



MS AKT Practice Paper 1

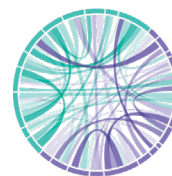
A suite of practice papers is available to help medical students prepare for the UK Medical School Applied Knowledge Test (MS AKT). Please note that while this practice paper reflects the style and type of questions that students will encounter in the MS AKT, it is not blueprinted to the MLA Content Map.

This practice paper comes with and without the answer options.

We would like to recognise the contribution of medical schools, and members of the AKT working groups in particular, for their help in preparing these which we hope students will find a valuable resource.

Please note the practice papers are reviewed on an annual basis and updated accordingly. Items that may have appeared in earlier versions may now have been retired as part of this exercise. Should you have any questions about the clinical content of the practice exam please speak to the Assessment Lead in your school in the first instance.

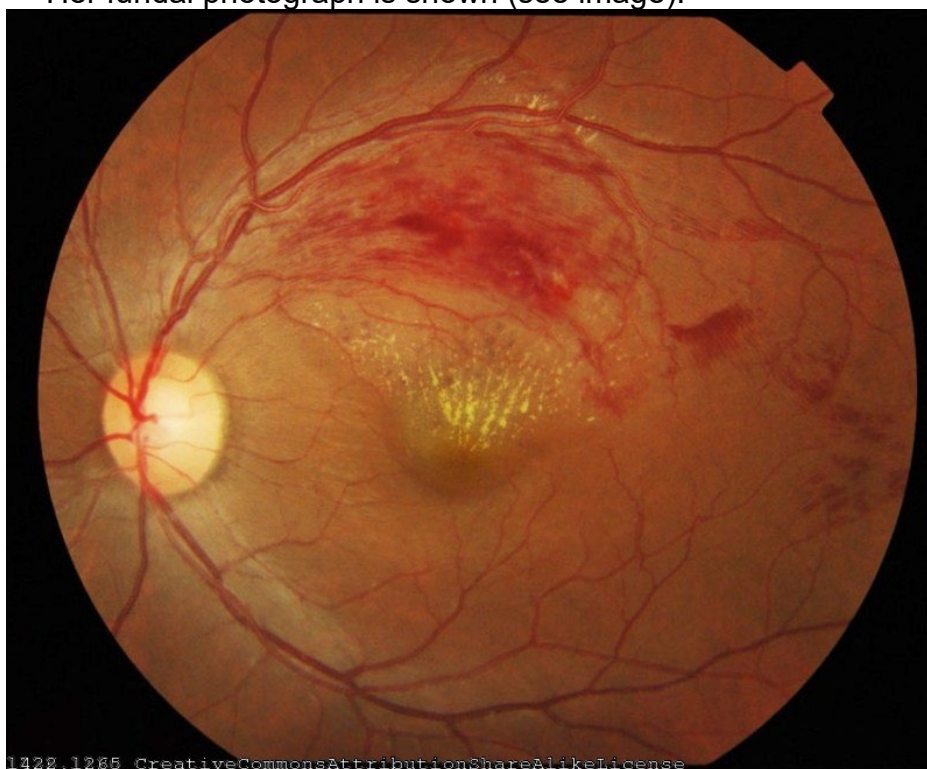
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1. A 67 year old woman attends the emergency department with sudden onset of blurred vision. She is otherwise in good health with no history of eye disease and is taking no medication.

Her right eye is normal. Visual acuity in her left eye is reduced and her left pupil reacts sluggishly to light.

Her fundal photograph is shown (see image).



What is the most likely cause of her visual loss?

- A. Branch retinal artery occlusion
- B. Branch retinal vein occlusion
- C. Central retinal artery occlusion
- D. Central retinal vein occlusion
- E. Optic neuritis



- 2.** A 78 year old man develops increasing confusion on the ward at night. He is wandering around naked asking for his wife, shouting, and threatening staff and patients. He was admitted earlier in the day with a productive cough and fever. He has idiopathic Parkinson disease.

His temperature is 37.6°C, pulse 100 bpm, BP 132/71 mmHg and oxygen saturation 95% breathing air. His capillary blood glucose is 5 mmol/L.

Attempts to calm him with nursing measures do not improve the situation and he begins hitting staff.

What is the most appropriate treatment?

- A.** Amitriptyline
- B.** Haloperidol
- C.** Immediate release carbidopa-levodopa
- D.** Lorazepam
- E.** Risperidone

- 3.** A 78 year old woman has had back pain for 2 weeks and bilateral leg weakness for 2 days. She had surgery for breast cancer 14 years ago. She had a minor fall at home a few days ago.

She has weakness of hip flexion bilaterally with brisk knee reflexes, extensor plantar responses and reduced sensation to pinprick in her feet.

What is the most likely diagnosis?

