Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International
Rheumatology

Question 01

A 42-year-old woman presents to her General Practitioner with a 2-month history of arthralgia and lethargy. She also complains of grittiness in her eyes and a dry mouth. There is no past medical history of note and she takes no regular medications. Investigations reveal a positive Schirmer's test.

Which of the following antibodies is most likely to be present?

- **A.** Anti-double-stranded deoxyribonucleic acid
- **B.** Anti-La
- **C.** Anti-Jo-1
- **D.** Anti-Ro
- **E.** Rheumatoid factor

Correct Answer: D- Anti-Ro

Explanation:

This patient has (primary) Sjögren syndrome clinically with arthritis, dry eyes and mouth. Conjunctival dryness can be quantified by Schirmer's test, in which a strip of filter paper is placed under the lower lid and the distance along the paper that tears are absorbed is measured – a distance of < 10 mm in five minutes is positive. Pathologically, secretory glands are infiltrated by lymphocytes and plasma cells. The most commonly seen antibodies are antinuclear antibodies (ANA) and anti-Ro, both seen in approximately 70% of patients.

Anti-double-stranded deoxyribonucleic acid

Anti-double-stranded deoxyribonucleic acid is highly specific for systemic lupus erythematosus. It is not seen in Sjögren syndrome.

Anti-La

Anti-La antibodies are positive in 30% of cases of Sjögren syndrome. It is not the most common antibody seen.

Anti-Jo-1

Anti-Jo-1 antibodies are seen in polymyositis. They are not present in Sjögren syndrome.

Rheumatoid factor

Rheumatoid factor is present in many arthritic diseases such as rheumatoid arthritis, systemic sclerosis and Sjögren syndrome. Rheumatoid factor, however, is only present in 50% of cases of Sjögren syndrome.

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Question 02

A 66-year-old woman is admitted with a left hip fracture after a fall at home. She has a history of hypothyroidism, hypertension and chronic kidney disease, with a baseline estimated glomerular filtration rate of 28 ml/min/m2. She is post-menopausal.
Dual-energy X-ray absorptiometry scan reveals a T score at the femoral neck of -2.8 (> −1).

Which treatment should be started to prevent further fractures?

- **A.** Alendronic acid
- **B.** Calcium and vitamin D supplementation
- **C.** Denosumab
- **D.** Hormone replacement therapy
- **E.** Strontium ranelate

Correct Answer: C- Denosumab

Explanation:

Denosumab can be used for secondary prevention of fractures in osteoporotic patients with any estimated glomerular filtration rate. This is given as a 60 mg subcutaneous injection every six months. It is contraindicated in hypocalcaemia and hypophosphataemia. Denosumab is a monoclonal antibody that targets the RANK ligand. Common side-effects are joint and muscle pains.

Alendronic acid

This patient is post-menopausal, with osteoporosis (T score < 2.5) and a fragility fracture. Alendronic acid is an appropriate treatment for secondary prevention. It is, however, contraindicated when the estimated glomerular filtration rate is < 35 ml/min/m2.

Calcium and vitamin D supplementation

If this patient had low vitamin D or dietary calcium intake, it would be appropriate to prescribe supplementation. The most appropriate preventative medication for this patient is denosumab. The patient has osteoporosis, is post-menopausal, has had a fragility fracture and has stage 4 chronic kidney disease.

Hormone replacement therapy

In women with premature menopause, or with symptoms of the menopause, hormone replacement therapy can be used for treatment and prevention of osteoporosis. In a post-menopausal woman, however, the risk : benefit ratio is not favourable. This patient has osteoporosis, is post-menopausal and has already had a fragility fracture. The most appropriate secondary preventative treatment would be denosumab due to her renal failure.

Strontium ranelate

This patient has osteoporosis, is post-menopausal and has had a fragility fracture. Strontium ranelate can be used in these patients; however, it carries an increased risk of myocardial

infarction and therefore is not first line. Risk factors for cardiovascular disease should be reassessed every 6–12 months. The patient has chronic kidney disease and hypertension. Denosumab is, therefore, a more appropriate choice.

Question 03

A 54-year-old man with a long history of type 1 diabetes and terminal kidney disease on haemodialysis is referred from the unit with a knee problem. Over the past 24 hours, his left knee has become swollen, erythematous and extremely painful such that he is only able to flex it 30 degrees and cannot weight bear. His temperature is 39 °C.

Investigations:

Synovial fluid	Cloudy yellow in colour
White cell count (WCC)	200 × 10^9/l
Gram stain	negative
Crystals	negative

Which of the following is the most likely diagnosis?

- **A.** Gout
- **B.** Inflammatory arthritis
- **C.** Osteoarthritis
- **D.** Pseudogout
- **E.** Septic arthritis

Correct Answer: E- Septic arthritis

Explanation:

Synovial fluid white cell count is unreliable in the diagnosis of septic arthritis, and Gram stain is only 60% sensitive. Given that this patient has sudden-onset monoarthritis and is pyrexial, he would be considered to have septic arthritis until proven otherwise. The effusion should be drained and the patient treated with IV antibiotics, eg flucloxacillin, until culture results are available.

Inflammatory arthritis

There are several types of inflammatory arthritis. Inflammatory arthritis, such as rheumatoid arthritis, can present as acute monoarthritis, but more commonly presents as symmetrical polyarthritis. The acute onset and presence of fever, as well as reduced range of motion makes this very unlikely.

Gout

Gout is monosodium urate crystal deposition within a joint from extracellular fluid urate saturation. Uric acid levels may be elevated in patients with chronic kidney disease, although even if they were in this case, this would not confirm an acute gout flare. Gout can cause recurrent acute inflammatory monoarthritis. The absence of crystals excludes this diagnosis.

Osteoarthritis

Osteoarthritis is a degenerative disease of joints characterised clinically by chronic pain which is worse with activity. The acute onset of symptoms, fever and inability to weight bear, and reduced range of motion makes this a very unlikely diagnosis, as does the erythematous and swollen nature of the joint.

Pseudogout

Pseudogout is acute calcium pyrophosphate crystal arthritis, which is clinically similar to gout but can be distinguished on microscopy of crystals. Pseudogout crystals are positively birefringent, whereas gout crystals are negatively birefringent. The absence of crystals on microscopy excludes this diagnosis.

Question 04

A 35-year-old woman is referred by her GP because she has been feeling unwell and has pain, stiffness and tenderness in her joints which have gradually worsened over the last 6 months. She has a detectable rheumatoid factor.

What is the most likely structure against which these antibodies are targeted?

- **A.** Complement
- **B.** Double-stranded DNA
- **C.** Fc portion of IgG1
- **D.** Interleukin-1
- **E.** Tumour necrosis factor-alpha

Correct Answer: C- Fc portion of IgG1

Explanation:

Rheumatoid factor is an autoantibody directed against epitopes on the constant domains of the Fc portion of IgG1. In the case of patients with active rheumatoid arthritis, rheumatoid factor complexes are present in synovial fluids, and IgG-producing B cells, whose rearranged immunoglobulin gene sequences implicate antigen stimulation, are present in inflamed synovium. B cells in rheumatoid joints also synthesise antibodies to some cartilage components such as collagen type II, although these are not disease-specific. Anti-CCP antibodies are also

described in the context of rheumatoid arthritis and are associated with more rapid disease progression.

Interleukin-1

Interleukin-1 is incorrect. Interleukin-1 is a pro-inflammatory cytokine thought to be the trigger for acute episodes of gout.

Complement

Complement is incorrect. Complement activation is associated with tissue inflammation, but is not primarily associated with rheumatoid factor.

Double-stranded DNA

Double-stranded DNA is incorrect. Anti-double stranded DNA antibodies are primarily associated with the development of SLE.

Tumour necrosis factor-alpha

Tumour necrosis factor-alpha is incorrect. Tumour necrosis factor-alpha is a pro-inflammatory cytokine associated with rheumatoid arthritis, although rheumatoid factor is not directed against it.

Question 05

A 70-year-old woman presented complaining of pain in her legs. A dual-energy X-ray absorptiometry (DEXA) scan revealed osteoporosis. Her doctor prescribed 400 IU of vitamin D along with calcium supplements.

Which is the most active metabolite of vitamin D involved in calcium homeostasis?

- **A.** 1,25-Dihydroxycholecalciferol
- **B.** 24,25-Dihydroxycholecalciferol
- **C.** 25-Hydroxycholecalciferol
- **D.** 7-Dehydrocholesterol
- **E.** Cholecaliferol

Correct Answer: A- 1,25-Dihydroxycholecalciferol

Explanation:

The primary source of vitamin D in humans is photoactivation (in the skin) of 7-dehydrocholesterol to cholecalciferol. This is converted in the liver to 25-hydroxycholecalciferol and further converted by the kidney enzyme 1α-hydroxylase to the active metabolite 1,25-dihydroxycholecalciferol.

N.B. A less active metabolite (24,25-Dihydroxycholecalciferol) is formed if vitamin D supplies are adequate.

25-Hydroxycholecalciferol

25-Hydroxycholecalciferol is incorrect. 25-Hydroxycholecalciferol is converted by the kidney enzyme 1α-hydroxylase to the active metabolite 1,25-dihydroxycholecalciferol.

24,25-Dihydroxycholecalciferol

24,25-Dihydroxycholecalciferol is incorrect. 24,25-Dihydroxycholecalciferol is a less active metabolite formed if vitamin D supplies are adequate.

7-Dehydrocholesterol

7-Dehydrocholesterol is incorrect. 7-Dehydrocholesterol is photoactivated in the skin to cholecalciferol.

Cholecaliferol

Cholecaliferol is incorrect. Cholecaliferol is converted in the liver to 25-hydroxycholecalciferol.

Question 06

A 45-year-old woman who is taking a tapering dose of prednisolone for severe asthma presents with right hip pain that is so severe that she is unable to weight-bear. Apparently the pain came on very quickly. She smokes 20 cigarettes per day and takes fluticasone high-dose inhaler, tiotropium, theophylline tablets and 5 mg of prednisolone a day. In total she has had four courses of oral corticosteroids in the past year.

On examination her blood pressure is 142/87 mmHg. She has limitation particularly of hip flexion, internal and external rotation of the right hip. The left hip is normal.

Investigations show:

Investigation	Result	Normal Value
Haemoglobin	123 g/l	115–155 g/l
White cell count (WCC)	8.7 × 10^9/l	4–11 × 10^9/l
Platelets	201 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	141 mmol/l	135–145 mmol/l
Potassium (K^+)	4.3 mmol/l	3.5–5.0 mmol/l
Creatinine	110 µmol/l	50–120 µmol/l

The right hip X-ray shows sclerosis of the femoral head.

Which one of the following is the most likely diagnosis?

- **A.** Pathological fracture
- **B.** Osteoporosis
- **C.** Paget's disease
- **D.** Avascular necrosis
- **E.** Osteoarthritis

Correct Answer: D- Avascular necrosis

Explanation:

This patient has risk factors for avascular necrosis (AVN) (steroid use and smoking) and the hip is a common site for AVN, as the blood supply to the hip is via an end-artery. The pain with AVN is usually of sudden onset and impairs mobility. Early changes in avascular necrosis include joint sclerosis, as seen here. Plain X-rays taken later in the process may show flattening of the femoral head, but early changes are better detected with MRI, which is the most sensitive modality for detecting bone changes associated with avascular necrosis. Unfortunately, most patients with advanced disease require arthroplasty, although osteotomy/decompression procedures are attempted in some patients with varying degrees of success.

Paget's disease

Paget's disease is incorrect. Paget's disease of the bone is caused by a disruption to the normal bone breakdown and renewal cycle, resulting in abnormal bone remodeling. This causes pain, weakness and deformity in the affected bone. In this patient, the X-ray showing sclerosis of the femoral head along with this history of steroid use and smoking indicates the diagnosis of AVN.

Pathological fracture

Pathological fracture is incorrect. The right hip X-ray shows sclerosis of the femoral head, with no evidence of fracture.

Osteoporosis

Osteoporosis is incorrect. Long term use of steroids alongside smoking increases the risk of steroid induced osteoporosis. Osteoporosis of the hip may be asymptomatic until a fracture occurs. However, there is no evidence of osteoporotic changes or fracture mentioned on the hip X-ray.

Osteoarthritis

Osteoarthritis is incorrect. Evidence of osteoarthritis such as loss of cartilage, joint space narrowing and bony spurs formation have not been described on the X-ray.

Question 07

A 55-year-old man presents with bowed legs, low back pain and increasing deafness over the past 6 months. His father was similarly affected at 60 years of age and died of bone cancer.

Given the likely clinical diagnosis, what would be the most characteristic finding in a blood test?

- **A.** Decreased 1,25-dihydroxycholecalciferol
- **B.** Decreased serum calcium levels
- **C.** Elevated ESR

D. Elevated serum alkaline phosphatase
E. Elevated serum phosphate

Correct Answer: D- Elevated serum alkaline phosphatase

Explanation:

This patient has Paget's disease, typified by the deformity (bowed legs), deafness (due to neural foraminal narrowing causing compression of the eighth cranial nerve) and positive family history (of osteosarcoma). In Paget's the serum alkaline phosphatase is increased (it may exceed 1000 U/l) and this reflects increased bone turnover.

Decreased 1,25-dihydroxycholecalciferol

Decreased 1,25-dihydroxycholecalciferol is incorrect. 1,25-dihydroxycholecalciferol levels are usually normal in this condition.

Decreased serum calcium levels

Decreased serum calcium levels is incorrect. Serum calcium levels are usually normal in this condition.

Elevated ESR

Elevated ESR is incorrect. ESR levels are usually normal in this condition.

Elevated serum phosphate

Elevated serum phosphate is incorrect. Serum phosphate levels are usually normal in this condition.

Question 08

Which of the following is a potentially fatal complication of microscopic polyangiitis, but not of classic PAN?

A. Bowel perforation
B. Cerebrovascular accident
C. Myocardial infarction
D. Pulmonary haemorrhage
E. Kidney disease

Correct Answer: D- Pulmonary haemorrhage

Explanation:

Pulmonary haemorrhage is not a common cause of death in classic polyarteritis nodosa (PAN), unlike in microscopic polyangiitis. Classic PAN, a necrotising vasculitis of medium-sized muscular arteries, is felt to be less common than microscopic polyangiitis (microscopic polyarteritis), which affects capillaries, venules and arterioles. Classic PAN does not involve pulmonary arterioles and death is usually the result of kidney disease, gastrointestinal

complications (infarct/perforation) and cardiovascular causes. In contrast, death in patients with microscopic polyangiitis is usually the result of kidney disease or pulmonary haemorrhage. Stroke and congestive heart failure due to intractable hypertension lead to additional late mortality and morbidity.

Myocardial infarction

Myocardial infarction is incorrect. It is described as a potentially life-threatening complication in PAN.

Bowel perforation

Bowel perforation is incorrect. It is described as a potentially life-threatening complication in PAN.

Cerebrovascular accident

Cerebrovascular accident is incorrect. It is described as a potentially life-threatening complication in PAN.

Kidney disease

Kidney disease is incorrect. It is described as a potentially life-threatening complication in PAN.

Question 09

A 33-year-old Japanese man complains of recurrent oral and genital ulcers as well as painful nodules on his shins. In the past he has suffered from recurrent episodes of itchy and red eyes and thrombophlebitis in his legs.

What is the most likely diagnosis?

- **A.** Behçet's syndrome
- **B.** Familial Mediterranean fever
- **C.** Palindromic rheumatism
- **D.** Reactive arthritis
- **E.** Vasculitis

Correct Answer: A- Behçet's syndrome

Explanation:

This patient has Behçet's syndrome. Behçet's syndrome is more severe in males and is commonly seen in natives of Japan and East Mediterranean countries. It is characterised by recurrent oral and genital ulcers, uveitis, DVTs and thrombophlebitis with rashes including erythema nodosum.

Reactive arthritis

Reactive arthritis is incorrect. There is no antecedent infective trigger.

Familial Mediterranean fever

Familial Mediterranean fever is incorrect. FMF is an inherited periodic fever syndrome characterised by recurrent fevers and serositis (pleuritic chest and abdominal pain).

Palindromic rheumatism

Palindromic rheumatism is incorrect. Palindromic rheumatism (a condition where patients have recurrent episodes of joint pain followed by asymptomatic intervals) is not associated with orogenital ulcers, erythema nodosum or thrombophlebitis.

Vasculitis

Vasculitis is incorrect. The term vasculitis is non-specific. This patient's symptoms fit very well with Behçet's syndrome.

Question 10

A 27-year-old man complains of low back pain for some years. He says he had an episode of severe diarrhoea 3 weeks earlier, and that he has experienced waxing and waning "stomach problems" that have gone on for a couple of years. An X-ray of the lumbosacral spine shows erosion of the lower joint margins of the vertebrae. Blood tests show a raised ESR of 47mm/hr.

What is the probable diagnosis?

- **A.** Ankylosing spondylitis
- **B.** Gonococcal arthritis
- **C.** Lumbar disc prolapse
- **D.** Osteoarthritis
- **E.** Reactive arthritis

Correct Answer: A- Ankylosing spondylitis

Explanation:

This patient has ankylosing spondylitis (AS). The main lesion is spinal ankylosis with sacroiliac joint involvement. X-ray of the sacroiliac joints might show squaring of the vertebrae, erosions of the apophyseal joints and obliteration of the sacroiliac joints. It may be precipitated by an infection (e.g. with *Yersinia*) in genetically predisposed individuals (*HLA-B27* gene). Although he describes 'stomach' pain, he is talking about GI symptoms. He should be investigated for inflammatory bowel disease.

Lumbar disc prolapse

Lumbar disc prolapse is incorrect. Restricted forward flexion with pain radiating into the buttocks or down the legs (sciatica) characterises lumbar disc prolapse.

Gonococcal arthritis

Gonococcal arthritis is incorrect. Gonococcal arthritis is usually migratory and can be associated with a tenosynovitis (inflammation of the tendon sheath) and pustular skin rash.

Osteoarthritis

Osteoarthritis is incorrect. Osteoarthritis is usually a degenerative disease of older age (> 55 years). Osteophytes may be seen in the intervertebral joints in osteoarthritis and the disc space might be narrowed.

Reactive arthritis

Reactive arthritis is incorrect. He has had back pain and GI symptoms for a number of years. His severe diarrhea (possible GI infection causing reactive arthritis) was only a few weeks ago.

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Cardiology

Question 11

A 25-year-old computer programmer suddenly develops dysphasia and right-sided weakness. He is obese with a BMI of 34 kg/m^2. You note that his left leg is swollen. His blood pressure is 155/85 mmHg, pulse is 85 bpm and regular.

Which investigation would confirm the underlying cardiological diagnosis?

- **A.** Chest X-ray
- **B.** 12-lead ECG
- **C.** 2D echocardiography
- **D.** Carotid Doppler study
- **E.** Transoesophageal echocardiogram with bubble study

Correct Answer: E- Transoesophageal echocardiogram with bubble study

Explanation:

The patient in this scenario has had a sudden onset stroke. The 'computer programmer' career implies a sedentary lifestyle with the possibility of DVT. The implication is that he has had a paradoxical embolus.

Patent foramen ovale:

- A young, otherwise healthy person who suddenly develops a stroke is likely to have a paradoxical embolism due to a patent foramen ovale (PFO) (or ostium secundum defect)
- PFOs are relatively common and may be present in 25–30% of the general population; however, the vast majority do not cause a problem
- PFOs greater than 4 mm and associated with shunting are more likely to be associated with systemic emboli.
- Diagnosis:
- A chest X-ray may show enlargement of the heart and pulmonary artery as well as pulmonary plethora
- ECG and echocardiography:
- Incomplete right bundle-branch block is seen on ECG in sinus rhythm
- Echocardiography may demonstrate the defect and show right ventricular dilatation and hypertrophy and pulmonary artery dilatation
- However, PFOs may be missed on a 2D echocardiogram
- The precise size and location of the defect can be shown on transoesophageal echocardiography

- A transoesophageal echocardiogram with Doppler colour-flow imaging would be the investigation of choice in this case.

Carotid Doppler study

Carotid Doppler study is incorrect. Carotid Doppler would be helpful in older patients where carotid stenosis and local plaque rupture is a more likely aetiology, but in this young patient, the diagnosis is more likely to be a PFO, for which a transoesophageal echo with bubble study would be the diagnostic test.

Chest X-ray

Chest X-ray is incorrect. This patient with symptoms of a stroke is likely to have a paradoxical embolus due to a patent foramen ovale, or less commonly an ostium secundum defect. A chest X-ray may show enlargement of the heart and pulmonary artery as well as pulmonary plethora; however, a chest X-ray alone cannot diagnose a PFO or atrial septal defect.

12-lead ECG

12-lead ECG is incorrect. The underlying diagnosis is likely to be a PFO or ostium secundum defect. Incomplete right bundle branch block may be seen on ECG in sinus rhythm, but an ECG alone cannot diagnose the condition.

2D echocardiography

2-D echocardiography is incorrect. A 2D echocardiogram alone cannot exclude a PFO unless a bubble study and Valsalva are performed; this is because a PFO is a potential space, only open during Valsalva conditions. Agitated saline is injected into a vein and then bubbles are seen to fill the right atrium. The patient is asked to Valsalva and this will alter the intracardiac pressures, enabling the PFO to open, and bubbles are seen entering the left atrium. Sometimes bubbles are seen in the left atrium after a delay – this is a shunting occurring at the pulmonary circulation. Bubble studies can be performed during transthoracic and transoesophageal echocardiograms.

Question 12

A 65-year-old man is admitted with a broad complex tachycardia. He has a heart rate of 140 bpm and his blood pressure is 90/50 mmHg.

Which one of the following features would suggest a diagnosis of supraventricular tachycardia (SVT) with aberrancy and help to exclude ventricular tachycardia (VT)?

A. Capture beats on the electrocardiogram (ECG)
B. Past history of ischaemic heart disease
C. Right bundle-branch block morphology with left axis deviation on the ECG
D. Temporary alleviation by carotid sinus massage
E. Variable intensity of the first heart sound

Correct Answer: D- Temporary alleviation by carotid sinus massage

Explanation:

VT does not involve the AV node and therefore is not be affected by adenosine or carotid sinus massage, which temporarily blocks the AV node. Therefore, if carotid sinus massage is performed and there is slowing of heart rate, this would suggest a diagnosis of SVT with aberrancy and help exclude VT.

Right bundle-branch block morphology with left axis deviation on the ECG

Right bundle-branch block morphology with left axis deviation on the ECG is incorrect. Right bundle-branch block morphology with left axis deviation on the ECG has emerged as a distinct entity of VT characterised by its typical QRS configuration and responsiveness to verapamil. It is encountered mostly in patients with undetected structural heart disease and usually carries a good prognosis. Debate still centers on the electrophysiological mechanism involved.

Capture beats on the electrocardiogram (ECG)

Capture beats on the electrocardiogram (ECG) is incorrect. VT may be distinguished from SVT by ECG features that indicate atrioventricular (AV) dissociation (i.e. the atria and ventricles are no longer linked in rate and rhythm). The three characteristic features of AV dissociation are irregular notching of the QRS complex, capture beats and fusion beats. Capture beats alone do not suggest SVT with aberrancy, therefore is incorrect.

Past history of ischaemic heart disease

A past history of ischaemic heart disease is incorrect. A past history of ischaemic heart disease is associated with a > 95% chance that broad complex tachycardia is VT.

Variable intensity of the first heart sound

Variable intensity of the first heart sound is incorrect. A variable intensity of the first heart sound in a regular tachycardia suggests AV dissociation causing variable filling of the ventricles from the atria. Atrial fibrillation is the most frequent cause of variable intensity of the first heart sound.

Question 13

A 54-year-old woman presents to the Emergency department with central crushing chest pain radiating down her left arm. She has a history of a previous left leg DVT and PE that developed after a flight from Australia 2 years ago, following which she was warfarinised for 6 months. On examination her BP is 135/72 mmHg, pulse is 95/min and regular and she is cold and sweaty. There is skin discolouration consistent with livedo reticularis and a butterfly rash on examination of her face.

Investigations reveal:

Investigation	Result	Normal Value
Haemoglobin	131 g/l	115–155 g/l
White Cell Count (WCC)	9.8 × 10^9/l	4–11 × 10^9/l
Platelets	204 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	137 mmol/l	135–145 mmol/l
Potassium (K^+)	4.3 mmol/l	3.5–5.0 mmol/l
Creatinine	110 µmol/l	50–120 µmol/l
ECG	Anterior myocardial infarction	

Which of the following autoantibodies are most likely to be associated with increased risk of myocardial infarction?

- **A.** Anti-phospholipid antibodies
- **B.** Anti-Ro antibodies
- **C.** Anti-nuclear antibodies
- **D.** Anti-smooth muscle antibodies
- **E.** Rheumatoid factor

Correct Answer: A- Anti-phospholipid antibodies

Explanation:

The clinical scenario is of a 54 year old woman with central crushing chest pain radiating down her left arm. On examination, she is cold and sweaty; pulse and blood pressure are normal (P=95 bpm, regular; B.P = 135/72 mmHg). Blood investigations are normal and ECG shows anterior myocardial infarction. The diagnosis is anterior wall myocardial infarction. She has skin discoloration consistent with livedo reticularis, a butterfly rash on her face and a previous history of left leg DVT and PE 2 years ago (received warfarin for 6 months). This indicates that she has underlying systemic lupus erythematosus and has had previous venous thromboembolism. This time she has presented with an arterial thrombus leading to MI.

Anti-phospholipid antibodies are associated with increased risk of arterial thrombosis (e.g. myocardial infarction, stroke) and venous thrombosis (e.g. DVT, pulmonary embolism in patients with SLE).

Antiphospholipid antibodies are present in 50% patients with SLE. There are 3 types of antiphospholipid antibodies – anticardiolipin antibodies, anti-B2 glycoprotein 1 antibodies and lupus anticoagulant. These predispose patients to arterial and venous clotting, fetal loss (recurrent abortions), thrombocytopenia, livedo reticularis and neurological lesions.

Anti-nuclear antibodies

Anti-nuclear antibodies is incorrect. Antinuclear antibodies are antibodies that bind to contents of the cell nucleus. These are positive in 98% of patients with SLE and hence are the best

screening test for SLE (repeated negative tests make the diagnosis very unlikely). If ANA is positive, then tests for other antibodies should also be done and the pattern of ANA also helps to determine which autoantibodies may be positive; however, antinuclear antibodies are not associated with venous and arterial thrombi in patients with SLE and do not predispose patients to MI, DVT or pulmonary embolism.

Anti-Ro antibodies

Anti-Ro antibodies is incorrect. Anti-Ro (SS-A) antibodies are present in 30% of patients with SLE. These antibodies are not specific for SLE and are associated with sicca syndrome (dry eyes, dry mouth – secondary Sjogren's syndrome associated with SLE). They also predispose the patient to subcutaneous lupus but are associated with a decreased risk of nephritis. These antibodies can cross the placenta (particularly anti-Ro 52 antibody) and result in congenital heart block. They do not cause venous and arterial thrombi and do not predispose patients to MI, DVT or pulmonary embolism.

Anti-La (SS-B) antibodies are usually associated with anti-Ro antibodies and are present in 10% patients with SLE. Similar to anti-Ro antibodies, anti-La antibodies are also not specific for SLE, are associated with sicca syndrome (dry eyes, dry mouth – secondary Sjogren's syndrome associated with SLE) and are associated with a decreased risk of nephritis.

Anti-smooth muscle antibodies

Anti-smooth muscle antibodies is incorrect. Anti-smooth muscle antibodies are autoantibodies against smooth muscle. They are useful for the diagnosis of Type I autoimmune hepatitis and may rarely be present in patients with SLE associated with autoimmune liver disease (in 1-5% patients). Autoimmune liver disease is relatively uncommon in patients with SLE. Anti-smooth muscle antibodies are not associated with venous and arterial thrombi in patients with SLE and do not predispose patients to MI, DVT or pulmonary embolism.

Rheumatoid factor

Rheumatoid factor is incorrect. Rheumatoid factor (RF) is a circulating antibody (usually IgM) which reacts with antigenic sites on the Fc portion of the patients own IgG. It is present in 20-30% of patients with SLE. In SLE patients with predominant arthralgias or arthritis, RF and anti-CCP antibodies may help exclude a diagnosis of rheumatoid arthritis. RF has less diagnostic utility since 20-30% of people with SLE have a positive rheumatoid factor; anti-CCP antibodies, however, have a much higher specificity for RA and may be more useful for distinguishing the arthritis associated with rheumatoid arhritis. RF is not associated with venous and arterial thrombi in patients with SLE and does not predispose patients to MI, DVT or pulmonary embolism.

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Question 14

A 42-year-old patient who has a history of paroxysmal atrial fibrillation (AF) has been treated with warfarin. The AF has now resolved after successful DC cardioversion.

Clinical results are given in the table below:

Investigation	Result	Normal Value
Haemoglobin	131 g/l	115–155 g/l
White Cell Count (WCC)	4.9 × 10^9/l	4–11 × 10^9/l
Platelets	294 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	139 mmol/l	135–145 mmol/l
Potassium (K^+)	4.8 mmol/l	3.5–5.0 mmol/l
Creatinine	100 µmol/l	50–120 µmol/l
Thyroid-Stimulating Hormone (TSH)	2.1 U/l	0.4–4.0 U/l
Echo	normal sized left atrium, no significant valvular disease	

For how long should the warfarin be continued?

- **A.** 4 weeks
- **B.** 6 months
- **C.** 1 year
- **D.** 3 years
- **E.** Stop with immediate effect

Correct Answer: A- 4 weeks

Explanation:

The clinical scenario is of a young 42-year-old patient with a history of paroxysmal atrial fibrillation (treated with warfarin) that has resolved after successful DC cardioversion. Blood investigations are normal; TSH is normal (normal range = 0.4 – 4.0 U.L) and ECHO shows normal sized left atrium and no significant valvular disease. Duration of the atrial fibrillation is not mentioned in this question. In this patient there is an increased risk of embolic events in the immediate post-cardioversion period, hence he should be continued on warfarin for 4 weeks after cardioversion.

1 year

1 year is incorrect. 1 year of anticoagulation, like 6 months, risk significant bleeding with no added benefit.

6 months

6 months is incorrect. Anti-coagulation for 6 months risks significant bleeding with no added benefit with respect to reducing risk of stroke.

3 years

3 years is incorrect. 3 years is inconsistent with guidance both for anti-coagulation after cardioversion and for anti-coagulation after a venous thromboembolism.

Stop with immediate effect

Stop with immediate effect is incorrect. In this case the risk of embolic disease would be markedly increased.

Question 15

An 18-year-old man comes to the Emergency Department because he has suffered a severe syncopal attack while playing a game of squash. His opponent tells you that he collapsed and took a few minutes to recover. Apparently this was the second episode, the first having occurred after a strenuous period of exercise at the swimming pool. Of note is the fact that his father died of a cardiac arrest at the age of 32. On examination he looks fit, his BP is 132/78 mmHg and his pulse is 70 bpm, sinus rhythm.

Clinical results are given in the table below:

Investigation	Result	Normal Value
Haemoglobin	128 g/l	135–175 g/l
White Cell Count (WCC)	5.0 × 10^9/l	4–11 × 10^9/l
Platelets	182 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	139 mmol/l	135–145 mmol/l
Potassium (K^+)	4.8 mmol/l	3.5–5.0 mmol/l
Creatinine	120 µmol	50–120 µmol/l
ECG	Sinus rhythm but QT intervals 0.51s	
24-h tape	Paroxysmal AF on two occasions	

Which one of the following agents should be given for rate control in this case?

- **A.** Adenosine
- **B.** Amiodarone
- **C.** Flecainide
- **D.** Metoprolol
- **E.** Verapamil

Correct Answer: D- Metoprolol

Explanation:

Beta-blocking agents are the drugs of choice for rate control in long QT syndrome.

- They decrease conduction through the atrioventricular (AV) node and have negatively inotropic and chronotropic effects.
- If patients continue to have rate disturbances on ß-blockade, cervical sympathectomy is one treatment option, or they may be referred for implantable cardioverter defibrillator (ICD).
- Lifestyle changes, such as avoiding competitive or particularly intensive sporting activity, may also be recommended.

Flecainide

Flecainide is incorrect. Although flecainide can shorten the QTc, it has been associated with unexpected heart rate responses and even sudden death.

Adenosine

Adenosine is incorrect. Adenosine is too short acting to act as a rhythm control agent and can provoke severe heart rate abnormalities in patients with long QT syndrome.

Amiodarone

Amiodarone is incorrect. Other agents, particularly amiodarone, lengthen the cardiac action potential and may increase the risk of torsades de pointes ventricular tachycardia (VT).

Verapamil

Verapamil is incorrect. There is some emerging interest in verapamil for these patients; however, there are insufficient data to recommend it over β-blockers.

Question 16

A 30-year-old man is being investigated for hypertension.

A combination of BPs estimated by colour flow Doppler and measured values are listed in the table below:

LV	200/10 mmHg
Ascending aorta	200/70 mmHg
Right arm	190/70 mmHg
Right femoral artery	110/70 mmHg

Which one of the following is the most likely diagnosis?

A. Coarctation of aorta
B. Left subclavian artery stenosis
C. Aortic regurgitation
D. Aortic stenosis
E. Hypertrophic obstructive cardiomyopathy (HOCM)

Correct Answer: A- Coarctation of aorta

Explanation:

The clinical scenario is of a young man (30 years old) with hypertension. He has differential blood pressure in the right arm and leg (lower blood pressure in the leg). Normally the blood pressure in the lower limbs is 10-20 mmHg greater than that in the upper limbs. The findings of reduced systolic blood pressure in the lower extremities compared with upper extremities would be typical for a diagnosis of coarctation of the aorta. It also leads to a delay between the radial and femoral pulses (radio-femoral delay).

In this clinical scenario, cardiac catheterisation ± MRI scanning is the next most appropriate next step in further characterising the pressure gradient across the coarctation.

Aortic stenosis

Aortic stenosis is incorrect. In aortic stenosis, the blood pressure is usually lower than normal and has a direct relation with the severity of the stenosis – the more severe the stenosis, the lower is the blood pressure. There is no difference in the blood pressure in all the four limbs and it is diminished throughout. In the question, there is hypertension and differential blood pressure between the upper and lower limbs. Both these features go against the diagnosis of aortic stenosis.

Left subclavian artery stenosis

Left subclavian artery stenosis is incorrect. The left subclavian artery supplies blood to the left upper limb. Left subclavian artery stenosis would result in diminished pulse and blood pressure in the left upper limb only with normal blood pressure in the right upper limb and both lower limbs. Isolated left subclavian artery stenosis would also not cause hypertension. In this case hypertension with a high blood pressure in the right upper limb and low blood pressure in the right femoral artery goes against the diagnosis of left subclavian artery stenosis.

Aortic regurgitation

Aortic regurgitation is incorrect. In aortic regurgitation, systolic blood pressure is markedly greater in the lower limbs than in the upper limbs. In this question, the blood pressure in the upper limbs is higher than the lower limbs, which goes against this diagnosis**.**

Normal arterial systolic pressure in the legs is 10-20 mm Hg greater than the arms. In aortic regurgitation the systolic pressure in the legs is 60-100 mmHg greater than the arms. (Hill's sign).

Hypertrophic obstructive cardiomyopathy (HOCM)

Hypertrophic obstructive cardiomyopathy (HOCM) is incorrect. HOCM usually presents similar to aortic stenosis (due to systolic anterior motion (SAM) of the mitral valve leaflet) with an abnormal blood pressure response during exercise (flattening of blood pressure or fall in blood pressure with exercise). Normally blood pressure rises with exercise. During rest blood pressure

may be high, normal or low. There is no difference in the blood pressure in all four limbs as indicated in the question.

Coarctation of the aorta is a narrowing of the descending aorta, which is typically located at the insertion of the ductus arteriosus just distal to the left subclavian artery (post-ductal coarctation). It may also be pre-ductal coarctation (located before the insertion of the ductus arteriosus proximal to the left subclavian artery). This defect generally results in hypertension (usually in a young person) with left ventricular pressure overload.

