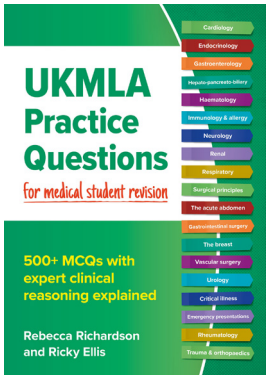

ANSWERS TO 'TEST YOURSELF' QUESTIONS

Question 1

A 45-year-old woodworker presents to the ED with a 24-hour history of a painful, erythematous left index finger. He reports removing a splinter from the same digit 2 days ago.

Which of these examination findings is **least** predictive of an infection in the flexor sheath?

A. Finger held in slight flexion
B. Fusiform swelling of digit
C. Pain on passive extension
D. **Palpable tense collection in the distal finger pulp – correct answer**
E. Tenderness on palpation along flexor sheath

HOW to reach the correct answer

Remember, we are looking for the answer that is the **least** predictive of an infection in the flexor sheath.

The flexor sheath is an enclosed tunnel that runs on the volar aspect of the fingers formed by the synovial sheaths of the long flexor tendons (flexor digitorum superficialis and flexor digitorum profundus) and the pulley system. Bacterial infections are a common cause of flexor sheath inflammation, leading to infective flexor sheath tenosynovitis.

It is a surgical emergency, as the increased pressure from purulent fluid and inflammation can compromise vascular supply to the tendon, leading to tendon necrosis and affecting function of the digit.

Patient demographics – not relevant in this question.

Positive clinical signs and symptoms – Kanavel's signs* describe four cardinal examination findings that, in combination, are highly sensitive to a diagnosis of flexor sheath tenosynovitis.

Negative clinical signs and symptoms – there are no relevant negative findings in this question.

Risk factors and associations – trauma with a foreign body, in this case a splinter, provides opportunity for the introduction of infection. Diabetes, intravenous (IV) drug use and immunocompromise are all associated with increased risk of developing flexor sheath infections.

Palpable tense collection in the distal finger pulp (option D) is the correct answer as it is the only finding listed that is not typically associated with flexor sheath infections. A palpable collection in the distal finger pulp may be caused by penetrative trauma and is indicative of a felon (painful infection in the pulp of the fingertip), rather than a flexor sheath infection.

***Kanavel's signs:**

- Fusiform swelling of digit
- Pain on passive extension
- Finger held in slight flexion
- Tenderness on palpation along flexor sheath

Question 2

A 13-year-old boy attends his GP practice with a 6-week history of pain in the left groin and increasing difficulty walking. On examination, he is systemically well, has an antalgic gait, limited range of flexion and internal rotation of the hip. His weight is in the 90th percentile for his age. There is no history of trauma, and his past medical history is unremarkable except for a chest infection 3 weeks ago.

What is the **most likely** diagnosis?

A. Osgood–Schlatter disease
B. Perthes disease
C. Septic arthritis of the hip

D. Slipped upper femoral epiphysis – correct answer
E. Transient synovitis

HOW to reach the correct answer

All answers are possible, but clues in the question guide us to which is the **most likely**.

Patient demographics – slipped upper femoral epiphysis (SUFE) is most common in adolescent males. Perthes disease and SUFE are difficult to diagnose based on clinical exam alone; however, Perthes disease is less likely, as it mainly affects children under the age of 10.

Positive clinical signs and symptoms – pain in the left groin (site of the hip joint), reduced range of movement, and the chronicity of the symptoms (6 weeks) strongly suggest SUFE as the correct answer. It should be noted that SUFE can also present with referred pain in the thigh or knee.

Negative clinical signs and symptoms – absence of trauma makes a fracture unlikely. As the patient is systemically well and the onset of symptoms predates the chest infection, a septic arthritis or transient synovitis are less likely. Furthermore, these usually present sooner than 3 weeks after an illness. There is also no mention of anterior tibial pain, which rules out Osgood–Schlatter disease.

Risk factors and associations – obesity is a key risk factor for SUFE, as it results in an increased load on the femoral head.

Good to know: SUFE is a frequently misdiagnosed paediatric condition, most commonly seen in adolescent males with obesity. The mechanism of injury is that the femoral head exerts a shearing force that results in a fracture through the physis, leading to anterior slippage and external rotation of the femoral metaphysis. Diagnosis is made via radiographs of the hip, with bilateral AP and frog-leg views.

Question 3

A 62-year-old Caucasian male presents to his GP with a concerning skin lesion on his shoulder. He has a 2.5 cm-wide flat, dark brown lesion with irregular asymmetric borders. It has doubled in size over the last 3 years.

Which of these is the **most likely** diagnosis?

A. Acral lentiginous melanoma
B. Amelanotic melanoma
C. Benign melanocytic naevus
D. Nodular melanoma
E. Superficial spreading melanoma – correct answer

HOW to reach the correct answer

All answers are possible, but clues in the question guide us to which is the **most likely**.

Patient demographics – advancing age is a risk factor for melanoma, along with lighter-coloured hair, skin and eyes. Acral lentiginous melanoma (option A) is the most common subtype in patients with darker skin colour and is usually found on the palmar/plantar surfaces. This form of melanoma is very rare in Caucasians.

Positive clinical signs and symptoms – the change in size and asymmetric borders suggest this is a malignant lesion, so option C (benign melanocytic naevus) is incorrect. A nodular melanoma (option D) is usually described as dome-shaped, rather than flat. The flat, relatively slow-growing lesion is typical of a superficial spreading melanoma.

Negative clinical signs and symptoms – the dark pigmentation suggests this is not an amelanotic lesion (option B), which are usually pink / light brown.

Risk factors and associations – although not relevant to this question, autoimmune conditions, family history, history of sun exposure and HIV-positive status are associated with an increased risk of melanoma.

Question 4

A 76-year-old female, with a past medical history of diabetes and cauda equina syndrome, is admitted to hospital with a urinary tract infection. She mobilises using a wheelchair and has a patch of non-blanching erythema on her ischial tuberosity. There is no history of trauma.

Which of these systems would help **establish her risk** of developing the **skin lesion** described?

A. Child–Pugh score
B. Gustilo–Anderson classification
C. Salter–Harris classification
D. Tscherne classification
E. **Waterlow score – correct answer**

HOW to reach the correct answer

Stage one: determine the type of **skin lesion** being described, using clues in the question.

The following clues suggest this is a pressure ulcer:

Patient demographics – older age, female gender and increased BMI are associated with increased risk of pressure ulcers. Patients with mobility issues, e.g. wheelchair users or bed-bound patients, are also at risk due to immobility creating pressure points.

Positive clinical signs and symptoms – the non-blanching erythema describes a stage I pressure sore based on the NPUAP-EPUAP classification system* of pressure sores. The location of the lesion on a bony prominence (ischial tuberosity) is further suggestive of a pressure sore, as this is a significant pressure point.

*The **NPUAP-EPUAP** classifies pressure ulcers by stages, which guide intervention and management:

Stage I	Non-blanching erythema
Stage II	Partial-thickness skin loss
Stage III	Full-thickness skin loss
Stage IV	Full-thickness skin and tissue loss
Unstageable	Depth unknown
Suspected deep tissue injury	Depth unknown

Negative clinical signs and symptoms – the absence of trauma makes a fracture with overlying traumatic soft tissue injury very unlikely (therefore the Gustilo–Anderson (option B), Salter–Harris (option C) and Tscherne (option D) classifications are incorrect).