- A.** Lumbar disc prolapse
- B.** Mechanical back pain
- C.** Osteomalacia
- D.** Osteoporotic vertebral collapse
- E.** Spinal cord compression



- 4.** A 28 year old man has polyuria and polydipsia. He has bipolar disorder for which he has taken lithium carbonate for 2 years.

Initial investigations:

Sodium	145 mmol/L	(135–146)
Potassium	3.9 mmol/L	(3.5–5.3)
Serum osmolality	296 mOsmol/kg	(275–295)
Urinary osmolality	356 mOsmol/kg	(350–1000)
Fasting glucose	5.8 mmol/L	(3.0–6.0)
Serum lithium	0.75 mmol/L	(0.5–1.2)

What is the most appropriate next investigation?

- A.** 24-h urinary cortisol
- B.** Glucose tolerance test
- C.** Serum corrected calcium
- D.** Short Synacthen test
- E.** Water deprivation test

- 5.** A 65 year old woman is seen in clinic 2 weeks following a stroke.

CT scan of the head shows a left frontal lobe infarct.

She is currently taking aspirin, atorvastatin and ramipril.

Investigations:

ECG: atrial fibrillation, heart rate 68 bpm, otherwise normal.

What is the most appropriate long-term anti-thrombotic therapy?

- A.** Apixaban
- B.** Aspirin
- C.** Aspirin and dipyridamole
- D.** Clopidogrel
- E.** Ticagrelor

6. A 49 year old man has 3 days of cough and fever. He undergoes haemodialysis three times per week.

His temperature is 38.6°C, pulse 90 bpm, BP 122/80 mmHg, respiratory rate 30 breaths per minute and oxygen saturation 95% breathing 15 L/min oxygen via a non-rebreather mask. His JVP is 4 cm above the sternal angle. He has inspiratory crackles in the right mid and lower zone and left upper zone. His blood capillary glucose is 12 mmol/L.

Investigations:

Sodium	131 mmol/L	(135–146)
Potassium	5.7 mmol/L	(3.5–5.3)
Urea	16.7 mmol/L	(2.5–7.8)
Creatinine	327 µmol/L	(60–120)

Chest X-ray: see image



What is the most appropriate initial treatment?

- A. Haemodialysis
- B. Intravenous 10 mL 10% calcium gluconate
- C. Intravenous 1000 mL 0.9% sodium chloride over 1 h
- D. Intravenous co-amoxiclav and clarithromycin
- E. Intravenous furosemide



7. A 67 year old man is due to have a CT scan of the chest, abdomen and pelvis with intravenous contrast as assessment for possible lymphoma. He had a renal transplant 5 years previously. He takes prednisolone, tacrolimus and lisinopril.

His BP is 131/86 mmHg.

Investigations:

Urea	12.9 mmol/L	(2.5–7.8)
Creatinine	165 μ mol/L	(60–120)
eGFR	39 mL/min/1.73 m ²	(>60)

What is the most appropriate treatment to give before the scan?

- A. Intravenous 0.9% sodium chloride
- B. Intravenous acetylcysteine
- C. Intravenous furosemide
- D. Intravenous hydrocortisone
- E. Intravenous mannitol



8. A 78 year old woman is admitted after being found collapsed at home. She has been lying on the floor overnight. She has hypertension and takes amlodipine. A urinary catheter is passed and she passes 60 mL of urine over the next 2 hours.

Her temperature is 35.8°C, pulse 88 bpm and irregular, and BP 102/60 mmHg.

Investigations:

Sodium	136 mmol/L	(135–146)
Potassium	5.8 mmol/L	(3.5–5.3)
Urea	20.9 mmol/L	(2.5–7.8)

Creatinine	180 µmol/L	(60–120)
Creatine kinase	870 U/L	(25–175)

Urinalysis: glucose negative, ketones negative, blood 2+, protein 1+, leucocytes positive (catheter sample).

She is treated with trimethoprim for presumed urosepsis.

What is the most likely additional cause for her acute kidney injury?

- A. Glomerulonephritis
- B. Hypovolaemia
- C. Renal arterial emboli
- D. Rhabdomyolysis
- E. Ureteric obstruction



- 9.** A 76 year old woman has become increasingly confused over the previous 2 weeks. She has hypertension for which she takes bendroflumethiazide, doxazosin, amlodipine, ramipril and atenolol.

Her BP is 108/71 mmHg.

Investigations:

Sodium	121 mmol/L	(135–146)
Potassium	3.5 mmol/L	(3.5–5.3)
Urea	10.0 mmol/L	(2.5–7.8)
Creatinine	105 µmol/L	(60–120)

Which medication is most likely to be responsible for her presentation?

- A.** Amlodipine
- B.** Atenolol
- C.** Bendroflumethiazide
- D.** Doxazosin
- E.** Ramipril

- 10.** A 92 year old woman has severe neck, chest and back pain following a fall. She has bruising around her right eye.