The site of origin of the left subclavian artery and the severity of the coarctation determine the pattern of pulse and blood pressure findings:

- In most cases, the origin of the left subclavian artery is proximal to the coarctation (post-ductal coarctation), resulting in hypertension in both arms and lower blood pressure in both lower limbs (as indicated in the question).
- Less often, the origin of the left subclavian artery is just distal to the coarctation (pre-ductal coarctation), so the left brachial pulse is diminished and is equal to the femoral pulse. As a result, in this setting, comparing the blood pressure from the left arm and legs can be misleading, as the coarctation is proximal to the origin of the left subclavian artery.
- In approximately 3-4% of cases, both the right and left subclavian arteries originate below the area of coarctation, resulting in the blood pressures and pulses that are equally decreased in all four extremities.
- In mild coarctation of the aorta, all the pulses may be easily palpable, but there may be a delay in the femoral pulse compared with the brachial pulse.
- If the origin of the right subclavian artery is anomalously located distal to the coarctation, comparing blood pressure measurements between the right arm and leg may be misleading as they will be diminished to a similar degree.

In this clinical scenario, cardiac catheterisation ± MRI scanning is the next most appropriate next step in further characterising the pressure gradient across the coarctation.

Question 17

A 62-year-old man is an inpatient after a myocardial infarction three days ago. Over 12 hours, he develops acute shortness of breath, severe orthopnoea, and a cough productive of frothy sputum. On examination, he has a pansystolic murmur and crepitations to the midzones of the lung bilaterally.

Investigations:

Chest X-ray	extensive patchy airspace shadowing, small bilateral pleural effusions
Echocardiogram	severe mitral regurgitation with papillary muscle rupture

What is the most appropriate definitive management?

- **A.** Beta-blockers, diuresis and nitroprusside
- **B.** Diuresis with furosemide
- **C.** Diuresis and nitroprusside
- **D.** Emergency surgical repair or replacement
- **E.** Thrombolysis

Correct Answer: D- Emergency surgical repair or replacement

Explanation:

Acute mitral regurgitation following myocardial infarction is life-threatening; it is a medical emergency. Patients managed medically (with aggressive diuresis, vasodilators and nitroprusside) have a poor prognosis; the key definitive management is emergency surgery, usually valve replacement in these situations.

Beta-blockers, diuresis and nitroprusside

Beta-blockers, diuresis and nitroprusside is incorrect. The definitive management for this patient should be emergency surgical repair, as he has a ruptured papillary muscle and patients treated with medical management alone have a poor outcome. In addition, patients with acute mitral regurgitation should not be given beta blockers; any tachycardia can be helpful in reducing the flow of blood from the left ventricle into the left atrium (ie it reduces the regurgitant jet). Diuresis, vasodilators and nitroprusside are useful in acute mitral regurgitation following myocardial infarction, but the best outcomes are reached with surgical correction.

Diuresis with furosemide

Diuresis with furosemide is incorrect. This patient has a ruptured papillary muscle and requires surgery for optimal definitive management; he could be managed aggressively with diuretics, vasodilators and nitroprusside, but medically managed patients have a poor prognosis.

Diuresis and nitroprusside

Diuresis and nitroprusside is incorrect. Aggressive diuresis and nitroprusside is appropriate medical management for this patient's condition; however, given that the papillary muscle has ruptured, prognosis with medical management will be poor. Better outcomes would be achieved with emergency surgical repair or replacement.

Thrombolysis

Thrombolysis is incorrect. It is vital to perform coronary angiography prior to surgery as revascularisation can have dramatic effects on mitral valve function; however this is more relevant in cases of papillary muscle ischaemia. This patient has a ruptured papillary muscle and therefore the most appropriate definitive management is emergency surgery.

Acute mitral regurgitation is a medical emergency and is life-threatening. Causes include:

- myocardial infarction with ischaemia, necrosis or rupture of the papillary muscle (most common in infero-posterior infarction)

- infective endocarditis.
- When secondary to papillary muscle ischaemia, revascularisation can lead to dramatic improvements in mitral valve function, and coronary angiography should always be carried out before surgery. Medical management includes aggressive treatment with diuretics, vasodilators and nitroprusside, although medically managed patients have a poor prognosis. Definitive management is emergency surgery, usually valve replacement.

Question 18

A 17-year-old girl with a history of Turner's syndrome attends the reproductive endocrinology clinic for routine follow up. She has a history of hypertension which is managed with amlodipine, but nil else of note. On examination her BP is 142/82 mmHg, and there is a systolic murmur best heard at the right sternal edge.

Which of the following is the most likely cause of the murmur?

A. Bicuspid aortic valve
B. Coarctation of the aorta
C. Mitral regurgitation
D. Patent ductus arteriosus
E. Ventricular septal defect

Correct Answer: A- Bicuspid aortic valve

Explanation:

The clinical scenario is of a young girl (17 years old) who attends the reproductive endocrinology clinic for routine follow up (patients with Turner syndrome have infertility secondary to ovarian failure (gonadal dysgenesis) and hence are followed up in the reproductive clinic).

She has a history of hypertension managed with amlodipine (hypertension is more common in women with Turner syndrome compared with the general population).

On examination, her B.P is a little high (B.P = 142/82 mmHg) and there is a systolic murmur best heard at the right sternal edge (patients with Turner syndrome have an increased risk of cardiovascular manifestations including bicuspid aortic valve, coarctation of the aorta, ventricular septal defect, atrial septal defect etc.).

The presence of a systolic murmur loudest at the right sternal edge and the background of Turner syndrome makes the most likely diagnosis bicuspid aortic valve.

Coarctation of the aorta

Coarctation of aorta is incorrect. Although this is commonly seen in patients with Turner syndrome (around 17% patients), the murmur of coarctation of aorta is a systolic murmur which

is best heard in the left infrascapular area and not the right sternal edge. This makes coarctation an unlikely diagnosis.

Mitral regurgitation

Mitral regurgitation is incorrect. Mitral regurgitation is associated with a pan systolic murmur loudest at the apex, and isn't commonly associated with Turner's syndrome.

Patent ductus arteriosus

Patent ductus arteriosus (PDA) is incorrect. This produces a continuous "machinery" murmur heard best just below the left clavicle and not the right sternal edge. Also Turner syndrome is not associated with an increased incidence of patent ductus arteriosus. These reasons make PDA an unlikely diagnosis.

Ventricular septal defect

Ventricular septal defect (VSD) is incorrect. Ventricular septal defect produces a pansystolic murmur that is best heard at the left sternal edge and is associated with Turner syndrome; however, VSD is much less common in Turner syndrome (seen in 1-4% patients) as compared to bicuspid aortic valve (seen in 15-30% patients) and this makes VSD an unlikely diagnosis as compared to bicuspid aortic valve.

Cardiovascular Disease

Cardiovascular disease is the **most serious** health problem for women with Turner syndrome and causes increased mortality. The morbidity and mortality are due to increased risks for cardiovascular malformations, compounded by renal abnormalities and hypertension, leading to increased risk for aortic dilatation and dissection. Some of the more common cardiac malformations encountered in the Turner syndrome population include:

- Any cardiac malformation – up to 50%
- Aortic valve abnormalities (primarily bicuspid aortic valve) – 15-30%
- Elongated transverse aortic arch – 40-50%
- Other aortic arch abnormalities (primarily coarctation of aorta) – up to 17%
- Ventricular septal defects – 1-4%
- Atrial septal defects – 1-2%
- Systemic venous abnormalities (such as persistent left superior vena cava) – 8–13%
- Pulmonary venous abnormalities – 13-15%
- Coronary artery abnormalities – up to 2%.

Patients with coarctation of aorta or bicuspid aortic valve are more likely to have additional cardiovascular abnormalities, such as aortic arch defects.

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Question 19

A 54-year-old man is referred with increased swelling of his ankles and abdomen, and a degree of shortness of breath on exertion. His jugular venous pressure (JVP) is elevated with prominent x- and y-descents. Apex beat is normal. ECG shows atrial fibrillation with widespread non-specific ST-segment abnormalities. Echo reveals preserved left ventricular systolic function with biatrial enlargement and an estimated pulmonary artery systolic pressure of around 60 mmHg. Chest X-ray shows atrial enlargement but no other abnormalities.

What is the most likely cardiac diagnosis?

- **A.** Chronic pulmonary emboli (PE)
- **B.** Dilated cardiomyopathy
- **C.** Restrictive cardiomyopathy
- **D.** Secundum atrial septal defect (ASD)
- **E.** Tricuspid regurgitation

Correct Answer: C- Restrictive cardiomyopathy

Explanation:

The presence of prominent x- and y-descents should immediately raise the suspicion of restrictive heart disease.

Restrictive cardiomyopathy

Restrictive cardiomyopathy results from fibrosis or infiltration of the endo- or myocardium. The result is failure of the ventricles to relax, with a subsequent increase in ventricular end-diastolic pressures leading on to biatrial enlargement.

Systolic function is normal.

Causes

Underlying causes include:

- amyloidosis
- storage disorders
- sarcoidosis
- haemochromatosis
- endomyocardial fibrosis.

Differentiation

It can be very difficult to differentiate restrictive cardiomyopathy from constrictive pericarditis. In restriction the pulmonary artery systolic pressure is usually elevated to > 45 mmHg, while it is lower in constriction.

Right and left heart catheter may aid differentiation.

Other notes

Symptoms are usually those of predominant right heart failure and atrial fibrillation is common.

The ECG may be normal but diffuse ST-segment and T-wave changes are commonly seen. Diuretics are the mainstay of symptomatic treatment.

Secundum atrial septal defect (ASD)

Secundum ASD is incorrect. A secundum ASD would typically be visualised on an echocardiogram and would be associated with right bundle-branch block (RBBB) on the ECG and fixed splitting of the second heart sound.

Chronic pulmonary emboli (PE)

Chronic PE is incorrect. Chronic PE could be considered since the pulmonary pressures are significantly raised, but it does not explain the x- and y-descents on the JVP.

Dilated cardiomyopathy

Dilated cardiomyopathy is incorrect. Dilated cardiomyopathy is not correct as the left ventricular function is preserved.

Tricuspid regurgitation

Tricuspid regurgitation is incorrect. Tricuspid regurgitation is associated with giant cV waves in the JVP which are not present here.

Question 20

A 72-year-old man presents for an extraction of three teeth under local anaesthesia. He has a past history of rheumatic heart disease. Mitral stenosis has been identified, but the rotten teeth are being removed before valve replacement. He is allergic to penicillin.

Which one of the following would be the most appropriate antibiotic regime for him?

- **A.** Amoxicillin 3 g po 1 hour before procedure
- **B.** Augmentin 1 g po before procedure
- **C.** Ciprofloxacin 1 g po 1 hour before procedure
- **D.** No prophylaxis necessary
- **E.** Vancomycin 1 g po 1 hour before procedure

Correct Answer: D- No prophylaxis necessary

Explanation:

Alternatives to penicillin

- At present, NICE guidelines (CG064) do not recommend antibiotic prophylaxis for a number of routine procedures, including dental extraction. Their conclusion is based on the fact that they were unable to determine any evidence which suggested that antibiotic prophylaxis prevented the development of endocarditis. This advice includes patients with rheumatic heart disease and those who have undergone valve replacement.

- Some studies have suggested that there has been an increase in the incidence of infective endocarditis since these guidelines were published. NICE is presently reviewing the data and will publish new guidelines.
- Due to this controversy, it is possible questions on this matter will be omitted by the RCP.

Ciprofloxacin 1 g po 1 hour before procedure

Ciprofloxacin 1 g po 1 hour before procedure is incorrect. Ciprofloxacin may be given in penicillin allergy but antibiotic treatment is not recommended in this instance.

Amoxicillin 3 g po 1 hour before procedure

Amoxicillin 3 g po 1 hour before procedure is incorrect. If antibiotics were to be given this would have to be avoided as he is penicillin allergic.

Augmentin 1 g po before procedure

Augmentin 1 g po before procedure is incorrect. If antibiotics were to be given this would have to be avoided as he is penicillin allergic.

Vancomycin 1 g po 1 hour before procedure

Vancomycin 1 g po 1 hour before procedure is incorrect. If antibiotics were to be given vancomycin could be used however oral vancomycin is only used in C. difficile infections due to low absorption rates.

Sample of Question Bank of MRCP-1 Regular Course
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Dermatology

Question 21

A 44-year-old man presents complaining of vague joint pains for over 2 months. He mentions that he had a circular red rash on his leg a few weeks before, which settled without treatment. According to his partner, he has suffered two episodes of unresponsiveness within the last 3 weeks, from which he recovered spontaneously. He is a salesman in a sports shop and had been to the USA 12 months ago with friends on a 3-month long camping holiday.

He is a non-smoker and does not drink alcohol. Which one of the following tests is most likely to establish the diagnosis?

- **A.** Autoimmune screen
- **B.** Cardiac enzymes
- **C.** Echocardiogram
- **D.** Holter ECG
- **E.** Serology for infection

Correct Answer: E- Serology for infection

Explanation:

- This patient has Lyme disease, which is caused by a spirochaete, *Borrelia burgdorferi*
- This is transmitted by the bite of an ixodid tick
- Its early cutaneous manifestation is called 'erythema chronicum migrans', a slowly spreading annular, erythematous macule or plaque around the site of the bite
- Neurological or cardiac problems such as arrhythmias, heart block, etc may develop
- Diagnosis is made by detecting the antibody to *B. burgdorferi* in serum and cerebrospinal fluid
- Lyme disease is usually successfully treated by a 2-4 week course of doxycycline or amoxicillin.

Autoimmune screen

Autoimmune screen is incorrect. Checking autoantibodies including antinuclear antibody would be reasonable in a patient with multisystem symptoms including rash and arthralgia, but is not likely to be diagnostic in this case.

Cardiac enzymes

Cardiac enzymes is incorrect. Cardiac enzymes may be raised in myocarditis, a possible complication of Lyme disease, but checking the Borrelia serology will give a much more specific diagnosis.

Echocardiogram

Echocardiogram is incorrect. An echocardiogram may be appropriate as part of the cardiac work-up, but will not confirm the underlying diagnosis.

Holter ECG

Holter ECG is incorrect. A Holter ECG will not reveal the underlying diagnosis.

Question 22

A 17-year-old woman has frequent attendances to the Emergency Department with self-harming and paracetamol overdoses. She complains of linear superficial skin lesions affecting both forearms. On examination she looks depressed, and her GP has recently started her on citalopram. Physical examination is entirely normal apart from wavy, linear superficial erosions tracking up both forearms.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	119 g/l	115 - 155 g/l
White Cell Count (WCC)	7.8 x 10^9/l	4 - 11 x 10^9/l
Platelets	189 x 10^9/l	150 - 400 x 10^9/l
Sodium (Na^+)	139 mmol/l	135 - 145 mmol/l
Potassium (K^+)	3.9 mmol/l	3.5 - 5.0 mmol/l
Creatinine	100 µmol/l	50 - 120 µmol/l
C-Reactive Protein (CRP)	8 mg/l	0 - 10 mg/l

Which one of the following is the most likely diagnosis?

- **A.** Contact dermatitis
- **B.** Dermatitis artefacta
- **C.** Dermatitis herpetiformis
- **D.** Drug eruption
- **E.** Pemphigoid

Correct Answer: B- Dermatitis artefacta

Explanation:

Dermatitis artefacta can be manifest in a range of lesions: red patches, swellings, blisters and wavy lines that appear in a geometric pattern on the skin. It is recommended that patients are not confronted over the rash, but rather given supportive measures, such as bandaging and

creams, as often support and acknowledgement of a problem actually leads to resolution and improvement, as self-harming reduces. Antidepressants are also of obvious value.

Dermatitis herpetiformis

Dermatitis herpetiformis is incorrect. Dermatitis herpetiformis is a blistering, intensely itchy rash found on the extensor surfaces, associated with coeliac disease.

Contact dermatitis

Contact dermatitis is incorrect. The linear appearance of the rashes, without contact with a linear irritant, makes contact dermatitis very unlikely.

Drug eruption

Drug eruption is incorrect. A drug reaction does not appear in a linear fashion.

Pemphigoid

Pemphigoid is incorrect. Pemphigoid lesions are usually large tense bullae/blisters.

Question 23

A 34-year-old pet-shop owner presents with a bald patch on his scalp. He has noticed it increasing in size over the past couple of weeks and the area is beginning to itch. On examination there is inflammatory change and some skin scaling. Examination under Wood's lamp reveals bright-green immunofluorescence.

Which diagnosis fits best with this clinical picture?

- **A.** Alopecia areata
- **B.** *Microsporum canis* infection
- **C.** Psoriasis
- **D.** Seborrhoeic dermatitis
- **E.** *Trichophyton rubrum* infection

Correct Answer: B- *Microsporum canis* infection

Explanation:

- Tinea capitis is the term given to fungal (dermatophyte) infection of the scalp.
- Most cases are due to either *Trichophyton tonsurans* or *M. canis*.
- Tinea capitis is much more common in young children than other age groups.
- *M. canis* is a zoophilic dermatophyte, which despite its name is usually acquired from infected cats.
- *M. canis* displays characteristic green fluorescence when illuminated under Wood's lamp (ultraviolet [UV] light with a wavelength > 365 nm).
- Diagnosis is confirmed via direct microscopy of scrapings, brushings or plucked hairs suspended in potassium hydroxide, preferably followed by successful culture.

- Tinea capitis always requires treatment with systemic antifungals, usually terbinafine; alternatives are itraconazole, or griseofulvin, which is licensed for young children.

***Trichophyton rubrum* infection**

Trichophyton rubrum infection is incorrect. Although this is another organism that can cause tinea capitis, the history suggestive of exposure to animals makes *M. canis* infection more likely, and this is confirmed by the fluorescence under Wood's lamp.

Alopecia areata

Alopecia areata is incorrect. Although this typically leads to bald patches, there are no associated skin changes and no fluorescence under Wood's lamp.

Psoriasis

Psoriasis is incorrect. This almost never leads to significant alopecia, and there is no fluorescence under Wood's lamp.

Seborrhoeic dermatitis

Seborrhoeic dermatitis is incorrect. This is a diffuse rather than localised condition; it does not lead to alopecia and there is no fluorescence under Wood's lamp.

Question 24

A 19-year-old woman presented with erythematous macules on the back, chest and forearm. She reported that the eruption had started with one red patch, and then had developed into multiple patches over the following 2 weeks. Routine bloods including FBC, U&E, LFT and ESR are normal.

Which of the following would help most with making the diagnosis?

A. Anti-nuclear antibody
B. Anti-smooth muscle antibodies
C. Anti-phospholipid antibodies
D. Porphyria screen
E. None of the above

Correct Answer: E- None of the above

Explanation:

This patient has pityriasis rosea, which is a clinical diagnosis and usually requires no further investigations. It typically presents with a 'herald patch' followed by widespread similar red patches with a fine collaret of scale. Although it can affect any age group, it most commonly affects young adults and is usually asymptomatic, although in some cases it can be slightly itchy. It can sometimes follow an upper respiratory tract viral infection, but often the patient denies

any preceding infection at all. Treatment is conservative, and it usually resolves up to 12 weeks later.

The lack of any past medical history and the normal routine blood tests make SLE, porphyria and primary biliary cholangitis highly unlikely, and therefore other blood tests are not indicated.

Anti-phospholipid antibodies

Anti-phospholipid antibodies is incorrect. Anti-phospholipid antibody syndrome is associated with increased risk of venous thrombosis.

Anti-nuclear antibody

Anti-nuclear antibody is incorrect. This is most useful in screening for SLE, where a photosensitive rash and joint pain would be expected.

Anti-smooth muscle antibodies

Anti-smooth muscle antibodies is incorrect. Anti-smooth muscle antibodies are associated with autoimmune hepatitis.

Porphyria screen

Porphyria screen is incorrect. Acute porphyria is associated with a photosensitive rash, hypertension and hyponatraemia.

Question 25

A 21-year-old gentleman presents with hyperkeratotic scaly plaques on the elbows, knees and at the scalp margin. Mycology of hair pullings showed no growth, and routine bloods showed a mildly raised ESR of 33 mm/hr, but were otherwise normal.

What is the likely diagnosis?

- **A.** Discoid eczema
- **B.** Lichen simplex
- **C.** Psoriasis
- **D.** Seborrhoeic dermatitis
- **E.** Tinea capitis

Correct Answer: C- Psoriasis

Explanation:

This patient is presenting with chronic plaque psoriasis. It typically looks like plaques of silver scale on a salmon-pink background, particularly affecting the extensor surfaces such as the knees and elbows, but also the scalp, hairline and behind the ears. Other types of psoriasis include guttate psoriasis (typically post-streptococcal infection), palmar–plantar psoriasis (typically associated with smoking), pustular psoriasis (indicating instability in disease and possibly warranting hospital admission) and psoriasis associated with sites of trauma – the

Koebner's phenomenon. Treatment modalities include topical therapies: for example, vitamin D analogues or coal tar preparations, systemic therapies (eg cyclosporine or methotrexate), phototherapy or biologic agents.

Seborrhoeic dermatitis

Seborrhoeic dermatitis is incorrect. Seborrhoeic dermatitis is a sensible differential for psoriasis. It is caused by the yeast Malassezia and most commonly appears in the greasy skin zones, for example the creases of the nose, forehead, scalp and chest. It typically arises in the very young (where it forms cradle cap) or the elderly. Treatment includes antifungals like ketoconazole.

Discoid eczema

Discoid eczema is incorrect. Discoid eczema appears as coin-shaped, scaly, red lesions that are typically intensely itchy. Although it can appear anywhere (dissimilar to atopic eczema, which is most common in the flexures), it is unusual for it to be at the scalp margin.

Lichen simplex

Lichen simplex is incorrect. Lichen simplex often occurs after excessive rubbing and scratching of an area and is most commonly found on the lower legs, genitals and the back of the neck. The skin typically looks 'lichenified' (thickened with exaggerated skin markings). Treatment includes moisturisers and topical or intralesional steroids.

Tinea capitis

Tinea capitis is incorrect. Although tinea capitis is another good differential, the negative mycology is reassuring, and although scaly, tinea does not typically look 'hyperkeratotic' (thickening of the stratum corneum).

Question 26

A 44-year-old woman has been admitted to hospital with pneumonia. She has now developed a rash on the palms and soles made up of lesions with concentric erythematous rings. She also complains of painful mouth ulcers.

What is the diagnosis?

- **A.** Erythema multiforme
- **B.** Erythema nodosum
- **C.** Fixed drug eruption
- **D.** Pemphigus vulgaris
- **E.** Toxic epidermal necrolysis

Correct Answer: A- Erythema multiforme

Explanation:

- Erythema multiforme is a reactive eruption, which is charactised by target lesions (concentric rings with a least three hues per individual lesion); these tend to predominate at acral sites and mucosal involvement can take place.
- It is typically associated with infection, most commonly herpes simplex virus; it can also follow mycoplasma infection, as is likely in this scenario; it has been associated with a variety of other viral infections, including HIV and hepatitis viruses.
- Occasionally, erythema multiforme occurs as a drug eruption: culprit drugs include anticonvulsants, sulfonamides, non-steroidal anti-inflammatory drugs and penicillins.

Fixed drug eruption

Fixed drug eruption is incorrect. Fixed drug eruption leads to one or more discrete macules or plaques, sometimes with central blistering, following exposure to the causative drug; on rechallenge, the lesions reappear at exactly the same site.

Erythema nodosum

Erythema nodosum is incorrect. Erythema nodosum is a reactive panniculitis that gives rise to tender lumps usually on the shins.

Pemphigus vulgaris

Pemphigus vulgaris is incorrect. Pemphigus vulgaris is an immunobullous disease, which presents with superficial blistering and erosions, affecting skin and mucosal surfaces.

Toxic epidermal necrolysis

Toxic epidermal necrolysis is incorrect. Toxic epidermal necrolysis, the most severe form of drug eruption, leads to extensive skin loss with mucosal involvement; it overlaps with Stevens–Johnson syndrome and, although 'targetoid' lesions may be seen, true target lesions, as described above, are not a feature.

Question 27

A 30-year-old female on returning from Brazil developed a non-healing ulcer on the left ankle. She had spent 2 weeks camping in the jungle where she remembers being bitten by flies.

Which one of the following statements is the most likely?

A. Cutaneous leishmaniasis frequently precedes kala azar
B. Cutaneous leishmaniasis usually responds to oral penicillin
C. Leishmaniasis is transmitted by the bot fly
D. Lesions of leishmaniasis acquired in the Americas requires treatment due to the risk of mucosal disease.
E. Mosquito nets are important in the prevention of leishmaniasis

Correct Answer: D- Lesions of leishmaniasis acquired in the Americas requires treatment due to the risk of mucosal disease.

Explanation:

- Leishmaniasis is caused the protozoan species *Leishmania* and is transmitted by female sandflies.
- Sandflies are only 1.5–3 mm in length and tend to feed at dawn and dusk.
- Their small size allows them to pass through standard mosquito nets: measures to prevent bites and thereby *Leishmania* infection include covering up with clothing, using insect repellents, and spraying of sleeping areas and clothing with permethrin.
- Manifestations of *Leishmania* infection depend on the species and the host response.
- Cutaneous leishmaniasis usually appears 2 weeks to 6 months after infection, but sometimes longer.
- Lesions are typically painless and most will resolve spontaneously to leave atrophic scarring.
- Treatment may be instituted to minimise complications such as scarring, superadded infection, and, in American leishmaniasis, the risk of later mucocutaneous disease.
- Antimonials are usually preferred: sodium stibogluconate may be administered intralesionally, or by intramuscular or intravenous injection.
- Cutaneous leishmaniasis does not progress to kala azar (visceral disease).

Cutaneous leishmaniasis frequently precedes kala azar

Cutaneous leishmaniasis frequently precedes kala azar is incorrect. Kala azar (visceral leishmaniasis) is a systemic infection which affects the liver, spleen and bone marrow. It ranges in severity and can be life-threatening, particularly in immunosuppressed or malnourished individuals. It is characterised by fever, weight loss, hepatosplenomegaly, pancytopenia and hypogammablobulinaemia.

Cutaneous leishmaniasis usually responds to oral penicillin

Cutaneous leishmaniasis usually responds to oral penicillin is incorrect. Penicillin is not an effective treatment for leishmaniasis, which is caused by a protozoan rather than a bacterium.

Leishmaniasis is transmitted by the bot fly

Leishmaniasis is transmitted by the bot fly is incorrect. The bot fly (*Dermatobia hominis*) is a cause of cutaneous myiasis (infestation by the larvae of various types of fly). It does occur in Central and South America, but is not related to leishmaniasis.

Mosquito nets are important in the prevention of leishmaniasis

Mosquito nets are important in the prevention of leishmaniasis is incorrect. As outlined, standard mosquito nets are not an effective barrier against the sandfly.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International

Question 28

A 35-year-old White woman presents with a painless ulcer on the back of the hand. It started as a small spot 2 months before and has gradually enlarged. She is fit and well otherwise. Examination shows a solitary, shallow ulcer of 3 cm diameter. The edges are heaped up. There is a family history of inflammatory bowel disease, although she reports no symptoms of this. Her last holiday was 6 months ago and was spent camping in North Africa.

What is the most likely diagnosis?

- **A.** Ecthyma gangrenosum
- **B.** Leishmaniasis
- **C.** Pyoderma gangrenosum
- **D.** Squamous cell carcinoma
- **E.** Tularaemia

Correct Answer: B- Leishmaniasis

Explanation:

- Leishmaniasis is caused the protozoan species *Leishmania* and is transmitted by female sandflies
- Sandflies are only 1.5–3 mm in length, and tend to feed at dawn and dusk
- Their small size allows them to pass through standard mosquito nets: measures to prevent bites and thereby *Leishmania* infection include covering up with clothing, insect repellents, and spraying of sleeping areas and clothing with permethrin
- Manifestations of *Leishmania* infection depend on the species and the host response
- Cutaneous leishmaniasis usually appears 2 weeks to 6 months after infection, but sometimes longer
- Lesions are typically painless and most will resolve spontaneously to leave atrophic scarring
- Treatment may be instituted to minimise complications such as scarring, superadded infection, and, in American leishmaniasis, the risk of later mucocutaneous disease
- Antimonials are usually preferred: sodium stibogluconate may be administered intralesionally, or by intramuscular or intravenous injection

Pyoderma gangrenosum

Pyoderma gangrenosum is incorrect. Pyoderma gangrenosum typically presents with a painful, rapidly enlarging ulcer on the leg. It is associated with various underlying conditions, including inflammatory bowel disease and myeloproliferative disease. The edges of the ulcer are classically violaceous and undermined, rather than heaped up.

Ecthyma gangrenosum

Ecthyma gangrenosum is incorrect. Ecthyma gangrenosum is a cutaneous infection usually due to *Pseudomonas*. It occurs in patients who are severely ill and immunocompromised. It presents with pustules, which evolve into necrotic ulcers and eschars.

Squamous cell carcinoma

Squamous cell carcinoma is incorrect. Squamous cell carcinoma is very unlikely to occur in such a young patient, although it could manifest as an ulcerated nodule on a sun-exposed site such as the hand.

Tularaemia

Tularaemia is incorrect. Tularaemia can present with a cutaneous ulcer, but affected individuals are usually markedly unwell. It has been reported from most European countries, as well as the USA, but doesn't quite fit with the clinical picture seen here.

Question 29

A 19-year-old woman comes to the Dermatology Clinic for review. She had an episode of Epstein–Barr virus (EBV) infection, the symptoms of which have now resolved. However, she is now left with a papular rash affecting her abdomen and chest that she finds very distressing. Each of the papules is 0.5–1.5 cm across, and they are filled with pus.
She asks about treatment for the rash.

Which of the following is the most appropriate intervention?

- **A.** Oral co-amoxiclav
- **B.** Oral prednisolone
- **C.** Topical 0.05% clobetasol
- **D.** Topical fucidin
- **E.** Topical tacrolimus

Correct Answer: E- Topical tacrolimus

Explanation:

This patient has pityriasis lichenoides. Topical tacrolimus is the intervention of choice because it avoids exposure to corticosteroids in a young patient and has been used successfully to treat patients with the condition, which was potentially triggered by EBV infection. It is potentially effective because it modulates T-cell function, and T cells are thought to be closely involved in the pathogenesis of pityriasis lichenoides. The tacrolimus is applied twice a day.

Topical 0.05% clobetasol

Topical clobetasol should be avoided if possible. Concerns in recent years about systemic side-effects of topical steroids delivered over a potentially large skin area have promoted a move towards non-steroidal topical therapies.

Oral co-amoxiclav

This patient's rash is consistent with pityriasis lichenoides that has now become chronic. Although the EBV infection has now resolved, the rash has continued, and the patient is distressed by it. The rash does not respond to antibiotic therapy because it is thought to be due to a chronic inflammatory process which may be T-cell mediated.

Oral prednisolone

Although this patient has chronic pityriasis lichenoides, which is thought to be due to a chronic inflammatory process, alternatives exist to systemic corticosteroids for treatment of the condition. In this case, the fact that she is only 19 prompts us to avoid higher doses of systemic corticosteroids.

Topical fucidin

Topical fucidin is not of value because the skin rash is not bacterial in origin. The most likely diagnosis is chronic pityriasis lichenoides, related to previous EBV, and driven by a chronic inflammatory process, likely to be in part mediated by T-cell overactivity.

Question 30

A 78-year-old man with a history of chronic venous insufficiency presents with a very well-demarcated area of intense erythema on the left leg. There is induration and a raised border.

What organism is most likely to be responsible for this clinical picture?

- **A.** Group-A beta-haemolytic *Streptococcus*
- **B.** *Haemophilus influenzae*
- **C.** *Pseudomonas aeruginosa*
- **D.** *Staphylococcus aureus*
- **E.** Viridans streptococci

Correct Answer: A- Group-A beta-haemolytic *Streptococcus*

Explanation:

- This is the typical picture of erysipelas (also known as St Anthony's fire), a superficial form of cellulitis caused by group-A Streptococcus (S. pyogenes).
- It is characterised by the distinctive warm, red, tender skin lesion with induration and a sharply defined, raised, rapidly advancing border.
- Vesicles or bullae may develop, and desquamation of the area may occur after 7–10 days.
- The face is also commonly affected.
- There is often an associated raised white blood cell count; blood cultures are only positive in 5% of affected patients.
- Culture of aspirated fluid has a low organism yield.

- Treatment of choice is intravenous or oral penicillin, depending on the severity of the lesion.

Pseudomonas aeruginosa

Pseudomonas aeruginosa is incorrect. *P. aeruginosa* is a common coloniser of ulcers, but rarely causes cellulitis.

Haemophilus influenzae

Haemophilus influenzae is incorrect. *H. influenzae* sometimes causes cellulitis in babies, particularly affecting the head and neck.

Staphylococcus aureus

Staphylococcus aureus is incorrect. *S. aureus* commonly causes skin and soft tissue infection including cellulitis, but the clinical picture described is classical for erysipelas.

Viridans streptococci

Viridans streptococci is incorrect. Viridans streptococci include several species of commensal bacteria mostly found in the mouth, although skin colonisation can also occur. They can cause a variety of infections in the context of impaired host defence mechanisms, but not usually cellulitis.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International
Endocrinology

Question 31

A 51-year-old White man was recently diagnosed with a solitary 2.7-cm papillary cancer of the thyroid with no invasion of the capsule, no lymphadenopathy and no distant metastases. He has no history of head and neck irradiation, hoarseness, pain, dysphagia or haemoptysis. His physical examination is otherwise normal, with no laboratory test abnormalities.

Which of the following measures is most appropriate for his management?

- **A.** Partial thyroidectomy followed by radioactive iodine treatment
- **B.** Near-total thyroidectomy followed by radioactive iodine treatment
- **C.** Thyroid hormone treatment
- **D.** Partial thyroidectomy, radioactive iodine treatment and thyroid hormone treatment
- **E.** Near-total thyroidectomy, radioactive iodine treatment and thyroid hormone treatment

Correct Answer: E- Near-total thyroidectomy, radioactive iodine treatment and thyroid hormone treatment

Explanation:

The most common type of thyroid cancer is papillary cancer, which accounts for approximately 70% of all thyroid cancers. It is two to three times more common in females and peaks in the third and fourth decades of life. Papillary cancer is usually non-encapsulated and sometimes multifocal and it tends to spread by the lymphatic route.

The first line of treatment of thyroid cancer consists of surgical resection. Although the optimum procedure is not known, the more aggressive tumours should be managed with more extensive procedures (near-total or total thyroidectomy, with or without lymph node dissection). Radioactive iodine (RAI) ablation should be considered when residual or metastatic disease is present.

Finally, thyroid hormone treatment should be used with a goal of keeping the thyroid-stimulating hormone (TSH) level as low as possible without causing overt hyperthyroidism. RAI ablation and thyroid hormone suppression have been shown to reduce recurrence of thyroid cancer. In this patient, age and tumour size predict a poor outcome. Treatment should, therefore, consist of near-total thyroidectomy, RAI ablation and thyroid hormone treatment.

Partial thyroidectomy, radioactive iodine treatment and thyroid hormone treatment

Partial thyroidectomy, RAI treatment and thyroid hormone treatment is incorrect. As much as is possible of the thyroid tissue surrounding the cancer should be removed because of potential lymphatic spread.

Partial thyroidectomy followed by radioactive iodine treatment

Partial thyroidectomy followed by RAI treatment is incorrect. This is inadequate, because it risks leaving cancer tissue in situ and hypothyroidism post-radioiodine.

Near-total thyroidectomy followed by radioactive iodine treatment

Near-thyroidectomy followed by RAI treatment is incorrect. This risks hypothyroidism, and not suppressing with exogenous thyroid hormone is considered inadequate therapy.

Thyroid hormone treatment

Thyroid hormone treatment is incorrect. This is clearly incorrect because it doesn't even propose surgery as a treatment intervention.

Question 32

A woman presents with secondary amenorrhoea and galactorrhoea. She has normal visual fields on confrontation. Her blood pressure is 120/80 mmHg with no postural deficit. You are concerned that she might have a prolactinoma.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	125 g/l	115–155 g/l
White Cell Count (WCC)	4.9 × 10^9/l	4–11 × 10^9/l
Platelets	199 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	140 mmol/l	135–145 mmol/l
Potassium (K^+)	4.9 mmol/l	3.5–5.0 mmol/l
Creatinine	90 µmol/l	50–120 µmol/l
Prolactin	2150 mU/l	<400 mU/l

Magnetic resonance imaging reveals a 7 mm pituitary microadenoma.

Which of the following hormones would you expect to be low?

- **A.** Antidiuretic hormone (ADH)
- **B.** Cortisol
- **C.** Growth hormone
- **D.** Thyroxine
- **E.** Luteinising hormone

Correct Answer: E- Luteinising hormone

Explanation:

This patient describes secondary amenorrhea and has biochemical evidence of an elevated prolactin and radiological evidence of a pituitary microadenoma. The overall diagnosis is in keeping with a pituitary microprolactinoma. Elevated levels of prolactin inhibit gonadotrophin-releasing hormone (GnRH) through a negative feedback mechanism. Inhibition of GnRH results in reduced stimulation and secretion of the gonadotrophin hormones (FSH and LH) from the anterior pituitary, resulting in hypothalamic hypogonadism and secondary amenorrhea.