Risk factors and associations – a previous history of cauda equina suggests there may be issues with incontinence and mobility, both of which increase the risk of developing pressure ulcers.

This patient most likely has a pressure sore.

Stage two: determine which scoring system can help **establish the risk** of pressure sores.

The Waterlow score (option E) is the correct answer. It is a scoring system that helps identify patients who are at risk of developing pressure ulcers, based on seven domains: weight, continence, mobility, skin condition, appetite, age group and special risks (tissue malnutrition, neurological deficit, surgery, medication).

Considering the other options:

Child–Pugh score: a tool to assess the prognosis and severity of liver cirrhosis.

Gustilo–Anderson classification: a grading system to assess severity of soft tissue injury associated with open fractures.

Salter–Harris classification: used to classify paediatric fractures that involve the epiphyseal plate.

Tscherne classification: a grading system to assess severity of soft tissue injury associated with open and closed fractures.

Question 5

A 28-year-old female presents to the ED with a 3-hour history of intermittent palpitations. On initial examination she is found to have a heart rate of 220 bpm, and she is moved quickly to resus. Her blood pressure is 125/85 mmHg, SpO_2 97% on air, and she has no chest pain, dizziness or breathlessness. She is alert and settled with a GCS of 15. An initial ECG shows a regular narrow complex tachycardia with a rate of 220 bpm.

Considering the **most likely** diagnosis, what is the **most appropriate initial** management for this patient?

A. Adenosine 6 mg
B. Bisoprolol 2.5 mg
C. DC cardioversion
D. Intravenous magnesium
E. **Vagal manoeuvres – correct answer**

HOW to reach the correct answer

Stage one: identify the **most likely** diagnosis using clues in the question.

Patient demographics – a 28-year-old is unlikely to have an arrhythmia related to ischaemic cardiomyopathy, but we don't know her personal or family history, so her age does not give much away here. We do know that females are more likely than males to develop supraventricular tachycardia (SVT).

Positive clinical signs and symptoms – the patient is tachycardic, with an ECG showing a regular narrow complex tachycardia with a rate of 220 bpm. This description is most suggestive of SVT.

Negative clinical signs and symptoms – there is no mention of any underlying causes for the tachycardia, which helps to rule out sinus tachycardia, as this is a physiological response to stressors such as infection or a PE. Additionally, the rate is much higher than would be expected for a sinus tachycardia. The regular rhythm rules out atrial fibrillation, and the narrow complexes rule out a ventricular tachycardia.

Risk factors and associations – there are no other risk factors mentioned in the stem.

This patient has a supraventricular tachycardia (SVT).

Stage two: determine the **most appropriate initial** treatment, looking at each option in turn.

A. Adenosine 6 mg: this is a treatment for SVT but should be used 2nd-line if vagal manoeuvres have failed, so it is not the best initial treatment.

B. Bisoprolol 2.5 mg: this is a good initial treatment for atrial fibrillation, not SVT.

C. DC cardioversion: this is a treatment for all tachyarrhythmias which show life-threatening features in the patients – shock, syncope, myocardial ischaemia or acute heart failure. This patient's blood pressure is normal, she has not lost consciousness or felt pre-syncopal, and she has no chest pain or signs of heart failure, so electrical cardioversion is not indicated here.

D. Intravenous magnesium: this is the treatment for polymorphic ventricular tachycardia (torsades des pointes).

E. Vagal manoeuvres: this is the correct answer option. Vagal manoeuvres, such as the Valsalva manoeuvre, should be 1st-line in stable patients with SVT.

Question 6

A 42-year-old female presents to her GP with frequent headaches, fatigue and muscle cramps. She has a history of hypertension that remains poorly controlled despite treatment with amlodipine and ramipril. She has not experienced any palpitations, weight changes or excessive sweating.

Her blood results are as follows:

Blood test	Result	Reference range
Sodium (mmol/L)	148	135–145
Potassium (mmol/L)	2.9	3.5–5.0
Bicarbonate (mmol/L)	31	22–28
Urea (mmol/L)	5.6	2.5–7.8
Creatinine (μmol/L)	80	60–110
TSH (mU/L)	3.2	0.5–5.0
Plasma renin activity	Suppressed	
Aldosterone	Elevated	

Considering the **likely** diagnosis, what is the **most appropriate initial** management for this patient?

A. Adrenalectomy
B. Amiloride
C. Doxazosin
D. Oral potassium supplementation
E. **Spironolactone – correct answer**

HOW to reach the correct answer

Stage one: identify the **likely** diagnosis using clues in the question.

Patient demographics – always suspect primary hyperaldosteronism, i.e. Conn's syndrome, in younger patients (30–50 years old) with refractory hypertension and hypokalaemia.

Positive clinical signs and symptoms – hypertension, fatigue, muscle cramps and hypokalaemia (K^+ 2.9 mmol/L) are classic features of aldosterone excess. Metabolic alkalosis (HCO_3^- 31 mmol/L) and suppressed renin, with elevated aldosterone, confirm inappropriate aldosterone secretion.

Negative clinical signs and symptoms – there is no history of sweating or palpitations, which makes phaeochromocytoma less likely. There are no cushingoid features mentioned in the question stem, such as weight gain. Normal renal function rules out secondary renal causes of hypertension.

Risk factors and associations – none relevant in this question.

This patient is presenting with symptoms supportive of the diagnosis of primary hyperaldosteronism, i.e. Conn's syndrome.

Stage two: determine the **most appropriate initial** management.

Spironolactone is an aldosterone antagonist (mineralocorticoid receptor blocker). It counteracts the effects of aldosterone by reducing sodium reabsorption and preventing potassium loss. It is first-line therapy for bilateral adrenal hyperplasia, the most common cause of primary hyperaldosteronism.

Considering the other options:

Adrenalectomy: indicated for unilateral aldosterone-producing adenoma, but only after localisation via CT and adrenal venous sampling. Medical therapy with spironolactone is the first step prior to surgical consideration.

Amiloride: a potassium-sparing diuretic which acts as a second-line agent that can be used if spironolactone is not tolerated, i.e. side-effects such as gynaecomastia occur.

Doxazosin: doxazosin is an α_1-adrenergic blocker used as an add-on antihypertensive, particularly in resistant hypertension. However, it does not address the underlying cause of primary hyperaldosteronism.

Oral potassium supplementation: this is a temporary measure which does not treat the cause of potassium wasting or hypertension.

Question 7

You are a resident doctor in a General Adult Psychiatry Clinic. You are asked to see a 24-year-old female who presents with a 4-month history of anxiety and difficulty sleeping. On further questioning, she reports being physically assaulted and robbed at knifepoint 4½ months ago. Since the event, she has avoided the road it occurred on, despite this being the quickest route home from work. She also reports having vivid images of the attack playing over in her head. She does not report any changes to her overall mood or any abnormal perceptions. She has not had any suicidal ideation or thoughts of deliberate self-harm.

What is the **most likely** diagnosis?