Investigations: Full blood count and clotting screen: normal

Chest X-ray: lung fields clear, left sided 4th and 5th rib fractures

CT scan of head: no intracranial injury or bleed, mild small vessel disease, right orbital fracture

What is the most appropriate next investigation?

- A.** Cervical spine X-ray
- B.** CT angiography
- C.** CT scan of chest
- D.** CT scan of neck
- E.** MR scan of brain



- 11.** A 64 year old woman develops an acutely painful right knee 3 weeks after a prosthetic right knee replacement.

Her temperature is 38.2°C and pulse 103 bpm. Her right knee is inflamed with serous fluid discharging from the lower end of the wound.

What is the most likely causative organism?

- A.** *Corynebacterium* species
- B.** *Enterococcus* species
- C.** *Pseudomonas aeruginosa*
- D.** *Staphylococcus aureus*
- E.** *Streptococcus pyogenes*

- 12.** A 52 year old man has 3 months of fatigue. He has ulcerative colitis and takes mesalazine. He drinks 20 units of alcohol per week.

His temperature is 36.8°C and pulse 80 bpm. He has 3 cm hepatomegaly.

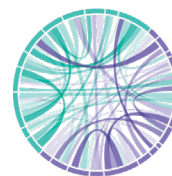
Investigations:

Albumin	36 g/L	(35–50)
ALT	65 IU/L	(10–50)
ALP	580 IU/L	(25–115)
Bilirubin	18 µmol/L	(<17)
γGT	230 IU/L	(9–40)

Ultrasound scan of abdomen: bile duct wall thickening and dilatation

What is the most appropriate next diagnostic investigation?

- A.** CT scan of abdomen
- B.** Endoscopic retrograde cholangiopancreatography
- C.** Liver biopsy
- D.** MR cholangiopancreatography
- E.** Percutaneous transhepatic cholangiography



- 13.** A 60 year old woman has 6 weeks cough productive of blood streaked sputum.

Investigations:

CT scan of chest: mass in left lower lobe.

Needle biopsy: nuclei that are enlarged, hyperchromatic and pleomorphic.

What is the most likely diagnosis?

- A.** Adenoma
- B.** Carcinoma
- C.** Hamartoma
- D.** Sarcoidosis
- E.** Tuberculosis

- 14.** A 65 year old woman has an infective exacerbation of COPD and has been treated with nebulised bronchodilators, antibiotics and steroids.

She is alert. Her temperature is 37.8°C, pulse 108 bpm, BP 100/75mmHg, respiratory rate 26 breaths per minute and oxygen saturation 88% breathing 15 L/minute oxygen via a non-rebreather mask.

Investigations:

Arterial blood gas on 15 L/min oxygen

pH	7.28	(7.35–7.45)
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PO ₂	7.2 kPa	(11–15)
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PCO ₂	8.9 kPa	(4.6–6.4)
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Bicarbonate	31.3 mmol/L	(22–30)
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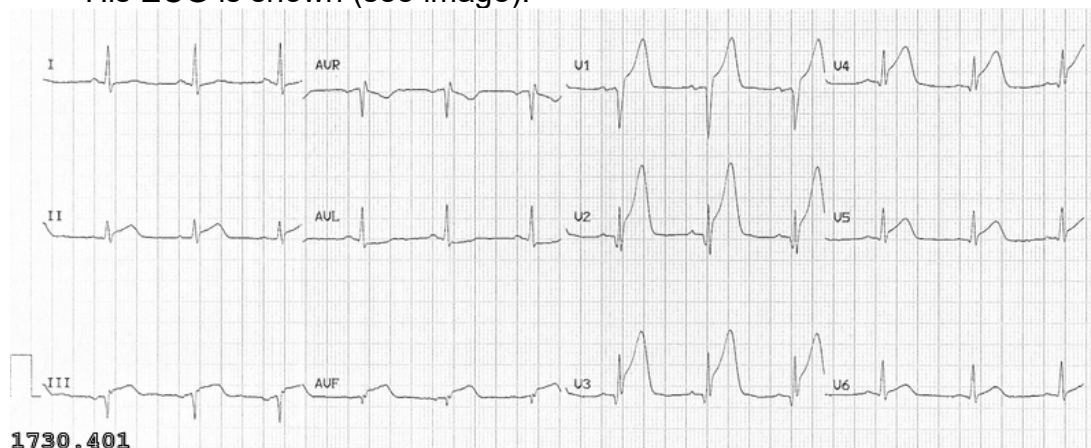
Lactate	1.2 mmol/L	(1–2)
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What is the most appropriate next management step?

- A.** Continuous positive airway pressure
- B.** Invasive ventilation
- C.** Nasal high flow oxygen
- D.** Nasopharyngeal airway
- E.** Non-invasive ventilation

- 15.** A 79 year old man attends the Emergency Department with 2 hours of chest pain and light-headedness.

His ECG is shown (see image).



What is the most likely explanation for the ECG findings?