Antidiuretic hormone (ADH)

Antidiuretic hormone (ADH) is incorrect. ADH is released from the posterior pituitary. The posterior pituitary function is rarely affected by adenomas in the anterior pituitary, but can be damaged by hypothalamic tumours, infiltrative disorders such as sarcoidosis, histocytosis or Wegner's granulamotosis. Therefore, ADH secretion is very unlikely to be affected in this case of pituitary microadenoma.

Cortisol

Cortisol is incorrect. Impaired ACTH secretion from the anterior pituitary can cause hypocortisolaemia in the setting of a macroadenoma, due to the compressive effects of a large adenoma on the normal pituitary tissue leading to hypopituitarism. However, this is very uncommon in the setting of a microadenoma and there are no clinical signs or symptoms of cortisol deficiency in this case.

Growth hormone

Growth hormone is incorrect. The sequential loss of pituitary hormones secondary to a mass effect is in the following order: growth hormone (GH), luteinising hormone (LH), follicle-stimulating hormone (FSH), thyroid-stimulating hormone (TSH), adrenocorticotropic hormone (ACTH) and prolactin. Therefore, if hypopituitarism occurs because of mass effect, growth hormone deficiency is often the first hormonal deficiency observed. In this case, the pituitary adenoma is a microadenoma and the risk of compression of normal pituitary tissue is minimal.

Thyroxine

Thyroxine is incorrect. An elevated thyroid-stimulating hormone in the setting of primary hypothyroidism can stimulate prolactin secretion through the effect of an elevated TRH. TRH can stimulate prolactin as well as TSH secretion from the anterior pituitary. An elevated prolactin level from a microprolactinoma, as in this case, is unlikely to affect thyroxine levels. If a patient had elevated prolactin because of a large macroprolactinoma, the compressive effects of a macroadenoma on normal pituitary tissue can cause hypopituitarism and lead to secondary hypothyroidism in this clinical setting.

Question 33

A 35-year-old woman presented with a 2 day history of vomiting and abdominal pain. She had a background of anorexia nervosa with diuretic abuse, though she was currently engaging well in

a treatment programme. On examination, her pulse rate was 86bpm and blood pressure 102/76mmHg. She weighed 55kg.

Investigations:

Investigation	Result	Normal Value
Sodium (Na^+)	132 mmol/l	135–145 mmol/l
Potassium (K^+)	5.5 mmol/l	3.5–5.0 mmol/l
Urea	9.8 mmol/l	2.5–6.5 mmol/l
Creatinine	92 µmol/l	50–120 µmol/l

What is the most likely cause for her hyperkalaemia?

- **A.** Addison's disease
- **B.** Bartter syndrome
- **C.** Conn's syndrome
- **D.** Diuretic abuse
- **E.** Renal tubular acidosis type 1

Correct Answer: A- Addison's disease

Explanation:

This patient has a mild hyponatraemia and mild hyperkalaemia which is typical for Addison's disease. Combined with her presenting symptoms and age, this is highly suggestive of Addison's disease.

Diuretic abuse

Diuretic abuse is incorrect. Unless the patient was abusing spironolactone, diuretic abuse would cause hypokalaemia, not hyperkalaemia. This patient is engaging well in a treatment programme, which makes diuretic abuse less likely. Furthermore, diuretic abuse would not explain her abdominal pain and vomiting. A much more likely explanation, which would also account for the laboratory findings of mild hyponatraemia and hyperkalaemia, would be Addison's disease.

Bartter syndrome

Bartter syndrome is incorrect. Bartter syndrome is an autosomal recessive renal condition causing hypokalaemia (not hyperkalaemia), metabolic alkalosis, and hypochloraemia. There is excessive renal loss of sodium, potassium and chloride. This patient's symptoms, combined with her mild hyponatraemia and hyperkalaemia, are suggestive of Addison's disease.

Conn's syndrome

Conn's syndrome is incorrect. Conn's syndrome is hyperaldosteronism, leading to hypertension (not seen here) and sodium retention with potassium loss. This patient has the opposite;

hyponatraemia and hyperkalaemia. This, combined with her symptoms, is much more suggestive of Addison's disease.

Renal tubular acidosis type 1

Renal tubular acidosis type 1 is incorrect. Renal tubular acidosis type 1 causes hypokalaemia, not hyperkalaemia. This patient's combination of symptoms, mild hyperkalaemia and mild hyponatraemia are more suggestive of Addison's disease.

Question 34

A 22-year-old woman comes to the clinic complaining of hirsuitism, particularly around her jaw line and around her upper chest and lower abdomen. In addition she has particular problems with acne. Apparently she has intermittent, heavy periods, which have a tendency to only occur every 3-4 months. On examination her BP is 148/84 mmHg, pulse is 70/min and regular and her BMI is 33. You confirm the pattern of excess hair over her jaw line, upper chest and abdomen.

Investigations;

Investigation	Result	Normal Value
Haemoglobin	128 g/l	115–155 g/l
White Cell Count (WCC)	7.5 × 10^9/l	4–11 × 10^9/l
Platelets	214 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	138 mmol/l	135–145 mmol/l
Potassium (K^+)	4.3 mmol/l	3.5–5.0 mmol/l
Creatinine	100 µmol/l	50–120 µmol/l
Luteinizing Hormone (LH)	17 U/l	1–70 U/l
Follicle-Stimulating Hormone (FSH)	5 U/l	1–25 U/l
Prolactin	750 mU/l	<400 mU/l
Testosterone	3.9 nmol/l	0.52–2.43 nmol/l

Which of the following is the most likely diagnosis?

- **A.** Androgen secreting tumour
- **B.** Hypothyroidism
- **C.** Microprolactinoma
- **D.** Polycystic ovarian syndrome
- **E.** Simple obesity

Correct Answer: D- Polycystic ovarian syndrome

Explanation:

The LH/FSH ratio is elevated in the presence of a mildly elevated testosterone, along with obesity, hirsuitism and acne, making PCOS the most likely diagnosis. Mild elevations in prolactin may be seen in up to 30% of patients with PCOS. Transvaginal ultrasound has a 90% or greater sensitivity for confirming the diagnosis in the hands of an experienced operator. Given that her BMI is significantly elevated at 33, weight loss is the initial treatment of choice.

Androgen secreting tumour

Androgen secreting tumour is incorrect. Her testosterone is only mildly elevated. This is inconsistent with an androgen secreting tumour.

Hypothyroidism

Hypothyroidism is incorrect. Hypothyroidism is not associated with hirsutism

Microprolactinoma

Microprolactinoma is incorrect. The normal level of prolactin is less than 400 mU/L. A very high prolactin level (>5000 mU/L) usually means that a prolactinoma is present. Levels in between may be due to a prolactinoma, or to other causes, as in this case, in which her LH:FSH ratio with hirsuitism and acne suggests PCOS.

Simple obesity

Simple obesity is incorrect. Simple obesity is not associated with significant hirsuitism, although some peripheral conversion of oestrogen to androgens may occur leading to minor increases in acne and hirsuitism.

Question 35

A 40-year-old man is receiving lithium for a bipolar disorder. He now complains of increased urinary frequency and nocturia. He has taken the medication for some 7 years, he also takes risperidone and has gained 7 kg in weight over the past year. Post water deprivation test his plasma osmolality has risen to 320 and urine osmolality is 280.

What is the most likely cause for his symptoms?

- **A.** Deficiency of vasopressin
- **B.** Reduced creatinine clearance
- **C.** Onset of thyrotoxicosis
- **D.** Development of resistance to vasopressin
- **E.** Excessive water intake

Correct Answer: D- Development of resistance to vasopressin

Explanation:

This patient's water deprivation test is consistent with a diagnosis of nephrogenic diabetes insipidus, which is recognised as a long-term consequence of therapy. Often only partial reversal occurs with withdrawal of lithium therapy.

Deficiency of vasopressin

Deficiency of vasopressin is incorrect. Although lithium causes diabetes insipidus, this is not due to deficiency of vasopressin.

Reduced creatinine clearance

Reduced creatinine clearance is incorrect. Renal impairment is a recognised cause of lithium intoxication, but reduced glomerular filtration rate (GFR) is not the cause of the presentation here.

Onset of thyrotoxicosis

Onset of thyrotoxicosis is incorrect. Lithium-related thyroid dysfunction does occur, and hypothyroidism may lead to syndrome of inappropriate secretion of antidiuretic hormone (SIADH), rather than the diabetes insipidus picture seen here.

Excessive water intake

Excessive water intake is incorrect. This is ruled out by the failure to concentrate urine adequately.

Question 36

A 35-year-old man with type 1 diabetes mellitus who is on insulin presents in the Emergency Department with fever, cough, vomiting and abdominal pain. Examination reveals a dry mucosa, decreased skin turgor and a temperature of 37.8°C. Chest examination reveals bronchial breathing in the right lower lobe, and a chest X-ray shows this to be due to a right lower-zone consolidation.

Other investigations show:

Investigation	Result	Normal Value
Glucose	30 mmol/l	3.5–5.5 mmol/l*
Sodium (Na^+)	130 mmol/l	135–145 mmol/l
Potassium (K^+)	5.7 mmol/l	3.5–5.0 mmol/l
Urea	8.0 mmol/l	2.5–6.5 mmol/l
Creatinine	120 µmol/l	50–120 µmol/l
pH	7.15	7.35–7.45
Bicarbonate (HCO_3^-)	12 mmol/l	24–30 mmol/l
PCO_2	4.6 kPa	4.6–6.0 kPa
Chloride (Cl^-)	106 mmol/l	98–106 mmol/l

Urinary ketones are positive (+++).

Which one of the following is the most important next intervention?

- **A.** Intravenous fluids
- **B.** Insulin
- **C.** Potassium
- **D.** Bicarbonate
- **E.** Antibiotics

Correct Answer: A- Intravenous fluids

Explanation:

In this situation, patients may be fluid depleted by 5 or more litres, early fluid replacement with stat 1litre of IV normal saline is crucial and can be instigated whilst an insulin pump is being set up. In the short term, it can help reduce acidosis by improving tissue perfusion, (although of course insulin is the most important step following initiation of IV fluid replacement).

Potassium

Potassium is incorrect. As insulin replacement is initiated in DKA, potassium levels can fall quite dramatically in a short period due to the effect of insulin on the intracellular shift of potassium. Therefore careful monitoring and correct replacement of potassium is a very important part of any DKA protocol and management.

Insulin

Insulin is incorrect. Insulin is the next step after IV fluid replacement is commenced, and modern thinking favours a fixed rate insulin infusion rather than use of a sliding scale. Fluid replacement combined with appropriate insulin dosing can reverse DKA over the course of a few hours.

Bicarbonate

Bicarbonate is incorrect. The role of bicarbonate in DKA is controversial. The acidosis usually corrects itself once the fluid and electrolyte balance is restored. Some physicians administer bicarbonate if there is severe acidosis (pH < 7). However, rapid correction of acidosis might impair cardiac function. Furthermore there is an argument that bicarbonate supplementation has a beneficial role in the treatment of normal anion gap metabolic acidosis only. DKA is a common cause of a raised anion gap acidosis.

Antibiotics

Antibiotics is incorrect. Treatment of the underlying precipitation of DKA is very important. In this case it was pneumonia and should be treated with antibiotics. It is important to screen all patients presenting with DKA for infection.

Common precipitating DKA factors:

- Inadequate insulin administration

- Infections (eg pneumonia, urinary tract infection)
- Myocardial infarction
- Stroke
- Alcohol.

Question 37

A 31-year-old woman is admitted with a collapse at work. By the time she is admitted to the Emergency Department she is complaining of a severe headache and drowsiness. The only medication of note is the combined oral contraceptive pill. On examination she is hypotensive at 95/60 mmHg. There appears to be no visual response in the right eye; her left eye shows a peripheral temporal field loss and partial third nerve palsy.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	121 g/l	115–155 g/l
White Cell Count (WCC)	5.0 × 10^9/l	4–11 × 10^9/l
Platelets	170 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	136 mmol/l	135–145 mmol/l
Potassium (K^+)	4.8 mmol/l	3.5–5.0 mmol/l
Creatinine	120 µmol/l	50–120 µmol/l

Which one of the following is the most likely cause?

A. Basilar artery thrombosis
B. Extradural haemorrhage
C. Pituitary apoplexy
D. Posterior communicating artery aneurysm
E. Subarachnoid haemorrhage

Correct Answer: C- Pituitary apoplexy

Explanation:

Cranial nerve palsies with a history of headache, collapse and hypotension should always raise the possibility of pituitary apoplexy. A pituitary hormone screen and MRI pituitary are the investigations of choice. Intravenous corticosteroids are the initial therapy of choice. Patients are often deficient in a range of pituitary hormones, and she may well require thyroid and sex hormone replacement in addition to corticosteroids.

Posterior communicating artery aneurysm

Posterior communicating artery aneurysm is incorrect. A posterior communicating artery aneurysm would usually present with a unilateral 'surgical' (i.e. pupil dilated) CN III palsy.

Basilar artery thrombosis

Basilar artery thrombosis is incorrect. Basilar artery thrombosis might be considered in this scenario, but is less likely due to the lack of any motor deficits affecting the facial muscles or limbs.

Extradural haemorrhage

Extradural haemorrhage is incorrect. Extradural haemorrhage usually follows head trauma and would not usually present with the cranial nerve palsies described here.

Subarachnoid haemorrhage

Subarachnoid haemorrhage is incorrect. This should be considered, but is less likely in this scenario, especially when the cranial palsies are recognised.

Question 38

A 37-year-old woman presents to the Emergency Department after chasing thieves who were stealing her car. Her blood pressure is noted to be 185/110 mmHg on admission. She admits to having episodic headaches and to feeling stressed and anxious. She is of normal appearance. Her serum calcium on admission is 2.95 mmol/l with normal renal function. Abdominal ultrasound reveals a possible adrenal mass.

What is the most likely diagnosis?

- **A.** Phaeochromocytoma
- **B.** Carcinoid syndrome
- **C.** Multiple endocrine neoplasia type 1 (MEN 1)
- **D.** MEN 2A
- **E.** MEN 2B

Correct Answer: D- MEN 2A

Explanation:

Medullary thyroid carcinoma occurs in almost all MEN 2A patients. Phaeochromocytoma occurs in 30-50% of patients. Hyperparathyroidism occurs in about 20% of patients. This patient has hypertension and symptoms of headache and anxiety suggestive of catecholamine excess. The likely cause of this is phaeochromocytoma, especially given the ultrasound findings. Her calcium is also high, which is suggestive of hyperparathyroidism.

Correct management of this patient includes:

- Appropriate α- and ß-blockade prior to surgical removal of the phaeochromocytoma

- Screening for medullary thyroid carcinoma, initially with ultrasound scan and calcitonin assay. Intravenous pentagastrin test should be considered if serum calcitonin and thyroid ultrasound scan are all normal in a patient from an MEN2 family
- Probable thyroidectomy and parathyroidectomy in the hands of an experienced surgeon

Multiple endocrine neoplasia type 1 (MEN 1)

Multiple endocrine neoplasia type 1 (MEN 1) is incorrect. MEN 1 consists of hyperparathyroidism (in 80% of patients), pancreatic tumours (in 70% of patients), pituitary adenomas (in 30-50% of patients) and angiofibromas.

Phaeochromocytoma

Phaeochromocytoma is incorrect. The patient does have symptoms suggestive of a phaeochromocytoma but the presence of hypercalcaemia suggests hyperparathyroidism, making a diagnosis of MEN 2A more likely.

Carcinoid syndrome

Carcinoid syndrome is incorrect. The symptoms of carcinoid syndrome include flushing, diarrhoea, abdominal pain, palpitations, hypotension and wheeze.

MEN 2B

MEN 2B is incorrect. MEN 2B consists of medullary thyroid cancer, phaeochromocytoma (which can be bilateral) and Marfinoid habitus. The patient is this scenario has a normal appearance.

Question 39

A 29-year-old woman presents with a sudden onset severe headache and vomiting accompanied by double vision and difficulty looking to the sides. She admits to feeling increasingly tired over the past few months and having low libido. On examination her BP is 120/70, pulse is 85 and regular. She has postural drop in blood pressure of 15 mmHg.

There is a bitemporal superior quadrantanopia.

Investigation	Result	Normal Value
Haemoglobin	119 g/l	115–155 g/l
White Cell Count (WCC)	7.2 × 10^9/l	4–11 × 10^9/l
Platelets	201 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	130 mmol/l	135–145 mmol/l
Potassium (K^+)	4.9 mmol/l	3.5–5.0 mmol/l
Creatinine	132 µmol/l	50–120 µmol/l

Which of the following is the most likely diagnosis?

A. Pituitary adenoma

B. Pituitary apoplexy

C. Subarachnoid haemorrhage
D. Tension headache
E. Viral meningitis

Correct Answer: B- Pituitary apoplexy
Explanation:
The prolonged history of tiredness and lack of libido may have indicated longer term pituitary dysfunction, and the sudden onset severe headache without a marked elevation in blood pressure is consistent with pituitary apoplexy, where haemorrhage or infarction of an adenoma may have occurred.
Subarachnoid haemorrhage
Subarachnoid haemorrhage is incorrect. Subarachnoid haemorrhage would be much more likely to be associated with hypertension than the hypotension seen here.
Pituitary adenoma
Pituitary adenoma is incorrect. Although a pituitary adenoma is likely to be the cause of the symptoms which pre-date the headache, the acute episode is more likely to be due to apoplexy.
Tension headache
Tension headache is incorrect. This is very unlikely given that the electrolyte results suggest an underlying endocrine abnormality.
Viral meningitis
Viral meningitis is incorrect. There are no symptoms of systemic infection to suggest this as the underlying cause of her headache.

Question 40

A 20-year-old male develops seizures. Examination reveals short stature, rounded face and shortening of the metacarpal and metatarsal bones. CT demonstrates bilateral basal ganglia calcification.

What is the most likely diagnosis?

A. Hypoparathyroidism
B. Juvenile myoclonic epilepsy
C. Mitochondrial cytopathy
D. Pseudohypoparathyroidism
E. Tuberous sclerosis

Correct Answer: D- Pseudohypoparathyroidism
Explanation:

Patients with pseudohypoparathyroidism may have short stature and have a characteristic shortening of the fourth and fifth metacarpals. The hypocalcaemia may result in generalised seizures. Basal ganglia calcification can be seen.

Tuberous sclerosis

Tuberous sclerosis is incorrect. Tuberous sclerosis is associated with epilepsy. Skin manifestations of tuberous sclerosis include ungual fibromata, shagreen patches and facial angiomata; brain lesions include cortical tuber glial astrocytomata and subependymal nodules.

Hypoparathyroidism

Hypoparathyroidism is incorrect. Hypoparathyroidism also causes low calcium and thus could produce siezures (and other neurological symptoms such as tetany), but there would be no abnormal skeletal phenotype.

Juvenile myoclonic epilepsy

Juvenile myoclonic epilepsy is incorrect. Juvenile myoclonic epilepsy usually presents with generalised seizures, myoclonic jerks and absences. No skeletal abnormalities are seen.

Mitochondrial cytopathy

Mitochondrial cytopathy is incorrect. Mitochondrial cytopathies are associated with seizures and such patients may have short stature. A wide range of neurological problems can be encountered, as can basal ganglia calcification. The shortened metacarpals are not particularly associated.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International
Neurology

Question 41

A wheelchair-bound 19-year-old woman complains that she has difficulty reading. She describes the words jumping as she tries to follow the text. She is known to have an Arnold–Chiari malformation.

What findings are you most likely to find on oculomotor examination?

- **A.** Brun's nystagmus
- **B.** Convergence retraction nystagmus
- **C.** Downbeat nystagmus
- **D.** Pendular nystagmus
- **E.** Upbeat nystagmus

Correct Answer: C- Downbeat nystagmus

Explanation:

Downbeat nystagmus is classically associated with lesions at the foramen magnum, although it may have other causes. Arnold–Chiari malformations consist of specific abnormalities in the formation of the brainstem, with elongation of the cerebellar tonsils and sometimes a syrinx in the cervical spinal cord; the tonsils protrude through the foramen magnum. Hydrocephalus may result from blockage of the fourth ventricular outlets or an associated aqueductal stenosis. This patient describes oscillopsia on looking down because the downward gaze accentuates the nystagmus.

Convergence retraction nystagmus

Convergence retraction nystagmus is incorrect. Convergence retraction nystagmus occurs in Parinaud syndrome due to dorsal midbrain lesions.

Brun's nystagmus

Brun's nystagmus is incorrect. Brun's nystagmus is defined by mild horizontal nystagmus in one direction of gaze and coarse horizontal nystagmus in the opposite direction of gaze. It occurs with brainstem compression, usually due to cerebellopontine angle lesions.

Pendular nystagmus

Pendular nystagmus is incorrect. Pendular nystagmus is defined as nystagmus with the speed of eye movement the same in both directions. The most common acquired cause is multiple sclerosis, but it may also be congential (in which case the patient does not describe symptoms of oscillopsia).

Upbeat nystagmus

Upbeat nystagmus is incorrect. Upbeat nystagmus generally occurs in brainstem lesions (cases with lesions anywhere between midbrain and medulla are reported) but is not characteristically seen in lesions of the foramen magnum.

Question 42

A 46-year-old woman with a history of type 1 diabetes presents to the clinic complaining of pain, pins and needles and loss of sensation in her feet. Her diabetes has been poorly controlled over a number of years, with her HbA1c averaging around 72.68 mmol/mol (8.8%) on a basal bolus insulin regime. You suspect she might have diabetic neuropathy.

What would be the expected findings on nerve conduction study?

- **A.** Increased nerve conduction velocity on peripheral nerve testing
- **B.** Increased sensory nerve amplitude responses
- **C.** Decreased sensory nerve amplitude responses
- **D.** Decreased nerve conduction velocity on peripheral nerve testing
- **E.** More marked loss of motor nerve conduction velocity

Correct Answer: C- Decreased sensory nerve amplitude responses

Explanation:

The patient has diabetic polyneuropathy, which is typically a predominantly sensory, length dependent axonal neuropathy. In such neuropathies the main neurophysiological finding is reduced sensory nerve amplitude potentials.

Decreased nerve conduction velocity on peripheral nerve testing

Decreased nerve conduction velocity on peripheral nerve testing is incorrect. Decreased conduction velocities are the hallmark of demyelinating neuropathies (like CIDP) not axonal neuroapthies such as the sort seen in diabetes.

Increased nerve conduction velocity on peripheral nerve testing

Increased nerve conduction velocity on peripheral nerve testing is incorrect. In neuropathy one will not see increases in the speed of nerve action potential transmission.

Increased sensory nerve amplitude responses

Increased sensory nerve amplitude responses is incorrect. One will see a decreased amplitude of response, not an increase.

More marked loss of motor nerve conduction velocity

More marked loss of motor nerve conduction velocity is incorrect. Decreased conduction velocities are the hallmark of demyelinating neuropathies (like CIDP) not axonal neuroapthies such as the sort seen in diabetes. In addition, in diabetes the sensory nerves are typically more affected than the motor nerves.

Sample of Question Bank of MRCP-1 Regular Course
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Question 43

A 45-year-old migraineur presents having had an episode of sudden onset posterior headache associated with nausea and vomiting. He is afebrile with no neck stiffness or photophobia, and the neurological examination is normal. CT of his head performed 12 hours after the onset of symptoms is normal.

What is the best course of action?

- **A.** Discharge with analgesia
- **B.** Lumbar puncture
- **C.** Monitor for 24 hours
- **D.** MRI (brain)
- **E.** Urgent neurology outpatient appointment

Correct Answer: B- Lumbar puncture

Explanation:

Although the patient has a history of migraine, sudden onset posterior headache is not typical of migraine and is an emergency situation; subarachnoid haemorrhage (SAH) has to be excluded. Small aneurysmal bleeds might not present with neck stiffness or photophobia. Plain CT brain with in the first 24 hours of the event is diagnostic in 95% of the cases; however, a negative scan means there is still a 5% chance of missing the bleed. Lumbar puncture for spectrophotometry, done after 12 hours following the event, is very sensitive and increases the yield for the diagnosis of SAH. Lumbar puncture would also help exclude CNS infections.

Monitor for 24 hours

Monitor for 24 hours is incorrect. Monitoring for 24 hours is not the right option because if there is SAH or CNS infection the patient may deteriorate rapidly and this can be life threatening. Prompt diagnosis is essential.

Discharge with analgesia

Discharge with analgesia is incorrect. Discharge with analgesia in this situation is not ideal as every sudden onset headache with a good history needs to be investigated.

MRI (brain)

MRI (brain) is incorrect. MRI (brain) confers no extra benefit over CT in this situation andit might be difficult to obtain in an emergency situation.

Urgent neurology outpatient appointment

Urgent neurology appointment is incorrect. Urgent neurology outpatient appointment is again not ideal as this is an emergency situation.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International

Question 44

An 85-year-old woman is referred for neurology review. In the course of an admission to the Geriatric Unit for investigation of anaemia, a full neurological examination has been carried out by the registrar. Several signs have been found and he is unsure which of these are significant. She has small pupils that react sluggishly to light; impaired upward gaze and poor convergence. She has reduced hearing in both ears, left more than the right, with a sensorineural pattern. The knee and the ankle jerks are absent. There is a mildly positive palmomental reflex. Vibration sense is diminished to the ankles. Her posture is stooped and she has an 'unsteady' gait.

In this patient, which one of these signs, when found, should prompt further investigation?

- **A.** Absent ankle jerks
- **B.** Absent knee jerks
- **C.** Impaired upgaze
- **D.** Impaired vibration sense
- **E.** Positive palmomental reflex

Correct Answer: A- Absent knee jerks

Explanation:

While absent or reduced ankle jerks are not uncommon after the age of 75 years, the absence of knee jerks implies a pathological process (assuming that they were previously present) such as neuropathy or radiculopathy.

Absent ankle jerks

Absent ankle jerks is incorrect. Absent or reduced ankle jerks are not uncommon after the age of 75.

Impaired upgaze

Impaired upgaze is incorrect. The neuro-ophthalmic signs may all occur as part of the normal ageing process. When considering eye signs in the elderly it is common to see impaired upgaze, but loss of downgaze is usually pathological (seen, for instance, in PSP).

Impaired vibration sense

Impaired vibration sense is incorrect. Reduced vibration sense may occur distally. In elderly subjects it is not unusual to find it is impaired in the feet, but usually can be felt again in the ankles.

Positive palmomental reflex

Positive palmomental reflex is incorrect. A weakly positive palmomental reflex (retraction of one side of the mouth and chin caused by contraction of the mentalis muscle, when the thenar eminence of the palm is stroked) is said to be present in as many as half of elderly people, although other primitive reflexes would suggest the presence of frontal lobe disease.

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Question 45

A 59-year-old man is referred to the Stroke Clinic after an episode of confusion. He had just got out of the shower when he started to behave in a manner that worried his wife. When she questioned him about what was the matter, he appeared not to know where he was, what day it was or indeed who the next-door neighbour that his wife called for help was. He did, however, know who he himself was. His wife mentioned that he also complained of having had a headache, so she suggested he should go to bed to sleep off the attack. He went to bed and slept for the rest of the day and night. On waking he felt well but was unable to recall exactly what had happened the previous day. He is a non-smoker. On examination there are no abnormalities other than an elevated blood pressure of 170/90 mmHg.

What is the most likely diagnosis?

- **A.** Cerebral venous thrombosis
- **B.** Right caudate haemorrhage
- **C.** Right hemisphere transient ischaemic attack (TIA)
- **D.** Subarachnoid haemorrhage
- **E.** Transient global amnesia

Correct Answer: E- Transient global amnesia

Explanation:

The features, particularly the retention of knowledge regarding his own identity, are characteristic of transient global amnesia (TGA). No investigations are required, as this is a clinical diagnosis.TGA is a benign condition, the aetiology of which is not clear.Its occurrence does not increase the risk of subsequent vascular events.The risk of recurrence is approximately 10%.

Right hemisphere transient ischaemic attack (TIA)

Right hemisphere transient ischaemic attack (TIA) is incorrect. Right hemisphere TIA would not present with an amnestic syndrome. Rather, it would produce left-sided limb symptoms of either weakness or sensory loss.

Cerebral venous thrombosis

Cerebral venous thrombosis is incorrect. Cerebral venous thrombosis can manifest in many ways, often with headache, seizures and focal neurological deficits. This presentation, however, with spontaneous resolution would be very unlikely.

Right caudate haemorrhage

Right caudate haemorrhage is incorrect. Caudate infarction or haemorrhage may cause cognitive dysfunction and be mistaken for depression, but symptoms would persist for longer than in this patient.

Subarachnoid haemorrhage

Subarachnoid haemorrhage is incorrect. Subarachnoid haemorrhage presents with a thunderclap headache and does not produce a focal amnestic syndrome.

Question 46

Which one of the following findings best supports a diagnosis of multiple sclerosis (MS)?

- **A.** CSF protein of > 1.2 g/dl
- **B.** Intrathecal synthesis of IgG
- **C.** Low CSF:serum glucose ratio
- **D.** Multiple grey matter lesions on 1.5T MRI
- **E.** Normal visual evoked potentials

Correct Answer: B- Intrathecal synthesis of IgG

Explanation:

The answer is Intrathecal synthesis of IgG.

MS is the most common demyelinating diseases of the central nervous system. It most often affects young adults between the ages of 20 and 50, with a 2:1 female:male ratio. Cerebrospinal fluid is typically examined for the presence of increased intrathecal synthesis of IgG and also for the presence of a discrete set of proteins, called oligoclonal bands, which appear on gel electrophoresis. Note that oligoclonal bands and increased rates of IgG synthesis are found in about 90% of patients with definite MS, but may also be present in other diseases.

Multiple grey matter lesions on 1.5T MRI

Multiple grey matter lesions on 1.5T MRI is incorrect. MS is classically thought of as a disease of the cerebral white matter, not grey matter.

CSF protein of > 1.2 g/dl

CSF protein of > 1.2 g/dl is incorrect. A raised CSF protein can be seen in MS but is very non-specific. A protein level this high would be more consistent with either an inflammatory neuropathy (eg Guillain–Barré syndrome) or a meningitic condition.

Low CSF:serum glucose ratio

Low CSF:serum glucose ratio is incorrect. A low CSF glucose level when compared to the serum level is indicative of a bacterial/mycobacterial/fungal/malignant (but not viral) meningitis.

Normal visual evoked potentials

Normal visual evoked potentials is incorrect. Abnormality of visual evoked potentials may be used to support a diagnosis of MS.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International

Question 47

Which one of the following statements is most accurate about chronic subdural haematoma?

- **A.** Headache is often absent
- **B.** Injury to the middle meningeal artery is the usual cause of the haematoma
- **C.** Lumbar puncture and CSF analysis should be done immediately on patient arrival
- **D.** Neck stiffness is an early feature
- **E.** The trauma to the head is usually minor and often forgotten by the patient

Correct Answer: E- The trauma to the head is usually minor and often forgotten by the patient

Explanation:

After minor head trauma, especially in an elderly patient, symptoms may develop weeks and even months later. Headache is the earliest feature and may be present almost from the time of the injury; subsequently, subtle mental changes may occur such as lethargy, loss of initiative, somnolence and even confusion. If untreated, patients may progress to signs and symptoms of tentorial herniation.

Lumbar puncture and CSF analysis should be done immediately on patient arrival

Lumbar puncture and CSF analysis should be done immediately on patient arrival is incorrect. Those with a space-occupying lesion should generally not undergo lumbar puncture for fear of causing brain herniation ('coning').

Headache is often absent

Headache is often absent is incorrect. Headache is a common feature of chronic subdural haematoma.

Injury to the middle meningeal artery is the usual cause of the haematoma

Injury to the middle meningeal artery is the usual cause of the haematoma is incorrect. Bleeding from the middle meningeal artery is associated with extradural haemorrhage. Subdural haematomas are caused by venous bleeding.

Neck stiffness is an early feature

Neck stiffness is an early feature is incorrect. Neck stiffness is more commonly a feature of arachnoid irritation seen due to subarachnoid haemorrhage or meningitis.

Question 48

A 56-year-old man presents with falls. On further questioning he complains of difficulty walking up stairs, worsening over the past year or so. His falls, he feels, have been precipitated by weak legs, rather than blackouts. He has never had an episode of loss of consciousness. He is

hypertensive, and has suffered chronic back pain for many years. He has smoked for many years and has a chronic 'smoker's cough'. On examination he has weakness of hip flexion, and particularly of knee extension. He is unable to keep his fingers flexed against force, the right being weaker than the left. There are no sensory abnormalities and reflexes are preserved. Serum CK is normal.

What is the most likely diagnosis?

- **A.** Cervical cord compression
- **B.** Inclusion body myositis
- **C.** Limb-girdle muscular dystrophy
- **D.** Motor neurone disease
- **E.** Polymyositis

Correct Answer: B- Inclusion body myositis

Explanation:

The pattern of muscle weakness (quadriceps and long-finger flexors), the asymmetry of signs and presentation with falls, is characteristic of inclusion body myositis (IBM), an idiopathic inflammatory myopathy. Importantly, serum CK can be normal in IBM. IBM is the most common acquired myopathy in those aged over 50 years and is more common in men.

Limb-girdle muscular dystrophy

Limb-girdle muscular dystrophy is incorrect. The limb-girdle syndromes usually present with slowly progressive proximal arm and/or leg weakness. The distal involvement in this case, as well as the normal CK, and the fact that most limb-girdle syndromes are very rare, suggest that inclusion body myositis is more likely.

Cervical cord compression

Cervical cord compression is incorrect. The signs are not consistent with upper cord compression, which would be sensory signs (ie a sensory level), reflex changes and sphincter symptoms.

Motor neurone disease

Motor neurone disease is incorrect. Motor neurone disease is an important differential diagnosis in this clinical scenario, but there are no upper motor neurone or bulbar features to support this diagnosis, making it less likely in this case.

Polymyositis

Polymyositis is incorrect as polymyositis is likely to cause a predominantly proximal weakness, sometimes associated with muscle pain.

Sample of Question Bank of MRCP-1 Regular Course
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Question 49

A 58-year-old man with a history of multiple sclerosis presents with horizontal diplopia. Clinically, the diplopia is most apparent while looking to the left. The outer image disappears when the right eye is occluded. On examination he has weakness of adduction of the right eye and nystagmus on attempted lateral gaze to either side, worse on looking to the left.

What is the most likely explanation of these clinical signs?

- **A.** Fourth nerve (NIV) palsy
- **B.** Internuclear ophthalmoplegia
- **C.** Parinaud's syndrome
- **D.** Sixth nerve (NVI) palsy
- **E.** Third nerve (NIII) palsy

Correct Answer: B- Internuclear ophthalmoplegia

Explanation:

Internuclear ophthalmoplegia (INO) is caused by a lesion in the medial longitudinal fasciculus (MLF), which connects the sixth nerve nuclei (supplying the lateral rectus muscle, which controls abduction) to the contralateral third nerve nucleus (supplying medial rectus, which controls adduction).

In unilateral INO this results in loss of adduction of the ipsilateral medial rectus on attempted conjugate gaze. There is abducting nystagmus of the contralateral eye. This case therefore presents a right-sided INO (the laterality of an INO corresponds to the side with failure of adduction). Commonest causes of INO include multiple sclerosis and cerebrovascular disease. Bilateral INO is very strongly associated with multiple sclerosis.

Fourth nerve (NIV) palsy

Fourth nerve (NIV) palsy is incorrect. NIV palsies are often subtle and present with diplopia and an associated compensatory head tilt.

Parinaud's syndrome

Parinaud's syndrome is incorrect. Parinaud's syndrome is caused by a lesion in the midbrain and is associated with a vertical (not horizontal) gaze paresis.

Sixth nerve (NVI) palsy

Sixth nerve (NVI) palsy is incorrect. In a NVI palsy, there would be failure of abduction of the affected eye. In the primary position of gaze, the affected eye is also usually slightly adducted due to weakness of lateral rectus.

Third nerve (NIII) palsy

Third nerve (NIII) palsy is incorrect. In a NIII palsy, the affected eye is mydriatic (apart from in the 'pupil sparing' or 'medical' NIII palsy), hypotropic (downwards deviation primarily due to

weakness of superior rectus) and exotropic (outwards deviation due to weakness of medial rectus).

