Independent learning program for GPs

Unit 536 March 2017

Chronic conditions

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The Royal Australian College of General Practitioners
100 Wellington Parade
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Telephone 03 8699 0414
Facsimile 03 8699 0400
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Chronic conditions

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About this activity

Acronyms

Case 1  Molly has Alzheimer’s disease

Case 2  Caterina needs repeat scripts

Case 3  John returns from Thailand

Case 4  April is planning a pregnancy

Case 5  Barbara has knee pain

Case 6  Fred has shortness of breath

Multiple choice questions

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
A considerable portion of the healthcare expenditure and workload of general practitioners (GPs) is on the diagnosis and management of chronic conditions. It is estimated that GPs managed 21.1 million more chronic conditions in 2015–16 than in 2006–07. In 2015, one in 10 Australians aged over 65 years and three in 10 aged 85 years and older had dementia. Chronic kidney disease affects approximately 1.7 million adult Australians, with those living in remote areas three times more likely to be affected. An estimated 25,000 Australians are currently living with human immunodeficiency virus (HIV). An estimated 10–15% of all cases of diabetes in Australia are type 1, and the onset of this condition commonly occurs in those under 30 years of age. Osteoarthritis is the most common form of arthritis, with an estimated 1.8 million Australians having this condition. Chronic heart failure affects approximately 1.7 million Australians and more than 30,000 new cases are diagnosed each year.

This edition of check considers the management of various chronic conditions in general practice.

LEARNING OUTCOMES
At the end of this activity, participants will be able to:
- outline the assessment and management of behavioural and psychological symptoms of dementia
- identify and manage the different stages of chronic kidney disease
- discuss the diagnosis of human immunodeficiency virus infection
- list the steps in investigating and managing type 1 diabetes
- describe the clinical signs and symptoms of osteoarthritis
- summarise the diagnosis and management of heart failure.

AUTHORS
Ralph Audehm (Case 6) MBBS, DipRACOG is a general practitioner who has worked for more than 25 years in general practice and is experienced in managing all types of patients. Assoc Prof Audehm graduated from the University of Melbourne in 1984 and obtained a diploma from The Royal Australian College of Obstetricians and Gynaecologists (RANZCOG) in 1987. He gained a Graduate Certificate in Clinical Research in 2005, was made an Honorary Research Fellow at the University of Melbourne and became an Honorary Clinical Associate Professor in 2014. Assoc Prof Audehm has had a longstanding interest in the management of chronic conditions in general practice, and has instigated and supported many initiatives to systematically improve health outcomes for people with diabetes and heart disease. He also has close links to the Department of General Practice, University of Melbourne, and participates in research and teaching of medical students, general practice registrars and general practitioners.

Kate Fawcett MBBS, AMC, FRACGP, MRCGP, DRCOG currently practices in Brisbane. Her general practice experience has included providing care for recently arrived refugees. Dr Fawcett is a general practitioner representative on the Kidney Health Australia Primary Care Education Advisory Committee. She was a contributor to the third edition of the Chronic Kidney Disease in General Practice Management Handbook. Dr Fawcett has also been involved in small group teaching and practice placements for MBBS students studying at The University of Queensland. Currently she is an assistant medical educator with GP Training Queensland.

Miriam Grotowski (Case 3) BMed, FRACGP DipPsychiatry (ED), is an S100 prescriber and principal general practitioner at Smith Street Practice, Tamworth, NSW, and a senior lecturer in medicine at the University of Newcastle. Dr Grotowski has a special interest in sexual health, including HIV, and is a member of NSW STIPU (STI Programs Unit) GP advisory committee, which helped develop this case study.

Madeleine Healy (Case 1) MBBS (Hons), FRACP, is a geriatrician and general physician at Monash Health in Melbourne, Victoria. Dr Healy has an interest in the management of behavioural and psychological symptoms of dementia, working in the psychogeriatric residential care facilities at Monash Health. She also works for the Severe Behavioural Response Team (SBRT), which is run through the Dementia Behaviour Management Advisory Service (DBMAS).

David Hunter (Case 5) MBBS, PhD, FRACP, is a rheumatology clinician researcher whose main research focus is clinical and translational research in osteoarthritis. He is the Florance and Cope Chair of Rheumatology and Professor of Medicine at the University of Sydney, Chair of the Institute of Bone and Joint Research and Staff Specialist at Royal North Shore Hospital and North Sydney Orthopaedic and Sports Medicine Centre.

Julie Lustig (Case 4) MBBS, FRACP, is a geriatrician at Monash Health in Melbourne, Victoria. She is the deputy director of Rehabilitation and Aged Care Services, and has extensive experience in both community and hospital-based geriatric medicine. Dr Lustig has a special interest in the prevention and management of delirium in acute and subacute hospitals and is clinical lead for the Monash Health Delirium and Dementia Strategy. She is a committee member of the Australasian Delirium Association.

Anthony James Pease (Case 4) MBBS (Hons), is an advanced trainee in endocrinology who is currently working at Monash Health in Melbourne, Victoria. Dr Pease has a special interest in type 1 diabetes mellitus and the use of novel technologies for the management of diabetes.

Shirley Yu (Case 5) MBBS, MPH, FRACP is a rheumatology physician at Royal North Shore Hospital and a clinical lecturer for the University of Sydney. In addition to general rheumatology, her interest is in osteoarthritis. Dr Yu consults as a member of the team managing the Osteoarthritis Chronic Care Program at Royal North Shore Hospital. She is also a consultant at North Sydney Orthopaedic and Sports Medicine Centre and BJC Health.

Sophia Zoungas (Case 4) MBBS, PhD, FRACP is an academic endocrinologist with a national and international reputation as a leading clinician and researcher in the field of diabetes. Prof Zoungas is Professorial Chair of Diabetes, Vascular Health and Ageing at the School of Public Health and Preventive Medicine, Monash University; a National Health and Medical Research Council (NHMRC) Senior Research Fellow; and current President of the Australian Diabetes Society. She is a senior staff specialist in endocrinology and diabetes at Monash Health in Melbourne, Victoria where she provides inpatient and outpatient care. Prof Zoungas’s research focus is on the generation and implementation of the best evidence for the prevention, screening and management of diabetes and vascular diseases, and the impact of these on the ageing population.
**PEER REVIEWERS**

Vicki Kotsirilos AM, MBBS, FRACGP, FACNEM, is a respected general practitioner with more than 30 years of clinical experience. In 2016, she received a Queen’s Birthday Honours Award (AM) for integrative medicine, health practitioner standards and regulation, medical education and the environment. In 2007, Assoc Prof Kotsirilos was awarded the General Practice Excellence Award by Australian General Practice Accreditation Limited (AGPAL); in 2013, she received an Honorary Fellowship Award from the RACGP. She has an interest in preventive medicine and lifestyle health advice. Assoc Prof Kotsirilos is a regular writer for Medical Observer, publishing a monthly column on integrative perspectives and keeps up to date with research on non-drug therapies. She is an adjunct Associate Professor with the School of Public Health at Monash University and an Associate Professor with the Department of Rehabilitation, Nutrition and Sports of the Faculty of Health Sciences at La Trobe University. Assoc Prof Kotsirilos has served on a number of state and federal Government committees, such as the Therapeutic Goods Administration.

Ian Williams MBBS, FRACGP, is the principal general practitioner at Camp Hill Healthcare in Brisbane, Queensland.

**REFERENCES**


CASE 1

MOLLY HAS ALZHEIMER’S DISEASE

Molly, 87 years of age, has been living in a residential aged care facility (RACF) for the past eight months. She has Alzheimer’s disease.

Since Molly’s admission to the RACF, she has frequently been agitated and distressed, particularly in the late afternoon. She repeatedly tells staff that some of her belongings have been stolen and wants to speak with her daughter. She often walks along the corridors and enters other residents’ rooms. Molly can become physically aggressive with staff when they try to redirect her to her own room. The staff at the RACF also report that she is becoming resistant to assistance with personal care and is incontinent of urine at times. Molly sleeps poorly and wanders out of her room at night. She has a PRN order for temazepam, which the staff have been giving her regularly of late.

You have been requested to see her to manage her behavioural and psychological symptoms of dementia (BPSD); specifically, her agitation in the afternoon, which is distressing to her and other residents. Staff are also very concerned about her risk of falls, and have asked whether a lap-belt restraint would be appropriate to reduce the risk of injury.

QUESTION 1
What initial assessment, history and investigations would be appropriate?

Past history
Her past medical history includes ischaemic heart disease, congestive cardiac failure, hypercholesterolaemia, osteoarthritis, osteoporosis, fractured left humerus, depression and anxiety.

Medications
Her medications include:
• aspirin: 100 g daily
• frusemide: 40 mg daily
• atorvastatin: 40 mg daily
• calcium carbonate: 600 mg tablet daily
• cholecalciferol: 1 tablet daily
• amitryptiline: 20 mg nocte
• perindopril: 2.5 mg daily
• temazepam: 10 mg nocte/prn.

QUESTION 2
What non-pharmacological approaches could be trialled?

QUESTION 3
What other approaches could be trialled?

FURTHER INFORMATION
Molly weighs 50 kg and walks with a four-wheel frame. She has had three falls since her admission to the RACF, including a fractured left humerus six months ago. She is widow, her husband having passed away shortly before her move into residential care. Molly has two children, a son living interstate and a daughter who lives locally and regularly visits in the mornings. Molly’s daughter has young children and is rarely able to visit later in the day. However, when family are present or speak to Molly by phone, she appears more settled. Other than family, Molly has no other visitors.
QUESTION 4
When should a patient with BPSD be referred to a specialist service? What services are available?

QUESTION 5
What are the recommendations for management of depression/anxiety in advanced dementia?

QUESTION 6
What are some factors that could be causing falls? How can falls, and the risk of injury from falls, be reduced in patients living in residential care?