A. Acute stress reaction
B. Emotionally unstable personality disorder (EUPD)
C. Generalised anxiety disorder
D. Moderate depressive episode
E. **Post-traumatic stress disorder (PTSD) – correct answer**

HOW to reach the correct answer

All answers are possible, but clues in the question guide us to which is **most likely**.

Patient demographics – a 24-year-old female could experience any of the listed pathologies.

Positive clinical signs and symptoms – in this case, the symptoms experienced are flashbacks (vivid images) after a traumatic event (the robbery) and subsequent avoidance of an activity that will remind her of the event (walking along the road where it happened). This combination of symptoms is most in keeping with post-traumatic stress disorder (PTSD).

Negative clinical signs and symptoms – these symptoms have only been present since the robbery (4½ months ago), making a personality disorder, such as EUPD, much less likely; in personality disorders symptoms are typically present throughout childhood and adolescence. The absence of any thoughts of deliberate self-harm or suicidal ideation also make EUPD less likely. In contrast, the symptoms have been going on for too long to suggest this is an acute stress reaction.

Risk factors and associations – PTSD is more likely to develop in women compared to men following a traumatic event, particularly after violence or sexual assault. The symptoms developed within a month of the traumatic event, which is typical of PTSD; however, it is possible for symptoms to develop much later.

Explanation: PTSD is a condition that occurs as a delayed/protracted response to a significantly stressful and traumatic/life-threatening event. It is characterised by symptoms of flashbacks (re-experiencing of the event), deliberate avoidance of reminders of the event, and hypervigilance. As per ICD-11, these disturbances lead to significant impairment in multiple important areas of functioning.

Question 8

A 62-year-old male attends his GP with a fine tremor. It is particularly affecting his hands but sometimes his wife notices his head is shaking too. The hand tremor is particularly bothersome when he is making a cup of tea or doing up his shirt buttons. He has noticed that the tremor is sometimes less prominent after he has been to the pub for a drink. He reports no weight loss, palpitations or issues with his speech. His gait is also unaffected. He remembers his father also suffered with similar symptoms in his older age.

What is the **most likely** diagnosis?

A. **Essential tremor – correct answer**
B. Huntington's disease
C. Hyperthyroidism
D. Parkinson's disease
E. Wilson's disease

HOW to reach the correct answer

All answers are possible, but clues in the question guide us to which is **most likely**.

Patient demographics – essential tremor is the most common cause of action tremor. The incidence of essential tremor increases with age (>60 years), although childhood and early adulthood

presentations do occur, especially in familial cases. Huntington's disease and Wilson's disease typically present at a younger age (<50 years old).

Positive clinical signs and symptoms – the tremor in this question is affecting both hands and is more obvious with action. This fits with a diagnosis of essential tremor, which is typically bilateral, although it may be slightly asymmetrical. In contrast, the tremor of idiopathic Parkinson's disease tends to be unilateral in onset. Tremor of the head/voice can also occur in essential tremor. Worsening of the tremor with movement/actions, and improvement with alcohol, is also typical of essential tremor and does not fit as well with the other listed answer options.

Negative clinical signs and symptoms – both Huntington's and Wilson's disease can present with a tremor, but typically this would be associated with other neurological symptoms, such as dysarthria (speech disturbances) and other abnormal movements which are not present in this scenario. Wilson's disease would also present with other systemic features, such as jaundice and psychiatric complaints. Parkinson's disease tremor is typically unilateral in onset, and the tremor would be more prominent at rest rather than on movement. Neurological examination in Parkinson's disease may also uncover other signs. Whilst a tremor can be a feature of hyperthyroidism, the question stem does not indicate the presence of any other features suggestive of thyroid disease (e.g. weight loss and palpitations). Nonetheless, thyroid function tests would still be important when investigating this presentation. A review of tremorgenic medications would also be sensible.

Risk factors and associations – essential tremor can run in families.

Question 9

A 60-year-old male presents with abdominal pain and vomiting, and has been generally unwell with fevers and loss of appetite for 3 days. He reports opening his bowels this morning. On examination his abdomen is soft but tender, and bowel sounds are normal. Urine dip is also negative for infection. He has a background of CKD and diabetes and receives renal replacement therapy via peritoneal dialysis (PD). He reports that his PD bag was cloudy this morning.

Considering the **likely** diagnosis, which investigation will yield the **most useful** result?

A. Abdominal X-ray
B. Blood cultures
C. CT abdomen and pelvis
D. Peritoneal dialysis fluid MC&S – correct answer
E. Urine MC&S

HOW to reach the correct answer

Stage one: identify the **likely** diagnosis using clues in the question.

Patient demographics – this patient is 60 years old with CKD, already receiving renal replacement therapy via peritoneal dialysis. The age and gender are less important than his comorbidities in this case.

Positive clinical signs and symptoms – he has abdominal pain and vomiting, and is generally unwell with fevers. These symptoms point towards infection as the likely cause of his illness and, given that his PD bag was cloudy, the likely source of his infection is PD peritonitis.

Negative clinical signs and symptoms – there are a few key differentials in this patient to consider, including constipation, bowel obstruction and urinary infection. The question states that his bowels opened recently, and urine dip was negative for infection, making these differentials less likely. Additionally, a soft abdomen points away from a surgical cause for his symptoms.

Risk factors and associations – any patient receiving PD dialysis is at risk of PD peritonitis. However, increasing age and diabetes are known risk factors. Other risk factors not included in this question are immunosuppression, malnutrition and increased BMI.

This patient most likely has PD peritonitis.

Stage two: decide which investigation will yield the **most useful** result.

In PD peritonitis, sending peritoneal dialysis fluid for MC&S is the most useful investigation, as a high white cell count is diagnostic, and identification of the causative organism will guide antimicrobial therapy and further treatment options. **Therefore, option D is correct.**

Considering the other options:

Abdominal X-ray: this would be appropriate if there was any concern that this patient's PD tube had migrated and was the source of his pain; however, there is nothing to indicate this in the question, and the patient would not have other key symptoms such as fevers.

Blood cultures: these are necessary to do for any patient presenting with fever and signs of infection, so should be sent in this case. However, given the likely source of infection is PD peritonitis, peritoneal dialysis fluid for MC&S will yield the **most useful** result, for the above reasons.

CT abdomen and pelvis: this is also a plausible investigation in this patient and could be done to rule out bowel obstruction and consider other sources of intrabdominal infection. However, it would not be 1st-line in this patient, given the negative clinical findings and obvious source of infection as discussed above.

Urine MC&S: as stated above, it would be important to include this investigation as part of a sepsis screen but it would not yield the most useful result, as the urinary tract is not the most likely source of infection.

Question 10

A 37-year-old female is under investigation for persistently dry eyes and mouth. She recently gave birth to a child with neonatal heart block.

Considering the **likely** diagnosis, which antibodies are **most strongly associated** with this condition?

A. Anti-CCP
B. Anti-dsDNA
C. Anti-Jo
D. Anti-Ro – correct answer
E. HLA-B27

HOW to reach the correct answer

Stage one: identify the **likely** diagnosis using clues in the question.

The most likely diagnosis is Sjögren's syndrome, which is explained below.