Question 50

An 18-year-old woman presented at the age of 3 years with progressive ataxia. She is now wheelchair-bound. On examination, she is now dysarthric, with bilateral Optic atrophy. There is ataxia in both upper limbs. Reflexes in her lower limbs are absent with bilateral extensor plantar response. She has absent vibration and impaired joint position in both feet. Bilateral pes cavus is apparent. ECG shows inverted T waves. Echocardiogram reveals left ventricular hypertrophy.

What is the most likely diagnosis?

- **A.** Charcot–Marie–Tooth disease
- **B.** Friedreich's ataxia
- **C.** Huntington's disease
- **D.** Multiple sclerosis
- **E.** Vitamin B12 deficiency

Correct Answer: B- Friedreich's ataxia

Explanation:

Friedreich's ataxia is considered the most common hereditary ataxia. It is an autosomal recessive disorder with variable phenotype. Onset is usually in early life and life expectancy is generally about 35 years. There is a degeneration of the cerebellum, certain spinal cord tracts and peripheral nerves. Associated clinical features include ataxia, dysarthria, optic atrophy, hearing impairment, learning difficulties, sensory neuropathy, extensor plantar responses, diabetes and cardiomyopathy. Pes cavus and kyphoscoliosis are also common features. Given the clinical information in the question, Friedreich's ataxia is the best answer.

Huntington's disease

Huntington's disease is incorrect. Huntington's disease is an autosomal dominant trinucleotide repeat disorder characterised by a progressive movement disorder (usually chorea or parkinsonism) with cognitive deterioration and affective disturbance. Thus the picture here does not fit with this diagnosis.

Charcot–Marie–Tooth disease

Charcot–Marie–Tooth (CMT) disease is incorrect. CMT describes a range of genetic neuropathies with a variable age of presentation (from infancy to old age) and a wide range of phenotypes. Most forms of CMT do not involve the central nervous system, so optic atrophy and upgoing plantars would not be expected.

Multiple sclerosis

Multiple sclerosis is incorrect. Multiple sclerosis rarely presents in early childhood and peripheral nervous system signs such as areflexia are not seen. The cardiac problems described here are not seen in MS.

Vitamin B12 deficiency

Vitamin B12 deficiency is incorrect. Vitamin B12 deficiency may cause subacute combined degeneration of the cord, which as the name suggests is an illness that evolves over weeks to months – not the chronic progressive course described in this question. The combination of spinal tract degeneration (corticospinal tract and posterior column) together with co-existing sensory neuropathy is seen in subacute combined degeneration, so some of the clinical signs may be similar.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International
Respiratory Medicine

Question 51

A 50-year-old man has been referred by his GP because of a long-standing history of persistent cough productive of mucopurulent sputum. The patient was treated several times for recurrent chest infections. The patient is a non-smoker.

What is the most appropriate diagnostic step to confirm the diagnosis?

- **A.** Bronchoscopy
- **B.** Chest X-ray
- **C.** High-resolution computed tomography
- **D.** Spirometry
- **E.** Ventilation/perfusion scan

Correct Answer: C- High-resolution computed tomography

Explanation:

The gold standard for the diagnosis of bronchiectasis is thin-section high-resolution computed tomography (HRCT) of the chest, which has replaced the more invasive investigation of bronchography.

The diagnostic criteria for bronchiectasis on HRCT depend on finding both dilatation and thickening of the affected bronchi, dilatation being present if the internal diameter of the bronchus is greater than the diameter of its accompanying pulmonary artery. The classic appearance of a cross-section of a thick-walled dilated bronchus next to the accompanying pulmonary artery is the 'signet ring' sign. Bronchial dilatation is also recognised when airways are seen in longitudinal section on CT and there is a failure of tapering as the bronchus courses towards the periphery.

Bronchoscopy

Bronchoscopy is incorrect. Bronchoscopy in bronchiectasis may demonstrate larger than expected bronchi with visible mucopurulent secretions, but it will not detect bronchiectasis affecting distal airways. Given the test is invasive and not always diagnostic, it is not routinely used in diagnosing bronchiectasis. Bronchoscopy is indicated in cases of localised bronchiectasis to rule out a foreign body or obstructing lesion, eg carcinoma.

Chest X-ray

Chest X-ray is incorrect. The chest radiograph can be normal in at least 50% of patients with computed tomographic or bronchographic evidence of bronchiectasis. If it is abnormal the findings reflect thickened and dilated bronchi, which produce tramline opacities and ring

shadows. Retained mucus might be seen as tubular opacities, and there can be associated volume loss of the affected lobe.

Spirometry

Spirometry is incorrect. Spirometry is normal or obstructive in bronchiectasis, depending on the severity, but spirometry alone is not a sufficient diagnostic test for bronchiectasis.

Ventilation/perfusion scan

Ventilation/perfusion scan is incorrect. Ventilation/perfusion scans are used in the diagnosis of pulmonary embolism. They are not used to investigate for bronchiectasis.

Question 52

You are asked to see a newly diagnosed asthmatic woman who is 8 weeks' pregnant. She is not on any treatment at the moment. Her peak expiratory flow rate (PEFR) diary shows wide diurnal variations and she also gives a past history of eczema.

Which of the following statements is true?

- **A.** A leukotriene-receptor antagonist is the first-line treatment
- **B.** Inhaled steroids are associated with major congenital deformities
- **C.** Low-dose inhaled corticosteroids would be considered acceptable
- **D.** Short-acting β2-agonists are contraindicated during the first trimester
- **E.** Steroid tablets are teratogenic

Correct Answer: C- Low-dose inhaled corticosteroids would be considered acceptable

Explanation:

In general, the medicines used for asthma are safe during pregnancy, including inhaled low-dose corticosteroids.

A leukotriene-receptor antagonist is the first-line treatment

A leukotriene-receptor antagonist is the first-line treatment is incorrect. Leukotriene-receptor antagonists are not the first-line treatment during pregnancy. However, they can be continued in women who have demonstrated significant improvement in asthma control with these agents prior to their pregnancy.

Inhaled steroids are associated with major congenital deformities

Inhaled steroids are associated with major congenital deformities is incorrect. There is no evidence to suggest that inhaled steroids are teratogenic. If clinically indicated, they can be safely used at any stage of pregnancy

Short-acting β2-agonists are contraindicated during the first trimester

Short-acting β2-agonists are contraindicated during the first trimester is incorrect. Short-acting β2-agonists are not contraindicated in any stage of pregnancy.

Steroid tablets are teratogenic

Steroid tablets are teratogenic is incorrect. There is no evidence to suggest that oral corticosteroids are teratogenic. If clinically indicated,they can be safely used at any stage of pregnancy.

Question 53

A 40-year-old nurse (white, UK-born) comes to the clinic. She has been coughing for the last 3 months, has a cavity on her chest X-ray and Mycobacterium tuberculosis has been grown from her sputum. HIV testing is negative. Antibiotic sensitivities are awaited.

Which of the following antibiotic regimens would be optimal?

- **A.** Rifampicin, isoniazid
- **B.** Rifampicin, isoniazid, pyrazinamide
- **C.** Rifampicin, isoniazid, pyrazinamide and ethambutol
- **D.** Rifampicin, isoniazid, pyrazinamide, ethambutol and ciprofloxacin
- **E.** Rifampicin, isoniazid, pyrazinamide, ethambutol, ciprofloxacin and streptomycin

Correct Answer: C- Rifampicin, isoniazid, pyrazinamide and ethambutol

Explanation:

For the initial empiric treatment of tuberculosis (TB) in patients deemed at low risk of multi-drug resistance, patients are started on a four-drug regimen: isoniazid, rifampicin, pyrazinamide and either ethambutol or streptomycin. Once the isolate is known to be fully susceptible, ethambutol (or streptomycin if used as a fourth drug) can be discontinued. After 2 months of therapy (for a fully susceptible isolate), pyrazinamide can be stopped. Isoniazid plus rifampicin are continued as daily or intermittent therapy for 4 or more months. Therapy must be extended if the patient has cavitary disease or remains culture positive after 2 months of treatment. Treatment regimes are different in the case of HIV-related TB, where immunocompromised and also the issue of drug interactions becomes important; this requires close specialist management. Extra-pulmonary TB (eg bone, CNS) requires a longer duration of treatment, usually 9–12 months. The emerging problem of drug-resistant TB also requires individual management by a specialist team, as patterns of drug resistance vary.

Rifampicin, isoniazid, pyrazinamide, ethambutol and ciprofloxacin

Rifampicin, isoniazid, pyrazinamide, ethambutol and ciprofloxacin is incorrect. This would not be considered the optimal antibiotic regimen in this situation.

Rifampicin, isoniazid

Rifampicin, isoniazid is incorrect. This would not be considered to be the optimal antibiotic regimen in this situation.

Rifampicin, isoniazid, pyrazinamide

Rifampicin, isoniazid, pyrazinamide is incorrect. This would not be considered the optimal antibiotic regimen in this situation.

Rifampicin, isoniazid, pyrazinamide, ethambutol, ciprofloxacin and streptomycin

Rifampicin, isoniazid, pyrazinamide, ethambutol, ciprofloxacin and streptomycin is incorrect. This would not be considered the optimal antibiotic regimen in this situation.

Question 54

A 32-year-old contract spray painter presents to the Respiratory Clinic for review. His asthma is becoming increasingly difficult to control and he now requires fluticasone 500 µg/day and salmeterol 100 µg/day just to perform reasonable activities of daily living. He reports that the only time he has felt well in recent months is when he spent 3 weeks on holiday at his mother's house at the seaside. Chest X-ray reveals mild hyperinflation, and lung function reveals an obstructive defect.

What is the diagnosis that best fits with his symptoms?

- **A.** α1-Antitrypsin deficiency
- **B.** Bronchiectasis
- **C.** Constitutional asthma
- **D.** Occupational asthma
- **E.** Pulmonary fibrosis

Correct Answer: D- Occupational asthma

Explanation:

This patient works as a paint sprayer, and asthma is known to be associated with isocyanates, which can be a component of industrial paints or lacquers. Other people who can develop occupational asthma include:

- Welders
- Laboratory animal workers
- Farmers
- Millers and grain handlers
- Workers manufacturing biological washing powders
- Workers involved in metal refining
- Workers involved in the industrial coatings business.

The clue to his condition is that he improved during his prolonged holiday. Workers who keep a peak-flow diary usually show marked deterioration in their peak flow associated with the

working week. Proper assessment of industrial processes and safety equipment should take place to minimise any risk.

Constitutional asthma

Constitutional asthma is incorrect. Consitutional asthma would not improve when off work. His occupation and the improvement of symptoms when on holiday make occupational asthma more likely.

α1-Antitrypsin deficiency

α1-Antitrypsin deficiency is incorrect. α1-Antitrypsin deficiency is associated with emphysema, not asthma. The chest X-ray did not reveal any evidence of emphysema and the history is higly suggestive of occupational asthma.

Bronchiectasis

Bronchiectasis is incorrect. There is no mention of chronic productive cough, making bronchiectasis an unlikely diagnosis.

Pulmonary fibrosis

Pulmonary fibrosis is incorrect. The symptoms of interstitial lung disease would not improve when on holiday and the chest radiograph would likely show interstitial shadowing.

Question 55

A 46-year-old man with a history of asthma, well controlled with regular low-dose Seretide, presents with a cough productive of purulent, blood-stained sputum. On examination his temperature is 38.6 °C, pulse is 90/min and regular; there is a cluster of cold sores on his upper lip. Auscultation reveals left-sided consolidation.

Which of the following causes of lower respiratory tract infection is most likely to be associated with herpes labialis?

- **A.** *Haemophilus influenzae*
- **B.** *Mycoplasma pneumoniae*
- **C.** *Staphylococcus aureus*
- **D.** *Streptococcus pneumoniae*
- **E.** *Streptococcus pyogenes*

Correct Answer: D- *Streptococcus pneumoniae*

Explanation:

Streptococcus pneumoniae is a common cause of community-acquired pneumonia and is characteristically associated with herpes labialis.

In this case the majority of standard hospital protocols recommend dual therapy with a combination of co-amoxiclav and clarithromycin as the intervention of choice.

Staphylococcus aureus

Staphylococcus aureus is incorrect. *Staphylococcus aureus* pneumonia is more likely to follow a viral respiratory tract infection such as influenza, and we are given no history of a prodromal viral illness here.

Haemophilus influenzae

Haemophilus influenzae is incorrect. *Haemophilus influenzae* is seen more frequently in patients with chronic obstructive pulmonary disease (COPD).

Mycoplasma pneumoniae

Mycoplasma pneumoniae is incorrect. *Mycoplasma* is a cause of atypical pneumonia.

Streptococcus pyogenes

Streptococcus pyogenes is incorrect. *Streptococcus pyogenes* is most commonly associated with head and neck infections, eg pharyngitis, and skin and soft tissue infections, eg cellulitis.

Question 56

You are examining peak flow results from a range of individuals presenting to the Respiratory Clinic with shortness of breath.

When examining peak expiratory flow rate (PEFR) results, which of the following is true?

- **A.** PEFR is a useful marker with respect to restrictive lung disease
- **B.** PEFR is never affected by reduced effort
- **C.** PEFR predicts mortality in COPD
- **D.** PEFR primarily reflects small airway flow
- **E.** Using PEFR to change therapy is superior to symptom-based care

Correct Answer: C- PEFR predicts mortality in COPD

Explanation:

Where chronic obstructive pulmonary disease (COPD) is concerned, PEFR predicts mortality in COPD, with the fall-off in PEFR being significantly slowed in patients who successfully achieve smoking cessation.

PEFR primarily reflects small airway flow

PEFR primarily reflects small airway flow is incorrect. PEFR primarily reflects large airway flow, and is used in the management of asthma, where it has a role in driving treatment intensification.

PEFR is a useful marker with respect to restrictive lung disease

PEFR is a useful marker with respect to the restrictive lung disease is incorrect. Forced vital capacity (FVC) is the most useful marker with respect to restrictive lung disease.

PEFR is never affected by reduced effort

PEFR is never affected by reduced effort is incorrect. PEFR is affected by reduced effort.

Using PEFR to change therapy is superior to symptom-based care

Using PEFR to change therapy is superior to symptom-based care is incorrect. PEFR does not show significantly better outcomes in terms of care utilisation versus symptom-guided therapy intensification.

Question 57

A homeless alcoholic has been admitted to hospital with increasing shortness of breath, sweats and purulent sputum. His Emergency Department records indicate that he was admitted in an unconscious state a few days ago but self-discharged when he woke up. On examination there is pyrexia and dullness at the apex associated with bronchial breathing. His chest X-ray shows right middle-lobe consolidation.

What is the most likely cause?

- **A.** Aspiration
- **B.** Chlamydia infection
- **C.** Legionella infection
- **D.** Mycoplasma infection
- **E.** Tuberculosis

Correct Answer: A- Aspiration

Explanation:

The typical patient with aspiration pneumonia has gingival crevice disease combined with a predisposition for aspiration that is usually due to a suppressed level of consciousness or dysphagia. The clinical presentation is usually more subtle than that for pneumococcal pneumonia, in that the infection evolves over a period of many days, weeks, or even months. Chest X-rays usually show infection in a dependent segment (usually the superior segments of the lower lobes or posterior segments of the upper lobes as these are dependent in the recumbent position), fever and sputum that is often putrid; evidence of chronic disease with weight loss or anaemia is also frequently found.

Legionella infection

Legionella infection is incorrect. Legionella causes an atypical pneumonia and features in the history may include atypical symptoms of pneumonia, such as headache, dry cough, or gastrointestinal upset. There may be a history of exposure to water-cooling systems (eg *Legionella pneumophila* exposure leading to Legionnaires' disease). The history given in this case is classical for an aspiration pneumonia rather than a pneumona caused by an atypical organism.

Chlamydia infection

Chlamydia infection is incorrect. Chlamydia causes an atypical pneumonia and features in the history may include atypical symptoms of pneumonia, such as headache, dry cough, or gastrointestinal upset. There may be a history of exposure to birds (*Chlamydia pssitaci* exposure causing psittacosis). The history given in this case is classical for an aspiration pneumonia rather than a pneumona caused by an atypical organism.

Mycoplasma infection

Mycoplasma infection is incorrect. Mycoplasma causes an atypical pneumonia and features in the history may include atypical symptoms of pneumonia, such as headache, dry cough, or gastrointestinal upset. The history given in this case is classical for an aspiration pneumonia rather than a pneumona caused by an atypical organism.

Tuberculosis

Tuberculosis is incorrect. The acute presentation counts against tuberculosis as an alternative diagnosis, which would be associated with a much more chronic disease time course.

Question 58

A 40-year-old Afro-Caribbean woman who has lived almost all her life in the UK presents to clinic following an insurance medical examination, where she was found to have bilateral hilar lymphadenopathy on her chest X-ray. Her computed tomographic (CT) scan confirms hilar lymphadenopathy and reports nodularity in the lung fields. Routine blood tests are unremarkable.

What would you do next?

- **A.** Arrange a lung biopsy
- **B.** Arrange a transbronchial needle aspiration of a lymph node
- **C.** Commence oral prednisolone
- **D.** Observe and repeat her chest X-ray in 3 months
- **E.** Send sputum samples to microbiology

Correct Answer: D- Observe and repeat her chest X-ray in 3 months

Explanation:

She can be followed up and observed radiologically at regular intervals. Some 50% of patients with stage 2 sarcoidosis (ie hilar lymphadenopathy and parenchymal infiltrate) recover spontaneously in 2 years.

Arrange a transbronchial needle aspiration of a lymph node

Arrange a transbronchial needle aspiration of a lymph node is incorrect. Transbronchial lymph-node aspiration is useful for assessing metastatic spread to lymph nodes, but is not a good test for non-malignant conditions.

Arrange a lung biopsy

Arrange a lung biopsy is incorrect. This woman has typical features of pulmonary and lymph-node sarcoid. If the history and radiology is typical, the diagnosis of sarcoidosis can be confidently made and there may not be a need to proceed to tissue biopsy. If there were atypical features and tissue biopsy was required, either transbronchial or open lung biopsy would be preferable.

Commence oral prednisolone

Commence oral prednisolone is incorrect. In the absence of symptoms, she does not need steroid treatment.

Send sputum samples to microbiology

Send sputum samples to microbiology is incorrect. She does not need sputum to be sent for culture as there is no suspicion of tuberculosis.

Question 59

A 34-year-old woman, who is a non-smoker, is found to have moderate hypoxaemia on blood gas analysis, with a Pao2 of 7.9 kPa. Lung function tests confirm normal lung volumes but a reduced Tlco at 45% of predicted.

The most likely cause for this picture is which one of the following?

- **A.** Acute asthma
- **B.** Emphysema
- **C.** Goodpasture syndrome
- **D.** Polycythaemia
- **E.** Pulmonary arteriovenous malformation

Correct Answer: E- Pulmonary arteriovenous malformation

Explanation:

Pulmonary arteriovenous (AV) malformations cause right-to-left shunts, so reducing Tlco values and provoking hypoxaemia.

Goodpasture syndrome

Goodpasture syndrome is incorrect. Pulmonary haemorrhage syndromes usually cause elevation of the Tlco.

Acute asthma

Acute asthma is incorrect. During acute asthma the lung volumes will be decreased, particularly the forced expiratory volume in 1 s (FEV_1).

Emphysema

Emphysema is incorrect. Emphysema also causes a reduced Tlco but is usually associated with an elevated residual volume and would be unusual in a young non-smoker.

Polycythaemia

Polycythaemia is incorrect. Polycythaemia usually causes elevation of the Tlco.

Question 60

A 30-year-old asthmatic patient has the following drug regimen: regular inhaled corticosteroids, regular inhaled long-acting·$ß_2$-agonists (salmeterol), oral leukotriene-receptor antagonists and inhaled short-acting $ß_2$-agonists when required. Although her compliance is good, her symptoms are still not satisfactorily controlled.

What is the next step in her therapy?

- **A.** Antibiotics
- **B.** Oral cromoglicate
- **C.** Oral steroids
- **D.** Oral theophylline
- **E.** Switch to nebuliser

Correct Answer: D- Oral theophylline

Explanation:

Theophylline is indicated in the treatment of chronic asthma when symptoms are still not controlled despite inhaled corticosteroids, long-acting ß-agonists and leukotriene receptor antagonists. Theophylline improves lung function and symptoms, but side-effects occur more commonly.

Oral steroids

Oral steroids is incorrect. Oral steroids are appropriate in acute exacerbations of asthma. Their long-term use is reserved as 'step 5' treatment. This lady requires 'step 4' treatment.

Antibiotics

Antibiotics is incorrect. Antibiotics are only indicated if there is evidence of a (non-viral) infective exacerbation, which is not the case here.

Oral cromoglicate

Oral cromoglicate is incorrect. Inhaled, not oral, cromoglicate is used in the treatment of asthma.

Switch to nebuliser

Switch to nebuliser is incorrect. Salbutamol nebulisers are usually reserved for the management of acute asthma exacerbations. They are occasionally used at home by very severe asthmatics on otherwise maximal therapy.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International
Gastroenterology & Hepatology

Question 61

A 42-year-old man presents to the GP with indigestion and is sent for a breath test for Helicobacter which is found to be positive.

Which of the following pathologies is most associated with H pylori infection?

- **A.** Duodenal ulcer
- **B.** Gastric carcinoma
- **C.** Gastric ulcer
- **D.** Gastro-oesophageal reflux disease (GORD)
- **E.** Non-ulcer dyspepsia

Correct Answer: A- Duodenal ulcer

Explanation:

Case series suggest that almost all cases of duodenal ulceration are associated with Helicobacter pylori infection, (90%).

Gastro-oesophageal reflux disease (GORD)

GORD is much more strongly linked to factors such as obesity, smoking and alcohol consumption.

Gastric carcinoma

While *H. pylori* is associated with gastric carcinoma, it is less strongly associated with carcinoma than with duodenal or gastric ulceration.

Gastric ulcer

Although gastric ulceration is associated with *H pylori*, case series suggest that slightly less, (at around 80%), are associated with the bacterium.

Non-ulcer dyspepsia

The cause of non-ulcer dyspepsia is unclear; it is a functional disorder and may be related to disorders of gastric emptying or gastric accommodation.

Question 62

A 17-year-old girl has been an inpatient for 4 days following ingestion of 20 500 mg paracetamol tablets after a row she had with her parents. She has some abdominal pain and grade 1 encephalopathy.

Investigations show:

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Investigation	Result	Normal Value
Haemoglobin	110 g/l	115–155 g/l
White Cell Count (WCC)	13.5 × 10^9/l	4–11 × 10^9/l
Platelets	475 × 10^9/l	150–400 × 10^9/l
Albumin	30 g/l	35–55 g/l
Alanine Aminotransferase (ALT)	1650 IU/l	5–30 IU/l
Aspartate Aminotransferase (AST)	1800 IU/l	10–40 IU/l
Bilirubin	150 µmol/l	2–17 µmol/l
International Normalised Ratio (INR)	2.8	0-1.1
Potassium (K^+)	4.5 mmol/l	3.5–5.0 mmol/l
Creatinine	230 µmol/l	50–120 µmol/l
pH	7.28	7.35–7.45
Lactate	3.0 mmol/l.	0.5–2.2 mmol/l

Which of the results qualify her to be listed for a super-urgent liver transplant?

- **A.** Cr 230 and INR 2.8
- **B.** ALT 1650 and AST 1800
- **C.** pH 7.28
- **D.** Bilirubin 150
- **E.** Grade 1 encephalopathy

Correct Answer: C- pH 7.28

Explanation:

This patient has acute liver failure secondary to paracetamol toxicity. Acute liver failure (ALF) is defined as a syndrome that occurs due to rapid cessation of normal liver function in individuals with previously normal livers. The rate of decline is taken as the time taken from the onset of jaundice until the onset of encephalopathy. Less than 7 days is considered 'hyperacute liver failure' (as applied to the case here).

The Kings criteria are used to determine which patients would benefit the most from liver transplantation. For ALF secondary to paracetamol toxicity the following criteria apply:

- pH < 7.3

OR

- INR > 6.5 + Cr > 300 mcmol + grade 3/4 hepatic encephalopathy

This patient has a pH lower than 7.3, and so qualifies for super-urgent listing.

ALT 1650 and AST 1800

ALT 1650 and AST 1800 is incorrect. The ALT and AST are not considered the best prognostic markers in liver failure as large rises can occur in patients with relatively well-preserved liver function.

Cr 230 and INR 2.8

Cr 230 and INR 2.8 is incorrect. Her Cr and INR alone are not enough to qualify for listing. Cr would need to be > 300 mcmol, INR > 6.5 and she would need to have at least grade 3 encephalopathy to be considered for transplant (if pH was more than 7.3).

Bilirubin 150

Bilirubin 150 is incorrect. Bilirubin levels are not part of the King's criteria for determining need for liver transplant in the context of paracetamol toxicity.

Grade 1 encephalopathy

Grade 1 encephalopathy is incorrect. Encephalopathy alone does not qualify for super-urgent listing in this context.

Question 63

A 70-year-old man was admitted with a two-week history of pruritus, jaundice and mild weight loss. He had not drunk any alcohol for at least eight years. One month previously, he had completed a course of co-amoxiclav (which had been prescribed by his General Practitioner for sinusitis), and he was also taking ibuprofen and paracetamol for hip osteoarthritis.

Investigations revealed:

Investigation	Results	Normal Value
Albumin	38 g/l	37–49 g/l
Bilirubin	200 µmol/l	1–22 µmol/l
Aspartate aminotransferase (AST)	150 IU/l	5–35 IU/l
Alkaline phosphatase	200 IU/l	50–110 IU/l

Abdominal ultrasound reveals gallstones but no biliary duct dilatation.

What is the most likely cause of his jaundice?

- **A.** Paracetamol
- **B.** Co-amoxiclav
- **C.** Hepatitis B infection
- **D.** Hepatitis C infection
- **E.** Ibuprofen

Correct Answer: B- Co-amoxiclav

Explanation:

Cholestatic/ mixed cholestatic and hepatitis liver injury can develop during co-amoxiclav therapy or shortly afterwards. Epidemiological studies put the risk of acute liver toxicity at about six times higher with co-amoxiclav compared to amoxicillin therapy alone. Cholestatic liver injury occurs more commonly in patients aged over 65 years and it is more common in men; these reactions are rarer in children. The jaundice is usually self-limiting and is rarely fatal.

The duration of co-amoxiclav therapy should be appropriate to the indication and not exceed 14 days on the advice of the Committee on Safety of Medicines. Rarer side-effects of co-amoxiclav include erythema multiforme, toxic epidermal necrolysis and exfoliative dermatitis.

Hepatitis C infection

Hepatitis C infection is incorrect. No risk factors are described for this man acquiring hepatitis C infection. Furthermore, hepatitis C causes a hepatitic liver injury, and would not explain why his alkaline phosphatase level was raised.

Paracetamol

Paracetamol is incorrect. Used at the prescribed dose in the absence of hepatic disease, paracetamol is unlikely to cause significant hepatic dysfunction. This is in contrast to acute overdose.

Hepatitis B infection

Hepatitis B infection is incorrect. No risk factors are described for this man acquiring hepatitis B infection. Furthermore, hepatitis B causes a hepatitic liver injury, and would not explain why his alkaline phosphatase level was raised.

Ibuprofen

Ibuprofen is incorrect. Mild elevations in transaminases associated with ibuprofen use are unusual but well-recognised; more severe liver injury associated with ibuprofen is exceptionally rare.

Question 64

A 60-year-old woman presents to the Emergency Department. She has had bloody diarrhoea with griping left-sided lower abdominal pain for the past 3 days. She is now feeling very sick and has a severe headache. There is no history of foreign travel. She has recently bought some processed meat products (beef burgers, pies, meatballs) from a local butcher. Her medical history includes arthritis and hyperlipidaemia. Her BP is 132/72 mmHg, with pulse 95/min and regular. She looks pale and there is a petechial rash. Her abdomen is soft, but tender to palpation.

Investigations show:

Investigation	Result	Normal Value

Haemoglobin	82 g/l	115–155 g/l
White Cell Count (WCC)	11.3 × 10^9/l	4–11 × 10^9/l
Platelets	67 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	137 mmol/l	135–145 mmol/l
Potassium (K^+)	5.3 mmol/l	3.5–5.0 mmol/l
Creatinine	210 µmol/l	50–120 µmol/l
Urine	blood +++, protein ++	

What is the likely cause of her diarrhoea?

- **A.** *Campylobacter*
- **B.** *Escherichia coli*
- **C.** Ischaemic colitis
- **D.** *Salmonella*
- **E.** Norovirus

Correct Answer: B- *Escherichia coli*

Explanation:

This patient looks like she has haemolytic uraemic syndrome (HUS), which is a complication of *E. coli* 0157. HUS is a clinical syndrome characterised by haemolytic anaemia, acute kidney injury and thrombocytopenia. The clues here are the consumption of processed meat products, symptoms of headache and diarrhoea, coupled with signs of thrombocytopenia and evidence of vasculitis including haematuria, proteinuria and deteriorating renal function. Whilst *E. coli* 0157 is rare, it does occur occasionally in outbreaks related to consumption of processed meat, and exposure to the bacterium on petting farms.

Ischaemic colitis

Ischemic colitis is incorrect. This can present with abdominal pain and bloody diarrhoea, but the abdominal pain tends to be more severe and usually occurs in patients with a background of existing vascular disease or AF.

Campylobacter

Campylobacter is incorrect. Infection with this organism is associated with bloody diarrhoea, but not with anaemia, thrombocytopenia or a vasculitic-type kidney disease. An AKI may develop secondary to dehydration, but you would not expect to see protein or blood in the urine. *Campylobacter* tends to be transmitted form unpasteurised milk and uncooked poultry.

Salmonella

Salmonella is incorrect. This can also cause bloody diarrhoea, but is not associated with the HUS picture described. *Salmonella* is transmitted from infected eggs, pork or poultry and is often associated with vomiting.

Norovirus

Norovirus is incorrect. This is the most common cause of gastroenteritis. It tends to cause watery diarrhoea (non-bloody) and vomiting, and again is not associated with HUS.

Question 65

A 23-year-old art student presented with a 5-week history of bloody diarrhoea, which had become more severe in the past 48 hours. She felt tired and depressed. On examination, she had a pulse rate of 120 bpm, blood pressure of 95/50 mmHg, temperature of 37.8°C and was tender to palpation in the left iliac fossa. Rectal examination revealed a granular mucosa.

Investigations showed:

Investigation	Result	Normal Value
Haemoglobin	92 g/l	115–155 g/l
White Cell Count (WCC)	11 × 10^9/l	4–11 × 10^9/l
Albumin	29 g/l	35–55 g/l
C-Reactive Protein (CRP)	54 mg/l	0–10 mg/l

What is the most appropriate next step?

- **A.** Transfuse albumin
- **B.** IV antibiotics
- **C.** CT abdomen and pelvis with contrast
- **D.** Sigmoidoscopy and biopsy
- **E.** Stool culture

Correct Answer: C- CT abdomen and pelvis with contrast

Explanation:

The scenario describes a classic presentation of severe colitis; the woman is now shocked, and may be developing toxic dilatation of the colon with or without a bowel perforation or abscess formation. Therefore, cross sectional imaging of the abdomen and pelvis with contrast is the most important next step. Should any of these complications be present, then a surgical opinion is appropriate. If the CT shows less severe changes, however, then the other investigations and management steps may become appropriate.

Transfuse albumin

Transfuse albumin is incorrect. Albumin is a negative acute phase reactant. Therefore, levels of albumin can decrease in cases of acute inflammatory disorders of an acute illness. Managing the underlying condition will normalize the album levels. There is no need to replace albumin at this time.

IV antibiotics

IV antibiotics is incorrect. The scenario describes a classic presentation of severe colitis. Although intravenous antibiotics may be appropriate (at least pending stool cultures, etc) in severe acute ulcerative colitis, the most important next step in her management is to assess for toxic megacolon, bowel perforation and abscesses (via a CT abdomen and pelvis with contrast), as this may be life-threatening if present.

Sigmoidoscopy and biopsy

Sigmoidoscopy and biopsy is incorrect. The scenario describes a classic presentation of severe colitis. Although sigmoidoscopy and biopsy is a useful investigation to perform in severe acute ulcerative colitis, the most important next step in her management is to assess for toxic megacolon, bowel perforation and abscesses (via a CT abdomen and pelvis with contrast), as this may be life-threatening if present.

Stool culture

Stool culture is incorrect. The scenario describes a classic presentation of severe colitis. Although stool cultures are a useful investigation to perform in severe acute ulcerative colitis, the most important next step in her management is to assess for toxic megacolon, bowel perforation and abscesses (via a CT abdomen and pelvis with contrast), as this may be life-threatening if present.

Question 66

A 26-year-old schoolteacher had been diagnosed with hepatitis B infection 2 years earlier. She was now worried about whether the infection was still active.

Which of the following test results is most sensitive at confirming continued viral replication?

- **A.** Anti-HBe
- **B.** Anti-HBs
- **C.** HBeAg
- **D.** HBV DNA
- **E.** IgM anti-HBc

Correct Answer: D- HBV DNA

Explanation:

Hepatitis B (HBV) DNA is the most sensitive index of viral replication. In people with chronic hepatitis B, HBV DNA titres may be high even if HBeAg (the traditional serological marker of high infectivity) is negative, because the patient may be infected with a hepatitis B 'pre core' mutant that does not produce HBeAg but which may cause severe disease.

Anti-HBe

Anti-HBe is incorrect. Anti-HBe is a marker of reduced infectivity, so does not give any information regarding viral replication.

Anti-HBs

Anti-HBs is incorrect. Anti-HBs is a serological marker of immunity against hepatitis B.

HBeAg

HBeAg is incorrect. HBeAg is a useful serological marker in people with chronic hepatitis B, and is consistent with a more highly infective state; however, it is not a sensitive marker of viral replication, unlike HBV DNA.

IgM anti-HBc

IgM anti-HBc is incorrect. IgM anti-HBc is a serological test that is useful for confirming acute hepatitis B infection, but does not in any way reflect on viral replication.

Question 67

A 75-year-old nun presented to her general practitioner with gradual-onset abdominal swelling over some months and generalised abdominal tenderness, perhaps worse in her right flank. On examination, there was inguinal lymphadenopathy. Blood tests revealed a normochromic, normocytic anaemia, decreased serum albumin level and an elevated creatinine of 180 µmol/l. Her CA-125 level was raised.

What is the most likely diagnosis?

- **A.** Cervical carcinoma
- **B.** Cirrhosis of the liver
- **C.** Haemochromatosis
- **D.** Ovarian carcinoma
- **E.** Wilson's disease

Correct Answer: D- Ovarian carcinoma

Explanation:

This scenario is very suggestive of ovarian carcinoma. Ovarian carcinoma has an annual incidence of around 12.9–15.1/100 000 women per year, but the incidence rises with increasing age: the median age of presentation is 61, with the peak occurring between the ages of 75 and 79 years. There is an increased genetic predisposition to the condition in carriers of the BRCA1 gene (breast–ovarian carcinoma syndrome). Low parity, delayed childbearing, obesity and subfertility all appear to be risk factors for the condition.

CA-125 has reasonable sensitivity and specificity for ovarian carcinoma, although levels may also be raised in certain benign gynaecological conditions (eg endometriosis), or non-gynaecological conditions (eg cirrhosis, ascites, breast cancer, and so on). Cross-sectional imaging is helpful in

confirming the diagnosis and staging the disease, with ultrasound, CT and MRI all being of use. This woman's creatinine may be raised because of urinary tract obstruction from the malignancy, either from the mass of the primary tumour, or because of spread of the cancer into the omentum. It would be typical for people with ovarian carcinoma to have a normochromic, normocytic anaemia and a low albumin level (although any ascitic fluid is likely to be protein-rich).

The initial treatment of choice in this scenario would be to drain the ascites (to relieve symptoms), and to consider stenting of the ureters if they are being extrinsically compressed by tumour mass. Chemotherapy (either with or without surgery) might be appropriate in younger patients, but many patients present with very advanced disease, which has a 5% 5-year survival rate.

Cervical carcinoma

Cervical carcinoma is incorrect. Cervical carcinoma tends to occur in younger women than this patient; furthermore, major risk factors include early onset of sexual activity, multiple sexual partners and sexually transmitted infections, which are all clearly unlikely here. In addition, the typical presenting symptom of cervical carcinoma is with heavy/irregular vaginal bleeding, which has not been described.