QUESTION 7
What restraints are recommended for falls reduction?
### CASE 1 ANSWERS

**ANSWER 1**  
A standard comprehensive assessment should be done, including past medical history, medications and usual function. It is important to know whether there has been a formal diagnosis of dementia and, if so, when this was made. Social history and knowledge of the patient are obviously important and may help understand the person’s reaction to their surroundings and events. It is important to consider the following:

- What are the behaviours of concern?
- How often do they happen?
- What is the trigger?
- Is there a time of day when it is happening?
- Is the patient actually distressed by the behaviour, or causing harm to themselves, other residents or staff?
  - Some behaviours, such as vocalising, may be frustrating for staff but not necessarily causing a problem for the patient. However, other residents may find the behaviour problematic.
- When the patient has ‘a good day’, what is different?

It is important to recognise and exclude contributing factors such as pain, depression/anxiety, constipation or urinary retention (also noted on physical examination), unrecognised infection, or environmental factors such as noise.

Pathology testing, including a full blood count, renal function, liver function and inflammatory markers can be helpful in looking for a contributing cause, and a urine dipstick or a midstream specimen of urine can also be helpful.

**ANSWER 2**  
There is mixed evidence for behavioural strategies in BPSD; however, some studies have shown reductions in agitation, aggression and wandering with these strategies, and they are helpful on a case-by-case basis. RACFs usually have an activities program that can be tailored to the individual patient.

Families often ask how they can help a family member and can help provide some of these interventions:

- activities – Montessori-based. This approach uses activities, social, activities of daily living and sensory activities that are meaningful to the individual. This approach is based on the Montessori approach to education
- music therapy
- massage/touch therapies
- carer interventions
- aromatherapy – evidence is equivocal
- pet therapy
- doll therapy
- reminiscence activities
- day/night differentiation

- exercise programs may improve the function of people with dementia, but have little impact on neuropsychiatric outcomes.

**ANSWER 3**  
**Pain management**  
Pain is under-recognised in people living with dementia and can contribute to BPSD. It can be difficult to diagnose and sometimes a trial of paracetamol can be helpful, with stepwise analgesia if the patient shows some response.

As pain can be difficult to recognise clinically, standardised pain scales can be helpful and include the Abbey Pain Scale (commonly used in residential care), Pain Assessment in Advanced Dementia Scale (PAINAD), Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC).

**Other pharmacological treatment**  
The National Institute for Health and Clinical Excellence (NICE) guidelines state that patients with BPSD should not receive pharmacological treatment unless they are severely distressed or pose risks to others. The principles of using psychotropic medication in the management of BPSD are as follows:

- Oral medication should be used in preference to parenteral medication.
- Use low doses, titrate slowly and monitor for side effects.

**Antidepressants**  
Depression and anxiety can be difficult to diagnose in patients with dementia. If suspected, it is reasonable to trial treatment, although, evidence in advanced dementia is mixed. Antidepressants can also be of benefit even if there is no clear depression or anxiety. A 2011 Cochrane review found that sertraline and citalopram were associated with decreased agitation and psychosis.

There may also be benefit of treatment in patients with frontotemporal dementia.

**Melatonin**  
Melatonin is commonly used for sleep disturbance; however, a recent meta-analysis failed to show benefit. It is not listed on the Pharmaceutical Benefits Scheme (PBS), but is often tried as it has a low risk of side effects when compared with placebo (nausea, headache, confusion). The Therapeutic Goods Administration (TGA) recommends treatment for no more than three weeks because of a lack of clinical benefit beyond that time. Usual dosing is 2 mg a night.

**Antipsychotics**  
People with severe BPSD causing distress to the patient (eg severe agitation/aggression, psychosis) may have symptomatic benefit from a small dose of antipsychotic medication. Risperidone and olanzapine have the strongest evidence. The evidence for quetiapine is unclear but is often used for patients with Parkinson’s disease or dementia with Lewy bodies (DLB) as it has the least anti-dopaminergic effects of the antipsychotic medications.

Fifty per cent of patients with DLB will have sensitivity to antipsychotics. If unavoidable, low doses of atypical antipsychotics should be trialled.
(eg quetiapine 12.5 mg) but ceased immediately if side effects occur (eg excess sedation, worsening confusion).9

Side effects of antipsychotics include increased morbidity, stroke, myocardial infarction, sedation, falls, prolonged QT interval and postural hypotension.

The principle of dosage is ‘start low and go slow’. Target dose approximately an hour before agitation begins. In Molly’s case, for example, if she became distressed and agitated at around 4.00 pm, it would be reasonable to trial risperidone 0.25 mg at 3.00 pm.

Treatment should be regularly reviewed and withdrawn, if possible, with monitoring for worsening of symptoms. If no benefit has been demonstrated, the medication should be ceased.

Other medications

There is no evidence for the use of benzodiazepines in the management of BPSD. They may also be contributing to falls in Molly’s case.

Initiation of cholinesterase inhibitors, if considered, will require specialist consultation. Although not a PBS-listed indication, cholinesterase inhibitors have some evidence for use in BPSD.9 Three cholinesterase inhibitors, donepezil, galantamine and rivastigmine, have some benefit in reducing agitation in patients with advanced Alzheimer’s disease.10 Patients with DLB may have a more beneficial response although evidence is weak, and the Australian clinical practice guideline and Principles of care for people with dementia recommend specialist review prior to trialling cholinesterase inhibitors in patients with DLB.9

At this stage systematic reviews do not show benefit from memantine. There is limited evidence for the following interventions, but they may warrant consideration:

• multi-targeted interdisciplinary approach (eg staff training, environmental modifications, balance/strength training, medication review)
• hip protectors
• vitamin D supplementation
• exercise
• multi-faceted podiatry program
• cataract surgery
• correction of postural hypotension.

There is limited evidence for the following interventions, but they may warrant consideration:

• Tai chi
  – beneficial in community but has not been found to be statistically significant in RACF
• medication review
  – limited evidence but is important in multifactorial falls prevention
• footwear
• bed/chair alarms.

There is no evidence that restraints reduce falls and, in fact, can be harmful (this includes bed rails).

ANSWER 6

Potential factors that could be causing Molly to fall include medications such as benzodiazepines and tricyclic antidepressants, which could contribute through sedation and their anticholinergic effects such as worsening confusion and postural hypotension. Antihypertensives and diuretics can also cause postural hypotension. Molly’s age and cognitive impairment are also risk factors. Chronic pain may also contribute to falls.14

Falls screening and risk identification are important. There is mixed evidence for whether falls reduction strategies in RACFs are effective; however, a recent meta-analysis found that fall prevention interventions significantly reduced the number of recurrent falls.15

The interventions with the most evidence include:

• multi-targeted interdisciplinary approach (eg staff training, environmental modifications, balance/strength training, medication review)
• hip protectors
• vitamin D supplementation
• exercise
• multi-faceted podiatry program
• cataract surgery
• correction of postural hypotension.

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• footwear
• bed/chair alarms.

There is no evidence that restraints reduce falls and, in fact, can be harmful (this includes bed rails).

ANSWER 7

The Australian and New Zealand Society for Geriatric Medicine position statement states that restraints should not be used outside of an emergency situation to protect patients or staff.16

Common reasons cited for applying restraints include reduction of falls risk, prevention of interference with medical treatment17 and prevention of injury to the patient or staff.18 However, restraints do not prevent falls; on the contrary, they can increase injury during falls19 and cause considerable distress to the patient.

Restraints include lap-belts and even elevated cot sides.

Alarm pads and devices can be useful, but do not replace close observation.

REFERENCES

CASE 2

CATERINA NEEDS REPEAT SCRIPTS

Caterina, 78 years of age, was a regular patient of a doctor who has left the practice. She comes to see you for the first time, for scripts to be renewed. You look through her notes and find two sets of pathology results over the past six months that have similar results (Table 1).

You also note that a renal ultrasound and abdominal computed tomography (CT) scan, taken 10 years apart, showed bilateral renal cortical thinning and multiple renal cysts with no hydronephrosis.

Caterina’s renal problems have been ascribed to her use of ‘Bex powders’ (phenacetin, aspirin and caffeine) years ago.

QUESTION 1

How would you define Caterina’s renal failure? What resources are available to assist you in determining this?

Table 1. Caterina’s pathology results

<table>
<thead>
<tr>
<th></th>
<th>Caterina’s result</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated glomerular</td>
<td>18 mL/min/1.73 m²</td>
<td>&gt;59 mL/min/1.73 m²</td>
</tr>
<tr>
<td>filtration rate CKD-EPI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>formula</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creatinine</td>
<td>217 µmol/L</td>
<td>45–95 µmol/L</td>
</tr>
<tr>
<td>Urea</td>
<td>16.3 mmol/L</td>
<td>3.5–10 mmol/L</td>
</tr>
<tr>
<td>Random glucose</td>
<td>5.0–6.5 mmol/L</td>
<td>3.6–7.7 mmol/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>5.4 mmol/L</td>
<td>3.5–5.5 mmol/L</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>19 mmol/L</td>
<td>20–32 mmol/L</td>
</tr>
<tr>
<td>Calcium (corrected for</td>
<td>2.55 mmol/L</td>
<td>2.15–2.60 mmol/L</td>
</tr>
<tr>
<td>albumin)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphate</td>
<td>0.9 mmol/L</td>
<td>0.8–1.5 mmol/L</td>
</tr>
<tr>
<td>Urine albumin-to-</td>
<td>48.6 mg/mol</td>
<td>0.0–3.5 mg/mol</td>
</tr>
<tr>
<td>creatinine ratio*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>120 g/L</td>
<td>110–160 g/L</td>
</tr>
</tbody>
</table>

*On two previous occasions UACR was also >35 g/mol

You explain to Caterina that some specialist guidance would help you manage her optimally and you refer her to the nearest public renal clinic. Her name is placed on a waiting list.