Patient demographics – Sjögren's syndrome is much more common in women, with a female to male prevalence ratio of 9:1. Its peak age of onset is between 45 and 55 years; however, it can present outside of this range.

Positive clinical signs and symptoms – Sjögren's syndrome is an autoimmune disorder that affects the exocrine glands and results in dry mucous membranes. As with this patient, it most typically presents with dry eyes and dry mouth and is often managed with artificial saliva and artificial tears. Medications such as pilocarpine can be used to stimulate secretory function.

Negative clinical signs and symptoms – none relevant in this question.

Risk factors and associations – Sjögren's syndrome is associated with neonatal complications such as neonatal heart block, which is most specifically associated with anti-Ro antibodies.

Stage two: find the antibodies **most strongly associated** with this diagnosis.

Sjögren's syndrome is strongly associated with anti-Ro antibodies. Other associated antibodies include anti-La, rheumatoid factor (RF) and ANA, although none of these are answer options here.

Considering the other options:

Anti-CCP: most strongly associated with rheumatoid arthritis.

Anti-dsDNA: most strongly associated with systemic lupus erythematosus (SLE).

Anti-Jo: most strongly associated with anti-synthase syndrome and polymyositis.

HLA-B27: most strongly associated with seronegative spondyloarthropathies such as axial spondyloarthritis, reactive arthritis, psoriatic arthritis and enteropathic arthritis.

Question 11

A 54-year-old female presents to the ED with a one-day history of blood in her stools. She has a history of atrial fibrillation for which she takes apixaban. Whilst in the department she has a further episode of per rectal bleeding. Examination demonstrates a large volume of fresh red blood mixed with brown-coloured stool. She receives a 500 ml bolus of intravenous fluids. Observations are taken afterwards which show BP is 88/53 mmHg and pulse rate 110 bpm. Bloods are taken and sent urgently.

Which of the following is the **most appropriate next** investigation for this patient?

A. Abdominal X-ray
B. CT angiogram – correct answer
C. Ultrasound scan of the abdomen
D. Urgent colonoscopy
E. Urgent upper gastrointestinal endoscopy

HOW to reach the correct answer

Stage one: consider the possible cause of this patient's presentation, using clues in the question.

Patient demographics – lower gastrointestinal (GI) bleeding has a wide range of differentials. However, this patient's age makes inflammatory bowel disease less likely, as this is usually diagnosed in younger patients, with a peak incidence between 25 and 30 years.

Positive clinical signs and symptoms – the main presenting complaint is recurrent episodes of PR bleeding. The presence of fresh red blood is a strong indicator that the bleed is from the lower GI tract, although massive upper GI bleeds can sometimes present with this too. The most common cause of lower GI bleeding in the UK is diverticular bleeding, with up to 60% of cases being severe. However, finding the cause can be challenging and other differentials to consider include ischaemic colitis, malignancy, polyps or angiodysplasia. Haemorrhoids can also cause bleeding; however, significant bleeding with haemorrhoids is less common. From the observations, we can see that this patient is hypotensive and tachycardic, even after initial fluid resuscitation, which is highly suggestive of a significant bleed causing haemodynamic instability.

Negative clinical signs and symptoms – the question tells us that the patient has brown-coloured stool; this is significant as it highlights that there is no evidence of melaena (which presents as black tarry stool). If melaena were present, it would indicate an *upper* GI bleed.

Risk factors and associations – this patient takes apixaban, a direct oral anticoagulant, which puts her at a higher risk of bleeding. In this case it would be important to stop the medication and consider reversing its anticoagulant effect, although this is more difficult with apixaban and requires specialist guidance.

This is a haemodynamically unstable patient with a significant lower GI bleed.

Stage two: choose the **most appropriate next** investigation.

CT angiogram is the correct answer. The British Society of Gastroenterology recommends this scan as the fastest and least invasive investigation to identify the bleeding site in a patient with lower GI bleeding and haemodynamic instability or significant active bleeding.

Considering the other options:

Abdominal X-ray: has a low sensitivity for intra-abdominal pathology and is unlikely to be beneficial in identifying the source of bleeding.

Ultrasound scans: can be useful for assessing abdominal pathology, particularly in less urgent presentations. However, ultrasound is not used to identify sources of GI bleeding.

Urgent colonoscopy: colonoscopy and flexible sigmoidoscopy are frequently used to investigate GI bleeding; however, in an unstable patient, CT angiogram is faster and more easily arranged and therefore preferred as the next investigation in this case.

Urgent upper gastrointestinal endoscopy: incorrect, as the likely source of bleeding is the lower, not upper, GI tract. However, as significant rectal bleeding with haemodynamic instability can sometimes represent massive upper GI bleed, endoscopy may be considered if no source of bleeding is found on the CT angiogram.

Question 12

A 38-year-old male presents with progressive fatigue and pruritus. He has a past medical history of ulcerative colitis and drinks an average of 14 units of alcohol per week. His LFTs show a raised ALP and a mildly raised ALT. Antimitochondrial antibody (AMA) is negative. MRCP shows multiple strictures and dilatations in both the intra- and extrahepatic bile ducts.

What is the **most likely** diagnosis?

A. Acute viral hepatitis
B. Alcohol-related liver disease
C. Choledocholithiasis
D. Primary biliary cholangitis (PBC)
E. **Primary sclerosing cholangitis (PSC) – correct answer**

HOW to reach the correct answer

All answers are possible, but clues in the question guide us to which is **most likely**.

Patient demographics – PSC is more common in young to middle-aged males, with a peak incidence around 30–40 years old. Note that PBC is more common in middle-aged females and is associated with other autoimmune conditions (e.g. thyroid disease, vitiligo). Patients with PSC are at higher risk of developing cholangiocarcinoma, with lifetime risk up to 20%.

Positive clinical signs and symptoms – fatigue and pruritus are common early symptoms of PSC but can also be seen in all of the answer options. The pattern of LFT derangement (raised ALP and mildly raised ALT) points to a cholestatic liver injury, making options A (acute viral hepatitis) and B (alcohol-related liver disease) less likely. Furthermore, the MRCP findings of strictures and dilatation, or 'beading', of both intrahepatic and extrahepatic bile ducts, are classic radiological features of PSC.

Negative clinical signs and symptoms – the negative AMA helps to rule out PBC, which typically has a positive AMA. Although this patient's alcohol intake is at the higher end, it is still within the recommended weekly limit; this makes alcoholic liver disease less likely. Although MRCP can miss small gallstones, it is unlikely to have missed stones causing such significant symptoms and duct dilatation; option C (choledocholithiasis) is therefore lower in the list of likely differentials here.

Risk factors and associations – the big clue in the question is the background of ulcerative colitis; this is seen in up to 80% patients with PSC. This strong association supports the diagnosis of PSC over other liver diseases in this question.

NB: there is no proven treatment for PSC, other than liver transplant.

Question 13

A 38-year-old primigravida attends clinic for her 32-week growth scan and consultant review. Her booking BMI was 41 kg/m^2, but she has no other medical history. Her father has a diagnosis of type 2 diabetes. She missed her oral glucose tolerance testing at 28 weeks. The 32-week scan shows that the fetus is measuring large for gestational age.

What is the **most appropriate next** step?