Cirrhosis of the liver

Cirrhosis of the liver is incorrect. Although this woman's abdominal swelling may suggest ascites, the absence of any obvious risk factors for or clinical features of chronic liver disease make it very unlikely that the diagnosis is cirrhosis.

Haemochromatosis

Haemochromatosis is incorrect. Although haemochromatosis may cause cirrhosis with subsequent ascites formation there is no specific information such as joint problems, diabetes and skin discoloration to suggest this diagnosis.

Wilson's disease

Wilson's disease is incorrect. Although Wilson's disease may cause cirrhosis with subsequent ascites formation there is no specific information such as neuropsychiatric disease to suggest this diagnosis.

Question 68

A 49-year-old bar owner who now lives in Southern Spain comes to the gastroenterology clinic for review. He has type 2 diabetes, osteoarthritis of both knees and early cirrhosis, (although he claims to drink only minimal amounts of alcohol). On examination his BP is 152/88, a pulse of 75 and regular. He is tanned and has a number of spider naevi over the upper body. His BMI is 31. Blood testing reveals elevated transaminases, ferritin, and transferrin saturation.

Which of the following is likely to be present?

- **A.** C282Y mutation
- **B.** H63D mutation
- **C.** Delta-F508
- **D.** SLC4A1 mutation
- **E.** W1282X

Correct Answer: A- C282Y mutation

Explanation:

The clinical picture here with cirrhosis, Type 2 diabetes, probable chondrocalcinosis of the knees, and hyperpigmentation, is consistent with a diagnosis of haemochromatosis. C282Y is responsible for the majority of cases of haemochromatosis.

Delta-F508

Delta-F508 is incorrect. This is the commonest mutation responsible for cystic fibrosis in Northern Europeans.

H63D mutation

H63D is incorrect. The H63D mutation is responsible for a smaller number of cases of haemochromatosis, and can precipitate symptoms in patients who are H63D/C282Y compound heterozygotes.

SLC4A1 mutation

SLC4A1 is incorrect. This is the mutation responsible for hereditary spherocytosis type 4.

W1282X

W1282X is incorrect. This is the mutation responsible for cases of cystic fibrosis in the Ashkenazi Jewish population.

Question 69

A 50-year-old woman presented with a 1-year history of recurrent episodes of right upper abdominal pain. She has now had jaundice and fever for the past 4 days. On examination she had a temperature of 38.4°C, was hypotensive and tachycardic. Abdominal ultrasonography demonstrated calculi in the common bile duct.

What is the next best step once she has been stabilised?

- **A.** Endoscopic retrograde cholangiopancreatography (ERCP)
- **B.** Laparoscopic cholecystectomy
- **C.** Laparotomy and stone extraction
- **D.** Lithotripsy
- **E.** Open cholecystectomy

Correct Answer: A- Endoscopic retrograde cholangiopancreatography (ERCP)

Explanation:

This patient has cholangitis, and has the full set of classic features of Charcot's triad – fever, pain and jaundice. Her hypotension and tachycardia suggest significant sepsis; her ultrasound result suggests that gallstones blocking the common bile duct are the source of her cholangitis, for which the definitive management is to relieve the pressure in the obstructed biliary system. Endoscopic bile duct clearance is the preferred technique, with ERCP being the typical route by which this is achieved.

Laparotomy and stone extraction

Laparotomy and stone extraction is incorrect. Laparotomy for acute presentations related to gallstones/cholecystitis is rarely performed.

Laparoscopic cholecystectomy

Laparoscopic cholecystectomy is incorrect. Cholecystectomy is indicated in people with recurrent problems related to gallstone disease (i.e. recurrent episodes of acute cholecystitis), but is not safe to perform at the time of cholangitis, when there is a great deal of inflammation present.

Lithotripsy

Lithotripsy is incorrect. Extracorporeal shock-wave lithotripsy (ESWL) is not useful for gallstone disease as – in contrast to ureteric calculi – these stones tend to contain very little calcium.

Open cholecystectomy

Open cholecystectomy is incorrect. The typical means of cholecystectomy is via laparoscopy, although an open procedure may be used in difficult cases.

Question 70

A patient with Crohn's disease attended for his annual review. He had heard about infliximab and wondered if it might be suitable for him.

What is the best description of infliximab?

- **A.** It can be given safely to the patient at home from the first dose
- **B.** It is a new selective corticosteroid
- **C.** It is an injectable anti-TNFα monoclonal antibody
- **D.** It is an oral anti-TNFα
- **E.** It is an oral glycoprotein 2b/3a inhibitor

Correct Answer: C- It is an injectable anti-TNFα monoclonal antibody

Explanation:

Infliximab is an injectable anti-TNFα (anti-tumour necrosis factor alpha) monoclonal antibody that may be used to treat inflammatory Crohn's disease and ulcerative colitis that is refractory to

steroids and conventional immunomodulatory agents. TNFα is a key cytokine involved in the pathophysiology of inflammatory bowel disease and TNFα levels are reduced by infliximab.

It can be given safely to the patient at home from the first dose

It can be given safely to the patient at home from the first dose is incorrect. Since infliximab is a chimeric antibody (including both human and mouse amino acid sequences), anaphylaxis is possible after its administration, and the medication must therefore be given within hospital at least for the first few doses. Once patients are established on therapy, at-home dosing may be considered.

It is a new selective corticosteroid

It is a new selective corticosteroid is incorrect. Infliximab has no relation to corticosteroids, and this option may therefore be ruled out.

It is an oral anti-TNFα

It is an oral anti-TNFα (anti-tumour necrosis factor alpha) monoclonal antibody is incorrect. Infliximab may only be administered intravenously.

It is an oral glycoprotein 2b/3a inhibitor

It is an oral glycoprotein 2b/3a inhibitor is incorrect. Oral glycoprotein 2b/3a inhibitors are medications that inhibit platelet aggregation, but are not medications that are useful for treating inflammatory bowel disease; infliximab does not act through this pathway.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International
Infectious diseases

Question 71

A 19-year-old man, born and brought up in Nepal and now studying accountancy, attended the outpatients' clinic with a swelling in his neck. He had a history of fevers, night sweats and weight loss. An acid-fast bacilli (AFB) stain from a fine needle aspiration proved positive and he was commenced on quadruple anti -tuberculous therapy. Now, 2 weeks later, his LFTs have become deranged with an ALT of 400 U/l and bilirubin of 50 µmol/l.

Which one of the following options is the most important management step?

- **A.** Blood cultures
- **B.** Give prednisolone
- **C.** HIV test
- **D.** Liver ultrasound
- **E.** Stop the TB medication

Correct Answer: E- Stop the TB medication

Explanation:

Taken from British Thoracic Society. *Chemotherapy and management of tuberculosis in the United Kingdom: Recommendations 1998. London: BTS, 1998.*

LIVER DISEASE – Patients with known liver disease (alcoholic/hepatitis liver-related disease) should have weekly liver function tests for the first 2 weeks, and then at 2-weekly intervals. Liver function should be repeated (and treatment stopped) if fever, malaise, vomiting, jaundice or unexplained deterioration occur. Virological tests to exclude coexistent viral hepatitis should be considered. If the AST/ALT level rises to five times normal or the bilirubin level rises, rifampicin, isoniazid and pyrazinamide should be stopped.

Once liver function is normal, challenge dosages of the original drugs can be reintroduced sequentially in the order:

- Isoniazid
- Rifampicin
- Pyrazinamide

If there is no further reaction, standard chemotherapy can be continued and any alternative drugs introduced temporarily can then be withdrawn.

Blood cultures

Blood cultures is incorrect. Blood cultures may help narrow the wide differential but will not conclusively determine the correct management plan.

Give prednisolone

Give prednisolone is incorrect. Prednisolone is put in to confuse the situation. It is used in acute hepatitis. This patient has a clear cause of his deranged liver function tests and addressing the TB chemotherapy is the most suitable.

HIV test

HIV test is incorrect. Although an HIV test is useful to do in all patients from a public health point of view, particularly in those presenting with illnesses consistent with immunosuppression, this will only help you narrow your differential.

Liver ultrasound

Liver ultrasound is incorrect. Liver ultrasound would be helpful if looking for abscesses/cysts/stones/neoplasia but would not be able to rule in/out TB chemotherapy-induced hepatitis.

Question 72

A 22-year-old school teacher comes to the Emergency department with fevers joint pains and severe lethargy over the past 48hrs. He has measured his temperature at home and it peaks at 39.5C with severe drenching sweats. He returned from teaching at a school in Thailand some 2 weeks earlier and admits to occasionally missing his anti-malarials. On examination his temperature is 38.5°C, BP is 100/70, a pulse of 90 and regular. He looks pale, there is epigastric and right upper quadrant tenderness on abdominal palpation.

Investigations:

Hb	85 g/l
WCC	12.2 x 10^9/l
PLT	74 x 10^9/l
Na^+	139 mmol/l
K^+	4.5 mmol/l
Creatinine	90 µmol/l
ALT	107 U/l
Alkaline phosphatase	119 U/l
Bilirubin	18 mmol/l
Thick and thin film: Vivax malaria identified	

Which of the following is the most appropriate intervention?

- **A.** Atovaquone proguanil
- **B.** Artemether-lumefantrine and primaquine
- **C.** Chloroquine and primaquine

D. Quinine sulphate and clindamycin

E. Quinine sulphate and doxycycline

Correct Answer: B- Artemether-lumefantrine and primaquine

Explanation:

Vivax resistance to chloroquine based therapies is high in South Asia. Current guidelines suggest that in areas where Vivax resistance to chloroquine is high, artemisinin combination therapy should be given.

Quinine sulphate and doxycycline

Quinine sulphate and doxycycline is incorrect. This is the standard treatment for adults with uncomplicated falciparum malaria.

Atovaquone proguanil

Atovaquone proguanil is incorrect. Atovaquone is used for the treatment of uncomplicated falciparum malaria and is usually given as a 3-day course.

Chloroquine and primaquine

Vivax malaria is usually sensitive to chloroquine which is used to clear the erythrocytic stage of the parasite, with primaquine added to achieve clearance from the liver. Artemisinin combination therapy is an alternative where chloroquine resistance is identified.

Quinine sulphate and clindamycin

Quinine sulphate and clindamycin is incorrect. This is a standard treatment regimen for pregnant women with uncomplicated falciparum malaria.

Question 73

A 42-year-old man comes to the Emergency Department because he is feeling increasingly unwell with lethargy, night sweats, anorexia and gradual weight loss. He has recently returned from a long-term assignment to rural Kenya. He has no past medical history of note and takes no medication. On examination his BP is 105/72 mmHg, pulse is 85/min and regular, he is apyrexial and looks pale. Hepatosplenomegaly is noted, and he has a raised, erythematous plaque-like rash over his buttocks.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	92 g/l	135–175 g/l
White Cell Count (WCC)	5.2 × 10^9/l	4–11 × 10^9/l
Platelets	142 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	137 mmol/l	135–145 mmol/l

Potassium (K^+)	4.3 mmol/l	3.5–5.0 mmol/l
Creatinine	110 µmol/l	50–120 µmol/l
Alanine Aminotransferase (ALT)	220 IU/l	5–30 IU/l
Alkaline Phosphatase	310 IU/l	30–130 IU/l
Bone marrow aspirate	amastigotes identified	

Which of the following is the most appropriate therapy?

- **A.** Albendazole
- **B.** Artemesin
- **C.** Mebendazole
- **D.** Liposomal amphotericin B
- **E.** Tinidazole

Correct Answer: D- Liposomal amphotericin B

Explanation:

The clinical presentation seen here, with an erythematous rash, hepatosplenomegaly, pancytopaenia, abnormal LFTs and amastigotes, suggests that visceral leishmaniasis is the most likely diagnosis. First line therapy is with liposomal amphotericin B, which is safe and highly effective in most areas. Sodium stibogluconate is second line therapy, is administered IV and may be associated with abdominal pain and nausea, fatigue, chemical pancreatitis and ECG changes. Pentamidine is an alternative therapy.

Albendazole

Albendazole is incorrect. This would have been a correct treatment option for helminth infection. There are several types of helminths that might mean that this is a correct treatment choice, but in general, mebendazole is first-line treatment for most of these infections. Examples include hookworm, which presents with chronic iron deficiency anaemia by parasites causing slow upper GI bleeding, and *Strongyloides* which causes migrating urticarial lesions on the legs and trunk with pneumonitis, enteritis and diarrhoea.

Artemesin

Artemesin is incorrect. This would have been the correct choice if the patient had presented with symptoms consistent with malaria. Whilst malaria can cause hepatosplenomegaly, anaemia, fever, renal and hepatic injury, it does not cause a rash with plaques. In addition, the slow history makes it less likely.

Mebendazole

Mebendazole is incorrect. This would have been a correct treatment option for helminth infection. There are several types of helminths that might mean that this is a correct treatment choice, and mebendazole is first-line treatment for most of these infections. Examples include hookworm, which presents with chronic iron deficiency anaemia by parasites causing slow upper

GI bleeding, and *Strongyloides* which causes migrating urticarial lesions on the legs and trunk with pneumonitis, enteritis and diarrhoea.

Tinidazole

Tinidazole is incorrect. This would have been the correct choice if the patient had presented with symptoms consistent with *Giardia*. *Giardia* is a flagellated protozoon causing infection in the duodenum and jejunum following faecal–oral spread. It results in diarrhoea, which can be explosive, with abdominal pain and flatulence. The absence of diarrhoea and the presence of a rash makes this less likely.

Question 74

A 40-year-old man presents to the HIV clinic for a follow-up visit, having tested positive for HIV during a sexual health screen 5 months ago. He is taking antiretroviral medications regularly. As you

Question him about symptoms, he tells you that he has noticed some lesions on his legs. On examination he has scattered, bruise-like lesions over both legs, and some purple patches in his mouth. You suspect Kaposi's sarcoma (KS).

Which one of the following statements with regard to Kaposi's sarcoma (KS) is true?

- **A.** The incidence of KS is high following the commencement of antiretroviral therapy (ART), before falling
- **B.** KS only occurs in immunocompromised patients
- **C.** The causative agent in KS is Kaposi's sarcoma-associated herpesvirus (KSHV), otherwise known as (human herpesvirus 7 (HHV-7)
- **D.** The causative agent in KS is spread by respiratory transmission
- **E.** Visceral disease is actually more common than cutaneous disease

Correct Answer: A- The incidence of KS is high following the commencement of antiretroviral therapy (ART), before falling

Explanation:

In general, KS incidence has declined with the advent of antiretroviral therapy (ART). There is, however, a high incidence in the immediate 6 months after starting ART. There are two theories for this, the first is immune reconstitution inflammatory syndrome (IRIS) which activates dormant HHV-8 whilst the second is the underlying severe immunosuppression that led to the diagnosis of HIV and usual commencement of ART soon after.

The causative agent in KS is Kaposi's sarcoma-associated herpesvirus (KSHV), otherwise known as (human herpesvirus 7 (HHV-7)

The causative agent in KS is Kaposi's sarcoma-associated herpesvirus (KSHV), otherwise known as human herpesvirus 7 (HHV-7) is incorrect. The causative virus is KSHV, otherwise known as human herpesvirus 8 (HHV-8).

KS only occurs in immunocompromised patients

KS only occurs in immunocompromised patients is incorrect. KS can rarely occur in immunocompetent groups, with classic KS typically occurring in elderly male patients of Mediterranean or Jewish origin, and endemic KS occurring in certain African populations; both are relatively benign in comparison with the disease in immunocompromised groups.

The causative agent in KS is spread by respiratory transmission

The causative agent in KS is spread by respiratory transmission is incorrect. HHV-8 is transmitted via close contact, including sexual contact, rather than respiratory transmission.

Visceral disease is actually more common than cutaneous disease

Visceral disease is actually more common than cutaneous disease is incorrect. Visceral involvement of the gastrointestinal (GI) tract and lungs can occur, with or without skin manifestations; however, skin involvement is more common.

Question 75

Which one of the following organisms is not transmitted to humans directly via an insect vector?

- **A.** *Brucella melitensis*
- **B.** Chikungunya virus
- **C.** Japanese encephalitis virus
- **D.** *Leishmania donovani*
- **E.** *Rickettsia prowazekii*

Correct Answer: A- *Brucella melitensis*

Explanation:

This is one of the *Brucella* species that are the causative agents in cases of brucellosis. They are zoonotic infections of sheep, cattle and other large domestic mammals, and transmission is either via direct animal contact (inhalation or via breaks in the skin) or from eating infected, unpasteurised dairy products.

Japanese encephalitis virus

Japanese encephalitis virus is incorrect. Japanese encephalitis is transmitted by the Culex species of mosquito, which can also transmit other arboviruses and filariasis.

Chikungunya virus

Chikungunya virus is incorrect. Chikungunya is transmitted via a mosquito vector, primarily by the *Aedes* species, but probably also by other groups. *Aedes* mosquitos are also responsible for the transmission of dengue, yellow fever and Zika viruses.

Leishmania donovani

Leishmania donovani is incorrect. *Leishmania donovani* causes visceral leishmaniasis and is transmitted via the sandfly.

Rickettsia prowazekii

Rickettsia prowazekii is incorrect. *Rickettsia prowazekii* is the cause of epidemic typhus fever and is transmitted from human to human via the human body louse. On the whole, the *Rickettsia* family are vector-borne, either via tick, flea, louse or mite.

Question 76

A 35-year-old man presents with a 10-day history of fever and malaise. On examination, he has a low-grade fever, generalised lymphadenopathy and tenderness in the right upper quadrant, with no rash or mucosal ulceration. An HIV test is negative; his liver function tests, however, are mildly deranged.

Which one of the following options is the most likely diagnosis?

- **A.** Acute cytomegalovirus (CMV) infection
- **B.** Hepatitis C
- **C.** HIV seroconversion
- **D.** Lymphogranuloma venereum (LGV)
- **E.** Secondary syphilis

Correct Answer: A- Acute cytomegalovirus (CMV) infection

Explanation:

CMV is a member of the family of herpes viruses and is spread by close person-to-person contact (including sexually) with an incubation period between 9 and 90 days. Many infections (particularly in childhood) are minimal or asymptomatic. Acute infection can, however, present in a very similar fashion to acute Epstein–Barr virus infection (glandular fever), with malaise, fever, lymphadenopathy, splenomegaly and – rarely – with a hepatitis, as described in this case. In immunocompromised hosts, disease can be multisystem and life-threatening, including pneumonitis, colitis and retinitis.

HIV seroconversion

HIV seroconversion is incorrect as although HIV seroconversion can present in a manner similar to this, the hepatitis would be less typical. Had he contracted HIV 6 weeks ago, however, the HIV test should by now be positive (the window period for current 4th generation tests is around 4

weeks), and although there is clearly a margin of error here, these factors combined make CMV a better answer in this case.

Hepatitis C

Hepatitis C is incorrect as hepatitis C presents with a chronic rather than acute hepatitis, and primary infection is generally asymptomatic, meaning that CMV is a better answer here. Given this patient's sexual risk factors however, hepatitis C should certainly be screened for.

Lymphogranuloma venereum (LGV)

Lymphogranuloma venereum (LGV) is incorrect as although LGV (caused by *Chlamydia trachomatis* serovars L1-3) is an increasing problem in the MSM (men who have sex with men) population, it presents in a rather different manner to this, with genital ulceration or proctitis, followed by extensive inguinal lymphadenopathy.

Secondary syphilis

Secondary syphilis is incorrect as although secondary syphilis again can present in a similar manner to this, is relatively common in MSM and should be screened for, hepatitis would be unusual, as would the lack of rash.

Question 77

An 18-year-old student with a history of epilepsy, which is well controlled on carbamazepine, is going on safari to Tanzania for 2 weeks with his family.

Which one of the following medications would be the best choice for malaria prophylaxis in this patient?

- **A.** Atovaquone and proguanil (Malarone®)
- **B.** Doxycycline
- **C.** Mefloquine
- **D.** Proguanil
- **E.** Quinine

Correct Answer: A- Atovaquone and proguanil (Malarone®)

Explanation:

Malarone® would be preferred in this patient as it offers adequate protection against malaria in sub-Saharan Africa (N.B. No prophylaxis is 100% effective and bite avoidance is still of key importance), is safe in epilepsy and should not interact with carbamazepine.

Mefloquine

Mefloquine is incorrect. Mefloquine is contraindicated in epilepsy (as well as in a range of psychiatric conditions).

Doxycycline

Doxycycline is incorrect. Although doxycycline is safe in epilepsy, its half-life can be reduced by carbamazepine, and an increased dose is recommended (which can lead to more adverse effects, oesophagitis being particularly problematic).

Proguanil

Proguanil is incorrect. Proguanil is not generally recommended to be used alone as prophylaxis, as many strains of falciparum are no longer fully sensitive to it.

Quinine

Quinine is incorrect. Quinine is still used in the treatment of malaria, but is not used as prophylaxis.

Question 78

There has been an outbreak in one of the older person medical wards: 15 patients have become very unwell with sudden-onset severe diarrhoea and vomiting. Your carers assure you that their food is unlikely to be responsible as they follow strict hygiene procedures. Patients infected earlier have recovered with rehydration therapy after about 48 hours.

Which one of the following viruses is most likely to be responsible for this outbreak?

- **A.** Human astrovirus
- **B.** Enteric adenovirus
- **C.** *Norovirus*
- **D.** Non-polio enterovirus
- **E.** Rotavirus

Correct Answer: C- *Norovirus*

Explanation:

- *Norovirus* is the most common cause of viral infectious gastroenteritis in adults; outbreaks are commonly seen in hospitals, nursing homes and on cruise ships.
- It accounts for a significant burden on the National Health Service (NHS), particularly during the winter months; there were a median of 4600 (range 1745–11 780) laboratory-confirmed cases of *Norovirus* in the UK per year, between 2000 and 2012.
- Symptoms begin 24–48 hours after infection, lasting for 12–60 hours; watery diarrhoea and vomiting are the primary features, sometimes accompanied by fever, headache and myalgia.
- Transmission occurs easily via the faecal–oral route; stringent infection control measures are needed to contain outbreaks.
- Unless adequately managed, older people in particular can become quickly dehydrated.
- Diagnosis is established via ELISA (enzyme-linked immunosorbent assay) or PCR (polymerase chain reaction) conducted on stool.

- Treatment is aimed at adequate rehydration.

Human astrovirus

Human astrovirus is incorrect. Globally, human astroviruses are thought to contribute to ~10% of non-bacterial gastroenteritis in children; prevalence in the UK is not clear. The illness is generally mild, with hospitalisation rarely required. They are an unlikely cause of the scenario described above.

Enteric adenovirus

Enteric adenovirus is incorrect. Enteric adenoviruses (types 40 and 41) commonly cause gastroenteritis in young children, but are unlikely to affect immunocompetent adults. Given that 15 individuals on a general medical ward are unlikely to all be severely immunosuppressed, Norovirus is a more likely cause of their illness.

Non-polio enterovirus

Non-polio enterovirus is incorrect. Non-polio enteroviruses (family *Picornaviridae*) cause a wide range of illnesses, including flaccid myelitis, aseptic meningitis, and hand, foot and mouth disease. Transmission occurs through bodily fluids, including faeces and saliva. Although there are picornaviruses associated with gastroenteritis, the majority cause respiratory or neurological illness. *Norovirus* would be by far the most likely pathogen responsible for the situation described in the Question.

Rotavirus

Rotavirus is incorrect. Rotavirus is the leading cause of infantile gastroenteritis. Due to the very high incidence in children under 5 years, most adults are immune to the infection. An oral rotavirus vaccine is now offered as part of the routine vaccination programme in the UK.

Question 79

A new patient attends your infectious diseases clinic. After taking a history, you are concerned that he may have HIV.

Which one of the following conditions, if present, would most lead you to suspect that he has a CD4 count of less than 100?

A. Cytomegalovirus (CMV) retinitis
B. Generalised lymphadenopathy
C. Herpes zoster (shingles) rash
D. Lesions consistent with Kaposi's sarcoma (KS)
E. Pulmonary tuberculosis (TB)

Correct Answer: A- Cytomegalovirus (CMV) retinitis

Explanation:

CMV retinitis, which is rare in patients with a CD4 count greater than 100, and is consequently the best answer here. The World Health Organization (WHO) have developed a clinical staging system – with stages from 1 to 4 – which can be used in resource-poor settings where CD4 counts and other serology are not readily available. Disseminated CMV or CMV retinitis are stage 4 conditions.

Lesions consistent with Kaposi's sarcoma (KS)

Lesions consistent with Kaposi's sarcoma (KS) is incorrect. Although KS is classed as a stage 4 condition, it is increasingly recognised as occurring at CD4 counts well above 100, including in patients taking antiretrovirals. It is consequently not as good an answer as CMV, which very rarely occurs at CD4 counts above 100.

Generalised lymphadenopathy

Generalised lymphadenopathy is incorrect. Generalised lymphadenopathy is common in HIV, can occur at any stage in disease (including during seroconversion), and can be caused by HIV itself or by conditions related to it (infective or malignant). It would not in isolation make you concerned about a low CD4 count.

Herpes zoster (shingles) rash

Herpes zoster (shingles) rash is incorrect. Shingles in an otherwise well, young patient can be a marker of immunosuppression. This is, however, more likely to be an early presentation, and can occur well before the CD4 count falls to less than 100.

Pulmonary tuberculosis (TB)

Pulmonary tuberculosis (TB) is incorrect. Tuberculosis (TB), particularly pulmonary infection, can occur at any CD4 count. At a CD4 count below 100, TB remains a significant issue; however, other *Mycobacteria* species also become a problem, such as *Mycobacterium avium complex (MAC)*.

Question 80

A 40-year-old businessman visits his GP with an itchy rash. He returned 2 weeks ago from a beach holiday in South America, and since then has been troubled with the rash on his right foot, which is linear, intensely itchy and seems to move. On examination he looks well and is afebrile. On the dorsum and around the medial malleolus of his right foot is a tortuous, slightly raised, erythematous tract.

Which one of the following is the most likely cause?

- **A.** *Leishmania braziliensis*
- **B.** *Ascaris lumbricoides*
- **C.** *Ancylostoma braziliense*
- **D.** Loa loa

E. *Wuchereria bancrofti*

Correct Answer: C- *Ancylostoma braziliense*

Explanation:

This patient has cutaneous larva migrans, a skin rash caused by hookworm infection. Hookworm larvae enter their host through the skin, and whereas some species are able to invade the human gut and set up a chronic infection, species adapted for other animals – including *Ancylostoma braziliense* – can enter the outer layer of skin in the human, but are unable to progress further. They then go on to cause an intensely itchy rash along the path of their travel – which is often on the feet, the most common site of entry.

Loa loa

Loa loa is incorrect. Loa loa is the eye worm – and although it can cause cutaneous itching, it does not typically cause a rash in this manner.

Leishmania braziliensis

Leishmania braziliensis is incorrect. This is one of the species causing cutaneous leishmaniasis, which presents as a nodule that gradually ulcerates, rather than the rash described here.

Ascaris lumbricoides

Ascaris lumbricoides is incorrect. *Ascaris lumbricoides* is a roundworm, which does not enter via the skin or cause this sort of rash.

Wuchereria bancrofti

Wuchereria bancrofti is incorrect. *Wuchereria bancrofti* is one of the causative worms in lymphatic filariasis, which can lead to acute or chronic inflammation and swelling, usually of the lower limbs; however, it does not cause this sort of rash.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International
Clinical Pharmacology & Toxicology

Question 81

A patient is admitted to the ward for observation after sustaining a head injury while running away from the police. After 36 h on the ward he is suffering from hallucinations, hypersalivation, irritability and diarrhoea. You suspect he is withdrawing from the effects of previous recreational drug abuse.

Withdrawal of which of the following would be most likely to account for these features?

- **A.** Alcohol
- **B.** Amphetamine
- **C.** Cocaine
- **D.** Ecstasy
- **E.** Heroin

Correct Answer: E- Heroin

Explanation:

The following are all signs of heroin withdrawal: sweating, diarrhoea, nausea and vomiting, irritability and restlessness, and muscle ache. Management of long-term heroin withdrawal involves methadone or buprenorphine maintenance programmes to avoid the hazards of heroin injection.

Amphetamine

Amphetamine is incorrect. Amphetamines are predominantly short-acting stimulants, and withdrawal is uncommon.

Alcohol

Alcohol is incorrect. Ethanol withdrawal may cause similar symptoms, but is less likely to cause excess salivation or diarrhoea.

Cocaine

Cocaine is incorrect. Cocaine is a short-acting potent stimulant.

Ecstasy

Ecstasy is incorrect. Ecstasy is an intermediate-acting stimulant that enhances serotonin activity within the central nervous system. Withdrawal may cause dysphoria.

Question 82

You are helping to draw up some prescribing guidelines in the Elderly Medicine department of your hospital.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International

Which of the following medications would require greatest caution when prescribed for older adults?

- **A.** Amoxicillin
- **B.** Low-dose (75 mg daily) aspirin
- **C.** Omeprazole
- **D.** Famotidine
- **E.** Triamterene

Correct Answer: E- Triamterene

Explanation:

The most common drugs associated with adverse effects in older adults are diuretics, digoxin, antihypertensives, anti-inflammatory agents and drugs acting on the central nervous system (CNS). Age-related changes include declining renal function and lessened capacity for hepatic drug metabolism. Triamterine is a diuretic that blocks the epithelial sodium channels in the distal convoluted tubule. Older adults are more susceptible to the volume depletion and hyponatraemic effects of diuretics.

Famotidine

Famotidine may be used safely in older adults.

Amoxicillin

Amoxicillin is incorrect. Amoxicillin may be used safely in older adults; it is subject to renal elimination, but has a very wide therapeutic window, such that any increased concentrations are unlikely to cause adverse effects.

Low-dose (75 mg daily) aspirin

Low-dose (75 mg daily) aspirin is incorrect. Aspirin may be slightly more likely to provoke gastric irritation in older adults than younger adults and should be used cautiously. However, the impact of age on drug response is much less obvious than for diuretics, which is why triamterene is the preferred answer.

Omeprazole

Omeprazole may be used safely in older adults.

Question 83

A 35-year-old woman is admitted to the Emergency Department with drowsiness, confusion, abdominal pain and vomiting. She has bipolar disorder and takes a range of medicines to control her mood swings.

According to the ambulance crew, she was found in her lounge, slumped on a sofa, with a suicide note next to her.

Her blood pressure is 90/60 mmHg; pulse is 110 bpm and regular. Her temperature is 37.4 °C. She moans incomprehensibly as you palpate her abdomen. You note muscle tremors and twitching as she is lying on the examination couch.

Investigations:

Investigation	**Result**	**Normal value**
Haemoglobin (Hb)	109 g/l	115–155 g/l
White cell count (WCC)	10.2 × 10^9/l	4–11 × 10^9/l
Platelets (PLT)	233 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	148 mmol/l	135–145 mmol/l
Potassium (K^+)	3.6 mmol/l	3.5–5.0 mmol/l
Creatinine (Cr)	185 µmol/l	50–120 µmol/l
Electrocardiogram (ECG)	Widespread T wave inversion, QRS 80 ms	

Which of the following is the most likely cause of her symptoms?

- **A.** Amitriptyline overdose
- **B.** Lithium overdose
- **C.** Neuroleptic malignant syndrome
- **D.** Sertraline overdose
- **E.** Sodium valproate overdose

Correct Answer: B- Lithium overdose

Explanation:

This scenario fits with lithium overdose where the patient has evidence of pre-renal failure, decreased consciousness and neuromuscular excitability, all features of the condition. ECG changes may be seen, including T-wave inversion, a prolonged PR interval, and QT prolongation. Measurement of lithium levels is crucial in this situation, with levels above 1.5 mmol/l indicating a significant overdose and levels above 4 mmol/l indicating dialysis as the only viable option for treatment. Activated charcoal does not have a role in the treatment of lithium overdose.

Neuroleptic malignant syndrome

Antipsychotic agents causing neuroleptic malignant syndrome are more rarely used in the treatment of bipolar disorder; lithium is a more usual chronic prescription, with sodium valproate used in patients where lithium is unsuitable or is not tolerated. Although neuromuscular excitability and rigidity would be expected, hyperpyrexia is also seen, which is not a feature here.

Amitriptyline overdose

Tricyclic antidepressant overdose can lead to a significant decrease in conscious level and patients become acidotic with evidence of renal impairment. It does not fit with the ECG findings here though, where QRS widening would be a normal finding in amitriptyline overdose. Also, considering the scenario, use of amitriptyline would be unusual in the context of bipolar disorder.

Sertraline overdose

Sertraline is rarely used in patients with bipolar disorder because of the risks of precipitating an episode of mania. Symptoms include serotonin-mediated side-effects such as somnolence, gastrointestinal disturbances (eg nausea and vomiting), tachycardia, tremor, agitation and dizziness. Coma has been reported although less frequently. QTC prolongation/Torsades de pointes has been reported following sertraline overdose; therefore, ECG monitoring is recommended in all ingestions of sertraline overdoses. Activated charcoal is of value in the treatment of sertraline poisoning.

Sodium valproate overdose

Signs of acute massive overdose of sodium valproate, ie plasma concentration 10–20 times maximum therapeutic levels, include central nervous system (CNS) depression or coma with muscular hypotonia, hyporeflexia, miosis, impaired respiratory function, metabolic acidosis, hypotension and circulatory collapse/shock**.** Activated charcoal is useful, and gastric lavage can be considered in some cases up to 10–12 hours after overdose. Both haemodialysis and haemoperfusion have been used successfully in the management of sodium valproate overdose.

Question 84

A 20-year-old woman who suffers from intermittent torticollis has severe vomiting and dehydration after a food-poisoning incident. You decide to give her an antiemetic as she is unable to tolerate oral intake.

Which medication would be most likely to cause adverse effects and should be avoided?

- **A.** Cetirizine
- **B.** Domperidone
- **C.** Ondansetron
- **D.** Prochlorperazine
- **E.** Promethazine

Correct Answer: D- Prochlorperazine

Explanation:

Torticollis or acute dystonia may occur in between 0.5% and 1% of patients given either prochlorperazine or metoclopramide, and the rate of occurrence is higher in young women. Benzatropine and procyclidine may be used to manage acute drug-induced dystonia.

Cetirizine

Cetirizine is incorrect. Cetirizine may worsen dry mouth sensation, but this poses less of a hazard than prochlorperazine.

Domperidone

Domperidone is incorrect. Domperidone would be effective in this situation.

Ondansetron

Ondansetron is incorrect. Ondansetron would be effective in this situation.

Promethazine

Promethazine is incorrect. Promethazine may cause drowsiness.

Question 85

A 57-year-old woman attends the medical clinic for review. She was commenced on a new medicine 6 months earlier, and has noticed that her weight has progressively increased.

Which of the following drugs is most likely to cause weight gain?

- **A.** Carbamazepine
- **B.** Diazepam
- **C.** Phenytoin
- **D.** Pregabalin
- **E.** Sodium valproate

Correct Answer: E- Sodium valproate

Explanation:

Sodium valproate causes the following side-effects: gastric irritation, nausea, ataxia and tremor, hyperammonaemia, increased appetite and weight gain.

Phenytoin

Phenytoin is incorrect. Phenytoin may cause weight gain, but this is normally minor, hence sodium valproate is the preferred answer here.

Carbamazepine

Carbamazepine is incorrect. Carbamazepine may cause minor weight gain, and is a less preferred answer than sodium valproate in this instance.

Diazepam

Diazepam is incorrect. Diazepam may cause drowsiness, but weight gain is not a significant adverse effect.

Pregabalin

Pregabalin is incorrect. Pregabalin may cause drowsiness, but weight gain is not a significant adverse effect.

Question 86

You are asked to review a 46-year-old lady who has been referred by her GP with a creatinine of 342 micromol/l. Renal function was normal before commencing chemotherapy recently.

Which one of the following agents used post-transplant is most likely to result in nephrotoxicity?

- **A.** Ciclosporin
- **B.** Cyclophosphamide
- **C.** Methotrexate
- **D.** Sulfasalazine
- **E.** Vincristine

Correct Answer: A- Ciclosporin

Explanation:

Ciclosporin is used as an immunosuppressive agent after renal transplantation. It has a narrow therapeutic window and can cause direct nephrotoxicity; as renal function worsens plasma concentrations increase and renal function progressively deteriorates.

Sulfasalazine

Sulfasalazine is incorrect. Sulfasalazine is an amino salicylate that is used in the treatment of ulcerative colitis, Crohn's disease and rheumatoid arthritis. Adverse effects include diarrhea, nausea, rash, Stevens–Johnson syndrome and hepatitis. Interstitial nephritis may occur, but this is rare and so ciclosporin is the preferred answer.