- A. Aortic dissection
- B. Hyperkalaemia
- C. Myocardial infarction
- D. Pericarditis
- E. Pulmonary embolism

- 16.** A 50 year old woman has acute onset of breathlessness. She underwent a laparoscopic cholecystectomy 10 days ago.

Her temperature is 37.4°C, pulse 104 bpm, BP 122/80 mmHg, respiratory rate 24 breaths per minute and oxygen saturation 94% breathing air. Her chest is clear. She has minimal tenderness over the right hypochondrium.

What is the most likely diagnosis?

- A. Myocardial infarction
- B. Pancreatitis
- C. Pneumonia
- D. Pulmonary embolus
- E. Subphrenic abscess



- 17.** A 39 year old man has had fever, chills and generalised weakness for 1 month. He has a systolic heart murmur. He is an intravenous drug user.

Investigations:

White cell count $15 \times 10^9/L$ (4.0–11.0)

C reactive protein. 88 mg/L (< 5)

Blood culture results are awaited.

What further investigation will help to establish the diagnosis?

- A.** Chest X-ray
- B.** ECG
- C.** Echocardiogram
- D.** HIV testing
- E.** Urine dipstick analysis

- 18.** A 16 year old girl attends the emergency department after an episode of loss of consciousness following a fall. She had consumed an excessive amount of alcohol at a party before the fall.

She has a dirty scalp wound and cannot remember recent events. Her pulse is 68 bpm, BP 110/80 mmHg and oxygen saturation 98% breathing air. She opens her eyes to command and is confused. Her capillary blood glucose is 6.0 mmol/L.

Her wound is cleaned and sutured.

What is the most appropriate immediate management plan?

- A.** Admit and observe for 24h
- B.** CT scan of head
- C.** Discharge with head injury instructions
- D.** Refer to neurosurgeon
- E.** X-ray of skull



- 19.** A 47 year old woman has had 1 year of increased urinary frequency, urgency and nocturia. She leaks urine if she cannot get to the toilet promptly. She had three normal pregnancies with no complications.

The perineum appears normal and there is no uterine prolapse. Incontinence is not provoked by coughing or straining.

Urinalysis is negative. A post-micturition ultrasound scan of bladder shows minimal residual urine volume.

Her symptoms do not improve following 6 weeks of bladder training.

What is the most appropriate next management step?

- A.** Botulinum toxin type A injection into bladder wall
- B.** Oral duloxetine
- C.** Oral oxybutynin
- D.** Percutaneous sacral nerve stimulation
- E.** Topical oestrogen

- 20.** A 72 year old woman has 6 months of constipation.

Investigations:

Creatinine	70 $\mu\text{mol/L}$	(60–120)
Calcium	2.90 mmol/L	(2.2–2.6)
Phosphate	0.65 mmol/L	(0.8–1.5)

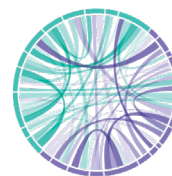
24 h urinary calcium 7.0 mmol (2–6)

Parathyroid hormone 11.2 pmol/L (1.6–8.5)

Vitamin D 65 nmol/L (>60)

What is the most likely diagnosis?

- A.** Familial hypocalciuric hypercalcaemia
- B.** Multiple myeloma
- C.** Primary hyperparathyroidism
- D.** Tertiary hyperparathyroidism
- E.** Vitamin D intoxication



- 21.** A 52 year old man attends his GP for health screening. He is well with no previous medical history.

His pulse is 80 bpm and irregular, and BP 128/84 mmHg.

Investigations:

Sodium 136 mmol/L (135–146)

Potassium 3.9 mmol/L (3.5–5.3)

Urea 4.9 mmol/L (2.5–7.8)

Creatinine 80 µmol/L (60–120)

HbA1C 40 mmol/mol (20–42)

Thyroid function tests are normal.

ECG shows atrial fibrillation, heart rate 76 bpm.

What is the most appropriate medication?

- A. Apixaban
- B. Aspirin
- C. Bisoprolol
- D. Diltiazem hydrochloride
- E. No medication

- 22.** An 80 year old man attends the emergency department with 2 hours of epistaxis that has not stopped despite compression. He has hypertension.

A bleeding site is visible in the anterior nasal cavity. His BP is 160/95 mmHg.

What is the most appropriate initial management option?

- A. Anterior pack
- B. Antihypertensive medication
- C. Cautery
- D. Cryotherapy
- E. Ice pack



- 23.** A 65 year old man has abdominal distension and vomiting 48 hours after a sigmoid colectomy with primary anastomosis for bowel cancer. He has not passed any flatus for 24 hours. He is taking regular paracetamol and as required intravenous morphine.

His temperature is 37.6°C, pulse 96 bpm and BP 122/85 mmHg. His abdomen is distended with tenderness over the wound but no rebound or guarding. There are no bowel sounds.