QUESTION 2

What are important clinical management considerations for Caterina? Where will you find appropriate guidance on the management of chronic kidney disease (CKD)?
QUESTION 3

While Caterina is waiting to see a specialist at the renal clinic, what important psychosocial aspects of care would you and/or your extended primary care team address?

FURTHER INFORMATION

Caterina returns to see you three weeks later to complete the health assessment. She complains of a sore, swollen left lower leg.

She had a deep venous thrombosis (DVT) five years ago, remembers injecting the medication herself and knows about the risk of ‘a clot on the lung’. However, she is not keen to go to hospital as there is no one to look after her cats.

After examining Caterina, you arrange a Doppler ultrasound, which shows an acute DVT from the femoral vein, involving the popliteal vein and extending into tibialis posterior and peroneal veins in Caterina’s left leg. There is also evidence of a chronic DVT within the femoral vein and profunda femoris vein. There is no Baker’s cyst.

QUESTION 4

How would you initiate treatment for the DVT? Where can you access information to guide you?

FURTHER INFORMATION

Caterina sees you again some weeks later, complaining of frequent micturition and dysuria. She has no fever and is not acutely distressed.

A dipstick test is positive for blood nitrites, leucocytes and, as would be expected, protein.

Presuming that she has a urinary tract infection (UTI), you order a midstream specimen of urine test and initiate treatment.

QUESTION 5

What therapeutic considerations are there when choosing an antibiotic? What are some reliable sources of prescribing information to guide you?

FURTHER INFORMATION

Caterina has been seen in the outpatient department and you have received their letter. She attends asking about her medications as these were changed. She seems confused. Her blood pressure is 200/110 mmHg, heart rate is 80 beats per minute, and temperature is 36.2°C. She mentions a vague pain in her upper back. On examination, there are no obvious new physical findings. A dipstick urine test is positive for protein only.

Your receptionist puts through a call from the local pharmacy. They describe Caterina’s rather odd behavior while she was in the pharmacy half an hour ago. You decide to arrange emergency department assessment for Caterina.

QUESTION 6

What are possible causes for Caterina’s confusion?
**CASE 2 ANSWERS**

**ANSWER 1**
Caterina’s estimated glomerular filtration rate (eGFR) and urinary albumin-to-creatinine ratio (UACR) indicate that she has stage 4 CKD with macroalbuminuria, presumed secondary to analgesic nephropathy.

Resources available include the *Chronic kidney disease management in general practice* handbook, 3rd edition. In particular, refer to page 19 of the handbook.

**ANSWER 2**
According to Kidney Health Australia’s *Chronic kidney disease management in general practice* handbook, Caterina’s management should follow the ‘Red clinical action plan’.

The app, CKD-GO, for mobile devices also indicates the ‘Red clinical action plan’.

Implementing the ‘Red clinical action plan’ includes some strategies that may be unfamiliar to some general practitioners (GPs). Management issues include:

**Blood pressure control** (page 39 in *Chronic kidney disease management in general practice* handbook)
Target blood pressure for stage 4 chronic renal failure with macroalbuminuria is ≤130/80 mmHg.

A pragmatic approach should be taken to minimise the risk of postural hypotension in the elderly.

**Acidosis** (page 35 in *Chronic kidney disease management in general practice* handbook)
One must consider whether a bicarbonate level of 19 mmol/L (normal range 20–32 mmol/L) justifies the risk of sodium overload that might be incurred by prescribing sodium bicarbonate.

**Lipids** (page 41 in *Chronic kidney disease management in general practice* handbook)
Note that advice regarding prescribing lipid-lowering medication may not concur with the current Pharmaceutical Benefits Scheme (PBS) guidelines.

**Bone health – calcium and phosphate metabolism** (pages 41 and 42 in *Chronic kidney disease management in general practice* handbook)
Caterina’s calcium and phosphate levels are currently just within the normal range. She should continue to take calcium and D3 supplements that the endocrinologist had recommended. You should also arrange to check ionised calcium and parathormone levels.

It is important to monitor calcium levels as denosumab may cause hypocalcaemia.

**Immunisations**
Ensure that immunisations are up to date, including tetanus, as Caterina has several cats.

**Lifestyle measures** (pages 23 and 37 in *Chronic kidney disease management in general practice* handbook)
Caterina should be encouraged to consider dietary choices that promote good health. This could include avoiding salty foods and not adding salt to her meals. Quality of life is important and it is not necessary for Caterina to adopt a stringent diet, particularly as her potassium level is within the normal range.

**ANSWER 3**
The following points should be considered:

- Assess capacity, for example, with a mini mental state examination, and ask if Caterina has appointed an enduring power of attorney.
- Try to arrange for Caterina to attend her appointment with a trusted family member so that you can explain important aspects of her care.
- Arrange for a health assessment with particular attention to falls risk and discussion of an advanced healthcare directive.
- Consider referral to an aged care assessment team (or similar organisation).

**ANSWER 4**
If your patient seems competent to self-administer and there is ready access to international normalised ratio (INR) testing, treatment in the community may be considered.

Novel oral anticoagulants are contraindicated in patients with CKD with eGFR <30 mL/min. Pharmacological treatment for a DVT when eGFR is <30 mL/min comprises low molecular weight heparin (enoxaparin, 1 mg/kg, subcutaneously, per 24 hours) for five days. Commence warfarin at low dose, within 72 hours to achieve an INR of 2–3 for two consecutive days prior to cessation of enoxaprin. It is important to closely monitor the INR.

**ANSWER 5**
Examples of antibiotic dose adjustments and dosing advice for patients with CKD are shown in Table 2.

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>GFR (mL/min)</th>
<th>Dose adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxycillin + clavulanate</td>
<td>&gt;30</td>
<td>Normal dosing: 875 + 125 mg orally, 12-hourly for 10–14 days</td>
</tr>
<tr>
<td></td>
<td>&lt;30</td>
<td>500 +125 mg 12-hourly</td>
</tr>
<tr>
<td>Cephalexin</td>
<td>&gt;10</td>
<td>Normal dosing: 500 mg orally, six-hourly for 10–14 days</td>
</tr>
<tr>
<td></td>
<td>&lt;10</td>
<td>500 mg 8–12-hourly</td>
</tr>
<tr>
<td>Trimethoprim</td>
<td>&gt;30</td>
<td>Normal dosing: 300 mg orally, daily for 10–14 days</td>
</tr>
<tr>
<td></td>
<td>15–30</td>
<td>Normal dosing: monitor full blood count</td>
</tr>
<tr>
<td></td>
<td>&lt;15</td>
<td>Avoid if possible; if essential, up to 150 mg 24-hourly; monitor full blood count</td>
</tr>
</tbody>
</table>

Resources that are helpful in guiding treatment include GP prescribing software such as MIMMS and the Therapeutic Guidelines (refer to ‘Resources for doctors’).
CASE 2

ANSWER 6
Possible causes of Caterina’s confusion include:
• A further UTI
• Subdural haematoma
• Anaemia secondary either to renal failure or from gastrointestinal (GI) blood loss
• Cerebrovascular accident
• Change in calcium levels
  – hypocalcaemia secondary to either denosumab or worsening renal function
  – hypercalcaemia due to calcium and vitamin D supplements
• Worsening renal function leading to uraemic encephalopathy.

CONCLUSION
During the subsequent hospital admission, a further UTI was detected and treated. Imaging revealed a new finding of unilateral hydronephrosis with no obvious cause except a possible pelvi-ureteric junction stricture. A CT head scan showed some widening of sulci and no subdural bleed. Full blood evaluation, electrolytes and liver function tests were similar to results from one month ago, with no acute changes in electrolytes. A cystoscopy was performed and ureteric stent inserted to manage the hydronephrosis.

On follow-up after this procedure Caterina’s blood pressure was 120/80 mmHg on her usual medications.

RESOURCES FOR DOCTORS
• https://tgldcp.tg.org.au

REFERENCES
CASE 3

JOHN RETURNS FROM THAILAND

You are a rural general practitioner (GP) and have worked for 25 years in the same town. John, a businessman aged 36 years, has been your patient since he was a child and his family is well known to you. He is married and has two children, aged eight and six years. He presents for a routine visit.

John went to Thailand eight weeks ago. That was his first trip there, but he did not have time for vaccinations before travelling. He has a business venture that might require several more trips to Thailand and he wants to check if vaccines are still recommended.

QUESTION 1

What questions would you ask John?

FURTHER INFORMATION

John’s records show that he has had the diphtheria/tetanus/pertussis (Boostrix) vaccination and two hepatitis A vaccinations in the past six years. He thinks he might have had a hepatitis B vaccination when he played football at high school, but he is not sure. John cannot remember ever having had a typhoid vaccination.

John is generally well, takes no prescription, over-the-counter (OTC) or complementary medicines, and has no known allergies to any drugs.

You advise John that he should have a typhoid vaccination and a blood test to establish his hepatitis B immunisation status. After explaining this process and giving John the pathology forms, you see he is not keen to leave. You ask if there is anything else you can do for him. He seems hesitant, but decides to discuss his recent trip in more detail. John mentions a casual sexual contact he had in Thailand. He told a friend about it and fears he may be at risk of a sexually transmissible infection (STI). His friend suggested that he talk to you about it.

QUESTION 2

How will you proceed? What further information would you like to know about this contact? How will you ask this?

FURTHER INFORMATION

John reveals he had one episode of unprotected vaginal sex with a local Thai woman he met in a bar eight weeks ago. He has no symptoms and he feels well, but has heard he may have been at risk of STIs. He has had unprotected sex with his wife since returning from his trip, most recently one week ago.

QUESTION 3

How would you proceed now? What STIs do you need to consider?