Cyclophosphamide

Cyclophosphamide is incorrect. Cyclophosphamide is an alkylating agent that typically causes bone marrow suppression.

Methotrexate

Methotrexate is incorrect. Methotrexate is a dihydrofolate reductase inhibitor that is used to treat acute lymphoblastic leukaemia, non-Hodgkin's lymphoma, some solid tumours and psoriasis. Folinic acid is concomitantly administered to reduce the risk of mucositis or myelosuppression.

Vincristine

Vincristine is incorrect. Vincristine is a vinca alkaloid that is used to treat acute leukaemia and some solid tumours. Its characteristic adverse effect profile is neurotoxicity; it does not cause prominent bone marrow suppression or renal impairment.

Question 87

A 53-year-old man is admitted in an intoxicated state having drunk a large quantity of methanol. His investigations show that the osmolal gap is raised, and there is a metabolic acidosis. You decide to administer fomepizole antidote.

When treating a methanol overdose with fomepizole, which of the following describes the pharmacological action of fomepizole?

- **A.** Competitive agonism
- **B.** Competitive inhibition
- **C.** Non-competitive agonism
- **D.** Non-competitive inhibition
- **E.** Partial agonism

Correct Answer: B- Competitive inhibition

Explanation:

Methanol is metabolised by alcohol dehydrogenase to formaldehyde and thence to formic acid, which leads to profound acidosis, kidney disease and blindness. Fomepizole (4-methylpyrazole) is a competitive inhibitor of alcohol dehydrogenase and so is used to treat methanol and ethylene glycol poisoning. Ethanol also competes for metabolism by alcohol dehydrogenase and can lessen the extent of metabolism of methanol or ethylene glycol; however, fomepizole is more effective and less toxic.

Non-competitive agonism

Non-competitive agonism is incorrect. Fomepizole is a competitive inhibitor.

Competitive agonism

Competitive agonism is incorrect. Fomepizole is a competitive inhibitor.

Non-competitive inhibition

Non-competitive inhibition is incorrect. Fomepizole is a competitive inhibitor.

Partial agonism

Partial agonism is incorrect. Fomepizole is a competitive inhibitor.

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Question 88

You are asked to undertake a review of heart failure prescribing in comparison to clinical guidelines within the Hospital Trust. You are examining evidence for the use of aldosterone antagonists in the treatment of heart failure.
The Randomised Aldactone Evaluation Study (RALES) trial demonstrated that adding the aldosterone antagonist spironolactone to an angiotensin-converting enzyme (ACE) inhibitor reduced all-cause mortality by 30% (RR 0.70, 95% CI 0.60% to 0.82%; p< 0.001; ARR 11%).

According to these figures, what is the number needed to treat (NNT) for the use of spironolactone in the treatment of heart failure with respect to all-cause mortality?

- **A.** 10
- **B.** 11
- **C.** 18
- **D.** 30
- **E.** 40

Correct Answer: A- 10

Explanation:

The number needed to treat in the RALES trial is calculated by dividing 100 by the absolute risk reduction, which in this case calculates to 9.09 (100 ÷ 11); however NNT is always rounded up to the next whole number, which is 10.

18

The number needed to treat in this study is 9, given that the absolute risk reduction was 11% and the NNT is calculated as 100 ÷ absolute risk reduction, which is 9.

11

The number needed to treat in the RALES trial is calculated as 100 ÷ the absolute risk reduction, which in this case is 100 ÷ 11 = 9.

30

The number needed to treat in this case is 9, calculated by 100 ÷ the absolute risk reduction.

40

The number needed to treat in this trial is 9, this number is calculated by dividing 100 by the absolute risk reduction, which is 11.

Question 89

A 45-year-old man who runs a cafe serving fresh food and fruit juices comes to the clinic for INR review as he is warfarinised for a left leg DVT. His INR has become mildly elevated at 3.5.

Which of the following foods is most likely to be responsible?

- **A.** Blueberry juice
- **B.** Brussels sprouts
- **C.** Cranberry juice
- **D.** Grapefruit juice
- **E.** Liver

Correct Answer: C- Cranberry juice

Explanation:

Cranberry juice and pomegranate juice are inhibitors of 2C9, the main P450 isoenzyme responsible for warfarin metabolism. Although case reports have suggested a significant risk of INR increase, this is modest according to two RCTs, and put at up to 30% at most.

Blueberry juice

Blueberry juice is incorrect. Blueberry juice contains chemicals that are capable of inhibiting cytochrome P450 (CYP) 3A, however clinical studies have not shown any important deleterious interactions.

Brussels sprouts

Brussels sprouts is incorrect. Liver and plants of the brassica family such as Brussels sprouts are recognised to contain large amounts of vitamin K, and inhibit the pharmacological effects of warfarin.

Grapefruit juice

Grapefruit juice is incorrect. Grapefruit juice contains chemicals that are capable of powerful inhibition of cytochrome 3A4, and may cause toxicity related to simvastatin, ciclosporin and other drugs that are extensively metabolised by cytochrome 3A4.

Liver

Liver is incorrect. Liver contains significant quantities of vitamin K, and so dietary ingestion causes inhibition of warfarin effects so that INR will fall.

Question 90

A 47-year-old public house owner is brought to the Emergency Department by his wife. He has had influenza for the past 48 hrs and has been confined to his bed. Although his cold symptoms have improved, he is becoming agitated, says there are monkeys clustered around the room, and he has insects crawling over his skin. He is known to drink 10 pints of beer and one-third of a bottle of whisky per day. On arrival in the Emergency Department he is extremely agitated and sweating profusely. His BP is 155/85 mmHg and pulse is 100/min and regular. He tries to fight you off as you examine him, but he says he will accept some tablets to help calm him down. A finger- prick glucose is 8.1 mmol/l.

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The patient remains agitated, which of the following is the most useful next medication?

- **A.** Chlordiazepoxide
- **B.** Haloperidol
- **C.** Hypostop
- **D.** Risperidone
- **E.** Thiamine

Correct Answer: A- Chlordiazepoxide

Explanation:

A reducing dose of chlordiazepoxide given over 5–7 days is the usual treatment for unplanned alcohol withdrawal, with oral diazepam as an alternative. A typical regimen might be as follows:
Day 1: 20 mg chlordiazepoxide four times daily.
Day 2: 15 mg chlordiazepoxide four times daily.
Day 3: 10 mg chlordiazepoxide four times daily.
Day 4: 5 mg chlordiazepoxide four times daily.
Day 5: 5 mg chlordiazepoxide twice daily.

Haloperidol

Haloperidol is incorrect. Haloperidol can be used as a rapid tranquiliser for agitated patients who are a harm to themselves or others but less restrictive, and more effective, options are available and should be tried first. Chlordiazepoxide, and in some regions diazepam, are used for alcohol withdrawal as a first line treatment.

Hypostop

Hypostop is incorrect. Hypostop is used as a treatment for acute hypoglycaemia but would not address the risk of seizures associated with acute alcohol withdrawal. Although glucose should be monitored, treatment of hypoglycaemia is not essential at this stage given a finger-prick glucose of 8.1 mmol/l.

Risperidone

Risperidone is incorrect. Risperidone is an atypical anti-psychotic and it is not routinely recommended in alcohol withdrawal.

Thiamine

Thiamine is incorrect. Consideration of thiamine replacement is essential. Immediate replacement may be given as two ampoules of Pabrinex® (each containing vitamins B1 125 mg, B2, B3, B6, vitamin C and anhydrous dextrose), followed by oral thiamine.

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Clinical Sciences

Question 91

A 42-year-old man presents with difficulty climbing the stairs due to pain and cramping in both lower limbs, and intermittent coughing when he eats too quickly. Apparently, his maternal grandfather suffered from a similar problem and died in his mid-sixties of progressive muscle weakness and disability. No females in the family have been affected by the condition.

Which of the following is the most likely diagnosis?

- **A.** Amyotrophic lateral sclerosis
- **B.** Becker's muscular dystrophy
- **C.** Kennedy disease
- **D.** Sydenham's chorea
- **E.** Wallenberg's syndrome

Correct Answer: C- Kennedy disease

Explanation:

Kennedy disease, also known as "X-linked bulbospinal neuronopathy", is a trinucleotide-repeat disorder.Other trinucleotide-repeat disorders include Huntington's chorea, fragile-X syndrome, myotonic dystrophy and Friedreich's ataxia. The typical age of onset is 40–60 years, but with repeat expansion it can appear as early as the 20s. The fact that no females have been affected by the condition drives us towards thinking about an X-linked disorder, and the gradual onset of limb and bulbar muscle weakness points us towards Kennedy's.

Becker's muscular dystrophy

Becker's muscular dystrophy is incorrect. This presents at an earlier age with predominant lower limb weakness and pseudohypertrophy of the calves.

Amyotrophic lateral sclerosis

Amyotrophic lateral sclerosis is incorrect. This is a form of motor neurone disease where both upper and lower motor tracts are affected. Both upper and lower motor neurone signs are seen. Amyotrophic lateral sclerosis may follow an autosomal dominant inheritance pattern, hence male and female members of the family would be affected.

Sydenham's chorea

Sydenham's chorea is incorrect. It is sometimes seen in patients with rheumatic fever and is also known as St Vitus' dance. It is associated with choreaform movements rather than the features seen here.

Wallenberg's syndrome

Wallenberg's syndrome is incorrect. It is also known as the lateral medullary syndrome, and is a form of stroke related to occlusion of the posterior inferior cerebellar artery.

Question 92

Which of the following conditions is not associated with acute painful scrotal swelling?

- **A.** Fournier's gangrene
- **B.** Idiopathic scrotal oedema
- **C.** Leukaemia
- **D.** Strangulated hernia
- **E.** Torsion of appendix of testis

Correct Answer: B- Idiopathic scrotal oedema

Explanation:

Idiopathic scrotal oedema is an unexplained condition (probably allergic) that occurs particularly in children, and leads to a swollen, erythematous scrotum; this can extend to the groin and perianal regions. The affected person is usually well in themselves (without significant pain). No treatment is needed as it usually resolves in 2–3 days.

Fournier's gangrene

Fournier's gangrene is incorrect. Fournier's gangrene – a variant of necrotising fasciitis of the scrotum – causes gross oedema, subcutaneous emphysema and patchy necrosis, and is therefore typically painful.

Leukaemia

Leukaemia is incorrect. Leukaemia can lead to acute painful enlargement of the testis and scrotum (particularly in children), but this is rare.

Strangulated hernia

Strangulated hernia is incorrect. Strangulated hernia refers to a painful irreducible hernia with a compromised blood supply.

Torsion of appendix of testis

Torsion of appendix of testis is incorrect. The appendix of the testis (hydatid of Morgagni) is a pedunculated remnant of the Mullerian duct that sits on top of the epididymis. Torsion of the testicular appendix can lead to bluish, tender swellings of the skin. The pain can simulate testicular torsion, but tends to be less severe.

Question 93

A 17-year-old woman is admitted to hospital having ingested a large quanity of her mother's iron tablets (ferrous sulphate) 4 hours earlier. There have been three episodes of vomiting so far. Her

BP is 100/80 mmHg, pulse is 90/min and regular, and she complains of epigastric pain. Bowel sounds are active.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	133 g/l	115–155 g/l
White Blood Cell Count (WCC)	11.1 × 10^9/l	4–11 × 10^9/l
Platelets	203 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	137 mmol/l	135–145 mmol/l
Potassium (K^+)	3.7 mmol/l	3.5–5.0 mmol/l
Bicarbonate (HCO_3^-)	18 mmol/l	24–30 mmol/l
Creatinine	132 µmol/l	50–120 µmol/l
Glucose	7.1 mmol/l	3.9–7.1 mmol/l
Serum iron	280 µmol	10.74–30.43 µmol
Plain abdominal radiograph	A number of tablets	

What would be the most important therapeutic measure?

- **A.** Gastric lavage with enteral desferrioxamine
- **B.** Induction of vomiting
- **C.** Intravenous infusion of desferrioxamine
- **D.** Oral activated charcoal
- **E.** Whole bowel irrigation

Correct Answer: C- Intravenous infusion of desferrioxamine

Explanation:

The most important intervention in this situation, with a very high level of serum iron, is chelation therapy, facilitating its urinary excretion. It is most effective given as a continuous infusion, approximately 8 mg of iron is bound by 100 mg of desferrioxamine.

Gastric lavage with enteral desferrioxamine

Gastric lavage with desferrioxamine is incorrect. Serum iron is already approaching highly toxic levels, as such although instilling desferrioxamine into the GI tract may drive some iron chelation, it is not likely to be effective in avoiding complications of iron overdose.

Induction of vomiting

Induction of vomiting is incorrect.The induction of vomiting is ineffective if carried out more than 1 hour after ingestion and iron toxicity itself often causes vomiting.

Oral activated charcoal

Oral activated charcoal is incorrect. Activated charcoal poorly adsorbs inorganic poisons such as iron.

Whole bowel irrigation

Whole bowel irrigation is incorrect. Whole bowel irrigation may be helpful if undissolved tablets remain in the gut, as is more likely to occur when slow-release iron preparations have been ingested. It is an additional therapy to desferrioxamine however, rather than an alternative to it.

Question 94

A young couple in their 20's come to the genetics clinic wanting to discuss the risk of future children they may have suffering from liver failure. Apparently, a niece died in very early childhood, suffering from progressive jaundice in infancy. No other family members have been affected, and the family remember there was a marked rise in unconjugated bilirubin in the child.

Which of the following fits best with the underlying inherited condition?

- **A.** Autosomally-dominant, severe conjugated hyperbilirubinaemia
- **B.** Autosomally inherited, severe unconjugated hyperbilirubinaemia
- **C.** Autosomal-recessive, mild unconjugated hyperbilirubinaemia
- **D.** X-linked, severe conjugated hyperbilirubinaemia
- **E.** X-linked, severe unconjugated hyperbilirubinaemia

Correct Answer: B- Autosomally inherited, severe unconjugated hyperbilirubinaemia

Explanation:

Crigler–Najjar is a rare syndrome that can be either autosomal-recessive (type 1) or autosomal-recessive with pseudodominance (type 2). Severe unconjugated hyperbilirubinaemia results from an absence (type 1) or decrease (type 2) of glucuronyl transferase. As, in effect, it is a prehepatic problem, liver histology is normal and only those with the type-2 disease can survive to adulthood. Liver transplantation is the only effective intervention.

Autosomal-recessive, mild unconjugated hyperbilirubinaemia

Autosomal-recessive, mild unconjugated hyperbilirubinaemia is incorrect. Gilbert's syndrome is an example of an autosomal recessive condition associated with mild unconjugated hyperbilirubinaemia.

Autosomally-dominant, severe conjugated hyperbilirubinaemia

Autosomal-dominant, severe conjugated hyperbilirubinaemia is incorrect. Conjugated hyperbilirubinaemia is seen in both Dubin-Johnson and Rotor syndrome, Dubin-Johnson carries an autosomal recessive inheritance pattern.

X-linked, severe conjugated hyperbilirubinaemia

X-linked, severe conjugated hyperbilirubinaemia is incorrect. X-linked severe conjugated hyperbilirubinaemia is not well described, and the fact that a niece was affected, makes an X-linked condition less likely.

X-linked, severe unconjugated hyperbilirubinaemia

X-linked, severe unconjugated hyperbilirubinaemia is incorrect. G6PD deficiency is X-linked and results in neonatal jaundice.

Question 95

A patient with sepsis secondary to pneumonia is admitted profoundly shocked to the intensive care unit.

Each of the following cellular pathophysiological processes occurs in the shock state EXCEPT?

- **A.** Cellular swelling
- **B.** Depletion of ATP and cyclic AMP
- **C.** Increase in insulin-mediated glucose uptake in muscle
- **D.** Increase in sodium/potassium ATPase activity
- **E.** Precipitation of calcium in the mitochondria

Correct Answer: C- Increase in insulin-mediated glucose uptake in muscle

Explanation:

ATP depletion may lead to alterations in the cellular response to insulin, glucagon, catecholamines and other hormones. In animals that have been subjected to haemorrhagic shock, insulin-mediated glucose uptake by muscle is reduced (not increased).

Cellular swelling

Cellular swelling is incorrect. In the shock state, an increase in membrane permeability to sodium and water, causing cellular swelling, is noted initially.

Depletion of ATP and cyclic AMP

Depletion of ATP and cyclic AMP is incorrect. Increased membrane ATPase activity does eventually lead to the depletion of ATP and cyclic AMP.

Increase in sodium/potassium ATPase activity

Increase in sodium/potassium ATPase activity is incorrect. The above increase in sodium/potassium ATPase activity is seen in an attempt to drive sodium out of the cell.

Precipitation of calcium in the mitochondria

Precipitation of calcium in the mitochondria is incorrect answer as calcium can precipitate in the mitochondria.

Question 96

What is the importance of the P1 receptor?

- **A.** Calcium channel activator

B. Increasing cytotoxic drug excretion from cells
C. Increasing cytotoxic drug metabolite clearance
D. Inducing apoptosis
E. Potassium channel activator

Correct Answer: D- Inducing apoptosis
Explanation:
P1 receptors are G-protein coupled membrane receptors preferentially bound by adenosine. There are a number of subtypes and thus a range of physiological effects. However, as a class the receptor is predominantly involved in mast cell function and eosinophil apoptosis – essentially functioning as a brake on an activated immune system
Increasing cytotoxic drug metabolite clearance
Increasing cytotoxic drug metabolite clearance is incorrect. Whilst a host of processes improve metabolite clearance, the P1 receptor is not implicated.
Calcium channel activator
Calcium channel activator is incorrect. Calcium channel receptors include L-type, T-type and ryanodine but not P1.
Increasing cytotoxic drug excretion from cells
Increasing cytotoxic drug excretion from cells is incorrect. Whilst some cells rely on secretion or efflux mechanisms to excrete cytotoxic drugs; these do not utilize the P1 receptor.
Potassium channel activator
Potassium channel activator is incorrect. Whilst a wide range of potassium channels exist including voltage gated, tandem pore domain, calcium activated and inwardly rectifying, the P1 receptor is not involved.

Question 97

A 28-year-old man who has been referred to the Neurology Outpatients Department with possible multiple sclerosis because of patchy sensory and motor loss in both lower limbs comes to the Emergency Department. He has been feeling increasingly unwell over the past few days with nausea, vomiting and symptoms of light-headedness suggestive of pre-syncope.
On examination, his BP is 115/70 mmHg but this falls to 95/60 mmHg on standing. There is a mixed pattern of motor and sensory loss affecting both lower limbs.
Investigations:

Investigation	Result	Normal Value
Haemoglobin	130 g/l	135 - 175 g/l
White Cell Count (WCC)	7.8 × 10^9/l	4 - 11 × 10^9/l

Platelets	210 × 10^9/l	150 - 400 × 10^9/l
Sodium (Na^+)	128 mmol/l	135 - 145 mmol/l
Potassium (K^+)	5.2 mmol/l	3.5 - 5.0 mmol/l
Creatinine	120 µmol/l	50 - 120 µmol/l

Which underlying diagnosis could best explain his symptoms and signs?

- **A.** Multiple sclerosis
- **B.** Addison's disease
- **C.** Autosomal recessive adrenoleukodystrophy
- **D.** X-Linked adrenoleukodystrophy
- **E.** Carotid sinus hypersensitivity

Correct Answer: D- X-Linked adrenoleukodystrophy

Explanation:

This is a rare cause of adrenal insufficiency and is caused by mutations in the *ABCD1* gene. This gene codes for ALD, a peroxisomal membrane transporter protein. The disorder may sometimes be misdiagnosed as multiple sclerosis. X-linked ALD is associated with a number of different phenotypes. The most common adult phenotype is "adrenomyeloneuropathy" which involves a combination of peripheral neuropathy and a myelopathy, with or without adrenal failure. Assay of very long chain fatty acids, which are markedly elevated, is useful in confirming the diagnosis. Lorenzo's oil may be a useful therapy in some patients, but does not usually impact on pre-existing endocrine dysfunction.

Autosomal recessive adrenoleukodystrophy

Autosomal recessive adrenoleukodystrophy is incorrect. Autosomal recessive adrenoleukodystrophy presents in neonates or young children, and is usually fatal before the age of 20 years. Clinical features include developmental delay, deafness and visual impairment.

Multiple sclerosis

Multiple sclerosis is incorrect. This case includes clear clinical and biochemical features of adrenal insufficiency. This is not a feature of multiple sclerosis.

Addison's disease

Addison's disease is incorrect. Addison's disease is primary adrenal failure. Some features in this case are clearly indicative of adrenal insufficiency, but Addison's disease alone would not be sufficient to explain the co-existing neurological symptoms and signs.

Carotid sinus hypersensitivity

Carotid sinus hypersensitivity is incorrect. Carotid sinus hypersensitivity is a disorder of the elderly and consists of an exaggerated response to carotid sinus baroreceptor stimulation. The consequent hypotension causes transient cerebral hypoperfusion and results in dizziness or syncope.

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Question 98

An 18-year-old suffers recurrent, proven bacterial chest infections requiring regular antibiotic treatment.

Which one of the following is the best way to exclude antibody deficiency?

- **A.** Serum immunoglobulins
- **B.** Immunoglobulin subclasses
- **C.** Specific antibodies to haemophilus and pneumococci
- **D.** Complement levels
- **E.** Mannan-binding protein

Correct Answer: C- Specific antibodies to haemophilus and pneumococci

Explanation:

It is important to recognise the clinical phenotype presented here of antibody deficiency: namely, recurrent bacterial upper respiratory tract infections. Normal specific antibodies to pneumococci, haemophilus and also tetanus will exclude a significant antibody deficiency because they demonstrate that the patient is able to mount a B cell mediated response to infection.

Serum immunoglobulins

Serum immunoglobulins is incorrect. Immunoglobulins and subclasses can be normal even when there is a profound absence of specific antibodies; as such, testing Igs and subclasses is too non-specific to draw conclusions about the efficacy of the immune response.

Immunoglobulin subclasses

Immunoglobulin subclasses is incorrect. Immunoglobulins and subclasses can be normal even when there is a profound absence of specific antibodies; as such, testing Igs and subclasses is too non-specific to draw conclusions about the efficacy of the immune response.

Complement levels

Complement levels is incorrect. Complement is part of the innate immune system and deficiencies do not usually present with recurrent chest infections. Equally, demonstrating normal functioning of complement would provide no reassurance about the integrity of the humoral immune system.

Mannan-binding protein

Mannan-binding protein is incorrect. The mannan-binding lectin pathway is one of the mechanisms by which complement can be activated. Defects in the final common pathway typically manifest with recurrent Neisseria infections.

Question 99

In an elderly patient found to have a large IgM–kappa paraprotein, which of the following would most suggest that it is related to Waldenstromm's macroglobulinaemia?

- **A.** Light chains in the urine
- **B.** No isotype suppression
- **C.** Recurrent infections
- **D.** Hyperviscosity
- **E.** Thrombocytos

Correct Answer: B- No isotype suppression

Explanation:

Isotype suppression (normal IgG and IgA levels) is more a feature of myeloma than Waldenström's macroglobulinaemia, and is therefore a good differentiator.

Light chains in the urine

Light chains in the urine is incorrect. Light chains in the urine are associated more with myeloma, than Waldenström's macroglobulinaemia.

Recurrent infections

Recurrent infections is incorrect. Recurrent infections are associated with a low serum IgG, not IgA and IgM.

Hyperviscosity

Hyperviscosity is incorrect. Hyperviscosity can occur with IgA myeloma as well as in patients with Waldenström's macroglobulinaemia, and therefore, while this may be true, it is not a strong differentiator.

Thrombocytosis

Thrombocytosis is incorrect. Marrow involvement in myeloma can lead to thrombocytopenia, not thrombocytosis.

Question 100

A study measures the reduction in Hb A_{1c} in patients with type-2 diabetes randomised to receive either a new drug or standard therapy.

Which one of the following tests is most appropriate to test the hypothesis that the mean Hb A_{1c} reduction is different in the two groups?

- **A.** Mann–Whitney U-test
- **B.** McNemar's test
- **C.** Paired t-test
- **D.** Unpaired t-test
- **E.** Wilcoxon signed-rank test

Correct Answer: D- Unpaired *t*-test

Explanation:

The ideal statistical method to compare means in two independent (unrelated) groups is an unpaired t-test.

Mann–Whitney U-test

Mann–Whitney U-test is incorrect. The Mann–Whitney U-test is a non-parametric test and compares the overall distributions between groups, rather than the mean values.

McNemar's test

McNemar's test is incorrect. McNemar's test is used to compare proportions, rather than means.

Paired *t*-test

Paired t-test is incorrect. A paired t-test would be a reasonable statistical method as it compares means between two groups. However, it compares dependent groups instead of independent groups, as in this question.

Wilcoxon signed-rank test

Wilcoxon signed-rank test is incorrect. The Wilcoxon signed-rank test is a non-parametric test and compares the overall distributions between groups, rather than the mean values.

Sample of Question Bank of MRCP-1 Regular Course
SsAcademy International
Renal Medicine

Question 101

A 32-year-old woman presents with bilateral flank pain. Her GP had diagnosed a urinary tract infection (UTI) 2 weeks earlier on the basis of proteinuria, but she returned with further pain, tiredness and general malaise. The GP then noted a raised serum creatinine of 285 µmol/l at this time. Repeat urinalysis revealed dipstick blood and protein, but no bacterial growth. Her only past medical history is that she discontinued the oral contraceptive pill after a deep vein thrombosis (DVT) 3 years ago.

Which one of the following diagnoses fits best with this clinical picture

- **A.** Bilateral renal vein thrombosis
- **B.** Ciprofloxacin-associated nephritis
- **C.** Inadequately treated UTI with associated kidney disease
- **D.** Nephritic syndrome
- **E.** Nephrotic syndrome

Correct Answer: A- Bilateral renal vein thrombosis

Explanation:

The clue in the question is that the patient appears to have a hypercoagulable state and has discontinued the pill due to DVT. Patients with a coagulation disorder are at increased risk of renal vein thrombosis. Abdominal ultrasound, magnetic resonance imaging (MRI) or renal arteriography (delayed films during the venous phase) may be useful in making the diagnosis; selective renal venography may also be considered. Acute anticoagulation is useful in preventing worsening of renal function and proteinuria. The value of long-term anticoagulation is unclear, except in those patients with membranous renal disease or multiple incidences of thrombosis. Studies of the long-term prognosis in this condition are rare, but some long-term renal damage is to be expected.

Inadequately treated UTI with associated kidney disease

Inadequately treated UTI with associated kidney disease is incorrect. This is possible, but bacterial growth or pyuria would usually be present. UTIs do not typically present with only proteinuria and pain.

Ciprofloxacin-associated nephritis

Ciprofloxacin-associated nephritis is incorrect. The onset of symptoms preceded the use of antibiotics. Acute interstitial nephritis is often asymptomatic or would be more likely to manifest with symptoms such as fever or rash rather than pain.

Nephritic syndrome

Nephritic syndrome is incorrect. This is among the differential diagnoses but the absence of systemic illness and the presence of pain with a prior history of DVT suggest thrombosis as the diagnosis.

Nephrotic syndrome

Nephrotic syndrome is incorrect. Nephrotic syndrome would be expected to have a longer course and is not typically associated with pain.

Question 102

A 24-year-old man is admitted after falling asleep, drunk, in a toilet cubicle. On examination his blood pressure is 130/70 mmHg, pulse is 98 bpm and there is no pericardial rub; there is 'boggy' tenderness of his right calf and both thigh muscles.

Biochemistry reveals:

Investigation	Result	Normal Value
Urea	38 mmol/l	2.5–6.5 mmol/l
Creatinine	410 µmol/l	50–120 µmol/l
Bicarbonate (HCO_3^-)	15 mmol/l	24–30 mmol/l
pH	7.1	7.35–7.45
Potassium (K^+)	7.8 mmol/l	3.5–5.0 mmol/l
Creatine Kinase	17000 IU/l	23–175 IU/l

Which one of the following is the most appropriate form of treatment?

- **A.** Continuous ambulatory peritoneal dialysis
- **B.** Dopamine
- **C.** Forced alkaline diuresis
- **D.** Haemodialysis
- **E.** High-dose diuretic therapy

Correct Answer: D- Haemodialysis

Explanation:

A raised creatine kinase suggests rhabdomyolysis. The resulting kidney disease is due to the toxic effects of myoglobin upon the renal tubular cells. In this situation, given the potassium and significant acidosis, haemodialysis is the obvious therapeutic step. The patient in the present case will probably require fasciotomy, so continuous therapies that are slower and require anticoagulation are not ideal. Rapid correction of the life-threatening hyperkalaemia and acidosis is necessary, and intermittent haemodialysis is the treatment of choice.

Continuous ambulatory peritoneal dialysis

Continuous ambulatory peritoneal dialysis is incorrect. Continuous ambulatory peritoneal dialysis may not reverse the abnormalities quickly enough. Emergency peritoneal dialysis is not widely available in all hospitals as it requires expertise to insert the peritoneal dialysis catheter tube and administer the therapy.

Dopamine

Dopamine is incorrect. There is no evidence that dopamine is effective in this situation; it will not correct any of the biochemical abnormalities. At present, it is widely accepted that use of low-dose dopamine for prevention or treatment of acute kidney disease cannot be justified on the basis of available evidence from large-scale meta-analyses.

Forced alkaline diuresis

Forced alkaline diuresis is incorrect. Forced alkaline diuresis may prevent acute kidney disease, but once kidney disease is established with life-threatening hyperkalaemia, it is inappropriate.

High-dose diuretic therapy

High-dose diuretic therapy is incorrect. High-dose diuretic therapy would worsen kidney disease in rhabdomyolysis by inducing dehydration. In less severe cases of rhabdomyolysis, the correct management would be to administer plenty of fluid.

Question 103

A 33-year-old woman presents with polydipsia and polyuria, symptoms that started soon after a road traffic collision 6 months ago, during which she was knocked unconcious but was released from hospital after a period of observation. She has also had episodes of flashbacks of the event over the last few months also, and is susptected to have post traumatic stress disorder for which she is currently under investigation for. Her BP is 120/80 mmHg with no postural drop. The daily urine output is 6–8 litres.

Investigations:

Investigation	Result	Normal Value
Sodium (Na^+)	130 mmol/l	135–145 mmol/l
Potassium (K^+)	3.5 mmol/l	3.5–5.0 mmol/l
Urea	5.5 mmol/l	2.5–6.5 mmol/l
Glucose	4.4 mmol/l	3.5–5.5 mmol/l*
Plasma osmolality	268 mosmol/l	
Urine osmolality	45 mosmol/l	100–900 mosmol/l

A water deprivation test is carried out, and stopped when urine osmolality reached 605 mosmol/l

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Which one of the following is the most likely diagnosis?

- **A.** Central diabetes insipidus
- **B.** Diuretic phase of acute tubular necrosis
- **C.** Nephrogenic diabetes insipidus
- **D.** Primary polydipsia
- **E.** Syndrome of inappropriate antidiuretic hormone (SIADH)

Correct Answer: D- Primary polydipsia

Explanation:

Primary or hysterical polydipsia is a psychiatric disturbance that leads to a fall in plasma sodium and osmolality, and a concomitant low urine osmolality in those patients who drink to significant excess. The condition is diferentiated from central diabetes insipidus by carrying out a water deprivation test, and is confirmed if the urine osmolality rises and reaches a normal value after water deprivation.

Diuretic phase of acute tubular necrosis

Diuretic phase of acute tubular necrosis is incorrect. During the resolving or diuretic phase of acute tubular necrosis, serum sodium is increased. The tubular function is restored in this resolving stage.

Central diabetes insipidus

Central diabetes insipidus is incorrect. This causes an increase in plasma osmolality and serum sodium, whereas both are decreased in the present case. Diabetes insipidus is characterised by polydipsia and polyuria with excessively dilute urine; a reduction in intake of fluid does not affect the concentration of urine. Central diabetes insipidus is more common than nephrogenic diabetes insipidus. In central cases, there is deficiency in the production of antidiuretic hormone (ADH). This can be differentiated from primary polydipsia using a water depriavation test.

Nephrogenic diabetes insipidus

Nephrogenic diabetes insipidus is incorrect. This causes an increase in plasma osmolality and serum sodium, whereas both are decreased in the present case. Diabetes insipidus is characterised by polydipsia and polyuria with excessively dilute urine; a reduction in intake of fluid does not affect the concentration of urine. Central diabetes insipidus is more common than nephrogenic diabetes insipidus. In nephrogenic cases, the kidneys are insensitive to ADH.

Syndrome of inappropriate antidiuretic hormone (SIADH)

Syndrome of inappropriate antidiuretic hormone (SIADH) is incorrect. In SIADH, there is low plasma osmolality with inappropriate urine osmolality, which is higher than plasma osmolality. SIADH is the most common cause of euvolaemic hyponatraemia in hospitalised patients. The hyponatraemia and hypo-osmolality result from inappropriate, continued secretion of ADH.

Sample of Question Bank of MRCP-1 Regular Course
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Question 104

A 70-year-old man has a background of type-2 diabetes, gout and bilateral knee replacements for osteoarthritis. His current medications include aspirin, metformin, gliclazide and allopurinol. He presents to hospital with a 2-month history of weight loss, polyuria, nausea, constipation and low back pain.
On examination, he was pale and clinically dehydrated.

His blood tests show:

Investigation	**Result**	**Normal Value**
Haemoglobin	69 g/l	135–175 g/l
Mean Corpuscular Volume (MCV)	89 fl	76–98 fl
Sodium (Na^+)	145 mmol/l	135–145 mmol/l
Potassium (K^+)	4.9 mmol/l	3.5–5.0 mmol/l
Urea	13.6 mmol/l	2.5–6.5 mmol/l
Creatinine	264 µmol/l (Was 65 µmol/l 6 months ago)	50–120 µmol/l
Corrected Calcium (Ca^{2+})	3.3 mmol/l	2.20–2.60 mmol/l

His urine dip was negative for blood, protein, nitirites and leucocytes.
A lumbar X-ray showed lytic lesions in multiple lumbar vertebrae.

Which of the following investigations would help secure the underlying diagnosis?

- **A.** US-renal tract
- **B.** Erythrocyte sedimentation rate
- **C.** Bone marrow biopsy
- **D.** Renal biopsy
- **E.** Parathyroid hormone

Correct Answer: C- Bone marrow biopsy

Explanation:

The patient likey has multiple myeloma given the hypercalcaemia and lytic lesions on the X-ray. Myeloma is a haematological malignancy caused by neoplastic proliferation of plasma cells and characterised by:

- the presence of ≥10% clonal plasma cells in the bone marrow
- a serum or urine paraprotein
- the presence of CRAB features:
    - **C**alcium raised

- **R**enal impairment
- **A**naemia
- **B**one lesions.

This patient has all the CRAB features.

Erythrocyte sedimentation rate

An erythrocyte sedimentation rate is incorrect. An erythrocyte sedimentation rate can be performed and would be very high in the setting of myeloma. It measures how quickly red cells sediment in the first hour when placed in an upright tube. In myeloma, the presence of excess immunoglobulins predisposes red cells to form rouleaux (or a stack of cells) and this causes them to sediment faster. Although it is a reasonable test to request, it would not establish the diagnosis.

US-renal tract

US-renal tract is incorrect. US-renal tract should be requested in the setting of the acute kidney injury to ensure there are two, unobstructed kidneys present, but this would not establish the underlying diagnosis.

Renal biopsy

A renal biopsy is incorrect. A renal biopsy could demonstrate findings of a myeloma kidney such as cast nephropathy and light chain deposition disease, but it is far better for diagnostic and prognostic reasons to acquire a bone marrow biopsy to establish the diagnosis of multiple myeloma.

Parathyroid hormone

Parathyroid hormone is incorrect. Parathyroid hormone again is something you could request as part of your work-up for hypercalcaemia, but again would not help to secure the underlying diagnosis.

Question 105

A 17-year-old man complains of malaise and the inability to take part in sports, as he gets tired easily. He has a past medical history of thyroid disease. His blood pressure is normal. His childhood development was said to be normal.

Investigations reveal:

Investigation	Result	Normal Value
Sodium (Na^+)	141 mmol/l	135–145 mmol/l
Potassium (K^+)	2.8 mmol/l	3.5–5.0 mmol/l
Bicarbonate (HCO_3^-)	34 mmol/l	24–30 mmol/l
Chloride	91 mmol/l	95–107 mmol/l

Magnesium	0.5 mmol/l	0.75 –1.00 mmol/l
Glucose	5.0 mmol/l	3.5–5.5 mmol/l*
Renin	5.1 pmol/ml per hour	3–4.3 pmol/ml per hour
Aldosterone	975 pmol/l	330–830 pmol/l
Urea	5.2 mmol/l	2.5–6.5 mmol/l

Which one of the following is the most probable diagnosis?