A. Arrange a HbA1c
B. Arrange a TORCH screen
C. Arrange for a specialist fetal medicine review
D. Arrange for an elective caesarean section
E. **Arrange for oral glucose tolerance testing as soon as possible – correct answer**

HOW to reach the correct answer

Stage one: interpret the scan results in the context of this patient's background, using clues in the question.

Patient demographics – the age of the patient is important in this question due to the increased risk of gestational diabetes with age. The fact that she has a raised BMI also puts her at increased risk of gestational diabetes.

Positive clinical signs and symptoms – in this case, the only sign that we have is fetal macrosomia (fetal size is large for gestational age). This, taken into consideration with her risk factors, should raise concern for gestational diabetes.

Negative clinical signs and symptoms – these are not present in this question.

Risk factors and associations – as above, her age and BMI increase her risk of gestational diabetes. The other risk factor is that she has a 1st-degree relative with T2DM (her father) – we know that this also increases the risk of gestational diabetes.

Her risk factors, demographics, and signs on ultrasound point towards a diagnosis of gestational diabetes.

Stage two: determine the **most appropriate next** step.

If we are considering gestational diabetes, then we need to organise an **oral glucose tolerance test to rule out / diagnose** this condition, in order to tailor antenatal care appropriately and commence treatment if required.

Considering the other options:

Arrange a HbA1c: unlike in T2DM, this is not used to diagnose or monitor gestational diabetes.

Arrange a TORCH screen: this would rule out infection; however, with macrosomia alone, it would not be indicated.

Arrange for a specialist fetal medicine review: this is not required purely for a large baby, particularly if no concerns have been raised at the anomaly scan or any subsequent scans.

Arrange for an elective caesarean section: while the patient may end up requiring a caesarean section if the baby is significantly large, it is not something that would be organised initially.

Question 14

A 7-year-old-boy attends the GP for bedwetting. His mother reports that this happens 4–5 times a week and that he has never been dry overnight. He has been dry during the daytime since the age of 4 years. There is no history of increased urinary frequency or urgency during the day, he drinks a normal amount of fluid for his age and does not complain of excessive thirst. His bowels open regularly once daily, and he does not suffer from abdominal pain or straining. He is otherwise fit and well, there are no stigmata of chronic disease, his development is normal and there are no safeguarding concerns. His mother has tried reducing fluids before bedtime and ensures he empties his bladder regularly in the day and specifically before bed every night. She has also tried implementing a positive rewards system. None of these interventions have helped.

What is the **most appropriate next step** in the **management** of this child?

A. 3-month course of desmopressin then review
B. **Enuresis alarm – correct answer**
C. Prophylactic trimethoprim
D. Referral to Paediatric nephrology for further investigation
E. Reassurance that bedwetting at this age is still normal and should self-resolve

HOW to reach the correct answer

Stage one: determine the likely diagnosis using clues in the question.

Patient demographics – bedwetting is common in young children and usually resolves as children get older. In children <5 years of age reassurance can be given that this will resolve without treatment, provided there is no other underlying cause. In this scenario the child is >5 years old and therefore it is appropriate to offer further management, particularly given the frequency of bedwetting being 4–5 times a week. This excludes option E.

Positive clinical signs and symptoms – the stem clearly describes a case of primary nocturnal enuresis – this is defined as involuntary bedwetting during sleep in a child that has never achieved sustained continence at night and does not have any daytime symptoms.

Negative clinical signs and symptoms – this child has no signs of type 1 diabetes, constipation or regular urinary tract infections. These are all important differential diagnoses to consider in a child with either primary or secondary enuresis. The stem also clearly states that the child has never been dry at night, thus confirming this to be a primary, not secondary, enuresis. In a case of secondary enuresis further investigation and full social and developmental history are important (thinking about safeguarding / behavioural problems) and a GP may consider a referral to secondary care.

Risk factors and associations – in this case no relevant risk factors are mentioned.

Primary nocturnal enuresis is the diagnosis in this case.

Stage two: decide which is the **most appropriate next step** in **management**.

The mother has already tried 1st-line management strategies, which include modifying daily fluid intake and avoiding large volumes of fluid overnight, following a good toileting pattern, ensuring bladder emptying before bed, and a positive reward system – it is important that no penalties are given for a wet night (i.e. removal of reward) as this can potentially humiliate the child.

The next step in management would be an enuresis alarm – this is a sensor that triggers an alarm to wake the child in response to wetness. This helps train the child to recognise the need to pass urine and to wake up to go to the toilet in the night. It may take a few weeks to see any response, but they are shown to have a high long-term success rate.

Considering the other options:

3-month course of desmopressin then review: desmopressin can be considered if the family are not happy to try an enuresis alarm or the enuresis alarm is unsuccessful. It can also be used for short-term improvement, e.g. for upcoming school trip / sleepover.

Prophylactic trimethoprim: this would only be considered in a child with high risk of recurrent UTI, such as structural kidney pathologies. In this case there are no signs or symptoms suggestive of recurrent UTI.

Referral to Paediatric nephrology for further investigation: this may be considered by GPs in cases of secondary enuresis, or if an alternative underlying diagnosis is being considered. Cases of simple primary nocturnal enuresis can normally be diagnosed and managed by the GP.

Reassurance that bedwetting at this age is still normal and should self-resolve: enuresis is very common in the under-5s, and usually resolves as children get older and develop an increased bladder capacity and produce less urine / learn to wake overnight. It is important to reassure parents that primary nocturnal enuresis >5 years old is not secondary to any other pathology and is not the child's fault, but the frequency in this case suggests that the enuresis is unlikely to self-resolve and therefore additional measures should be considered.

Question 15

A 63-year-old female with metastatic breast cancer attends her palliative care clinic appointment. She has been suffering with significant generalised body pains throughout the day. She has been taking 5 mg immediate-release oral morphine as required (PRN) and is needing this 6 times per day for the last month. This has adequately controlled her pain, and she has not had any adverse side-effects. However, she is wondering whether there is an alternative medication that she can take less regularly which will still have the same analgesic effect.

What is the **most suitable** analgesic regimen for this patient, to provide cover for both **background and breakthrough pain**?

A. Continue her current regimen of 5 mg immediate-release oral morphine PRN
B. Increase to 10 mg immediate-release oral morphine PRN
C. Start 10 mg modified-release morphine twice daily (BD) with 2.5 mg immediate-release morphine PRN for breakthrough pain
D. Start 15 mg modified-release morphine twice daily (BD) with 5 mg immediate-release oral morphine PRN for breakthrough pain – correct answer
E. Switch to 20 mg modified-release oxycodone twice daily (BD) with 2.5 mg immediate-release oxycodone PRN for breakthrough pain

HOW to reach the correct answer

We are being asked to identify the **most suitable** regimen from the given options to cover both **background and breakthrough pain**. This can be approached in a stepwise fashion.

Step one: identify the correct analgesia type. She is currently taking morphine, which is working well to control her pain and has not caused adverse side-effects. Therefore, it is appropriate to continue morphine; we can eliminate the other opioid analgesia option (option E).