QUESTION 4

What tests will you offer John? What is involved in ordering those tests?
John is shocked at the number of tests ordered. He reveals he had a negative human immunodeficiency virus (HIV) test result in the past year when he increased his life insurance premium.

You arrange a follow-up visit one week later for results and to ensure you discuss safe sex and vaccinations as required.

John’s test results show:
- HIV: Positive on immunoassay and western blot
- Hepatitis B antigen (HBsAg): Negative for anti Hbc (hepatitis B core), positive for anti-HBs (confirms previous vaccination)
- Syphilis: Non-reactive
- Chlamydia and gonorrhoea: Negative.

**QUESTION 5**
What are your next steps?

**QUESTION 7**
What about John’s contacts?

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The town where John lives is 50 km from a regional sexual health clinic. This has a visiting sexual health physician once a month. You ring the clinic prior to John’s appointment to check their availability in the next few weeks. The staff are helpful and direct you to some online resources that you can offer John, as someone newly diagnosed with HIV (refer to ‘Resources for patients and doctors’).
**CASE 3 ANSWERS**

**ANSWER 1**

Apart from travel-specific information, including the purpose of the trip, location, duration and accommodation type (to determine John’s likely risk exposure), it is important to obtain the following information:

- John’s immunisation status
- Use of medications, including prescription, OTC and complementary medicines
- Sexual health.

Many patients find it difficult to answer questions about sexual health. Placing posters in waiting rooms that indicate you are open to such questions can pave the way for the patient to start the conversation.

**ANSWER 2**

It may be a good idea to acknowledge that although it may be difficult to have this conversation, it is good that John has brought it up.

You require a brief sexual history. It will need to be asked sensitively and appropriately. Studies show that patients expect, and are comfortable with, doctors asking them personal health questions when asked in a professional manner.

You could start the conversation by saying: ‘Thailand is considered a country with high rates of some diseases and infections. In order to work out what tests to order, I need to ask you some more questions about sexual risk. Is that OK?’

Alternatively, given that John has told you about one contact, you could start with: ‘You mentioned a casual sex partner while in Thailand. How long ago was that? Was the contact male or female? Did you use any protection?’

These questions could be followed up with: ‘Have you had other partners in the past 6–12 months? If so, were they male, female or both? Did you use any protection?’

**ANSWER 3**

John needs to be offered some testing and support. He needs to be counselled not to have any further unprotected sexual contact with his wife or any other sexual contacts until test results are back.

STIs to consider are chlamydia, gonorrhoea, syphilis, hepatitis B and HIV.

**ANSWER 4**

Refer to the STI testing tool and STIGMA guidelines. Testing for chlamydia and gonorrhoea requires a urine sample for a nucleic acid amplification test (NAAT).

Bloods tests are required for:

- HBsAg and antibodies (anti-HBs, anti-HBc)
- Syphilis serology
- HIV Ab, Ag.

Refer to the National HIV Testing Guidelines (http://testingportal.ashm.org.au/hiv) for details on informed consent and giving a positive HIV result.

**ANSWER 5**

Although not a common diagnosis in general practice, in New South Wales, around half of the new HIV diagnoses are made by GPs.

A positive HIV result can affect the GP, particularly if the patient is well known to the GP, as in this case. It is good to acknowledge our feelings and process them away from the consultation with our patients. This allows us to be more ‘available’ during the consultation when we give patients unexpected news.

Men who have sex with men (MSM) are the most at risk for HIV in Australia, accounting for around 70% of new cases of HIV; however, travellers who have unprotected sex with people from high-risk countries are also at risk.

A list of other groups in whom to consider testing is shown in Box 1.

**Box 1. HIV testing**

Regular testing for HIV should be offered to anyone who asks for it, as well as the following high prevalence groups, even if asymptomatic:

- MSM
- People who inject drugs
- People with multiple sexual partners/recent partner change
- People having travelled to countries of high prevalence and engaged in risky behaviour
- People from high-prevalence countries
- Partners of the above groups
- Partners of people living with HIV
- Pregnant women
- People who have received a blood transfusion or blood products prior to 1985 in Australia or from overseas

The number and rate of notifications for HIV infection in Australia in the past 10 years has remained around 1000 per year and 4.2–4.9 per 100,000 population, respectively.
You already have a follow-up appointment with John in a few days. It may be better to ensure John attends by himself so as not to overly complicate matters. It would be wise to allow a long appointment and some doctors find that making such appointments at the end of a session ensures the doctor is not under undue time pressure. This can allow the patient time to explore the impact of the unexpected, unwelcome news.

You need to ensure you are aware of HIV service availability in your area.

**ANSWER 6**

The follow-up plan includes:

- supportive counselling after giving the diagnosis – wait for the patient to express their feelings, emotions and thoughts, and ask any specific questions they may have
- patient education regarding HIV infection
- referral to specialist service – sexual health clinic
- follow-up of contact tracing
  - offer to support John in telling his wife
  - determine how far back to trace
- work with HIV support coordinator (a NSW-only initiative).

John’s wife may also need supportive counselling and the opportunity to explore what this means for her. Offering a separate appointment to provide support, education, advice and possible referral to psychological support would be appropriate.

Keep the information simple and clear. John needs to understand that he has HIV, what it is, that local treatment is available and how to prevent further transmission. Try not to give too much information at once. Allow time for questions from John.

You may wish to consider asking John what he understands about HIV once the diagnosis has been given. This can help direct further questions and discussions. John may wish to share the information with a trusted friend for support. You may need to discuss how and what he might like to tell them.

Other information to consider includes the following reassurance and advice for patients newly diagnosed with HIV:

- HIV is now a disease that people live with rather than die of. Offer encouragement with the message of hope: ‘With early effective treatment, John, you can expect near normal life expectancy.’
- HIV is a readily treatable chronic disease and can be managed with medication in your local community. Early treatment can change the outcome for John and is recommended in Australia.
- Treatment is now simpler and better tolerated than ever before. It can be as simple as one tablet once a day.
- Let John know that as his GP, you will support him and assist in linking him with specialist HIV and counselling services.
- John should continue to use condoms with any sexual partners.
- Contact tracing will be necessary – John’s wife and, if possible, his Thai contact will need to be told. You could introduce this by saying: ‘You have a lot to take in right now, but we do need to discuss who else might need testing and I can support you in this.’

It is advisable to have arranged a follow-up appointment before he leaves (within one week, and at the end of that appointment another one should be organised). Check that he is safe to leave and has some supports – resources such as website links or state/territory HIV support programs can be useful here (refer to ‘Resources for patients’).

**ANSWER 7**

John’s wife is a contact of recently acquired HIV. His last sexual contact with her is now two weeks ago. From clinical experience, the best option is to ask John how he will tell his wife about his HIV status. John has several options including:

- John can tell his wife himself.
- John and his wife can attend the practice together and John can tell his wife in the presence of the GP.
- The GP can inform John’s wife with John’s consent (consent will need to be clearly documented). This can be done anonymously with help of the local sexual health clinic, either by referring John to the counsellor at the clinic (if available), or by providing the contacts’ names and contact details to the sexual health clinic so they can notify partners of their possible exposure.

It may be difficult to find his Thai contact.

An HIV Ab/Ag test can be ordered for John’s wife two weeks after the last sexual contact with her (assuming his wife has no other independent risk factors). The results at this stage are reasonably indicative, but she will need repeat testing at six weeks. It is no longer necessary to wait three months as the result is essentially 100% sensitive by six weeks, as long as there has been no further exposure.

**CONCLUSION**

John attends the surgery with his wife and, with your support, tells her he is HIV-positive.

John’s wife is shocked at the news — she thought something was up, but never imagined HIV. She is further alarmed at the thought she may have acquired HIV; she feels completely well but wants a test as soon as possible.

You offer supportive counselling and you discuss the importance of condoms during sex.

John is referred to the sexual health clinic and is commenced on treatment, which he is tolerating well. His wife’s initial results and follow-up test are negative for HIV. They remain together and continue as patients of your surgery.

Important aspects include:

- Normalise HIV testing.
- Regular testing and early treatment improve outcomes for patient and reduce transmission in the population.
- Treatment is a critical part of HIV prevention and is now simpler and better tolerated.

**RESOURCES FOR PATIENTS AND DOCTORS**

- www.sti.guidelines.org.au
REFERENCES

CASE 4

APRIL IS PLANNING A PREGNANCY

April, 28 years of age, presents for a routine Pap smear. On history-taking, she discloses that she is in a long-term relationship and has talked with her partner about becoming pregnant in the coming year. April also tells you that she has type 1 diabetes mellitus (T1DM), which was diagnosed when she was five years of age. She works in administration and moved to regional Australia from a major metropolitan centre three years ago. She has not seen an endocrinologist or other physicians regarding her T1DM during this interval. She is not aware of having any microvascular complications. April takes fixed doses of insulin aspart, seven units subcutaneously, three times daily with meals, as well as insulin glargine, 18 units subcutaneously at night. She has not brought her glucometer with her and states that she recently lost her blood glucose record book.

QUESTION 1

What are the next steps in investigating and managing April’s T1DM?

FURTHER INFORMATION

April smokes five cigarettes per month and drinks alcohol infrequently. She denies any use of illicit drugs. Her family history is unremarkable. Examination reveals a height of 160 cm, weight of 67 kg, with a body mass index (BMI) of 26 kg/m². Blood pressure is 125/80 mmHg and heart rate is 78 beats per minute without irregularity. April’s thyroid gland is palpable but not enlarged and there is no focal nodularity. No organomegaly is palpable on abdominal examination. Pedal pulses are present and strong, and there is normal sensation to monofilament testing.

QUESTION 2

What preventive health strategies might be implemented at this stage, in the context of likely conception in the next 12 months?