- **A.** Bartter syndrome
- **B.** Chronic fatigue syndrome
- **C.** Gitelman syndrome
- **D.** Hypokalaemic periodic paralysis
- **E.** Liddle syndrome

Correct Answer: C- Gitelman syndrome

Explanation:

Gitelman syndrome is characterised by hypokalaemia, metabolic alkalosis, hypocalciuria, hypomagnesaemia (which is pathognomic), normal blood pressure and elevated plasma renin and **aldosterone**

You may find it useful to remember the location of the nephron defects in these conditions as being alphabetical, i.e. Bartter affects the thick ascending limb, Gitelman affects distal tubule and Liddle syndrome affects the collecting ducts. BGL is in alphabetical order, as is the order of the affected location in the nephrons.

Hypokalaemic periodic paralysis

Hypokalaemic periodic paralysis is incorrect. Hypokalaemic periodic paralysis may be precipitated by carbohydrate intake. It is characterised by generalised weakness, including the speech and bulbar muscles, which often starts after a heavy carbohydrate meal or following a period of rest after exertion. The serum potassium concentration is usually below 3.0 mmol/l during an attack. It is generally an autosomal dominant trait caused by mutations in a muscle voltage-gated calcium channel. Non-familial forms of this condition may occur in patients with thyrotoxicosis.

Bartter syndrome

Bartter syndrome is incorrect. Bartter syndrome consists of metabolic alkalosis, hypokalaemia, hypercalciuria, normal blood pressure and elevated plasma renin and aldosterone; magnesium wasting is rarer in this condition. Excessive distal sodium delivery increases distal tubular sodium reabsorption and exchange with the electrically equivalent potassium or hydrogen ion. This in turn promotes hypokalaemia, while lack of chloride reabsorption promotes inadequate exchange of bicarbonate for chloride, and the combined hypokalaemia and excessive bicarbonate retention lead to metabolic alkalosis.

You may find it useful to remember the location of the nephron defects in these conditions as being alphabetical, i.e. Bartter affects the thick ascending limb, Gitelman affects distal tubule and Liddle syndrome affects the collecting ducts. BGL is in alphabetical order, as is the order of the affected location in the nephrons.

Chronic fatigue syndrome

Chronic fatigue syndrome is incorrect. Chronic fatigue syndrome is a condition of unknown aetiology associated with myalgia, prolonged tiredness and depression. It typically occurs after a viral infection. It is not associated with any biochemical abnormality.

Liddle syndrome

Liddle syndrome is incorrect. Liddle syndrome is characterised by potassium wasting, hypokalaemia and alkalosis, but is associated with low renin and aldosterone production and high blood pressure.

You may find it useful to remember the location of the nephron defects in these conditions as being alphabetical, i.e. Bartter affects the thick ascending limb, Gitelman affects distal tubule and Liddle syndrome affects the collecting ducts. BGL is in alphabetical order, as is the order of the affected location in the nephrons.

Question 106

An 86-year-old man presented with his first episode of urinary tract infection. He has no past medical history of note. Urine examination confirmed blood and protein, and *E. coli* was grown on urine culture.

Which one of the following is the next step in management after treating him with antibiotics?

- **A.** Take no action
- **B.** Cystoscopy
- **C.** Retrograde pyelography
- **D.** Re-testing of urine with cytological examination after antibiotics
- **E.** Renal ultrasound scan

Correct Answer: D- Re-testing of urine with cytological examination after antibiotics

Explanation:

Urinary tract infection may develop in patients with an underlying urothelial tumour. Presentation with a first urinary tract infection at the age of 86 suggests that it is worth retesting urine for persistent haematuria and carrying out urinary cytology after a period of antibiotic treatment. Persistent haematuria should be investigated with excretion urography and cystoscopy. Transitional cell carcinomas of the urinary tract account for around 3% of deaths

from all forms of malignancy and are uncommon below 40 years of age. Bladder tumours are around 50 times more common than tumours of the ureter or renal pelvis. Many early bladder tumours may be managed with local cystodiathermy or resection, so diagnosis early in the time course of the disease is desirable.

Take no action

Take no action is incorrect. It is important to exclude neoplasm if there is persistent haematuria.

Cystoscopy

Cystoscopy is incorrect. Cystoscopy would not be the next investigation after antibiotics, but would be required if there is persistent haematuria. It is important to perform non-invasive investigations first.

Retrograde pyelography

Retrograde pyelography is incorrect. Retrograde pyelography would be used to identify any ureteric obstruction, but there is no history of renal calculi in this case.

Renal ultrasound scan

Renal ultrasound scan is incorrect. Renal ultrasound scan would be able to discern the kidney size and any hydronephrosis, which may be indicated in this case if the renal function was abnormal in addition to persistence of haematoproteinuria, but there is no mention of renal function in this case.

Question 107

An 18-year-old man is brought to the Emergency Department with sudden-onset left flank pain and nausea for the past three hours. The pain is colicky and radiating towards his groin. He drinks multiple glasses of iced tea every day. He has had similar abdominal pain previously. His maternal uncle has similar history of abdominal pain.
His temperature is 37.4 °C, his heart rate is 92 bpm and his blood pressure is 110/82 mmHg. Examination shows a non-tender abdomen with left renal angle tenderness. An X-ray of the abdomen was normal. A urinary cyanide nitroprusside test is positive.

Which of the following would be expected upon further evaluation of this patient?

- **A.** Hexagon-shaped crystals on urine analysis
- **B.** Increased serum parathyroid hormone (PTH) level
- **C.** *Proteus mirabilis* on urine culture
- **D.** Rhomboid crystals on urine analysis
- **E.** Urinary pH of 7.8

Correct Answer: A- Hexagon-shaped crystals on urine analysis

Explanation:

Colicky flank pain radiating to the groin with costovertebral angle tenderness is suggestive of urolithiasis. Recurrent urolithiasis in a young adult with negative X-ray findings is suspicious of cystinuria. Hexagon-shaped crystals indicate cystine stones caused by cystinuria. Cystine stones are only poorly radiopaque and often do not appear on X-ray; they are visible on computed tomography (CT), however. Regardless, the positive urine cyanide nitroprusside test confirms the diagnosis.

Rhomboid crystals on urine analysis

Rhomboid crystals on urinalysis are seen in cases of uric acid stones. Although these stones are classically radiolucent on X-ray, their development is strongly associated with increased serum uric acid levels. This otherwise healthy young adult has no risk factors for increased uric acid levels, such as Lesch–Nyhan syndrome, a history of gout or tumour lysis syndrome.

Increased serum parathyroid hormone (PTH) level

Increased serum PTH levels can cause hypercalciuria, which predisposes to calcium stone formation. Calcium stones are virtually always radiopaque, whereas this patient has a stone that is not visualised on X-ray. Furthermore, this young patient has none of the common risk factors for parathyroid disease, such as previous neck radiation, lithium use or being a postmenopausal woman. Increased serum PTH levels would therefore be unlikely.

***Proteus mirabilis* on urine culture**

Proteus mirabilis is a common cause of urinary tract infection and struvite stones. However, these stones are radio-opaque and would appear on abdominal X-ray. Also, struvite stones will not cause a positive urinary cyanide nitroprusside test.

Urinary pH of 7.8

A urinary pH of 7.8 indicates alkaline urine. Alkaline urine is an important pathophysiological feature of calcium phosphate stones and struvite stones. Both these varieties are radio-opaque and visible on plain radiograph.

Question 108

A 60-year-old patient attends the renal transplant clinic. She has had her transplant for 10 years. She reports swelling of her gums that has been more noticeable in recent months. On examination, there is evidence of gingival hypertrophy.

Which of the following medications is likely to have caused this?

- **A.** Mycophenolate mofetil
- **B.** Ciclosporin
- **C.** Azathioprine
- **D.** Prednisolone
- **E.** Methotrexate

Correct Answer: B- Ciclosporin

Explanation:

This is a calcineurin inhibitor and a side-effect of this class of drugs is gingival hypertrophy.

Methotrexate

Methotrexate is incorrect. An important side-effect is myelosuppression.

Mycophenolate mofetil

Mycophenolate mofetil is incorrect. A common side-effect is gastrointestinal disturbance, especially diarrhoea.

Azathioprine

Azathioprine is incorrect. An important side-effect is myelosuppression.

Prednisolone

Prednisolone is incorrect. A prolonged steroid course can give rise to Cushing syndrome.

Question 109

You are asked to review a 56-year-old man with myocardial infarction who is on the third day of his admission. There is a history of arthritis for which he uses non-steroidal anti-inflammatory drugs (NSAIDs), but nil else of note.

During his admission, he had a short period of atrial fibrillation that reverted spontaneously, and a period of left ventricular failure for which he was treated with high dose diuretics.

It has been noted that his urine output is tailing off. His serum creatinine level has now risen from 156 µmol/l (60–110) on admission to 195 µmol/l, and his urea is 12 mmol/l (2.5–7.5). His urine osmolality has been measured at 1000 mosmol/kg (350–1000), with a low urine sodium at 15 mmol/l.

Which one of the following is the most likely diagnosis?

- **A.** Acute interstitial nephritis
- **B.** Acute tubular necrosis (ATN)
- **C.** Chronic interstitial nephritis
- **D.** Pre-renal uraemia
- **E.** Renal artery embolus

Correct Answer: D- Pre-renal uraemia

Explanation:

The urine results in the present patient suggest pre-renal uraemia, with raised urine osmolality and appropriately low urine sodium. It is likely that the patient in the present case received large amounts of diuretics at the time of admission and that this, coupled with any period of

hypotension, is likely to have led to a drop in the glomerular filtration rate (GFR) and pre-renal uraemia. Drugs that impair renal autoregulation (e.g. angiotensin-converting enzyme (ACE) inhibitors and non-steroidal anti-inflammatory drugs (NSAIDs)) may increase the tendency to develop the problem. All causes of pre-renal uraemia may lead to the development of established parenchymal kidney damage if not correctly managed.

Acute tubular necrosis (ATN)

Acute tubular necrosis is incorrect. Measurement of urinary sodium is useful in differentiating between pre-renal and intrinsic renal dysfunction. Pre-kidney disease is considered likely if urinary sodium excretion is <20 mmol/l, whereas intrinsic kidney disease (ATN) is considered if urinary sodium excretion is >40 mmol/l. Depending on the status and site of his myocardial infarction, this may be undertaken with the benefit of a central line and monitoring via a Picco device. This man's fluid status should be assessed in the context of his myocardial infarction, and if he looks dry then some fluid replacement should be instigated.

Acute interstitial nephritis

Acute interstitial nephritis (AIN) is incorrect. This accounts for up to 15% of acute kidney injury in hospitalised patients. It may be precipitated by medications, infections or other causes such as systemic lupus erythromatosus, sarcoidosis or Sjögren syndrome. There would be high fractional excretion of sodium >1%. There may also be eosinophiluria if the acute interstitial nephritis is due to medications. Urinary sodium excretion would be >40 mmol/l, which it is not in this case.

Chronic interstitial nephritis

Chronic interstitial nephritis is incorrect. This presents with a slowly progressive deterioration in renal function. The patient is usually asymptomatic. There may be normal or low-grade proteinuria (<1.5 g/day) and/or pyuria. Renal biopsy shows cellular infiltration of the interstitium, tubular atrophy and fibrosis. Causes include medications, irradiation, toxins and metabolic disorders. Urinary sodium excretion would be >40 mmol/l, which it is not in this case.

Renal artery embolus

Renal artery embolus is incorrect. This is relatively uncommon and is related to cardiac thrombus formation. Therefore, the history of atrial fibrillation may be relevant. However, patients with renal artery embolus are typically in their sixth decade of life and complain of acute onset of abdominal, flank or back pain. Vomiting and fever are common with hypertension (renin-mediated mechanism) and there may be signs of extra-renal embolism. Leukocytosis is usually present on blood testing. Urinalysis may reveal haematuria.

Question 110

A 48-year-old woman presents for follow up after three episodes of uncomplicated urinary tract infection and one of fever, with left loin and supra-pubic pain. These have been identified as *Proteus* infections. A left-sided stag horn calculus is identified.

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Which of the following is the most likely chemical composition of the calculus?

- **A.** Ammonium magnesium phosphate
- **B.** Calcium phosphate
- **C.** Calcium oxalate
- **D.** Calcium urate
- **E.** Cystine

Correct Answer: A- Ammonium magnesium phosphate

Explanation:

Ammonium magnesium phosphate, also known as struvite, is formed in response to urinary infections with *Proteus*, *Klebsiella* or *Serratia*, capable of splitting urea to ammonium and hydroxyl ions (thus increasing urinary pH) and predisposing to struvite stone formation. The stones act as reservoirs for infection and often expand to fill much of the collecting system, typically being seen on ultrasound of the kidneys, ureters and urinary bladder (KUB). Treatment depends on size, but may involve nephrolithotomy then lithotripsy. Infection is treated vigorously.

Calcium phosphate

Calcium phosphate is incorrect. Calcium phosphate stones occur in association with a metabolic abnormality in most cases, but may be idiopathic. There is often a family history of renal stones. Risk factors include increased calcium loss in the urine and factors that promote solubility. These include: hyperparathryoidism, hyperuricosuria, hyperoxaluria and hypocitraturia with chronic acidosis.

Calcium oxalate

Calcium oxalate is incorrect. Urinary calcium oxalate is increased in patients with short bowel syndrome/small bowel malabsorption, and in patients who consume large amounts of foods high in oxalate such as rhubarb.

Calcium urate

Calcium urate is incorrect. Calcium urate stones are seen with increased frequency in patients with gout. Pure uric acid stones are less common. Uric acid stone formation can result from the presence of high urine loss of urate with a urinary pH of <5.5'

Cystine

Cystine is incorrect. Cystinuria is an autosomal recessive condition, leading to increased urinary cystine excretion. Other amino acids are lost too, such as ornithine, lysine and arginine. Cystine stones are suspected in childhood stone formers.

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Question 111

A 32-year-old woman presents with a 3-month history of tiredness, shortness of breath and rash. She admits to passing dark urine but denies any other urinary symptoms. There is no previous medical history of note other than a 6-month course of oral anticoagulants for a spontaneous deep vein thrombosis (DVT) 2 years previously. On examination she has a petechial rash around her ankles and some bruises on her forearms. The full blood count demonstrates haemoglobin 61 g/l, white blood cell count 1.2 × 10^9/l, platelets 10 × 10^9/l, mean cell volume 105 fl and reticulocytes 4%. Dipstick analysis of the urine was positive for 'blood', but the microscopy showed no red cells.

Which one of the following is the most likely diagnosis?

- **A.** Acute myeloid leukaemia
- **B.** Aplastic anaemia
- **C.** Megaloblastic anaemia
- **D.** Paroxysmal nocturnal haemoglobinuria
- **E.** Systemic lupus erythematosus

Correct Answer: D- Paroxysmal nocturnal haemoglobinuria

Explanation:

The combination of thromboembolic events with a pancytopenia blood picture does suggest this rare diagnosis. In particular, dipstick analysis of the urine was positive for 'blood', but the microscopy showed no red blood cells. This final statement is because there is intravascular haemolysis, with intravascular release of haemoglobin. This then passes through the renal tubules, ending up in the urine, and turning the dipstick analysis positive. However, because there are no actual red blood cells in the urine, the microscopy is negative.

Megaloblastic anaemia

Megaloblastic anaemia is incorrect. Megaloblastic anaemia would not present with haematuria and less likely to present with pancytopenia.

Acute myeloid leukaemia

Acute myeloid leukaemia is incorrect. Acute myeloid leukaemia can cause a pancytopenic state but does not have an association with previous thrombotic events and would not give a positive dipstick for blood.

Aplastic anaemia

Aplastic anaemia is incorrect. Aplastic anaemia once again can cause a pancytopenic state, but the combination of thrombotic events, and the pancytopenia, suggest PNH.

Systemic lupus erythematosus

Systemic lupus erythematosus is incorrect. Systemic lupus erythematosus would not result in such a profound pancytopenia, and there are no other clinical features to suggest this disease.

Question 112

A 45-year-old woman presents with rectal bleeding and weight loss. She is found to have a metastatic adenocarcinoma of the colon. She was previously fit and well and takes no regular medications. A regime of combination chemotherapy with capecitabine is planned.

What is the major advantage of capecitabine over 5-fluorouracil?

- **A.** Eliminated by the kidneys
- **B.** Half life
- **C.** Oral administration
- **D.** Reversible toxicity
- **E.** Volume of distribution

Correct Answer: C- Oral administration

Explanation:

Capecitabine is a prodrug of 5-fluorouracil (5-FU). Its major advantage is with respect to oral administration, versus IV administration for 5-FU. The administration of 5-FU requires a central venous access device to be inserted (eg Hickman line) through which a 48-h infusion is given every fortnight. Capecitabine oral tablets are taken twice daily, reducing the number of hospital visits and invasive procedures required for oncology patients.

Given that 5-FU is the active metabolite of capecitabine, half-life, toxicity, elimination and volume of distribution are essentially the same. Data on efficacy are broadly similar for 5-FU and capecitabine. Toxicities include neutropaenia, diarrhoea, hand-foot syndrome and, rarely, coronary vasospasm. Patient education is crucial when administering oral chemotherapy in order to prevent patients from continuing treatment without seeking medical advice in the face of severe toxicity.

Reversible toxicity

Reversible toxicity is incorrect. Given that 5-FU is the active metabolite of capecitabine, toxicity is essentially the same; capecitabine, however, has an advantage with its route of administration.

Eliminated by the kidneys

Eliminated by the kidneys is incorrect. Given that 5-FU is the active metabolite of capecitabine, elimination is essentially the same; capecitabine, however, has an advantage with its route of administration.

Half life

Half life is incorrect. Given that 5-FU is the active metabolite of capecitabine, half life is essentially the same; capecitabine, however, has an advantage with its route of administration.

Volume of distribution

Volume of distribution is incorrect. Given that 5-FU is the active metabolite of capecitabine, volume of distribution is essentially the same; capecitabine, however, has an advantage with its route of administration.

Question 113

A 52-year-old man is referred to the Haematology Clinic after a routine FBC showed a WCC of 6 × 10^3/mm^3, Hb 184 g/l and platelets 142 × 10^3/mm^3. He smokes and has hypertension that is controlled by atenolol. He was admitted 2 years ago with a pulmonary embolism after a transatlantic flight, at which time his blood gases showed $p(O_2)$ of 6.6 kPa, $p(CO_2)$ 3.2 kPa, pH 7.53, O_2 saturation 98%. His FBC results at the time were WCC 9.9 × 10^3/mm^3, Hb 179 g/l, platelets 198 × 10^3/mm^3. Clinical examination reveals a normal cardiovascular and respiratory system, with a respiratory rate 12 breaths per minute and BP 121/74 mmHg.

Which one of the following is the most likely cause of his polycythaemia?

- **A.** Polycythaemia rubravera (PRV)
- **B.** Chronic pulmonary vascular disease
- **C.** 'Stress' polycythaemia
- **D.** Increased-affinity haemoglobin
- **E.** Chronic obstructive airways disease

Correct Answer: D- Increased-affinity haemoglobin

Explanation:

This man has polycythaemia. It could be primary polycythaemia, secondary polycythaemia or apparent polycythaemia. Increased-affinity haemoglobin is the correct answer. This shows that when he was hypoxic, he had oxygen saturations of 98%. This implies that the affinity of his haemoglobin for oxygen is high, ie even at a low $p(O_2)$, his haemoglobin is reluctant to give up oxygen to the tissues. This therefore renders them hypoxic and drives an increase in red blood cell production.

Polycythaemia rubravera (PRV)

Polycythaemia rubra vera is incorrect. Polycythaemia rubra vera would not explain the abnormal blood gases, and there are no other features to suggest this myeloproliferative disorder, such as a raised white cell count, or splenomegaly.

Chronic pulmonary vascular disease

Chronic pulmonary vascular disease is incorrect. Once again, a lower O_2 saturation would be expected.

'Stress' polycythaemia

Stress polycythaemia is incorrect. Stress polycythaemia also known as apparent polycythaemia, is a possibility, but again it does not explain the abnormal arterial blood gases.

Chronic obstructive airways disease

Chronic obstructive airways disease is incorrect - because it would not explain the normal oxygen saturation in the presence of a low $p(O_2)$ and clinical examination reveals a normal respiratory system.

Question 114

A 17-year-old girl presents to the Emergency Department with a single painless cervical lymph node. She has no other significant symptoms apart from a chronic cough for which her GP has recently prescribed a salbutamol inhaler. On examination she has a 4-cm-diameter cervical lymph node. Her BP is 128/74 mmHg, her pulse is 80 bpm and regular, and she is apyrexial.

Investigations;

Investigation	Result	Normal Value
Haemoglobin	109 g/l	115–155 g/l
White Cell Count (WCC)	11.9 × 10^9/l	4–11 × 10^9/l
Platelets	203 × 10^9/l	150–400 × 10^9/
Erythrocyte Sedimentation Rate (ESR)	75 mm/hr	0–10 mm in the 1st hour
Sodium (Na^+)	138 mmol/l	135–145 mmol/l
Potassium (K^+)	4.3 mmol/l	3.5–5.0 mmol/l
Creatinine	110 µmol/l	50–120 µmol/l
Chest X-Ray	Gross mediastinal lymphadenopathy	

Which one of the following is the most likely diagnosis?

- **A.** Acute myeloid leukaemia
- **B.** Chronic myeloid leukaemia
- **C.** Hodgkin's lymphoma
- **D.** Non-Hodgkin's B-cell lymphoma
- **E.** T-cell lymphoma

Correct Answer: C- Hodgkin's lymphoma

Explanation:

This patient has significant mediastinal lymphadenopathy on a chest X-ray, associated with a cervical lymph node. This presentation is typical of Hodgkin's lymphoma. She requires an urgent lymph node biopsy.

Acute myeloid leukaemia

Acute myeloid leukaemia is incorrect. Acute myeloid leukaemia would cause anaemia, blasts in the peripheral blood with a thrombocytopaenia. It would not be associated with mediastinal or cervicallymphadenopathy.

Chronic myeloid leukaemia

Chronic myeloid leukaemia is incorrect. Chronic myeloid leukaemia would be associated with a very raised white cell count. It would not be associated with lymphadenopathy.

Non-Hodgkin's B-cell lymphoma

Non-Hodgkin's B-cell lymphoma is incorrect. Non-Hodgkin's lymphoma is a possible differential diagnosis. However, this young woman's presentation is entirely typical of Hodgkin's disease which would be more common than rarer forms of non-Hodgkin's disease. However, a lymph node biopsy would be critical in order to make a definitive diagnosis.

T-cell lymphoma

T-cell lymphoma is incorrect. The clinical scenario presented is much more likely to be Hodgkin's disease in terms of likely prevalence of diseases. Once again, however, a full lymph node biopsy is always indicated to confirm the definitive diagnosis.

Question 115

A 55-year-old single Afro-Caribbean lady presented to the Emergency Department of a busy general hospital in the UK with sudden onset of confusion, coma and constipation. On examination, she was febrile with generalised plaque-like lesions noted. There were some palpable symmetrical lymph nodes in the cervical region. Her FBC showed a pleomorphic lymphocytosis with a characteristic morphology. Her serum calcium was elevated at 2.79 mmol/l.

What viral agent should be sought to confirm the diagnosis?

- **A.** Cytomegalovirus infection
- **B.** Epstein Barr virus infection
- **C.** Human immunodeficiency virus 1
- **D.** Human T-cell lymphotropic virus 1
- **E.** Varicella zoster virus

Correct Answer: D- Human T-cell lymphotropic virus 1

Explanation:

This lady is of Afro-Caribbean origin and presents with skin lesions, lymphadenopathy and hypercalcaemia. These features are suggestive of adult T-cell leukaemia/lymphoma. This is associated with the human T-cell leukaemia virus type I (HTLV-1). Treatment is with chemotherapy, but overall survival is poor.

Epstein Barr virus infection

Epstein Barr virus infection is incorrect. Epstein Barr virus is not responsible for adult T-cell leukaemia/lymphoma.

Cytomegalovirus infection

Cytomegalovirus is incorrect. Cytomegalovirus is not responsible for adult T-cell leukaemia/lymphoma.

Human immunodeficiency virus 1

Human immunodeficiency virus 1 is incorrect. Human immunodeficiency virus 1 is not responsible for adult T-cell leukaemia/lymphoma.

Varicella zoster virus

Varicella zoster virus is incorrect. Varicella zoster virus is not responsible for adult T-cell leukaemia/lymphoma.

Question 116

A 19-year-old woman who is currently undergoing intensive chemotherapy for a haematological malignancy comes to the Emergency Department having suffered a fever and sore throat over the past 72 h. On examination her temperature is 38.5°C, BP is 105/70 mmHg, pulse is 95/min and regular. There is clear evidence of pharyngitis and crackles at the right base on auscultation.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	85 g/l	115 - 155 g/l
White Cell Count (WCC)	4.2 x 10^9/l	4 - 11 x 10^9/l
Neutrophils	0.1 x 10^9/l	2.5 - 7.58 x 10^9/l
Platelets	20 x 10^9/l	150 - 400 x 10^9/l
Sodium (Na^+)	138 mmol/l	135 - 145 mmol/l
Potassium (K^+)	4.2 mmol/l	3.5 - 5.0 mmol/l
Creatinine	110 µmol/l	50 - 120 µmol/l

Which of the following is the most appropriate next intervention?

- **A.** Close observation
- **B.** G-CSF
- **C.** IV antibiotics
- **D.** Packed red cells
- **E.** Platelets

Correct Answer: C- IV antibiotics

Explanation:

This lady has neutropaenic sepsis and needs urgent broad-spectrum antibiotics. This is a medical emergency and should be given within an hour of presentation.

Packed red cells

Packed red cells is incorrect. Packed red cells is much less important that IV antibiotics, and the haemoglobin is only 85 g/l in a young woman. This would generally indicate that transfusion was not required at this haemoglobin level.

Close observation

Close observation is incorrect. Close observation is insufficient intervention here. This is a medical emergency that requires broad-spectrum antibiotics.

G-CSF

G-CSF is incorrect. G-CSF may be required to reduce the period of neutropaenia, but the most pressing intervention is broad-spectrum antibiotics.

Platelets

Platelets is incorrect. Platelet transfusion is usually only given when platelets are less than 20 in the setting of fever, or less than 10 in the absence of fever. Therefore, this could be considered, but not as a first-line intervention before rapidly giving IV antibiotics.

Question 117

A 48-year-old man with long-standing human immunodeficiency virus (HIV) attends the clinic with a 3-week history of rapidly enlarging lymphadenopathy in the left cervical region measuring 8 × 10 cm.

Investigation	Result	Normal Value
Current CD4 count	120 × 10^6/l	
Haemoglobin	104 g/l	135–175 g/l
White Cell Count (WCC)	3.4 × 10^9/l	4–11 × 10^9/l
Platelets	115 × 10^9/l	150–400 × 10^9/l
Thyroid-Stimulating Hormone (TSH)	normal	0.17–3.2 μU/l

Lactate Dehydrogenase (LDH)	1140 IU/l	100–190 IU/l

Which one of the following is the most likely diagnosis?

- **A.** Atypical tuberculosis
- **B.** Cytomegalovirus infection
- **C.** High-grade non-Hodgkin's lymphoma
- **D.** Kaposi's sarcoma
- **E.** Thyroid carcinoma

Correct Answer: C- High-grade non-Hodgkin's lymphoma

Explanation:

This man with longstanding HIV infection has evidence of a pancytopenia. There are symptoms of lymphoma, with a 3-week history of a rapidly enlarging lymph node mass in the left cervical region. The LDH level is also very significantly elevated. This is an AIDS defining illness.

Atypical tuberculosis

Atypical tuberculosis is incorrect. Although this can present with rapidly enlarging lymphadenopathy, the LDH is usually not as elevated as the level seen here.

Cytomegalovirus infection

Cytomegalovirus infection is incorrect. Cytomegalovirus infection in advanced HIV disease usually manifests as retinitis, usually with CD4 counts of less than 50×10^6/l.

Kaposi's sarcoma

Kaposi's sarcoma is incorrect. This usually manifests as single or multiple papular skin lesions.

Thyroid carcinoma

Thyroid carcinoma is incorrect. Thyroid carcinoma is entirely false and not related to this man's rapidly enlarging lymph node mass in the left cervical region.

Question 118

A 73-year-old man comes to the clinic for a routine check-up involving general physical examination, full blood count, U&E and ESR. He is well, apart from a history of mild hypertension treated with lisinopril. On examination his BP is 149/82 mmHg, pulse is 80/min and his BMI is 23. One enlarged cervical lymph node (1cm) is noted; there are no other abnormal findings apart from splenomegaly.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	129 g/l	135 - 175 g/l

White Cell Count (WCC)	16.3 x 10^9/l	4 - 11 x 10^9/l
Lymphocytes	11.2 x 10^9/l	1.5 - 3.5 x 10^9/l
Platelets	173 x 10^9/l	150 - 400 x 10^9/l
Sodium (Na^+)	136 mmol/l	135 - 145 mmol/l
Potassium (K^+)	4.3 mmol/l	3.5 - 5.0 mmol/l
Creatinine	129 µmol/l	50 - 120 µmol/l
Erythrocyte Sedimentation Rate (ESR)	75 mm/h	0-10 mm in the 1st hour

Which of the following is the next most appropriate investigation to confirm the cause of this lymphocytosis?

- **A.** Bone marrow aspiration
- **B.** CT abdomen
- **C.** LDH
- **D.** Lymph node biopsy
- **E.** Peripheral blood flow cytometry immunophenotyping

Correct Answer: E- Peripheral blood flow cytometry immunophenotyping

Explanation:

Peripheral blood flow cytometry, also known as immunophenotyping, is the next most appropriate investigation to confirm the cause of his lymphocytosis. Immunophenotyping looks at the expression of proteins on the surface of the lymphocytes. The most likely diagnosis here is early-stage chronic lymphocytic leukaemia (CLL). The lymphocytes in CLL express certain proteins on the surface, which can be characterised by immunophenotyping. The advantage is that this can be done on peripheral blood, which is not invasive, with results readily available in a few hours or days.

CT abdomen

CT abdomen is incorrect. CT scan of the abdomen is not a first-line investigation. Although this may show lymphadenopathy, this will not help to distinguish between CLL and other lymphoproliferative disorders.

Bone marrow aspiration

Bone marrow aspiration is incorrect. Bone marrow aspiration is an invasive procedure and this is not required. Investigating cell surface markers in the peripheral blood is much less invasive and certainly is the first-line investigation to confirm the cause of the lymphocytosis. If cell surface markers suggested perhaps an underlying lymphoma, then at that point in time a bone marrow examination may be required, but it is not the first investigation in this patient.

LDH

LDH is incorrect. LDH elevation is a non-specific finding for haematological malignancies. It is usually normal in CLL, and this investigation again does not distinguish CLL from other lymphoproliferative disorders.

Lymph node biopsy

Lymph node biopsy is incorrect. Lymph node biopsy is an invasive procedure, and a lymph node biopsy is only required if there is evidence of rapidly progressive lymphadenopathy, or other features suggestive of a high-grade lymphoma.

Question 119

A 64-year-old woman presents to her General Practitioner with a 3-week history of dyspnoea, weight loss and cough. Her performance status is 1.

Investigations:

Investigation	Result
Computed tomography (CT) scan (thorax, abdomen and pelvis)	4 × 5-cm left hilar mass; no distant disease
Bronchoscopy and biopsy	Small cell lung cancer

What is the most appropriate systemic therapy to be given with concurrent radiotherapy?

- **A.** Cisplatin and etoposide
- **B.** Carboplatin and etoposide
- **C.** Carboplatin and paclitaxel
- **D.** Topotecan and ifosfamide
- **E.** Vinorelbine and cisplatin

Correct Answer: A- Cisplatin and etoposide

Explanation:

Standard chemotherapy for small cell lung cancer remains cisplatin and etoposide, but carboplatin is frequently used in patients who cannot tolerate or who have a contraindication to cisplatin. However, this area of medicine is subject to rapid change as immunotherapy has already started to alter the management of advanced small cell lung cancer; this may soon be extended to limited small cell lung cancer, as in this case.

Carboplatin and etoposide

This is a second-line option in the treatment of small cell lung cancer. The combination of cisplatin and etoposide is only replaced by carboplatin and etoposide in patients who cannot tolerate or who have a contraindication to cisplatin.

Carboplatin and paclitaxel

Carboplatin and paclitaxel is a treatment option for non-small cell lung cancer as opposed to small cell lung cancer.

Topotecan and ifosfamide

Topotecan and ifosfamide have activity in relapsed small cell lung cancer.

Vinorelbine and cisplatin

Vinorelbine and cisplatin are used in non-small cell lung cancer. This patient has small cell lung cancer.

Question 120

A 34-year-old woman is receiving a cisplatin-based chemotherapy regimen as part of a treatment programme for malignant carcinoma of the ovary. During the consenting process prior to starting chemotherapy she was warned about numerous potential toxicities of the therapy.

Which one of the following is a typical side-effect of cisplatin-based chemotherapy?

- **A.** Excessive hair growth
- **B.** Hypercalcaemia
- **C.** Hypermagnesaemia
- **D.** Optic neuritis
- **E.** Ototoxicity

Correct Answer: E- Ototoxicity

Explanation:

Ototoxicity is an important concern of cisplatin-based chemotherapy and as yet there is no recognised effective treatment for it.

Hypocalcaemia, hypomagnesaemia and hypokalaemia may occur as a result of nephrotoxicity associated with cisplatin.

Nausea and vomiting are often seen, but can be managed with effective antiemetics.

Myelosuppression and associated risks of neutropaenic sepsis, anaemia and haemorrhage are also common toxicities.

Optic neuritis

Optic neuritis is incorrect. Although nerve toxicity is seen, this does not usually take the form of optic neuritis; rather a peripheral sensory neuropathy is more common.

Excessive hair growth

Excessive hair growth is incorrect. Alopecia, rather than excessive hair growth is usually seen.

Hypercalcaemia

Hypercalcaemia is incorrect. Hypocalcaemia may occur as a result of nephrotoxicity associated

with cisplatin.

Hypermagnesaemia

Hypermagnesaemia is incorrect. Hypomagnesaemia may occur as a result of nephrotoxicity associated with cisplatin.

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Question 121

A 22-year-old man is admitted for assessment after being found wandering the streets saying that he is being controlled by radio waves from a mobile-phone tower. He hears voices being critical about him. After talking to his family it is clear he has had these symptoms for 6 weeks.

Which treatment is most appropriate to control his symptoms?

- **A.** Chlorpromazine
- **B.** Cognitive behavioural therapy
- **C.** Fluoxetine
- **D.** Haloperidol
- **E.** Risperidone

Correct Answer: E- Risperidone

Explanation:

This man has characteristic symptoms of schizophrenia (auditory hallucinations and delusions of control). Antipsychotics are first-line treatment for schizophrenia.

Antipsychotics are commonly divided into 'typical' antipsychotics, which are the older drugs, and 'atypical', which are newer second-generation drugs. 2002 NICE guidelines used to recommend atypical antipsychotics in preference due to fewer side-effects, particularly extrapyramidal side-effects and tardive dyskinesia. However, the more recent 2014 guidelines no longer explicitly recommend atypical antipsychotics, and instead state the choice should be based on the views of the patient and healthcare professional after considering the likely benefits and possible side-effects of each drug. In practice, atypical drugs are often still first-choice, which is why risperidone is correct as the only atypical antipsychotic among the possible answers.

Chlorpromazine

Chlorpromazine is incorrect as chlorpromazine is a typical antipsychotic and its common side-effects include extrapyramidal symptoms, tardive dyskinesia, weight gain and glucose intolerance.

Cognitive behavioural therapy

Cognitive behavioural therapy is incorrect as cognitive behavioural therapy alone is unlikely to be the most appropriate initial treatment in a new presentation of schizophrenia, although it may have a role in long-term management and prevention of relapse

Fluoxetine

Fluoxetine is incorrect as fluoxetine is an antidepressant not an antipsychotic.

Haloperidol

Haloperidol is incorrect as haloperidol is also a typical antipsychotic and has a particularly high incidence of extrapyramidal side-effects.