Step two: calculate an appropriate background dose of morphine. She is currently taking a total of 30 mg immediate-release morphine per day (6 × 5 mg). It is therefore appropriate to consider starting her on a regular dose of longer-acting morphine to control her background pain, rather than just using multiple PRN doses. This should reduce the number of times per day she needs to take medication. Her pain is well-controlled currently, so increasing the total dose of morphine would not be beneficial and may cause unwanted side-effects.

To calculate the most appropriate dose of modified-release morphine, we **take the current total daily requirement of morphine and divide it by 2 (30 mg ÷ 2 = 15 mg)**. Therefore, she will need 15 mg modified-release morphine twice daily (BD), meaning **option D is correct**.

Prescribing 10 mg modified-release morphine BD would be a lower dose than she is currently taking and therefore unlikely to control her pain (eliminating option C). We can also eliminate the options with only PRN preparations (options A and B) as these will not help to reduce the number of times a day she is taking medication.

Step three: calculate the most appropriate dose for breakthrough pain. The regular modified-release morphine should control her pain, but it is important to also prescribe PRN analgesia, in case she has breakthrough pain in between her regular morphine doses. **PRN doses of immediate-release morphine should be 1/10th to 1/6th of total daily modified-release morphine dose.** In this case this is 30 mg/10 = 3 mg or 30 mg/6 = 5 mg. PRN immediate-release morphine should be 3–5 mg, which fits with **option D as the correct answer**.

Question 16

A 60-year-old female is admitted to the intensive care unit with sepsis secondary to pneumonia. She has no past medical history and is not on any regular medications. Despite aggressive fluid resuscitation (3 L in 2 hours) on the respiratory ward, her blood pressure remains low at 80/50 mmHg. Oxygen saturations are 94% on 4 L through nasal cannulae. Empirical broad-spectrum antibiotics have already been started as per the local guidelines.

Which of the following is the **most appropriate next step** in management?

A. Complete a DNACPR form
B. **Discuss with the ITU registrar on call – correct answer**
C. Discuss with the respiratory consultant on call
D. Increase her oxygen to a 15 L non-rebreather mask
E. Rediscuss the choice of antibiotics with microbiology

HOW to reach the correct answer

All answers are possible, but clues in the question help to determine which would be **most appropriate** as a **next step**.

Patient demographics – a 60-year-old female with no previous medical history or regular medications is likely to have good physiological reserves. She is therefore an appropriate candidate for ITU and so a DNACPR is not an appropriate next step.

Positive clinical signs and symptoms – this patient is being treated for sepsis, secondary to pneumonia. She has a low BP despite adequate fluid resuscitation (guidelines recommend 30 ml/kg in the first 3 hours). This indicates that she is in septic (distributive) shock. If volume expansion with IV fluids is not successful, we need to consider alternative ways to increase the blood pressure. These include the use of vasopressors and inotropes. These medications would be administered on the intensive care unit.

Negative clinical signs and symptoms – there is no evidence to suggest that alternative antibiotics are indicated at this point. Once culture results are back it may be necessary to rediscuss this patient with microbiology. However, the issue that needs addressing urgently is the refractory hypotension and this will require ITU input. Similarly, although O_2 sats are borderline on 4 L, this is not the most significant problem and can probably be resolved by a small increase in O_2 delivery. There is no indication to discuss this patient with the respiratory consultant at present.

Risk factors and associations – there are no relevant risk factors in this question.

Question 17

A 78-year-old male presents to the ED with a 48-hour history of shortness of breath, wheeze and a cough productive of green phlegm. On auscultation of his lungs there is widespread wheeze. Observations reveal oxygen saturations of 86% on room air, with the other parameters within the normal range. His medical history includes hypertension and T2DM. He is a current smoker with a smoking history of 40 pack years. Blood tests show raised CRP and WCC. A chest X-ray shows hyperinflated lungs, but nil acute consolidation.

Results of arterial blood gas (ABG) on room air:

	Result	Reference range
pH	7.36	7.35–7.45
***PCO*$_2$** (kPa)	7.5	4.5–6.0
***PO*$_2$** (kPa)	6.8	10–14
Bicarbonate (mmol/L)	32	22–26
Lactate (mmol/L)	1.2	<2.0

Which option is **not routinely used** in the management of the **most likely** diagnosis?

A. 15 L oxygen via non-rebreather mask – correct answer
B. Antibiotics
C. Nebulised bronchodilators
D. Non-invasive ventilation (NIV)
E. Oral corticosteroids (30 mg prednisolone OD)

HOW to reach the correct answer

Stage one: identify the **most likely** diagnosis using clues in the question.

Patient demographics – while a 78-year-old male could present with a range of respiratory conditions, COPD is more common in the elderly because it is a progressive disease that develops over many years, primarily due to smoking. The gradual damage to the lungs means it is most often diagnosed in middle-aged or older adults. Asthma is another common obstructive airway disease, but would be less likely to have a first presentation in this age group.

Positive clinical signs and symptoms – there are a range of clues pointing us towards a diagnosis of an infective exacerbation of COPD. These include symptoms of shortness of breath, wheeze and productive cough, reduced oxygen saturations of 86% and blood tests showing raised infection / inflammatory markers. The ABG shows a type 2 respiratory failure (low PO_2 + high PCO_2) with metabolic compensation (high bicarbonate); this is most in keeping with a chronic respiratory pathology, further supporting an underlying diagnosis of COPD. The chest X-ray finding of hyperinflated lungs is also in keeping with COPD.

Negative clinical signs and symptoms – the chest X-ray doesn't show any acute consolidation, ruling out pneumonia as a cause for this patient's shortness of breath and productive cough.

Risk factors and associations – a 40 pack-year smoking history points us to an underlying diagnosis of COPD. Additionally, the fact that this patient is still smoking significantly increases the risk of having recurrent exacerbations of his airway disease.

This patient is most likely having an infective exacerbation of (undiagnosed) COPD.

Stage two: identify the treatment option that is **not routinely used** in the management of an infective exacerbation of COPD (IECOPD).

Antibiotics, nebulised bronchodilators and oral steroids (options B, C and E) are all standard management strategies for an IECOPD. If the patient is not responding to medical management, and there is worsening respiratory acidosis and hypercapnic respiratory failure, then non-invasive ventilation (NIV) (option D) is indicated. Therefore, by a process of elimination, the **correct answer is option A – 15 L oxygen via non-rebreather mask**.

For people with COPD, the target oxygen saturation is 88–92%, especially during an acute exacerbation. This range is used because higher oxygen levels can cause dangerous amounts of carbon dioxide to build up in patients with COPD (hypercapnic respiratory failure). Oxygen is administered at a controlled rate using devices such as a Venturi mask, which prevents over-oxygenation and worsening respiratory acidosis.

Question 18

A 24-year-old male presents to his GP asking for a sick note. He says that he has already taken a considerable amount of time off work for an episode of tonsillitis a month ago and has been struggling with extreme lethargy ever since. He denies any night sweats or weight loss. His past medical history includes Hashimoto's thyroiditis. On examination, there is no tonsillar enlargement or exudate when examining the oropharynx. He has prominent cervical lymph nodes, but no palpable thyroid mass. On deep palpation of the abdomen, there is a painless, smooth, firm edge under the left costal margin that moves with inspiration. He is not jaundiced.

What is the **most likely** diagnosis?