FURTHER INFORMATION

April returns for review of her pathology and Pap smear results. Her glycated haemoglobin (HbA1c) is 62 mmol/mol (7.8%) and her Pap smear is unremarkable. The urine albumin-to-creatinine ratio (UACR) is 3.9 mg/mmol (reference range <3.5 mg/mmol) but with normal renal function (estimated glomerular filtration rate [eGFR] >90 mL/min/1.72m²). She is not anaemic and has a normal lipid profile, and normal calcium, magnesium and phosphate levels; however, she is deficient in vitamin D with a level of 32 nmol/L. Iron deficiency is also noted:

- Iron: 16 µmol/L (2–25 µmol/L)
- Transferrin: 3.5 g/L (2.0–3.5 g/L)
- Transferrin saturation: 18% (5–35%)
- Ferritin: 10 µg/L (20–200 µg/L).

Her blood glucose record book indicates fasting blood glucose levels (BGLs) of 4.8–6.5 mmol/L, substantial glycaemic variability, with multiple episodes of mild hypoglycaemia (down to 3.2 mmol/L) usually after breakfast, and multiple episodes of hyperglycaemia pre-dinner (10–17 mmol/L). She has forgotten to bring her glucometer to her appointment. She denies ever having severe hypoglycaemia (with cognitive impairment requiring third party assistance) and has not had a hypoglycaemic event while driving.

QUESTION 3

What unifying pathology related to T1DM may explain vitamin D and iron deficiencies?
QUESTION 4
What is the significance of a UACR level of 3.9 mg/mmol? What should be done next?

FURTHER INFORMATION
You order follow-up UACR tests and, fortunately, April’s second and third UACR levels are 2.4 mg/mmol and 2.2 mg/mmol respectively.

QUESTION 5
Regarding glycaemic control, what must be discussed at this consultation as a matter of urgency?

QUESTION 6
What strategies may be used to assist April in the time between this consultation and review with an endocrinologist? How will you arrange review with an endocrinologist or other specialists in diabetes management?

QUESTION 7
What advice would you give April about planning for conception at this stage, given that she has T1DM?

QUESTION 8
What are the glycaemic treatment targets for women prior to conception and during pregnancy? How are these best achieved? Are insulin pumps and/or continuous glucose monitoring systems required?
Chronic conditions

**CASE 4 ANSWERS**

**ANSWER 1**
A blood glucose record book may be given to April in addition to a glucometer that allows testing for ketones (if her current meter does not perform this function). Alternatively, the patient may purchase these from their nearest National Diabetes Services Scheme (NDSS)-registered pharmacy.

Optometry referral and review must be performed prior to conception. Ophthalmology input would be required promptly if there is known retinal pathology preceding pregnancy, or urgently if it is detected during pregnancy because there is a risk of progression of both proliferative and non-proliferative retinopathy.

Blood and urine tests should be performed, including a full blood count, iron studies, assessment of HbA1c, vitamin D levels, UACR, urea/electrolytes/creatinine, as well as fasting lipid profile. A follow-up visit with the general practitioner (GP) would be recommended to review the results of these investigations. This would also allow more accurate and efficient referral and triage to a specialist centre.

**ANSWER 2**
A high dose (5 mg) of folic acid may be commenced at this consultation and should be continued for the first 12 weeks of pregnancy because of the increased risk of neural tube defects. Smoking cessation should be strongly encouraged and early screening for retinal pathology should be arranged as discussed above. A ‘safe’ level of alcohol consumption in pregnancy has not been determined, so the preference for alcohol cessation should be discussed along with diet and exercise advice targeting a BMI of 18.5–24.9 kg/m².

To assist in coordinating preconception care and ongoing management during pregnancy, an early referral to a multidisciplinary team, including diabetes physicians, would be optimal. This team may then assist with every aspect of patient care, including the discussions around transition to another basal insulin formulation such as insulin detemir (category A) or the widely used neutral protamine hagedorn (NPH) insulin. In the absence of geographical proximity to such a multidisciplinary team, the GP may need to pursue other referral strategies, which are discussed in Question 6.

April’s current level of glycaemic control may be less stable following conception because of fluctuating oral intake with nausea, proclivity for ketosis at lower blood glucose levels, and variable insulin sensitivity at different stages of gestation with extremely tight glycaemic targets.

**ANSWER 3**
The possibility of co-existent autoimmune disease in women with T1DM should be considered. Coeliac disease may explain April’s vitamin D and iron deficiencies. Other autoimmune conditions, such as thyroid dysfunction and B12 deficiency (pernicious anaemia), should also be considered.

Other considerations when viewing April’s biochemistry would be reduced sun exposure and low dietary iron intake or blood loss such as is seen with menorrhagia. These are not features in this case. Replacement of vitamin D and iron should be discussed.

**ANSWER 4**
April is normotensive, meaning this result is not concerning in isolation, but a UACR result of >3.5 mg/mmol warrants investigation. A further two urine samples or a timed sample should be collected within three months of initial screening. Albuminuria would be confirmed if at least two of three tests were elevated. The significance being that female patients with pre-existing albuminuria are more likely to develop pre-eclampsia. It is also reasonable to order urine microscopy, culture and sensitivity (MCS) assessment in addition to any future spot urine samples. This may help to exclude the possibility of a urinary tract infection (UTI) explaining the increased albumin level. Albuminuria in a patient with T1DM may not necessarily represent diabetic nephropathy, and other conditions such as glomerulonephritis should be considered.

**ANSWER 5**
Hypoglycaemia and driving should be discussed as a matter of urgency and indeed is important enough to be discussed at every consultation. It is essential to consider the medico-legal ramifications of relying on a patient’s own record of blood glucose readings in the absence of a glucometer to corroborate these results. This is of particular importance when patients request medical certification of safety to drive.

**ANSWER 6**
You should discuss the legal requirements around driving, such as ‘Above 5 to Drive’, as well as hypoglycaemia prevention and management. In relation to preventing hypoglycaemia, the concepts that would most assist April would be education around assessment of carbohydrate content and insulin dose titration, depending on oral intake. This may be discussed by the GP although, if available, specialist health professionals such as dietitians and diabetes nurse educators are particularly well placed to educate patients and possibly in the patient’s home environment.

Insulin dose adjustments may be made at the consultation, such as reducing the breakfast insulin aspart and increasing the lunch dose of insulin aspart. Assuming the patient will continue to have the same dietary intake, you may need to increase the evening insulin aspart and reducing the breakfast insulin aspart to compensate for the evening meal and indeed is important enough to be discussed at every consultation. It is essential to consider the medico-legal ramifications of relying on a patient’s own record of blood glucose readings in the absence of a glucometer to corroborate these results. This is of particular importance when patients request medical certification of safety to drive.

The above information will assist the triaging diabetes physician recognise the urgency of the GP’s referral as well as which health professionals the patient may need to see at the multidisciplinary team appointment. If there is no multidisciplinary team in geographical proximity to the patient, then other referral strategies are essential. These may include an enquiry about telemedicine consultations with a centre providing obstetric and endocrinology care. The GP may enquire about visiting specialists to local centres, or centres to which patients may reasonably commute before and during pregnancy.

**ANSWER 7**
It is not advisable to conceive without optimal glycaemic control, given the possible impact on embryogenesis and fetal development, as well as maternal health. The minimum standard set by the National Diabetes in Pregnancy Advisory Council relating to T1DM and type 2 diabetes
Mellitus (T2DM) is for an HbA1c <1% above the normal range (ie <7% or 53 mmol/mol), acknowledging that tight glycaemic targets may not be possible in T1DM because of increased frequency and severity of hypoglycaemia. As such, it would be prudent to discuss appropriate contraception options with April until regular self-monitoring of BGLs and optimal glycaemic control can be established.1

The Australian categories for prescribing medicines in pregnancy should also be discussed with April. Insulin glargine is considered Category B3, which denotes no observed harmful effects to the human fetus, although it has only been studied in a limited number of pregnant women. This category also signifies that studies in animals suggest increased fetal damage but is of uncertain significance in humans.11 Insulin aspart is considered Category A, denoting that it has had extensive use in pregnant women (or women of childbearing age) without any proven increase of direct or indirect damage to the fetus.12

**ANSWER 8**

BGLs should be maintained as close as possible to the normal range while minimising the risk of maternal hypoglycaemia. The BGL treatment targets for patients with T1DM set out by the Australasian Diabetes in Pregnancy Society (ADIPS) consensus guidelines are:4

- Fasting and preprandial: 4.0–5.5 mmol/L; or
- Postprandial: <8.0 mmol/L at 1 hour; or
- Postprandial: <7.0 mmol/L at 2 hours.

Glycaemic targets may differ slightly across institutional jurisdictions. Health professionals should always check with their local specialist services as to which targets are being followed.

In the preconception period, the Australian Type 1 Diabetes Guidelines Expert Advisory Group acknowledge that achieving the optimal HbA1c target may take three to six months; thus, at least three-monthly HbA1c testing should be performed. It is therefore prudent to advise either barrier or pharmaceutical contraception until April has achieved optimal glycaemic control. Once April is pregnant, HbA1c levels should be monitored every four to eight weeks.1,2,4

Basal-bolus insulin regimens may provide tight glycaemic control. Insulin pump therapy with or without continuous glucose monitoring may be considered as an alternative. This should be considered if there is available infrastructure to assist the patient to use this technology, as well as the professional expertise to analyse the data collected by such technology.1,2,4

**CONCLUSION**

Management of T1DM can be extremely challenging and is optimally managed with a multidisciplinary team approach. This is particularly true in the case of planning for conception, where all aspects of management may be affected. Issues around oral intake with nausea, proclivity for ketosis at lower blood glucose levels, and variable insulin sensitivity with extremely tight glycaemic targets underlie these difficulties. Embryogenesis and fetal development are paramount in planning for conception. Further, any complications from T1DM may be exacerbated by pregnancy, and require close and specialised review. The GP is particularly well placed to screen for potential pregnancies, complications, and gathering baseline clinical and biochemical information. Varying infrastructure and local expertise makes the GP’s role and referral pathways varied and so clinicians should make themselves aware of local services and specialists.1,4,6

**KEY POINTS**

- Patients with T1DM face extreme complexity in self-management, and assistance by a multidisciplinary team with endocrine expertise and obstetric expertise for women planning pregnancy is optimal.
- Hypoglycaemia and driving are essential points to be discussed during consultations for all patients with T1DM. Reviewing the patient’s glucometer should not be neglected.
- Optimal glycaemic control is paramount for normal embryogenesis and fetal development, as well as maternal health.
- Lifestyle and dietary advice is essential for diabetes management as well as preconception care.