What is the most appropriate initial management?

- A.** Give intravenous piperacillin with tazobactam
- B.** Give Microlax® enema
- C.** Insert a nasogastric tube
- D.** Start regular intravenous morphine
- E.** Take to theatre for laparotomy

- 24.** A 23 year old man attends the sexual health clinic with a painful swelling in his groin and pain when opening his bowels. He had unprotected anal sex with a new male partner 4 weeks ago.

He has a perianal ulcer and tender inguinal lymphadenopathy.

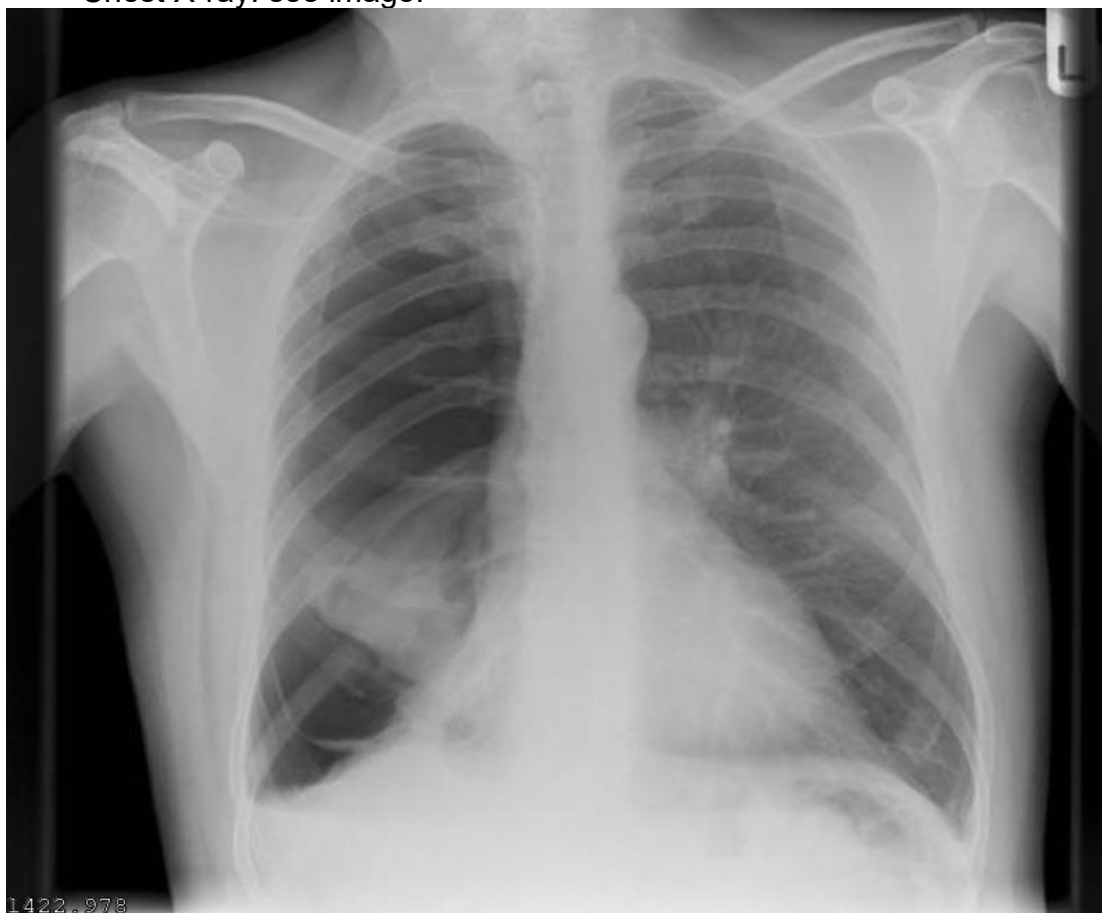
What is the most likely diagnosis?

- A.** Genital herpes
- B.** Gonorrhoea
- C.** HIV seroconversion
- D.** Lymphogranuloma venereum
- E.** Secondary syphilis



- 25.** A 63 year old man has pain of sudden onset in the right side of his chest radiating to the right shoulder and increasing breathlessness. He has mild COPD and has had a hacking cough for 2 days.

Chest X-ray: see image.



What is the most likely cause of his acute deterioration?

- A.** Diaphragmatic hernia
- B.** Lobar pneumonia
- C.** Oesophageal rupture
- D.** Pneumothorax
- E.** Pulmonary embolus



- 26.** A 25 year old man attends the emergency department after vomiting a large quantity of blood.

At endoscopy, there is a deep ulcer in the posterior wall at the junction of the first and second parts of the duodenum, with a bleeding vessel in its base.

From which artery is the bleeding most likely to be arising?

- A.** Gastroduodenal
- B.** Left gastric
- C.** Short gastric
- D.** Splenic
- E.** Superior mesenteric

- 27.** A 27 year old woman has a long history of irregular menstruation. She does not take any medication.