A. Cholangiocarcinoma
B. Diffuse B-cell lymphoma
C. Human immunodeficiency virus (HIV)
D. Infectious mononucleosis (Epstein–Barr virus, EBV) – correct answer
E. MALT lymphoma

HOW to reach the correct answer

All answers are possible, but clues in the question guide us to which is **most likely**.

Patient demographics – the incidence of infectious mononucleosis is highest in young adults, typically between 15 and 24 years old. It would be unlikely for a patient of this young age to have a cholangiocarcinoma.

Positive clinical signs and symptoms – this patient has persistent fatigue following a resolved oropharyngeal infection. Infectious mononucleosis, otherwise known as glandular fever, can easily be mistaken for a bacterial or viral tonsillitis and can cause these lingering symptoms. In this case, the normal oropharyngeal exam suggests against a diagnosis of current tonsillitis. In primary care, blood results are not as readily available as in the hospital setting, and a careful abdominal examination is therefore very important. This patient has a painless smooth mass palpable under the left costal margin, which moves with inspiration; this is most in keeping with an enlarged spleen. Splenomegaly affects as many as 50% of patients with glandular fever and, as with the cervical lymphadenopathy, it typically resolves within 4 weeks.

Negative clinical signs and symptoms – splenomegaly should always prompt consideration of malignancies, such as lymphoma; the absence of B symptoms makes this less likely in our list of differentials for this patient. A significant minority of patients with EBV will also have hepatomegaly, but there is no jaundice or right upper quadrant abdominal findings to suggest this here. If there was a painless mass in the right upper quadrant in an older patient, this should also raise concern for cholangiocarcinoma. Despite the absence of these findings in this case, the patient should still have a full blood count and liver function tests.

Risk factors and associations – hypothyroidism is associated with primary thyroid lymphomas, including MALT lymphoma and diffuse large B-cell lymphoma, which may present as splenomegaly; however, these are very rare and the absence of a thyroid mass is reassuring. We must consider what is **most likely**, particularly in the context of the history given.

HIV should always be considered in cases of newly identified splenomegaly. Important risk factors would be intravenous drug use, risky sexual behaviours, or potential vertical transmission through mothers. These are not mentioned here but would be worth specifically asking about in the history.

Given all of the above, infectious mononucleosis is our most likely answer. This patient should be advised to rest and to avoid contact sports for 6 weeks, as this risks splenic rupture. Symptoms generally improve but patients should be safety-netted for any worsening in symptoms or lack of improvement within the appropriate timeframe.

Question 19

A 74-year-old male presents to his GP with symptoms of hesitancy, urinary frequency and nocturia. He denies any incontinence. On examination his bladder is not palpable. His prostate gland is smooth, moderately enlarged, and non-tender on digital rectal examination (DRE). A urine dip is negative for blood, leukocytes and nitrites. A prostate-specific antigen (PSA) blood test is requested. The GP decides to initiate medical management with two different medications.

Which of the following adverse effects is **least likely** to arise as a result of these medications?

A. Constipation – correct answer
B. Gynaecomastia
C. Micturition syncope
D. Postural hypotension
E. Sexual dysfunction

HOW to reach the correct answer

Stage one: identify the likely diagnosis using clues in the question.

Patient demographics – more than 80% of males in their 70s have histologic evidence of benign prostatic hyperplasia (BPH), so this diagnosis should be considered in any patient fitting this demographic who presents with lower urinary tract symptoms (LUTS).

Positive clinical signs and symptoms – the case describes LUTS consistent with a diagnosis of bladder outlet obstruction: hesitancy is a voiding symptom attributable to difficulty forcing urine past an obstruction. Frequency and nocturia are storage symptoms which could be the result of incomplete bladder emptying on urination. The finding of an enlarged prostate on DRE provides an explanation for the suspected bladder outlet obstruction. The clue here is that the prostate feels smooth, in keeping with BPH. In contrast, prostate cancer most commonly results in an irregular, 'craggy' enlargement of the gland.

Negative clinical signs and symptoms – BPH is not the only possible cause of LUTS in older males, but the question stem mentions negatives which help to lower our suspicion for certain other causes. As above, the DRE findings are not in keeping with a prostate cancer. Secondly, the patient does not experience incontinence; if this were present, checking for a palpable bladder and performing a bladder scan would be helpful to decide whether this was overflow incontinence (in the context of bladder outlet obstruction) or an overactive bladder. Medical treatment options for overactive bladder would include antimuscarinics (usually oxybutynin) and beta-3-adrenoceptor agonists (usually mirabegron). The negative urine dip reassures us that our patient does not have a urinary tract infection (UTI); the absence of blood is also reassuring, as haematuria is commonly caused by urinary tract cancers, such as bladder cancer.

This patient most likely has bladder outlet obstruction, secondary to benign prostatic hyperplasia (BPH).

The two medications which a GP might initiate to manage this are an **alpha-blocker** (usually tamsulosin) and a **5-alpha reductase inhibitor** (usually finasteride).

Stage two: determine which of the listed adverse effects is **least likely** to arise as a result of starting these two medications.

Risk factors and associations – simultaneous initiation of multiple medications with overlapping adverse effect profiles comes with a higher chance of those adverse effects manifesting than if only one of the medications is started. In this case, both alpha-blockers and 5-alpha reductase inhibitors can cause sexual dysfunction (option E), so we should certainly warn our patient about this (consider that this might be a concern for your patient regardless of their age!).

Hypotension is another important side-effect of alpha-blockers. Although tamsulosin is selective for alpha adrenoceptor subtypes found in the smooth muscle of the urinary tract, it still has some antagonistic effect on adrenoreceptors in the peripheral vasculature. Patients who start tamsulosin are therefore more vulnerable to hypotension at times when the body would normally rely on alpha adrenoceptor-mediated vasoconstriction to maintain blood pressure, such as when standing up or urinating. Postural hypotension (option D) or micturition syncope (option C) can result, with older patients being especially vulnerable to these effects.

5-alpha reductase inhibitors such as finasteride can cause gynaecomastia (option B).

Constipation (answer A) is the only symptom which is not a recognised adverse effect of either alpha-blockers or 5-alpha reductase inhibitors, making this the correct answer.

NB: NICE does recommend offering an alpha-blocker and a 5-alpha reductase inhibitor at the same time to patients with prostate enlargement and moderate–severe LUTS. This question should be a reminder to consider and warn patients about possible adverse effects of new medications, especially when starting more than one simultaneously.

Question 20

A 21-year-old female presents to the GUM clinic with a 5-day history of vaginal discharge and vulval irritation. She describes the discharge as yellow/green and frothy and reports some dysuria and lower abdominal pain. She denies any itching or skin changes. She had a one-night stand with a male friend 3 weeks ago. She uses injectable contraception and last had her injection 11 weeks ago. On external examination she has a normal vulva; however, on speculum examination there is profuse yellow/green discharge and vaginitis. Her cervix appears normal.

The vaginal pH is 4.0. Microscopy shows motile flagellated protozoa.

What is the **most appropriate first-line** treatment for the **most likely** diagnosis?