**REFERENCES**

CASE 5

BARBARA HAS KNEE PAIN
Barbara, a retired schoolteacher aged 66 years, presents with right knee pain that has progressively worsened over the past two years. She has discomfort most of the time and finds her symptoms are worse in winter but improve during summer. Walking up and down stairs usually aggravates the pain. Barbara helps to look after her grandson, who is two years of age, and is finding it increasingly difficult to keep up with him.

QUESTION 1
What additional information should you ask Barbara? What would you look for during physical examination?

QUESTION 2
What are your differential diagnoses?

QUESTION 3
Would you consider doing any investigations? What is your rationale?

FURTHER INFORMATION
You diagnose Barbara with osteoarthritis. Barbara wants to know how her symptoms can be managed so she can continue with her regular activities and look after her grandson without experiencing any discomfort in her right knee.

QUESTION 4
How would you manage Barbara’s symptoms?

FURTHER INFORMATION
Barbara is not very keen on taking medications and says that her friends have been recommending she take nutritional supplements. She also has friends who have had total knee replacements or arthroscopies and is wondering if she should have it done.

QUESTION 5
How would you advise Barbara regarding the use of nutritional supplements for osteoarthritis?

FURTHER INFORMATION
Barbara has a past medical history of hypercholesterolaemia and is on rosuvastatin. She has no known drug allergies.
On examination, Barbara’s blood pressure is 125/70 mmHg and she is afebrile. She is obese, with a body mass index (BMI) of 31 kg/m². She has difficulty rising from a sitting to standing position, requiring upper body strength to push herself from the chair. Barbara mobilises with an antalgic gait, favouring her right side. She has a varus deformity to her right knee and is only able to attain flexion movement up to 120 degrees, compared with 135 degrees on the left. There is a small effusion and Barbara has quadriceps muscle wasting. She has patellofemoral crepitus with passive range of movement.
QUESTION 6

How would you advise Barbara in regards to surgical intervention for osteoarthritis?

CASE 5 ANSWERS

ANSWER 1

A standard history taking should be undertaken, focusing on symptoms. The most likely diagnosis, on the basis of Barbara’s symptoms, is osteoarthritis. The typical clinical features assisting with a diagnosis of osteoarthritis include:1,2

- aged >45 years
- joint pain related to activity (for >3 months)
- presence of short-lived, self-limiting stiffness (<30 minutes in duration)
- no atypical features (ie persistent night time pain, prolonged early morning stiffness, fevers, weight-loss, and a hot swollen joint)
- an alternative diagnosis is unlikely.

Other clinical features that can assist diagnosis include:

- symptoms of clicking/grinding in the knee
- swelling
- does the knee give way or lock up?
- can the knee be fully extended?
- what other movements aggravate the knee pain (ie kneeling or squatting)?
- any other joints affected
- previous history of trauma to the knee.

Part of the clinical examination includes the general system of ‘look, feel, move and special tests’. Gait should be assessed, looking for limp or abnormalities, and gait speed should be used as an indicator of functional decline and frailty.

Clinical signs consistent with osteoarthritis to look for on examination:

- small-to-moderate effusions
- reduced range of movement
- crepitus and tenderness along the joint line or with pressure on the patella
- weakness and wasting of quadriceps muscle
- joint malalignment.

Exploring the patient’s comorbidities – assessing cardiovascular disease, hypertension, obesity, multi-site joint pain and other chronic conditions, and depression – are important factors that will impact management decisions.

ANSWER 2

There are several differential diagnoses to consider in a patient presenting with a monoarthritis, including:

- crystal arthropathy (gout or calcium pyrophosphate deposition disease)
- other inflammatory arthritis (eg rheumatoid arthritis, psoriatic arthritis)
- less commonly, septic arthritis, insufficiency fracture, avascular necrosis, pigmented villonodular synovitis or malignancy.
 Clinicians should be aware that the following atypical features and red flags might indicate the presence of the alternative diagnoses listed above:
- history of recent trauma
- rapid worsening of symptoms
- presence of a hot swollen joint
- prolonged morning joint-related stiffness
- persistent night pain (on most nights)
- unexplained weight loss
- fever or other systemic manifestation
- severe single joint involvement (with rapid deterioration or signs suggestive of infection or inflammation)
- neurological symptoms and signs.

The differential diagnosis of someone presenting with knee pain also includes:
- pes anserine bursitis
- patellofemoral pain syndrome
- patellar tendinopathy
- iliobibial band friction syndrome
- meniscal/ligament tear
- referred pain from spine or hip.

**ANSWER 3**

It is often standard practice to order an X-ray when patients present with joint pain. Typical X-ray changes include joint space loss, osteophyte formation, subchondral and cyst formation. Although conventional X-rays are the most inexpensive and readily accessible method of imaging, magnetic resonance imaging (MRI) is becoming increasingly used. It is important to note that in general, imaging is not required for the diagnosis of osteoarthritis. There is poor correlation with patients’ symptoms and X-ray findings. The diagnosis should be focused towards clinical signs and symptoms. Unnecessary use of imaging can cause patients to think that osteoarthritis is a disease mainly of the cartilage, for which nothing can be done. It is better for patients to focus on the signs and symptoms, and for treatment to be tailored to target these issues.

The use of MRI should be reserved to investigate for uncommon conditions or when there are red flag signs, including:
- avascular necrosis
- pigmented villonodular synovitis
- osteochondritis dissecans.

A referral to a specialist is warranted when there are red flag signs or if the above conditions are found on investigation.

**ANSWER 4**

The principles of care for osteoarthritides are based on that of chronic disease management. Care and treatment should be tailored to the individual, with decision-making based on the best evidence available. Patients’ adherence with recommendations and behavioural modification are amplified through education, self-management strategies, establishment of treatment goals and regular monitoring by health professionals.

Understanding the disease mechanism will help patients to deal with the pain and its consequences, without creating anxiety and concern with expectations of progressive worsening of their condition with further joint use. Osteoarthritis, as defined by the National Institute for Health and Clinical Excellence (NICE), is a syndrome of ‘joint pain accompanied by varying degrees of functional limitation and reduced quality of life’. Most commonly, it affects the knees, hips, hands and feet, and is a major cause of pain and disability. Patients should understand that osteoarthritis is an active process of the body, responding to underlying structural damage within the joint, or obesity. The traditional vocabulary used with osteoarthritis, such as ‘joint wear and tear’, ‘degeneration’ or ‘overuse’, gives an inaccurate impression to patients.

First-line management of osteoarthritis is divided into non-pharmacological and pharmacological managements (Figure 1).

**Non-pharmacological management**

Non-pharmacological interventions should be the core of osteoarthritis management and implemented along with pharmacological treatment if required. Therapies include weight management, exercises, education and, when required for patients with malalignment, use of assistive devices, such as walking aids, foot orthoses and knee braces.

Exercises should include a combination of aerobic and strengthening exercises to address the functional limitation associated with osteoarthritis, and should be tailored to the individual’s ability. A 2015 Cochrane review showed reduction in pain and improvement in the function of people with osteoarthritis with aerobic, strengthening and Tai chi exercises. Decision on land-based or water-based exercises (hydrotherapy) should be determined by the patient’s physical capabilities and underlying medical conditions.

Prevention of osteoarthritis flare-ups includes pacing one’s activities with regular breaks, and avoiding prolonged excessive exercises, especially weight-bearing exercises. Walking therapy is still recommended in addition to targeted strengthening therapies to maintain function and general health. Distance and duration should be titrated according to the individual’s abilities. Use of cold packs, analgesia and rest can be used when there is a flare-up.

Weight loss through a combination of diet and exercises is generally recommended. Loss of at least 10% of body weight has been associated with a 50% reduction in pain scores after 18 months in patients who are overweight/obese with knee osteoarthritis.

Assessments by occupational therapists, physiotherapists and even psychologists should be considered for patients who require assistive devices, have weakness or functional deficits, or those who need assistance with psychological symptoms or have issues coping with pain.

**Pharmacological management**

Pharmacological treatments are palliative in nature, targeting pain management. The number of joints involved, patients’ underlying comorbidities and age should guide the choice of medications. Medications recommended by recent osteoarthritis guidelines (OARSI, American College of Rheumatology and NICE) include oral and topical non-steroidal anti-inflammatory drugs (NSAIDs), topical capsaicin, duloxetine or intra-articular injections with corticosteroid.
Figure 1. Recommended algorithm for management of osteoarthritis

Clinical diagnosis of osteoarthritis (OA) based on history and examination

Assess comorbidities, current medications and patient’s physical function

Non pharmacological interventions

Education in OA and self-management
- Weight loss program
- Exercise program (community/home-based, land or water-based)
- Self-management programs
- Psychological interventions (i.e. cognitive behavioral therapy) if required

Consider referral to physiotherapy or occupational therapy if patient is weak, stiff or has limited activities of daily living
- Assisted devices
- Individualised exercise program
- Neuromuscular training
- Knee bracing

If disabling symptoms and if already exhausted conservative management, offer referral for surgical treatment

Pharmacological interventions

1. Topical NSAID
2. Oral NSAIDs
3. Intermittent paracetamol
4. Duloxetine
5. Intra-articular corticosteroid
6. Opioids if contraindication to other analgesia or severe and disabling pain


Topical NSAIDs have been shown to have similar efficacy as oral NSAIDs, but with a potentially more favourable side-effect profile. Oral NSAIDs should be considered in those with inadequate response to topical NSAIDs, or in those with symptomatic osteoarthritis in multiple sites. NSAID use is limited by potential cardiovascular, gastrointestinal and renal complications. A proton-pump inhibitor should be used concomitantly in those prescribed a non-selective NSAID.