Her BMI is 29.4 kg/m².

Investigations:

LH (pre-menopausal female)	15 U/L (follicular)	(1–11)
FSH	6 U/L (follicular)	(2–8)
Testosterone	3.5 nmol/L	(0.2–2.9)
Cortisol post 1 mg dexamethasone	40 nmol/L	(<50)
Prolactin	425 U/L	(100–500)

What is the most likely diagnosis?

- A.** Androgen secreting tumour
- B.** Cushing syndrome
- C.** Polycystic ovary syndrome
- D.** Premature ovarian failure
- E.** Prolactinoma



- 28.** A 30 year old woman attends her GP 3 months after a diagnosis of iron deficiency anaemia. She was advised to take oral iron supplements and has been taking these regularly. She has some looseness of her stools. Her periods are scanty on a combined oral contraceptive.

Investigations:

Haemoglobin	92 g/L	(115–165)
MCV	70 fL	(80–96)
Ferritin	8 µg/L	(12–200)

What antibody test is most likely to confirm the underlying cause?

- A. Anti-gastric parietal cell
- B. Antimitochondrial
- C. Antinuclear
- D. Anti-smooth muscle
- E. Anti-tissue transglutaminase

- 29.** A 75 year old man is admitted with weakness in his legs. He has a squamous cell lung cancer treated by radiotherapy 18 months ago.

He is cachectic. He has 4 out of 5 strength in hip flexion and knee flexion bilaterally. Sensation and reflexes are normal, and sphincter function is preserved. His BMI is 17 kg/m².

MR scan of spine shows destructive bony lesions of T12 and of L2, L3 and L4 vertebral bodies.

What treatment is most appropriate to preserve neurological function?

- A. Chemotherapy
- B. External beam radiotherapy
- C. Intravenous bisphosphonate
- D. Radiation brachytherapy
- E. Surgical decompression of the spinal cord



- 30.** A 34 year old woman has had headaches for 3 months. Her mother developed hypertension at the age of 38 years.

Her BP is 180/92 mmHg. Fundoscopy is normal.

Investigations:

Sodium	136 mmol/L (135–146)
Potassium	3.3 mmol/L (3.5–5.3)
Chloride	97 mmol/L (95–106)
Urea	4.0 mmol/L (2.5–7.8)
Creatinine	94 µmol/L (60–120)
Plasma aldosterone:renin ratio	50 (<25)
Cortisol (9am)	307 nmol/L (200–700)

Urinalysis is normal.

What is the most likely diagnosis?

- A.** Essential hypertension
- B.** Glucocorticoid excess
- C.** Pheochromocytoma
- D.** Primary hyperaldosteronism
- E.** Primary hypoadrenalism

- 31.** A 20 year old man has had 2 days of visible haematuria. Three days before the haematuria started, he developed tonsillitis and was treated with phenoxymethylpenicillin.

His BP is 112/54 mmHg.

Investigations:

Urea	3.2 mmol/L (2.5–7.8)
Creatinine	61 µmol/L (60–120)

Urinalysis: glucose negative, ketones negative, blood 3+, protein 3+, nitrites negative, leucocytes negative.

What is the most likely cause of his haematuria?

- A.** Alport nephropathy
- B.** Drug reaction
- C.** Granulomatosis with polyangiitis
- D.** IgA nephropathy
- E.** Postinfectious glomerulonephritis



- 32.** A 38 year old man has had 2 months of epigastric pain that radiates into his back. It is worse at night and sometimes wakes him up. It is better after eating. He has been very busy at work. He occasionally misses lunch, which worsens the pain. He has not lost weight. He smokes 10 cigarettes per day and drinks two bottles of wine per week.

Examination is normal.

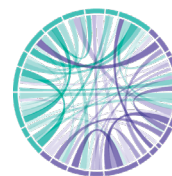
What is the most likely diagnosis?

- A.** Cholecystitis
- B.** Chronic pancreatitis
- C.** Duodenal ulcer
- D.** Gastric ulcer
- E.** Gastric carcinoma

- 33.** A 26 year old woman has had 12 months of back pain, located in the low lumbosacral region. She has intermittent bilateral thigh pain. The back pain disturbs her sleep. It is improved by activity but not relieved by resting. She finds it difficult to bend down to pick things up from the floor.

Which clinical feature is most specific for inflammatory back pain?

- A.** Improvement with activity
- B.** Nocturnal pain
- C.** Radiation to leg
- D.** Stiffness during the day
- E.** Young age



- 34.** A 68 year old man has had a swollen tender knee for 3 days and cannot weight bear. He has had previous episodes of big toe swelling. He has chronic kidney disease stage 4.

Investigations:

Fluid analysis of knee aspirate:

White cell count 55 000/mL, 95% neutrophils

Gram stain negative

Copious 10 μ m intracellular needle shaped crystals

What is the best initial treatment for his acute knee pain and swelling?