A. Ceftriaxone (intramuscular)
B. Clotrimazole (pessary)
C. Doxycycline (oral)
D. Fluconazole (oral)
E. **Metronidazole (oral) – correct answer**

HOW to reach the correct answer

Stage one: identify the **most likely** diagnosis using clues in the question.

Patient demographics – most sexually transmitted infections (STIs) are diagnosed in patients aged 16–24 years. STIs are more strongly associated with new partners or inconsistent condom use.

Positive clinical signs and symptoms – the stem gives several classical features of trichomoniasis infection, including frothy yellow/green discharge and vulval irritation. However, you might see similar presentations with other STIs. The strongest indicator of trichomoniasis in the stem is the presence of motile flagellated protozoa on microscopy. This is the distinguishing feature from other STIs that can have overlapping symptoms; for example, gonorrhoea may have green discharge but will show Gram-negative intracellular diplococci on microscopy.

Negative clinical signs and symptoms – the cervix appears normal. Although a 'strawberry cervix' is a textbook association of *Trichomonas vaginalis* (TV), the red punctate marks on the cervix are only seen in 2% of cases; therefore the absence of this does not rule TV out. The vaginal pH is in the normal range (3.5–4.5), making bacterial vaginosis (BV) a less likely diagnosis, as this typically raises the pH >4.5.

Risk factors and associations – condomless sex is a significant risk factor for sexually transmitted infections.

From this we can identify the most likely diagnosis is *Trichomonas vaginalis*.

Stage two: determine the **most appropriate first-line** treatment.

Of the listed options, only metronidazole is a treatment for *Trichomonas vaginalis*. Therefore, **option E is the correct answer**.

Considering the other options:

Ceftriaxone (intramuscular): this is the treatment for gonorrhoea.

Clotrimazole (pessary): this is the treatment for candidiasis.

Doxycycline (oral): this is the treatment for chlamydia.

Fluconazole (oral): this is the treatment for candidiasis.

Question 21

An 84-year-old male presents to the ED with sudden-onset severe abdominal pain that started 1 hour ago. The pain is generalised over the abdomen and radiates to his back. His regular medications include ramipril, amlodipine and doxazosin. He is a lifelong smoker. On examination bowel sounds are normal and a pulsatile, expansile mass is present. His observations reveal that he is tachycardic (HR 120 bpm), hypotensive (BP 92/58 mmHg) and apyrexial (temp. 37.2°C). He has no vomiting and his wife reports that he opened his bowels this morning.

What is the **most likely** diagnosis?

A. Appendicitis
B. Large bowel obstruction
C. Pancreatitis
D. Perforated peptic ulcer
E. **Ruptured abdominal aortic aneurysm – correct answer**

HOW to reach the correct answer

All answers are possible, but clues in the question guide us to which is **most likely**.

Patient demographics – abdominal aortic aneurysms (AAAs) are more common with increasing age.

Positive clinical signs and symptoms – the differentials for abdominal pain are extremely wide. However, the very sudden onset in this case gives us a clue that this may be a vascular pathology. Asymptomatic AAAs are at risk of rupture, particularly as they increase in size. Rupture of the vessel happens suddenly, causing acute onset of severe pain, as in this case. Furthermore, there will be leakage of blood into the abdomen, resulting in the haemodynamic instability, also seen in this patient's presentation. The pulsatile expansile mass present on examination is typical of an AAA and further supports AAA rupture as a top differential here.

Negative clinical signs and symptoms – pancreatitis also presents with severe abdominal pain radiating to the back; however, the pain is usually located in the epigastric region. In pancreatitis the patient may also have a low-grade fever and often some vomiting, neither of which are present in this case. Bowel obstruction will also present with abdominal pain, but the patient would either have vomiting or absolute constipation and examination would reveal a distended abdomen and abnormal or absent bowel sounds. A perforated peptic ulcer can also present with haemodynamic instability and abdominal pain. However, it would more commonly be associated with coffee-ground vomiting or melaena, neither of which are present in the question. Abdominal pain associated with appendicitis would be more gradual in onset, starting in the umbilical region and then localising to the right iliac fossa; there may also be associated fever present.

Risk factors and associations – smoking and hypertension are risk factors for AAAs. The presence of three antihypertensives suggests this patient has difficult-to-control hypertension. Men are more commonly affected.

Further reading

Question 4

Child, C.G. and Turcotte, J.G. (1964) Surgery and portal hypertension. *Major Probl Clin Surg*, **1:** 1–85.

Gustilo, R.B. and Anderson, J.T. (1976) Prevention of infection in the treatment of one thousand and twenty-five open fractures of long bones: retrospective and prospective analyses. *J Bone Joint Surg Am*, **58(4):** 453–8.

National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance (2025) *Prevention and Treatment of Pressure Ulcers/Injuries: Quick Reference Guide*. The International Guideline: 4th edition. Available at: https://internationalguideline.com

Salter, R.B. and Harris, R.W. (1963) Injuries involving the epiphyseal plate. *Journal of Bone & Joint Surgery*, **45(3):** 587–622.

Tscherne, H. and Oestern, H.J. (1982) Die Klassifizierung des Weichteilschadens bei offenen und geschlossenen Frakturen [A new classification of soft-tissue damage in open and closed fractures (author's transl.)]. *Unfallheilkunde*, **85(3):** 111–15. German.

Waterlow, J. (1985) Pressure sores: a risk assessment card. *Nurs Times*, **81(48):** 49–55.

Question 10

Carsons, S.E. and Blum, M.A. (updated 2025) *Sjogren syndrome*. StatPearls. Available at: www.ncbi.nlm.nih.gov/books/NBK431049

Lab Tests Online UK (updated 2019) *Sjögren's syndrome*. Available at: https://labtestsonline.org.uk/conditions/sjogrens-syndrome

Moutasim, K.A., Shirlaw, P.J., Escudier, M.P. and Poate, T.W. (2009) Congenital heart block associated with Sjögren syndrome: case report. *Int Arch Med*, **2:** 21. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC2731088

Question 12

Chapman, M.H., Thorburn, D., Hirschfield, G.M. *et al.* (2019) British Society of Gastroenterology and UK-PSC guidelines for the diagnosis and management of primary sclerosing cholangitis. *Gut*, **66:** 1–23. Available at: www.bsg.org.uk/getattachment/0c8c59d1-f776-4b3d-9aee-af7c7c1d85a1/Diagnosis-and-Management-of-PSC_gutjnl-2018-317993.pdf?lang=en-US

Question 14

ERIC (reviewed 2022) *Bedwetting – reasons and how to stop it*. Available at: https://eric.org.uk/childrens-bladders/bedwetting

Question 19

NICE (updated 2015) *Lower urinary tract symptoms in men: management* [CG97]. Available at: www.nice.org.uk/guidance/cg97

Sarma A.V. and Wei, J.T. (2012) Benign prostatic hyperplasia and lower urinary tract symptoms. *New England Journal of Medicine*, **367(3):** 248–57.

Question 20

Sherrard, J., Pitt, R., Russell Hobbs, K. *et al.* (2022) British Association for Sexual Health and HIV (BASHH) United Kingdom national guideline on the management of *Trichomonas vaginalis* 2021. *International Journal of STD & AIDS*, **0(0):** 1–11. Available at: www.bashh.org/resources/20/trichomonas_vaginalis_2021