On the basis of the role of central sensitisation in pain modulation in osteoarthritis, duloxetine has been found to be effective in osteoarthritis, especially in those with multiple joints involved and with comorbidities.

Intra-articular corticosteroids should be reserved for those who present with an acute osteoarthritis exacerbation, and with associated joint effusion and local inflammation. A Cochrane review found that intra-articular corticosteroids only provide short-term pain relief, lasting two to four weeks. Therefore, we are unable to justify repeated injections with only short-term benefits in those with chronic symptoms, as there are associated risks, particularly infections. Intra-articular injections should only be performed by general practitioners (GPs) who have had training, or specialists. They can be referred to a radiologist to be done under radiological guidance.

The benefit of hyaluronic acid injection is controversial, with inconsistent findings in meta-analyses. In general, there is only a small positive effect that is not of clinical importance when compared with placebo. Paracetamol was once the recommended first-line medication for pain, but recent evidence shows limited benefit in patients with hip and knee osteoarthritis. There are also safety concerns, with studies showing a similar side-effect profile as that of NSAIDs.

The use of opioids is generally discouraged by most osteoarthritis management trials, given the increased risk of adverse events, including fractures, cardiovascular events and all-cause mortality.

ANSWER 5

Nutritional supplements, such as glucosamine and vitamin D, are not routinely recommended because there is a lack of clear evidence demonstrating a clinically significant benefit in patients with osteoarthritis. Some of the supplements, such as chondroitin, fish oil and curcumin/turmeric, have been shown to have small effects in those with mild disease.
ANSWER 6
Total joint replacement is an effective treatment in patients with advanced osteoarthritis, when more conservative therapies have failed to provide adequate pain relief. Care must be taken when considering referrals as up to one-third of patients do not have a positive outcome after total knee replacement: the main issue is moderate-to-severe long-term pain. Unfavourable pain outcomes following surgery are related to pre-operative levels of pain, presence of depression and comorbidities, and presence of concomitant pain at other joint sites. 
Arthroscopic lavage and/or debridement are not recommended for the treatment of osteoarthritis. Multiple trials have failed to demonstrate the benefit of these procedures over placebo/sham procedures or intensive physiotherapy. Arthroscopic surgery should be reserved to those with a clear history of specific mechanical symptoms such as locking. 

CONCLUSION
The general principle of osteoarthritis management is a holistic, integrated care with a focus on prevention, especially in younger patients. Screening for the presence of underlying comorbidities will ensure more appropriate use of medications and implementation of psychological help to improve pain and function levels. As with any chronic disease, education, development of self-management strategies, identification of treatment goals and regular monitoring are the cores of chronic disease management models. Losing weight and doing exercise are critical, but are challenging to implement and problematic for patients to adhere to; appropriate referral to exercise and weight loss programs, and relevant allied health professionals, is helpful. Treatment should integrate non-pharmacological management; pain medications should be an adjunct treatment. Surgical intervention is the final step when conservative therapies have failed.

RESOURCES FOR PATIENTS
• myjointpain.org.au

RESOURCES FOR DOCTORS
• Osteoarthritis online module on the RACGP’s gplearning, available at http://gplearning.racgp.org.au

REFERENCES
CASE 6

FRED HAS SHORTNESS OF BREATH

Fred, 65 years of age, is a new patient to your clinic. He presents with increasing shortness of breath with exertion (SOBOE) over the past three months, decreased exercise tolerance and a non-productive cough, which is worse at night. Fred also complains of tiredness and swelling around his ankles, which is worse towards the end of the day. He has no chest pains, wheeze or abdominal symptoms.

Fred has a history of chronic obstructive pulmonary disease (COPD), hypertension and myocardial infarction. He has a 20-pack year smoking history but no longer smokes, having stopped five years ago.

His medications include tiotropium 18 μg daily, combined clopidogrel and aspirin 75 mg/100 mg daily, atorvastatin 40 mg daily, ramipril 5 mg daily and amlodipine 5 mg daily.

On examination, his blood pressure is 135/75 mmHg, heart rate is 92 beats per minute and regular, and he has two heart sounds. Fred’s jugular venous pressure is difficult to assess. You detect a few basal wheezes and crackles in his lungs, and oedema around the mid-calf region. His conjunctiva are normal, he has no signs of cyanosis, and abdominal examination is normal. Oxygen saturation is 94%.

QUESTION 1

What are your differential diagnoses? What further questions may help in confirming the diagnosis?

FURTHER INFORMATION

Fred tells you that he feels uncomfortable when lying flat and now routinely sleeps on three pillows. He has gained 4 kg since he was last weighed, four months ago. Fred remembers to take his medication most of the time, but occasionally skips his tiotropium. You suspect his symptoms are related more to his heart than his lungs.

QUESTION 2

What tests/investigations would you order?

FURTHER INFORMATION

You order blood tests and refer Fred for a chest X-ray, electrocardiogram (ECG) and echocardiography. You review Fred the next day. He is symptomatically better.

The chest X-ray shows a large heart, minor prominence of the bases, some blunting of the diaphragmatic angles, but no other abnormalities. The ECG shows sinus rhythm and evidence of an old anterior infarct. The full blood evaluation (FBE), irons studies, thyroid function tests (TFTs), and urea, creatinine and electrolytes are normal. The echocardiogram will not be available for two weeks.

As he has improved, you organise a visit next week and then the week after with his echocardiogram results. You prescribe 20 mg frusemide. A urea, creatinine and electrolytes test is organised for the next visit. Two weeks later, the echocardiogram shows dilation of the left ventricle with an estimated ejection fraction of 28%.

QUESTION 3

Would you start any treatment?

FURTHER INFORMATION
CASE 6  check  Chronic conditions

QUESTION 4 🚩
What is your diagnosis?

FURTHER INFORMATION
Fred feels much better after using the frusemide you prescribed. His leg swelling has improved as has his breathing. Fred no longer has orthopnoea and can walk in his flat unimpeded. He still has shortness of breath when climbing stairs, but this has been present for many years. On examination, he has lost a further 2 kg in weight and his blood pressure is 120/70 mmHg.

QUESTION 5 🚩
What is the new nomenclature for heart failure?

QUESTION 6 🚩
How common is heart failure following myocardial infarction? What is the mortality of heart failure?

FURTHER INFORMATION
You refer Fred to a cardiologist and organise an appointment, which will be in four weeks. In the interim, you increase his ramipril to 10 mg daily. You review him one week after he sees the cardiologist, who confirms the diagnosis of heart failure with reduced ejection fraction (HFREF). Fred’s current medication includes tiotropium 18 μg daily, combined clopidogrel and aspirin 75 mg/100 mg daily, atorvastatin 40 mg daily, ramipril 10 mg daily, frusemide 20 mg daily, and nebivolol 5 mg daily.

His weight has been stable, blood pressure is 110/65 mmHg; heart rate is 68 beats per minute and regular. Fred has no oedema and his lungs are clear. The cardiologist has asked you to increase his nebivolol progressively before he sees Fred in three months.

QUESTION 7 🚩
What are the key evidence-based drug treatments for heart failure? What evidence is there for exercise programs for people living with heart failure?

QUESTION 8 🚩
What is the target dose of nebivolol? How often do you increase? What do you look out for in titrating his dose?

FURTHER INFORMATION
Following the advice of the cardiologist, you progressively increased Fred’s nebivolol to the maximum recommended dose of 10 mg. At his next visit, after being on the maximum dose, his blood pressure is 95/65 mmHg. On questioning, he reveals brief dizziness on standing up from a chair and occasionally in the morning getting out of bed. His weight is stable. Fred feels well and his breathing is good. He is sleeping on one pillow.
QUESTION 9
How would you manage Fred’s hypotension?

ANSWER 1
Fred’s symptoms could be related to his COPD. Other possible diagnoses include heart failure, anaemia, ischaemic heart disease, other lung pathology and lung cancer.

Additional questions to ask Fred that may help with the diagnosis are whether he feels uncomfortable or has difficulty breathing when lying down (orthopnoea). This is a good indicator of heart failure. It is also important to ask if he has gained or lost any weight and whether he takes his medication as prescribed. Weight gain can be a good indicator of fluid overloading with heart failure.

ANSWER 2
The following tests and investigations are recommended for patients with suspected heart failure:

- chest X-ray
- ECG
- echocardiography
- FBE, including iron studies
- urea, creatinine and electrolytes
- TFTs
- liver function tests (LFTs).

Distinguishing between shortness of breath related to lung or heart disease can be problematic. If uncertain, plasma levels of brain natriuretic peptide (BNP) can be assessed; however, this test is not rebateable through the Medicare Benefits Schedule (MBS). Heart failure is unlikely if the BNP level is low.

ANSWER 3
Salbutamol and frusemide could be added. A small dose of frusemide (20 mg) may be sufficient to give relief in the short term and will not do harm while waiting for results. If the presentation has significant wheeze, salbutamol may be started while waiting for results and diagnostic clarity.

ANSWER 4
The test results are consistent with HFREF, which is most likely to be related to his ischaemic heart disease.

ANSWER 5
HFREF, previously termed systolic heart failure, is defined as an ejection fraction <40%.