- A. Arthroscopic joint washout
- B. Intravenous flucloxacillin
- C. Oral allopurinol
- D. Oral naproxen
- E. Oral prednisolone

- 35.** An 18 year old man is in the intensive care unit with septic shock as a result of a compound fracture of his leg. His urine output has been <30 mL for the past 2 hours.

His pulse is 125 bpm, BP 85/40 mmHg and JVP 4 cm above the sternal angle. There are basal crackles on auscultation of the chest.

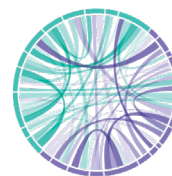
Investigations:

ECG shows sinus rhythm, 125 bpm.

He is being treated with intravenous 0.9% sodium chloride at 125 mL/h and antibiotics.

What is the most appropriate additional intravenous treatment?

- A. 500 mL 0.9% sodium chloride over 15 min
- B. 500 mL Hartmann solution over 15 min
- C. Dopamine hydrochloride
- D. Furosemide
- E. Noradrenaline/norepinephrine



- 36.** A 34 year old man has had pain in his right shoulder and upper arm for 6 weeks that worsens when elevating his arm above his head. He does not recall any injury.

There is no deformity, tenderness or reduced range of movement. There is pain on abduction of the right shoulder that is worse with the arm in internal rotation and when abduction is resisted. He is treated with ibuprofen.

What is the most appropriate next step in management?

- A.** MR scan of shoulder
- B.** Refer for orthopaedic opinion
- C.** Refer for physiotherapy
- D.** Ultrasound scan of shoulder
- E.** X-ray of shoulder

- 37.** A 65 year old woman has advanced carcinoma of the breast with cerebral and liver metastases, and is rapidly deteriorating. She is recognised to be dying. She has become confused and agitated.

What is the most suitable initial treatment?

- A.** Diamorphine hydrochloride
- B.** Glycopyrronium
- C.** Hyoscine hydrobromide
- D.** Midazolam
- E.** Mirtazapine



38. A 80 year old man has progressive memory loss over 2 years.

He scores 20/30 on the Montreal Cognitive Assessment.

The doctor suspects early Alzheimer disease and requests an MR scan of brain.

In which part of the brain are changes most likely?

- A.** Basal ganglia
- B.** Frontal lobe
- C.** Medulla oblongata
- D.** Parietal lobe
- E.** Temporal lobe

39. A 43 year old woman is admitted to hospital with an overdose of amitriptyline taken 4 hours ago. She has a history of chronic headache.

Her pulse is 105 bpm and BP 95/40 mmHg. She is drowsy and her pupils are dilated.

ECG shows significant QRS prolongation.

What is the most appropriate immediate management?

- A.** Activated charcoal
- B.** Intravenous amiodarone
- C.** Intravenous atropine
- D.** Intravenous magnesium
- E.** Intravenous sodium bicarbonate



40. A 76 year old man undergoes an abdominoperineal resection for a low rectal carcinoma. He has severe COPD and hypertension.

What is the most appropriate method for providing analgesia during the early postoperative period?

- A.** Epidural anaesthesia
- B.** Intramuscular opioid
- C.** Oral non-steroidal analgesia
- D.** Patient controlled intravenous analgesia
- E.** Spinal anaesthesia

41. A 75 year old woman becomes breathless while receiving the third unit of a blood transfusion. She was admitted with melaena and her haemoglobin was 65 g/L (115–150). She has ischaemic heart disease and takes aspirin and lisinopril.

Her temperature is 37.3°C, pulse 96 bpm, BP 120/80 mmHg, respiratory rate 30 breaths per minute and oxygen saturation 90% breathing air. Chest auscultation reveals bibasal inspiratory crackles and occasional wheeze.

She is treated with high flow oxygen and the blood transfusion is stopped.

What is the most appropriate additional treatment?

- A.** Intramuscular adrenaline/epinephrine
- B.** Intravenous chlorphenamine maleate
- C.** Intravenous furosemide
- D.** Intravenous hydrocortisone
- E.** Nebulised salbutamol



- 42.** A researcher is seeking to examine whether long-term mobile phone use is linked to the risk of developing vestibular schwannoma (acoustic neuroma).

The information on mobile phone usage is collected from participants with vestibular schwannoma and a comparable group of participants without vestibular schwannoma, selected from the general practice register.

What type of study design is being used?

- A.** Case–control study
- B.** Case series
- C.** Cohort study
- D.** Cross-sectional study
- E.** Ecological study

- 43.** A 56 year old woman has home blood pressure readings averaging 160/90 mmHg. She has type 1 diabetes mellitus.

Investigations:

Urinary albumin: creatinine ratio	42 mg/mmol	(<3.5)
eGFR	43 mL/min/1.73 m ²	(>60)

Hypertension is confirmed on 24 hour ambulatory monitoring.

