in hard copy or online at the *gplearning* website at www.gplearning.com.au, and
- log onto the *gplearning* website at www.gplearning.com.au and answer the following 10 multiple choice questions (MCQs) online, and
- complete the online evaluation.

If you are not an RACGP member, please contact the *gplearning* helpdesk on 1800 284 789 to register in the first instance. You will be provided with a username and password that will enable you access to the test.

The expected time to complete this activity is 3 hours.

Do not send answers to the MCQs into the *check* office. This activity can only be completed online at www.gplearning.com.au.

If you have any queries or technical issues accessing the test online, please contact the *gplearning* helpdesk on 1800 284 789.

FOR A FULL LIST OF ABBREVIATIONS AND ACRONYMS USED IN THESE QUESTIONS PLEASE GO TO PAGE 3

QUESTION 1

Ray, aged 55 years, presents with urinary frequency and urgency, which is affecting his quality of life. DRE reveals a benign-feeling, moderately enlarged prostate. His urinalysis is normal, his PSA is 2.2 and UEC are normal. A urinary tract ultrasound reveals minimal residual volume following micturition.
You consider that his symptoms are likely to be due to BPH. Which of the following is true regarding the various medication options for Ray?

A. Alpha blockers stop the progression of BPH.
B. 5 alpha reductase inhibitors have a rapid onset of action (days).
C. 5 alpha reductase inhibitors do not tend to cause side effects of sexual dysfunction.
D. A combined alpha blocker/5 alpha reductase inhibitor reduces the PSA level without changing the prostate cancer risk.
E. Anticholinergics should not be used as an adjunct to alpha blockers.

QUESTION 2

Ray is very reluctant to take medication long-term and asks you about surgical options for treatment of benign prostatic hypertrophy. Which of the following treatments is considered 'gold standard' surgical treatment for benign prostatic hypertrophy?

A. Bladder neck incision
B. Laser prostatectomy
C. Transurethral resection of the prostate
D. Transurethral needle ablation
E. Transurethral microwave thermotherapy.

QUESTION 3

Tusharti, aged 38 years, presents to you with a 12-month history of urinary urgency, urinary frequency and nocturia. After appropriate clinical assessment and investigations you decide that it is most likely that she has an overactive bladder. You inform her that the most common cause of an overactive bladder is:

A. previous obstructed labours
B. a pelvic tumour
C. side effects of medication
D. detrusor overactivity
E. anxiety.

QUESTION 4

Which of the following BEST describes the three important elements in the appropriate initial management of Tusharti's overactive bladder?

A. Fluid management, frequent voiding and pelvic floor physiotherapy
B. Increased fluid intake, frequent voiding and pelvic floor physiotherapy
C. Fluid management, bladder training and pelvic floor physiotherapy
D. Increased fluid intake, frequent voiding and bladder surgery
E. Bladder training, pelvic floor physiotherapy and bladder surgery.

QUESTION 5

Uzochi, aged 68 years, presents to you after having had a single episode of painless haematuria. The haematuria occurred throughout the urinary stream. His examination is normal apart from a mildly enlarged benign-feeling prostate. Blood tests including PSA and UEC are normal, MSU confirms haematuria and red blood cell morphology suggests that the blood is of non-glomerular origin. One of three cytology results reveals abnormal cells. A triphasic CT urogram reveals no abnormality. What would your management be?

A. Reassure Uzochi that no further action is needed.
B. Repeat his MSU and urinary cytology (three specimens) in three months time.
C. Request an ultrasound of his kidneys, ureters and bladder.
D. Request an MRI.
E. Refer him to a urologist for a cystoscopy.

QUESTION 6

Nathan, aged 36 years, presented with right ureteric colic and subsequently passed a urinary stone. A CT scan revealed an incidental 8 mm stone in the left renal pelvis. Which is the most appropriate treatment option for this stone out of the following options?

A. Observation alone
B. Pyeloscopy and laser
C. Percutaneous nephrolithotomy
D. Open stone surgery
E. Radiofrequency ablation.

QUESTION 7

Elek, aged 54 years, has formed calcium oxalate stones recurrently. He asks you what he should do to prevent further stone formation. Which of the following has been proven to reduce the risk of further stone formation?

A. Reducing dietary calcium intake
B. Reducing intake of citrus juice
C. Increasing dietary salt intake
D. Increasing dietary oxalate consumption
E. Increasing fluid intake.

QUESTION 8

David, aged 58 years, presents to you with a history consistent with erectile dysfunction. He still has some morning and nocturnal erections, but they have reduced in frequency and intensity. Erectile dysfunction may be an early indicator of disease. Which of the following test(s) is/are relevant in assessing the risk of this disease in David?

A. PSA
B. Testosterone level and luteinising hormone
C. Fasting glucose level and serum lipids
D. Thyroid function tests
E. FBE.

QUESTION 9

After obtaining further history, examining David and requesting appropriate investigations, you discuss the various treatment options available. David says that he would like to try a PDE5 inhibitor. Which of the following is true of the PDE5 inhibitors?

A. They are not likely to be effective in those who cannot satisfactorily complete sexual intercourse, even if they still have some morning and nocturnal erections.
B. They can cause spontaneous erections in the absence of sexual stimulation.
C. They can all be taken with food without delaying their onset of action.
D. They can cause side effects that usually lessen after several weeks of use.
E. Failure to respond to one PDE5 inhibitor precludes success with a different PDE5 inhibitor.

QUESTION 10

You are giving a presentation to other GPs in your practice about RCCs. Which of the following is NOT true regarding treatment of small (<3 cm) RCCs?

A. The same rates of metastatic progression are observed with active surveillance and surgical excision.
B. Cancer specific survival rates for radical and partial nephrectomy are the approximately the same.
C. Local recurrence free survival rates for radical and partial nephrectomy are approximately the same.
D. Overall survival rates for partial nephrectomy and total radial nephrectomy are approximately the same.
E. Local recurrence free survival rates for radiofrequency ablation and surgical excision are approximately the same.