Heart failure with preserved ejection fraction (HFPEF), previously called diastolic heart failure, has an ejection fraction of >40%.

Heart failure can also be graded according to functional levels.

ANSWER 6
Bettering the Evaluation and Care of Health (BEACH) data indicate a prevalence of 3.6% of the general practice population. An estimate by
Chan et al suggested a prevalence of 6.3% in people aged >45 years.\textsuperscript{4} The incidence is higher (13%) in patients aged >75 years and those with previous episodes of myocardial infarction.\textsuperscript{5} Up to 18% of people with a previous myocardial infarction will have clinically significant left ventricular dysfunction.\textsuperscript{6} Active screening of people with a past history of myocardial infarction is important.

In 2011, 13% of all deaths in Australia were associated with heart failure.\textsuperscript{7} Of patients with mild-to-moderate heart failure, 20–30% will die within one year; 50% of patients with severe heart failure will die within one year.\textsuperscript{7}

\textbf{ANSWER 7}

Evidence-based drug treatments that have been shown to improve survival include:\textsuperscript{1, 8}

- angiotensin converting enzyme inhibitors (ACEIs)
- angiotensin II receptor blockers (if ACEIs are not tolerated)
- Heart failure specific beta-blockers – carvedilol, nebivolol, metoprolol XR, bisoprolol
- Aldosterone antagonists – spironolactone (if still symptomatic with ACEI and beta blockers).

Neprilysin inhibitor/angiotensin II receptor blocker combination (sacubitril/valsartan) is relatively new to Australia. Studies have shown a further improvement in mortality and hospital presentations when replacing ACEI in a stable patient.\textsuperscript{9, 10}

Formal exercise programs can have a significant impact on morbidity and mortality of heart failure. An Italian study over 10 years demonstrated a significantly lower rate of hospital readmission (hazard ratio: 0.64, $P < 0.001$) and cardiac mortality (hazard ratio: 0.68, $P < 0.001$) than controls.\textsuperscript{11}

\textbf{ANSWER 8}

The target dose of all the beta-blockers is maximal dose if tolerated:

- Nebivolol: 10 mg daily
- Carvedilol: 25 mg twice daily
- Metoprolol XR: 190 mg daily

- Bisoprolol: 10 mg daily.

Doses are usually increased every one to two weeks, with review of blood pressure, heart rate and assessment of any symptoms of hypotension.

\textbf{ANSWER 9}

The dizziness on standing up is likely to be due to postural hypotension, which is a side effect of nebivolol. This is a common issue facing doctors who manage patients with heart failure. Fred is mildly symptomatic. Given the benefits of the medications at maximal doses, a dose reduction is not necessary at present. However, if Fred’s postural hypotension becomes problematic, then a reduction in medications would be appropriate.

\textbf{ANSWER 10}

Self-management strategies include:\textsuperscript{10}

- heart failure rehabilitation program – if unavailable, referral to an exercise program/cardiac rehabilitation program could be considered/removing active (eg tai chi)\textsuperscript{12}
- daily weight checks and flexible diuretic therapy
- early presentation to health professionals if weight increases/symptoms change
- fluid and salt restriction – this could be reviewed by a dietitian
- medication adherence – home medicines review is an excellent resource for patients
- awareness of psychosocial issues and depression; depression is more common in people with heart failure (up to 50%) which predicts mortality
- advanced care plan.

\textbf{REFERENCES}


\textbf{Table 1. NYHA grading of symptoms of CHF}

<table>
<thead>
<tr>
<th>NYHA grading</th>
<th>MET*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>No limitations. Ordinary physical activity does not cause undue fatigue, dyspnoea or palpitations (asymptomatic LV dysfunction).</td>
</tr>
<tr>
<td>Class II</td>
<td>Slight limitation of physical activity. Ordinary physical activity results in fatigue, palpitation, dyspnoea or angina pectoris (mild CHF).</td>
</tr>
<tr>
<td>Class III</td>
<td>Marked limitation of physical activity. Less than ordinary physical activity leads to symptoms (moderate CHF).</td>
</tr>
<tr>
<td>Class IV</td>
<td>Unable to carry on any physical activity without discomfort. Symptoms of CHF present at rest (severe CHF).</td>
</tr>
</tbody>
</table>

*MET (metabolic equivalent) is defined as the resting $\text{VO}_2$ for a 40-year-old 70kg man.\textsuperscript{1} MET = 3.5 mL O$_2$/min/kg body weight.

10. Australian Prescriber. New drugs – Sacubitril/valsartan. Aust Prescr 2016. Available at https://cdn0.scrvt.com/08ab3606b0b7a8ea53f0d0b40b1c44f86f1/4868c8b774a3/81f8ace800601/New-drug_Sacubitril-valsartan_39-6.pdf [Accessed 9 January 2017].
MULTIPLE CHOICE QUESTIONS

ACTIVITY ID: 81665
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This unit of check is approved for six Category 2 points in the RACGP QI&CPD program. The expected time to complete this activity is three hours and consists of:
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• answering the following multiple choice questions (MCQs) by logging on to the gplearning website, http://gplearning.racgp.org.au
  – you must score ≥80% before you can mark the activity as ‘Complete’
• completing the online evaluation form.
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CASE 1 – GRANT
Grant is 80 years of age and has been living in a residential aged care facility (RACF) for the past six months. Prior to being admitted to the RACF, Grant was diagnosed with dementia. He has a son and two daughters who visit him at weekends. During one of your visits to the RACF, the staff ask if you could see Grant, as he seems agitated and unable to sleep at night. They often find him pacing up and down the passage, or sitting in the recreation area in the early hours of the morning with the television on and the volume turned up high. Occasionally, Grant becomes aggressive when they try to take him back to his room.

QUESTION 1
When assessing Grant, the most important initial consideration is to determine:
A. if there are any underlying factors that might be contributing to his behaviour
B. if his behaviour is different when his son and daughter visit him
C. the frequency of the behaviour
D. whether other residents have noticed the behaviour.

QUESTION 2
What would you recommend if assessment of Grant indicates moderate-to-severe behavioural and psychological symptoms of dementia?
A. Antipsychotics medication
B. Mood stabilisers
C. Anticholinesterase inhibitors
D. Referral to a specialist service

CASE 2 – CONNIE
Connie is 76 years of age and has been your patient for many years. She comes to see you today for the results of blood and urine tests that she had a week ago. Her estimated glomerular filtration rate (eGFR) is 25 mL/min/1.73 m² and her urinary albumin-to-creatinine ratio (UACR) is 35 mg/mol.

QUESTION 3
What is the recommended target blood pressure for Connie?
A. <140/90 mmHg
B. <130/90 mmHg
C. <130/80 mmHg
D. <120/80 mmHg

QUESTION 4
If Connie developed an infection requiring antibiotic treatment, which of the following would you prescribe?
A. Amoxycillin 875 mg + clavulanate 125 mg orally, 12-hourly for 10–14 days
B. Cephalexin 500 mg orally, six-hourly for 10–14 days
C. Cephalexin 500 mg orally, 8–12-hourly for 10–14 days
D. Trimethoprim 300 mg orally, daily for 10–14 days

CASE 3 – SHANE
Shane, 35 years of age, comes to see you because he is worried that he might have been exposed to a sexually transmissible infection (STI) from a casual sexual encounter at a party. You order STI tests, which show a positive result for human immunodeficiency virus (HIV). You discuss the result with Shane and offer to provide support, including assistance in telling his wife if he needs it.

QUESTION 5
What would you include in a follow-up plan for Shane?
A. Contact tracing
B. Education about HIV infection
C. Counselling
D. All of the above
**CASE 4 – CARA**

Cara has been your patient since she was diagnosed with type 1 diabetes mellitus (T1DM) at 12 years of age. She is now aged 24 years and is planning to start driving lessons. Previously, Cara had been nervous about driving, and so had put off learning to drive. Now, she thinks it would be useful to have a driver’s licence, particularly because she is planning to have a baby in the near future. Cara comes to see you for a report that she needs before she can get her learner’s permit. You discuss the need for regular monitoring and recording of her blood glucose levels (BGLs), particularly before driving.

**QUESTION 7**

A key piece of advice to give Cara is that she must not drive if her BGL is:

A. $\leq 5$ mmol/L
B. $< 5$ mmol/L
C. $\geq 5$ mmol/L
D. $> 5$ mmol/L

**CASE 5 – FRANK**

Frank is 54 years of age and has had a successful business as a landscape gardener. He presents today because he has had worsening pain in his knees in the past nine months and this is now beginning to affect his work. Frank has always been generally healthy. His blood pressure is 120/85 mmHg and his body mass index (BMI) is 24 kg/m². Your provisional diagnosis, after history-taking and examination, is osteoarthritis.

**QUESTION 8**

Which of the following is a typical clinical feature of osteoarthritis?

A. Age $> 55$ years
B. Joint pain unrelated to activity
C. Presence of short-lived (≤30 minutes in duration), self-limiting stiffness
D. All of the above

**QUESTION 9**

Clinical examination findings that might exclude osteoarthritis or suggest an alternative diagnosis include:

A. tenderness with pressure on the patella
B. presence of a hot, swollen joint
C. joint malalignment
D. weakness and wasting of the quadriceps muscle.

**FURTHER INFORMATION**

Frank tells you that, apart from the pain in his knees, he now tends to get short of breath very easily. For example, when mowing lawns or clearing away rubbish, he often needs to stop and rest. Sometimes he wakes up at night feeling uncomfortable and unable to breathe. Frank has always been physically active and fit, has never had any respiratory problems, and does not smoke. He tells you that the shortness of breath is quite distressing. You refer Frank for further investigation of heart failure.

**QUESTION 10**

The most useful investigation for suspected heart failure is

A. electrocardiogram
B. trans-thoracic echocardiography
C. brain natriuretic peptide testing.
D. angiography.
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