What class of antihypertensive drug is most appropriate?

- A.** ACE inhibitor
- B.** Alpha blocker
- C.** Beta blocker
- D.** Calcium channel blocker
- E.** Thiazide-like diuretic



- 44.** A 70 year old man has had a dry cough and breathlessness on exertion for 3 months. He has lost 4 kg in weight. He has ischaemic heart disease and atrial fibrillation. He takes apixaban, ramipril and amiodarone. He has never smoked cigarettes.

His temperature is 37.5°C, pulse 70 bpm, respiratory rate 18 breaths per minute and oxygen saturation 91% breathing air. He has fine bibasal inspiratory crackles. There is no finger clubbing.

Investigations:

Haemoglobin	141 g/L	(130–175)
White cell count	$14.0 \times 10^9/L$	(3.0–10.0)
Erythrocyte sedimentation rate	65 mm/hr	(<20)

Chest X-ray shows reticular opacities in both bases.

What investigation is most likely to confirm the diagnosis?

- A. Blood cultures
- B. Bronchoscopy
- C. Echocardiography
- D. High resolution CT scan of chest
- E. Induced sputum for microscopy and culture

- 45.** A 31 year old woman is admitted with 24 hours of confusion. She is having visual hallucinations of snakes and mice on the floor. Her partner says that she often drinks 80 units of alcohol per week. He has not seen her for the past week. She has depression and takes fluoxetine.

Her temperature is 37.6°C, pulse 100 bpm and BP 162/98 mmHg. She is disorientated in time and place but has no focal neurological deficit.

What is the most likely diagnosis?

- A. Delirium tremens
- B. Fluoxetine overdose
- C. Hepatic encephalopathy
- D. Korsakoff psychosis
- E. Wernicke encephalopathy



46. A 61 year old woman is admitted with 2 days of confusion. She has hypertension and takes nifedipine. She smokes 20 cigarettes per day.

She is confused but has no focal neurological deficit. Her pulse is 75 bpm, BP 139/87 mmHg and JVP 2 cm above the sternal angle.

Investigations:

Sodium 117 mmol/L (135–146)

Potassium 4.2 mmol/L (3.5–5.3)

Urea 1.9 mmol/L (2.5–7.8)

Creatinine 57 μ mol/L (60–120)

Serum osmolality 252 mOsmol/kg (285–295)

Urine osmolality 585 mOsmol/kg (100–1000)

What mechanism best explains the development of hyponatraemia?

- A. Increased sodium secretion in the distal tubule
- B. Increased water absorption in the collecting duct
- C. Increased water ingestion
- D. Reduced cortisol secretion
- E. Reduced sodium reabsorption in the proximal tubule

47. A 43 year old woman has a sudden severe headache that started 24 hours ago. She has autosomal dominant polycystic kidney disease.

Her temperature is 36.8°C, pulse 92 bpm and BP 140/100 mmHg. Neurological examination is normal.

CT scan of head is normal.

What is the most appropriate next step in management?

- A. Erythrocyte sedimentation rate
- B. Lumbar puncture
- C. MR scan of brain
- D. Refer to outpatient headache clinic
- E. Start amlodipine



- 48.** A 74 year old man has progressively worsening muscle aches that are now causing him to struggle to get up from a chair or raise his arms above his head. He has oesophageal cancer, treated surgically, and ischaemic heart disease. He takes bisoprolol, clopidogrel, ramipril and simvastatin.

Investigations:

Haemoglobin	125 g/L	(130–175)
White cell count	$7.8 \times 10^9/\text{L}$	(3.0–10.0)
Platelets	$391 \times 10^9/\text{L}$	(150–400)
Erythrocyte sedimentation rate	105 mm/hr	(<20)

What is the most appropriate therapeutic change?

- A. Start co-codamol
- B. Start ibuprofen
- C. Start prednisolone
- D. Stop bisoprolol
- E. Stop simvastatin

- 49.** A 59 year old woman has had 6 months of pain affecting her hips and lower back. She is from Libya and has lived in the UK for 10 years. She has chronic kidney disease stage 3 and hypertension. She takes lisinopril and simvastatin.

She has weakness of hip flexion bilaterally. There is no muscle or bony tenderness.

Investigations:

Urea	7.8 mmol/L	(2.5–7.8)
Creatinine	122 $\mu\text{mol/L}$	(60–120)
Calcium	2.1 mmol/L	(2.2–2.6)
eGFR	41 mL/min/1.73 m ²	(>60)

Alkaline phosphatase	230 IU/L	(25–115)
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Parathyroid hormone	14.5 pmol/L	(1.6–8.5)
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What additional investigation is most likely to confirm the diagnosis?

- A. Creatine kinase
- B. Erythrocyte sedimentation rate
- C. Serum 25-OH cholecalciferol
- D. Ultrasound scan of neck
- E. X-ray of thoracic and lumbar spine