Question 122

You see a woman who tells you she has felt empty and low in mood for a long time. She tells you that she has no friends, prefers to stay at home but hates being alone, uses cannabis, has a history of alcohol use and history of self-harm with threatening suicide. On examination of her Emergency Department records it transpires she has self-harmed on around six occasions over the past year. She denies early morning wakening or lack of appetite.

What is the most likely diagnosis?

- **A.** Borderline personality disorder
- **B.** Depressive disorder
- **C.** Schizoid personality disorder
- **D.** Histrionic personality disorder
- **E.** Narcissistic personality disorder

Correct Answer: A- Borderline personality disorder

Explanation:

Borderline personality disorder is characterised by instability of mood, self-image and interpersonal relationships. Frequently patients complain and worry about being left alone, but are unstable with respect to interpersonal relationships. They have a problem with self-harming and feelings of emptiness. Management of personality disorder is generally to avoid medication, and counsel patients with strategies to avoid this type of behaviour if possible.

Schizoid personality disorder

Schizoid personality disorder is incorrect. Schizoid personality disorder is characterised by a lack of interest in social relationships, a tendency towards a solitary or sheltered lifestyle, secretiveness, emotional coldness and apathy rather than the impulsive behaviour seen here.

Depressive disorder

Depressive disorder is incorrect. This patient has no appetite loss or early morning wakening, which are normally associated with endogenous depression, the chronic repeated cycles of her abnormal behaviour make personality disorder more likely than a depressive illness.

Histrionic personality disorder

Histrionic personality disorder is incorrect. Histrionic personality disorder is characterised by a pattern of excessive attention-seeking emotions, usually beginning in early adulthood, including inappropriately seductive behaviour and an excessive need for approval.

Narcissistic personality disorder

Narcissistic personality disorder is incorrect. Narcissistic personality disorder is characterised by individuals who have an inflated sense of their own importance, a deep need for admiration and a lack of empathy for others.

Question 123

A 32-year-old woman is started on lithium therapy for bipolar disorder.

Which one of the following is the most important side effect of therapy that you should warn her about?

- **A.** Abnormal liver function
- **B.** Fever
- **C.** Hypothyroidism
- **D.** Leukopenia
- **E.** Cystitis

Correct Answer: C- Hypothyroidism

Explanation:

Lithium-induced hypothyroidism occurs in approximately 5% of individuals on lithium maintenance therapy. The prevalence of thyroid abnormalities overall is up to 20% of patients on long-term treatment, (includes goiter and thyrotoxicosis).

Abnormal liver function

Abnormal liver function is incorrect. Abnormal liver function tests (LFTs) are not normally a consequence of lithium therapy.

Fever

Fever is incorrect. Excessive sweating and fever may be reported with lithium therapy but they are only rarely seen.

Leukopenia

Leukopenia is incorrect. Leukocytosis rather than leukopenia is more likely to be reported in association with lithium therapy.

Cystitis

Cystitis is incorrect. Polyuria and nephrogenic diabetes *insipidus (*DI) are reported in association with lithium therapy, as are renal histological changes, rather than frank cystitis.

Question 124

A 23-year-old woman who presented with an acute psychotic episode has been started on Risperidone. She has a significant improvement in her mental state, but asks on discharge about

long term physiological effects of her treatment. She has no significant past medical history and takes only the oral contraceptive pill. Her BP is 115/72 mmHg, BMI is 23 and there are no abnormal findings on physical examination.

Which of the following is most frequently seen with Risperidone therapy?

- **A.** Diabetes mellitus
- **B.** Hyperprolactinaemia
- **C.** Jaundice
- **D.** Orthostatic hypotension
- **E.** Vertigo

Correct Answer: B- Hyperprolactinaemia

Explanation:

Hyperprolactinaemia is a common occurence in patients prescribed Risperidone therapy, and can in in some cases lead to gynaecomastia in men, menstrual disturbances or amenorrhoea in women, and galactorrhea in both women and men.

Jaundice

Jaundice is incorrect. Elevations in transaminases are relatively common, although jaundice is only rarely associated with Risperidone treatment.

Diabetes mellitus

Diabetes mellitus is incorrect. Diabetes mellitus is another concern with respect to atypical antipsychotic therapy. In the Risperidone program however, the risk of diabetes was not increased vs placebo, (diabetes mellitus was reported in 0.18% in Risperidone-treated subjects compared to a rate of 0.11% in placebo group. Overall incidence from all clinical trials was 0.43% in all Risperidone-treated subjects).

Orthostatic hypotension

Orthostatic hypotension is incorrect. This is uncommonly seen in risperidone treatment.

Vertigo

Vertigo is incorrect. Like orthostatic hypotension, vertigo is uncommonly seen.

Question 125

A 23-year-old lady on antipsychotic medication for schizophrenia is referred to the Endocrine Clinic by her GP. She complains of significant galactorrhoea, particularly when her breasts are stimulated during sexual intercourse with her boyfriend. Since starting medication she has been able to hold down a job and form a stable relationship, and she is reluctant to discontinue it. On examination her BP is 125/80 mmHg, physical examination including visual field testing is

unremarkable, but in the presence of a chaperone she demonstrates that her breasts express milk.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	124 g/l	115–155 g/l
White Cell Count (WCC)	6.4 × 10^9/l	4–11 × 10^9/l
Platelets	232 × 10^9/l	150–400 × 10^9/l
Sodium (Na^+)	140 mmol/l	135–145 mmol/l
Potassium (K^+)	4.5 mmol/l	3.5–5.0 mmol/l
Creatinine	110 µmol/l	50–120 µmol/l
Prolactin	900 mU/l	<400 mU/l
Follicle-Stimulating Hormone (FSH)	Low	1–25 U/l
Luteinizing Hormone (LH)	Low	1–70 U/l

Which one of the following is the most likely cause of her symptoms?

- **A.** Microprolactinoma
- **B.** Macroprolactinoma
- **C.** Olanzapine
- **D.** Clozapine
- **E.** Risperidone

Correct Answer: E- Risperidone

Explanation:

Risperidone is associated with significant hyperprolactinaemia, and hence suppression of both follicle-stimulating hormone and luteinising hormone. It is quite possible at a prolactin level of around 900 mU/l with risperidone, which results in galactorrhoea. Other atypical antipsychotics such as olanzapine, clozapine and quetiapine are not associated with significant increases in prolactin. If her psychiatric condition is stable then discussion could take place with her psychiatrist to broach the possibility of changing to one of these alternative medications.

Macroprolactinoma

Macroprolactinoma is incorrect. Macroprolactinomas are associated with elevation in prolactin to 5000 or greater, and visual field defects due to optic chiasm compression are a prominent feature.

Microprolactinoma

Microprolactinoma is incorrect. Microprolactinomas are associated with much greater elevation in prolactin to the 3000 or greater level.

Olanzapine

Olanzapine is incorrect. Olanzapine is considered a relative prolactin-sparing anti-psychotic, hence a much lower level than 900 would be expected here.

Clozapine

Clozapine is incorrect. Like olanzapine, there is not thought to be significant risk of hyperprolactinaemia in association with therapy.

Question 126

A 77-year-old man with end-stage dementia undergoes a post-mortem examination. Pathological specimens of brain tissue reveal both neurofibrillary tangles (NFTs) and senile plaques.

From which type of dementia is he most likely to have suffered?

- **A.** Alzheimer's disease
- **B.** Huntington's disease
- **C.** Lewy body dementia
- **D.** Pick's disease
- **E.** Punch-drunk syndrome

Correct Answer: A- Alzheimer's disease

Explanation:

Typical pathological findings of Alzheimer's disease (AD) include neurofibrillary tangles (NFTs) with the associated protein tau, senile plaques and extracellular deposits of amyloid beta peptides. Cerebral amyloid angiopathy and hippocampal sclerosis are other common findings.

Punch-drunk syndrome

Punch-drunk syndrome is incorrect. NFTs but not senile plaques are seen in patients with the punch-drunk syndrome (also known as dementia pugilistica or chronic traumatic encephalopathy). This is a syndrome that was first described in boxers and alcoholics where repeated cerebral concussions lead to cognitive impairment, with dementia-like features later on in life.

Huntington's disease

Huntington's disease is incorrect. Typical pathological findings in Huntington's disease include neuronal cell loss and atrophy, particularly of the caudate and putamen.

Lewy body dementia

Lewy body dementia is incorrect. Lewy bodies are found in Lewy body dementia (LBD). These are round neuronal inclusion bodies of aggregated protein, a major component being the protein alpha-synuclein. Senile plaques are also seen, but not NFTs.

Pick's disease

Pick's disease is incorrect. Pick's disease is a subset of frontotemporal dementia that does not have (NFTs) or senile plaques. It does have distinctive round silver-staining inclusions called Pick bodies, which contain hyperphosphorylated tau protein. Other pathological features of frontotemporal dementias include microvacuolation and neuronal loss, swollen neurons, myelin loss and astrocytic gliosis.

Question 127

A 20-year-old male attends a clinic, along with his mother who is concerned that he has recently lost a significant amount of weight and appears to be exercising excessively. The patient refers to the fact that he hates how fat he is but does not feel he is over-exercising. His primary concern when you speak to him alone is that he has been having issues with impotency. On examination, he has a BMI of 17.

What is the most likely diagnosis?

- **A.** Bulimia nervosa
- **B.** Bingeing
- **C.** Anorexia nervosa
- **D.** Generalised anxiety disorder
- **E.** Body dysmorphic disorder

Correct Answer: C- Anorexia nervosa

Explanation:

This describes an eating disorder where individuals induce weight loss of >15% of normal weight resulting in BMI <17.5, and where individuals hold an overvalued idea that fatness is a dreadful state and will not allow their weight to rise above a very low threshold.

Epidemiological studies of anorexia nervosa have demonstrated a marked predominance of females over males, but it is becoming better recognised and diagnosed in males.

Other epidemiological factors shown in anorexia nervosa include:

- a peak age of onset of 15 years
- an increased incidence in higher socioeconomic groups
- an increased incidence in Westernised countries (it seems that culture rather than race is important, as there is a high incidence in second-generation Asian girls)
- an increased incidence in high-risk professions, eg models, ballet dancers and jockeys.

Body dysmorphic disorder

Body dysmorphic disorder is incorrect, this describes an anxiety disorder where an individual has a distorted view of their appearance and becomes obsessed with worrying about particular

defects in their appearance that are not seen by others. Body dysmorphic disorder can be seen in individuals with anorexia nervosa, but is less likely than a diagnosis of anorexia nervosa in this case as the patient's view of his appearance is only one symptom alongside his weight loss and excessive exercise that are diagnostic of anorexia nervosa.

Bulimia nervosa

Bulimia nervosa is incorrect. This describes an eating disorder where individuals have a persistent preoccupation with eating and have irresistible cravings for food resulting in episodes of binge eating. They then display behaviours in an attempt to counteract the 'fattening' effects of food, such as self-induced vomiting, periods of starvation and diuretic abuse. Around one third of individuals who suffer from bulimia nervosa have a previous history of anorexia.

Bingeing

Bingeing is incorrect. This refers to the behaviour of excessive and compulsive consumption of food and overeating seen in bulimia nervosa.

Generalised anxiety disorder

Generalised anxiety disorder is incorrect. Although anxiety is a common cause of impotence, the clinical features of generalised anxiety disorder are persistent and generalised symptoms of anxiety, which occur across a range of daily circumstances and are not related to particular events or circumstances.

Question 128

A 52-year-old man is reported to have serious problems in developing social relationships. He is self-centred, arrogant, aggressively violent at times, exaggerates his abilities and fantasises that he is superior to others. His wife has suffered several mental breakdowns related to his selfishness and lack of empathy and remorse. From his medical history, you have ascertained that he is not suffering from any physical illnesses, although his mental health status remains to be investigated.

What is the most likely psychiatric diagnosis?

- **A.** Antisocial personality disorder
- **B.** Histrionic personality disorder
- **C.** Schizoid personality disorder
- **D.** Dependent personality disorder
- **E.** Narcissistic personality disorder

Correct Answer: E- Narcissistic personality disorder

Explanation:

Narcissistic personality disorder is characterised by false beliefs about oneself being successful and perfect. This patient is self-centred and intensely selfish in his relationship with others; he uses others to satisfy his own desires and lacks empathy and remorse. The patient uses others for his/her personal gains using his/her personal charisma. Narcissistic personality disorder is similar to antisocial personality disorder, except that narcissistic personality disorder does not tend to manifest severe criminal behaviour; rather it is concentrated on self-serving interests, and is thus mainly a form of deviant covert behaviour. However, the tendency to commit criminal activities cannot be ruled out, especially if this concerns self-promotion.
Treatment involves long-term intervention and community rehabilitation programmes.
ICD-10 defines a personality disorder as a severe disturbance in the characterological condition and behavioural tendencies of the individual, usually involving several areas of the personality and nearly always associated with considerable personal and social disruption.

Antisocial personality disorder

Antisocial personality disorder is incorrect. Antisocial personality disorder is characterised by impulsive, irresponsible and criminal behaviour. Individuals often show a disregard for normal social behaviour, manipulate or violate the rights of others and lack concern or guilt and often blame other people for the problems in their lives.

Histrionic personality disorder

Histrionic personality disorder is incorrect. Histrionic personality disorder is characterised by the overwhelming need to be noticed and gain attention from others. They may display excessive emotions, seek constant reassurance and approval from others and appear self-centred and show little care for other people.

Schizoid personality disorder

Schizoid personality disorder is incorrect. Schizoid personality disorder is characterised by a detached individual who avoids making close social contact with others; they often complete activities in isolation, do not have or desire close relationships and are uninterested in others' opinions of themselves.

Dependent personality disorder

Dependent personality disorder is incorrect. Dependent personality disorder is characterised by an individual who feels they are unable to be independent. They show an excessive need for others to look after them or make decisions for them, have a constant fear of being left alone and feel the need to start new relationships as soon as an old relationship ends.

Question 129

A 17 year old woman comes to the clinic for review. She is some 3 months away from her A-levels and is depressed and anxious about her potential grades. She is currently waking at 4:30am, and is findng it difficult to eat. She has thought that it might be easier to just take

an overdose of paracetamol, and end it all, but has so far resisted the urge to do so. She has no physical health problems and is predicted to achieve 4 A grades.

Which of the following is the most appropriate intervention?

- **A.** Amitriptyline
- **B.** Citalopram
- **C.** Cognitive behavioural therapy
- **D.** Counselling
- **E.** Zopiclone

Correct Answer: C- Cognitive behavioural therapy

Explanation:

Pharmacotherapy is not recommended for teenagers with depression because of increased risk of suicide in this population. CBT is therefore the intervention of choice.

Zopiclone

Zopiclone is incorrect. Used short term to improve sleep zopiclone may have a role, although it is inferior to a CBT intervention for depression.

Amitriptyline

Amitriptyline is incorrect. This is a sedating tricyclic anti-depressant and is normally used in the elderly population for treatment of depression.

Citalopram

Citalopram is incorrect. Citalopram may be associated with a lower rate of anxiety and increased activity in teenagers with depression than other SSRIs, although it is still considered a second line option in patients who fail to respond to CBT alone.

Counselling

Counselling is incorrect. Unfocussed counselling used alone is unlikely to significantly impact on symptoms of depression.

Question 130

A 51-year-old woman who is taking long term lithium for bipolar disorder comes to the psychiatry clinic for review. She has been diagnosed with nephrogenic diabetes insipidus and the plan is to switch the lithium for an alternative.

Which of the following is considered as the next most appropriate intervention?

- **A.** Carbamazepine
- **B.** Citalopram
- **C.** Lamotrigine

D. Sodium valproate
E. Topiramate

Correct Answer: D- Sodium valproate

Explanation:

Valproate is the second line therapy for bipolar disorder in patients who don't tolerate lithium or where it's contraindicated. It shouldn't be used in patients of childbearing potential because of the risk of teratogenicity, in this case contraception should be offered.

Carbamazepine

Carbamazepine is incorrect. Carbamazepine is considered as a third or fourth line therapy and is usually instigated by specialist psychiatry services for patients who fail to respond to alternative interventions.

Citalopram

Citalopram is incorrect. Citalopram, an SSRI, runs the risk of exacerbating an episode of mania.

Lamotrigine

Lamotrigine is incorrect. Lamotrigine is considered for patients in whom lithium and sodium valproate are contraindicated or unsuitable.

Topiramate

Topiramate is incorrect. Topiramate is not recommended by NICE for the treatment of patients with bipolar disease.

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Question 131

A 25-year-old man develops cirrhosis of the liver and is referred from the Gastroenterology Clinic to the Ophthalmology Clinic to look for evidence of Wilson's disease.

What will the ophthalmologist be looking out for?

- **A.** Corneal arcus
- **B.** Hudson–Stahli lines
- **C.** Kayser–Fleischer rings
- **D.** Cornea verticillata
- **E.** Band keratopathy

Correct Answer: C- Kayser–Fleischer rings

Explanation:

Kayser-Fleischer rings are due to copper deposition in Descemet's membrane of the cornea, usually appear to encircle the iris.

Corneal arcus

Corneal arcus is incorrect. Corneal arcus is a common finding in the elderly population and can be related to hyperlipidaemia.

Hudson–Stahli lines

Hudson-Stahli lines is incorrect. Hudson-Stahli lines are due to iron deposition and occur with normal ageing, but you would not ordinarily be expected to remember this for the MRCP exam.

Cornea verticillata

Cornea verticillata is incorrect. Cornea verticillata (vortex keratopathy) is commonly a side-effect of amiodarone (and rarely due to chloroquine, hydroxychloroquine, indometacin, tamoxifen, chlorpromazine or Fabry's disease).

Band keratopathy

Band keratopathy is incorrect. Band keratopathy is due to calcium deposition in chronic eye diseases or due to hypercalcaemia.

Question 132

A physician suspects that his diabetic patient might be at risk of proliferative retinopathy.

Which one of the following features on fundoscopy is most likley to lead to proliferative retinopathy?

A. Peripheral cotton-wool spots
B. Venous beading in the inferior nasal quadrant
C. Micro-aneurysms in the superior temporal quadrant
D. Peripheral hard exudates
E. Multiple blot haemorrhages in all four quadrants

Correct Answer: E- Multiple blot haemorrhages in all four quadrants

Explanation:

This is consistent with preproliferative or severe non-proliferative diabetic retinopathy, and may lead to neovascularisation. Therefore of the options available, this is the one which is most likely to lead to proliferative retinopathy.

Micro-aneurysms in the superior temporal quadrant

Micro-aneurysms in the superior temporal quadrant is incorrect. Micro-aneurysms are consistent with background retinopathy if present in one quadrant. If present in all four quadrants it is consistent with severe non-proliferative diabetic retinopathy.

Peripheral cotton-wool spots

Peripheral cotton-wool spots is incorrect. This signifies moderate non-proliferative diabetic retinopathy, with ischaemia of retinal ganglion axons.

Venous beading in the inferior nasal quadrant

Venous beading in the inferior nasal quadrant is incorrect. Venous beading in two quadrants is part of the criteria for diagnosing severe non-proliferative diabetic retinopathy.

Peripheral hard exudates

Peripheral hard exudates is incorrect. This is consistent with background retinopathy changes.

Classification of non-proliferative diabetic retinopathy (NB: this differs from the diabetic screening service criteria)

- Mild non-proliferative (background) diabetic retinopathy: at least one micro-aneurysm. Screening criteria includes exudates.
- Moderate non-proliferative diabetic retinopathy: intra-retinal haemorrhages or micro-aneurysms <ETDRS standard photograph 2a and/or cotton-wool spots, venous beading, intra-retinal microvascular abnormalities (IRMA).
- Severe non-proliferative retinopathy: one of the following:
    - intra-retinal haemorrhages or micro-aneurysms in four quadrants
    - venous beading in two quadrants or more
    - IRMA in one quadrant.
- Very severe non-proliferative diabetic retinopathy: at least two of the three criteria above.

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Question 133

A 21-year-old man presents to the Emergency department. He has double vision on looking to the left. There is no past medical history of note. On examination his BP is 110/70 mmHg, pulse is 70/min and regular. Upon examination of ocular movements, the patient is unable to abduct his left eye. Diplopia with horizontal separation of images is evoked when attempting to look left, and is worse when looking into the distance. Upon covering the left eye, the outer image disappears.

Weakness of which of the following muscles is most likely responsible for his symptoms?

- **A.** Left lateral rectus
- **B.** Left medial rectus
- **C.** Left superior oblique
- **D.** Right lateral rectus
- **E.** Right medial rectus

Correct Answer: A- Left lateral rectus

Explanation:

Loss of unilateral abduction is consistent with a sixth nerve palsy, which innervates the lateral rectus muscle. Additionally, it is important to remember 3 rules: double vision is maximal in the direction of gaze of the affected eye, the false image is the outer image, and the false image arises in the affected eye. Therefore, an isolated sixth nerve palsy leading to paralysis of the left lateral rectus is by far the most likely diagnosis. The most common cause in an adult is microvascular, however with this patients' young age and absence of medical history other causes such as a neoplasm, raised intracranial pressure and infection become more likely, although it may simply be idiopathic.

Right lateral rectus

Right lateral rectus is incorrect. The left eye in this scenario is unable to abduct, not the right eye.

Left medial rectus

Left medial rectus is incorrect. The medial rectus is innervated by the third nerve and a palsy would cause weakness of adduction, not abduction as in this case. Additionally, the third nerve also innervates the superior and inferior rectus, the inferior oblique, the ciliary ganglion and the levator palpebrae superioris. A third nerve palsy would thus typically cause ptosis and a dilated pupil, which are not present in this scenario.

Left superior oblique

Left superior oblique is incorrect. The superior oblique muscle is innervated by the fourth nerve. A fourth nerve palsy, which is rare in itself, would cause vertical diplopia which is worse on

looking down. They may have a head tilt to the opposite side of gaze with chin depression to compensate.

Right medial rectus

Right medial rectus is incorrect. The left eye is clearly the abnormal eye with weakness of abduction and worsening of diplopia when looking to the left. The medial rectus is not affected here as explained in Option B.

Question 134

A 48-year-old Chinese man presents urgently to you via his GP. He tells you that he was due to see you in the clinic the next week because six weeks ago he experienced painless loss of vision in his right eye, which progressed over a two-week period such that now he is only able to see shadows out of that eye. Over the last two days, the vision has deteriorated in his left eye and this has prompted his urgent referral. His past medical history is that he is hypertensive and had a nasal sinus carcinoma treated with radiotherapy two years ago.

On examination his visual acuities are hand movements right, 6/12 left. He has a right relative afferent pupillary defect and his right optic nerve is pale. There are no other physical signs. An urgent computed tomography (CT) scan is performed, which shows no abnormality of the anterior visual pathway.

What is the likely diagnosis?

- **A.** Demyelinative optic neuropathy
- **B.** Metastases in the occipital cortices
- **C.** Radiation optic neuropathy
- **D.** Sequential occipital cortex infarcts
- **E.** Tumour recurrence too small to be resolved by CT

Correct Answer: C- Radiation optic neuropathy

Explanation:

The examination findings point to an abnormality of the anterior visual pathway. Radiation optic neuropathy is an ischaemic disorder of the optic nerve that classically occurs months to years after radiation to the brain, orbits or paranasal sinuses. This results in progressive and profound irreversible visual loss that is often sequential. The onset can be within a few months of the radiation, with a peak at 1.5 years.

Demyelinative optic neuropathy

Demyelinative optic neuropathy is incorrect. This typically occurs as a presenting symptom of multiple sclerosis and is associated with decreased visual acuity, specifically colour loss, and pain

on eye movements. It would be unusual to have such profound visual loss, and some recovery usually occurs.

Metastases in the occipital cortices

Metastases in the occipital cortex is incorrect. These would cause a homonymous hemianopia with macular sparing, and would typically be visible on imaging, although MRI is indicated if an initial CT is negative. There would not be a pupillary defect.

Sequential occipital cortex infarcts

Sequential occipital cortex infarcts is incorrect. These would also cause a homonymous hemianopia and no pupillary defect.

Tumour recurrence too small to be resolved by CT

Tumour recurrence too small to be resolved by CT is possible, but incorrect. However, in this case the patient has had his right eye irradiated and therefore radiation-induced neuropathy is more likely than tumour recurrence with a negative CT.

Question 135

A 28-year-old man presents to the Emergency Department with a sudden deterioration of vision with severe blurring leading to count fingers vision only in his left eye. Colour vision is intact in both eyes. Visual acuity in the right eye is 6/6. He is tall at 1.92m and thin, with a BMI of 21. You note that he has pectus excavatum and a long arm span compared to the length of his body. He is hypermobile.

Which of the following is the most likely cause of his visual disturbance?

- **A.** Glaucoma
- **B.** Lens dislocation
- **C.** Optic neuritis
- **D.** Cataract
- **E.** Retinal vein occlusion

Correct Answer: B- Lens dislocation

Explanation:

A number of features consistent with a diagnosis of Marfan's syndrome are described in the scenario. Ocular manifestations of Marfan's syndrome include lens dislocation, myopia, corneal abnormalities including keratoconus and retinal detachment. The most likely cause for his loss of vision in the above options is lens dislocation.

Retinal vein occlusion

Retinal vein occlusion is incorrect. Fundal examination should be performed in any patient with acute loss of vision. Retinal vein occlusion is a cause of painless loss of vision, however it is not commonly associated with Marfan's syndrome, which is a connective tissue disorder.

Glaucoma

Glaucoma is incorrect. Sudden deterioration of vision may occur in acute angle closure glaucoma, however this is painful and associated with headache and nausea. This patient is also relatively young to have glaucoma.

Optic neuritis

Optic neuritis is incorrect. This typically causes painful eye movements, which is not mentioned in the above scenario. It is also not an associated finding with Marfan's syndrome.

Cataract

Cataract is incorrect. A cataract would not cause an abrupt loss of vision. It typically causes gradual loss of vision and is usually bilateral.

Question 136

A 26-year-old man with aortic regurgitation is referred from the Cardiology Department to the Eye Clinic to look for features of Marfan syndrome.

Which one of the following ocular features suggests the diagnosis?

A. High hyperopia
B. Band keratopathy
C. Dislocated lenses
D. Raised intraocular pressure
E. Retinitis pigmentosa

Correct Answer: C- Dislocated lenses

Explanation:

Ocular features suggesting a diagnosis of Marfan syndrome include:

- Lens dislocation (classically upwards)
- High myopia
- Peripheral retinal degeneration, with a risk of retinal detachment.

Raised intraocular pressure

Raised intraocular pressure is incorrect. Raised ocular pressure is not associated with Marfan syndrome.

High hyperopia

High hyperopia is incorrect. Hyperopia refers to being long sighted, and is not associated with Marfan syndrome.

Band keratopathy

Band keratopathy is incorrect. Band keratopathy is an abnormal accumulation of calcium deposits on the cornea, usually from recurrent corneal disease, but can also be related to hypercalcaemia.

Retinitis pigmentosa

Retinitis pigmentosa is incorrect. Retinitis pigmentosa is a genetic eye condition that causes gradual visual impairment in peripheral and night vision.

Question 137

A 18-year-old boy with syncopal episodes is found to have a heart block and is referred to the eye clinic because the doctor in the Emergency Department found limited eye movements. On further
Questioning, he admits to decreased vision.

Which one of the following retinal findings might be related to the cardiac problem?

- **A.** Myopic degeneration
- **B.** Papilloedema
- **C.** Old chorioretinitis
- **D.** Retinitis pigmentosa
- **E.** Macular degeneration

Correct Answer: D- Retinitis pigmentosa

Explanation:

Kearns-Sayre Syndrome (KSS) is the combination of chronic progressive external ophthalmoplegia (CPEO) with pigmentary retinopathy (including retinitis pigmentosa) and onset before age 20. Other abnormalities include short stature, cerebellar ataxia, raised cerebrospinal fluid protein (> 100 mg/dl), cardiac conduction defects, anemia, diabetes, deafness, and cognitive deficits or intelectual disability. KSS is usually more severe than isolated CPEO, progressing to complete ophthalmoparesis, and often to death by the fourth decade due to the associated deficits. The pattern of inheritance can be sporadic, maternal, autosomal dominant, or autosomal recessive.

Myopic degeneration

Myopic degeneration is incorrect. Myopia (short-sightedness) can be associated with degeneration at the macula, but is not associated with cardiac problems.

Papilloedema

Papilloedema is incorrect. Papilloedema is not associated with night vision problems, and more frequently causes transient, posturally induced visual obscurations.

Old chorioretinitis

Old chorioretinitis is incorrect. Chorioretinitis is not typically associated with cardiac or ocular motility problems.

Macular degeneration

Macular degeneration is incorrect. Age-related macular degeneration is the most common cause of blindness in the UK, but is not associated with cardiac problems and night vision is typically spared.

Question 138

A 34-year-old man comes to the clinic with deteriorating night vision. It is thought that he has an inherited defect in the retinal protein responsible for light perception in low-light conditions.

Which of the following proteins is most likely defective?

- **A.** Cone opsin
- **B.** Melanopsin
- **C.** Panopsin/Opsin-3
- **D.** Rhodopsin
- **E.** Vertebrate-Ancient (VA) opsin

Correct Answer: D- Rhodopsin

Explanation:

Rhodopsin is a cell membrane protein present in rod photoreceptors, and is responsible for initiating visual phototransduction, the conversion of light energy to an electrochemical response. Rhodopsin is responsible for enabling light in low-light conditions. Defects in rhodopsin are responsible for the condition retinitis pigmentosa manifesting as deteriorating night vision.

Vertebrate-Ancient (VA) opsin

Vertebrate-Ancient (VA) opsin is incorrect. This is found in most vertebrate species, but not mammals. It is found in the inner retina, the pineal body and the habenular region of the brain.

Cone opsin

Cone opsin is incorrect. Whilst rods are responsible for dark adaptation, cones are responsible for light adaptation. The photosensitive pigment in rods and cones is rhodopsin and opsin respectively. There are three types of cone opsin that respond differently to the same wavelength of light, with peak sensitivities to blue, red and green portions of the visible light spectrum. Defects lead to varying degrees of colour blindness.

Melanopsin

Melanopsin is incorrect. Melanopsin is a photopigment detected in retinal ganglion cells, of which there are five types with different functions, including regulation of circadian rhythms and pupillary responses.

Panopsin/Opsin-3

Panopsin or Opsin-3 is incorrect. This is a protein encoded by the Opsin-3 gene. This is largely expressed in tissues outside the eye, including the liver, testis, brain and pancreas.

Question 139

A 30-year-old man, under investigation for abdominal cramps and passing blood rectally, presents with an acutely painful, red and photophobic eye.

What is the most likely sign on ocular examination?

- **A.** Conjunctival purulent discharge
- **B.** White corneal stromal infiltrate
- **C.** Mydriasis of the affected eye
- **D.** Hypopyon
- **E.** Swollen optic disc

Correct Answer: D- Hypopyon

Explanation:

Passing blood rectally is a symptom of inflammatory bowel disease. There are many causes of a red eye but, in this context, iritis (anterior uveitis) should be suspected. The classical symptom of iritis is photophobia. A cardinal sign of iritis is the presence of inflammatory cells in the anterior chamber of the eye, visible with a slit lamp. In cases of severe iritis, the degree of inflammation in the anterior chamber is enough to cause settling of inflammatory cells inferiorly to form a level – a hypopyon. While a hypopyon may imply infective endophthalmitis (eg following cataract surgery), a sterile hypopyon can occur in cases of severe iritis.

Mydriasis of the affected eye

Mydriasis of the affected eye is incorrect. Iritis often causes pupillary miosis, because the pupil becomes adherent to the lens owing to the inflammation. While acute angle closure, an ophthalmological emergency, causes mydriasis in a red, painful eye, it is also less likely in a patient as young as 30.

Conjunctival purulent discharge

Conjunctival purulent discharge is incorrect. Bacterial conjunctivitis causes purulent discharge but is very unlikely to cause severe pain and photophobia. Iritis does not cause a discharge.

White corneal stromal infiltrate

White corneal stromal infiltrate is incorrect. Microbial keratitis, causing a white corneal infiltrate, is more likely if there is a history of contact lens wear or trauma, such as a corneal abrasion or a corneal foreign body.

Swollen optic disc

Swollen optic disc is incorrect. Cerebral metastases from colorectal carcinoma can cause raised intracranial pressure and papilloedema, but this is unlikely in a young patient, and would not cause conjunctival injection (ie a red eye).

Question 140

An 82-year-old woman presents with sudden loss of vision in her left eye. On further Questioning, she complains of a left-sided headache over the past few weeks, associated with tenderness of her head when she brushes her hair. On examination, her vision is reduced to counting fingers in the left eye. A left relative afferent pupillary defect is present. Fundoscopy reveals a pale, swollen left optic disc with some flame-shaped haemorrhages. The right eye is entirely normal. An urgent erythrocyte sedimentation rate (ESR) is elevated at 72 mm/h.

Which one of the following management options should be carried out first?

- **A.** Temporal artery biopsy
- **B.** Ophthalmic outpatient review
- **C.** Administration of high-dose systemic steroids
- **D.** Automated visual field assessment
- **E.** Computed tomography (CT) scan of brain and orbits

Correct Answer: C- Administration of high-dose systemic steroids

Explanation:

The symptoms and signs, coupled with an elevated ESR, are consistent with a diagnosis of giant cell arteritis (GCA) or arteritic ischaemic optic neuropathy (AION). GCA should always be suspected in a patient over the age of 50 who presents with a history of headache and scalp tenderness. Other systemic symptoms include scalp tenderness, jaw claudication, weight loss and fever. It is associated with polymyalgia rheumatica. ESR and C-reactive protein are typically raised, and ocular examination reveals a relative afferent pupillary defect, optic disc swelling and impaired colour vision. To avoid visual loss in the contralateral eye, high-dose systemic steroids should be commenced immediately.

Automated visual field assessment

Automated visual field assessment is incorrect. This may be performed after commencing steroids and to monitor progress, but is not the most immediate management step in the acute setting of GCA.

Temporal artery biopsy

Temporal artery biopsy is incorrect. If a diagnosis of GCA is suspected clinically, steroids may be commenced without first performing a temporal artery biopsy. A biopsy should typically be performed within the first two weeks following the onset of symptoms, but a relatively high false-negative rate is likely due to the presence of skip lesions.

Ophthalmic outpatient review

Ophthalmic outpatient review is incorrect. Once GCA is suspected, patients may be admitted for intravenous steroids or commenced on high-dose oral steroids and seen daily as an outpatient. This should be arranged after steroids have been started.

Computed tomography (CT) scan of brain and orbits

Computed tomography (CT) scan of brain and orbits is incorrect. This patient has clinical features of GCA and thus should be treated as such; however, if there is any doubt regarding the diagnosis, a CT scan may be performed to exclude a compressive optic nerve tumour causing optic neuropathy. Visual loss in this case is usually gradual and progressive, without the systemic features of GCA.

Sample of Question Bank of MRCP-1 Regular Course
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Geriatric Medicine

Question 141

A 65-year-old smoker recently underwent radiotherapy for an inoperable lung carcinoma. He presents to the Emergency Department because his carer noticed significant bruising and bleeding, which she could not stop, after she was shaving him that morning. On examination he is cachectic and jaundiced. The following laboratory results are obtained. Hb, WCC normal and MCV elevated, thrombocytes 33 × 10^9/litre, PT, APTT and bleeding time prolonged, fibrinogen levels decreased.

Which one of the following is the most likely cause for this patient's bleeding tendency?

- **A.** Liver metastases
- **B.** Fibrin deficiency
- **C.** Disseminated intravascular coagulation
- **D.** Warfarin overdose
- **E.** Bone metastases

Correct Answer: C- Disseminated intravascular coagulation

Explanation:

This man has advanced lung cancer. He has thrombocytopenia, evidence of a prolonged PT, APTT, as well as reduced fibrinogen levels. The fact that he has an advanced malignancy, low platelets and prolonged coagulation times with a low serum fibrinogen all suggests underlying disseminated intravascular coagulation secondary to his lung carcinoma.

Liver metastases

Liver metastases is incorrect. Although liver metastases may have some effect on coagulation factor production, this would not really explain the very low platelet count at 33 × 10^9/litre and rapidity that these symptoms have occurred.

Fibrin deficiency

Fibrin deficiency is incorrect because it clearly has nothing to do with the fact that this man has an inoperable lung carcinoma. Primary fibrin deficiency is extremely rare and again would not explain the low platelet count.

Warfarin overdose

Warfarin overdose is incorrect. There is nothing to suggest that this man is on warfarin! It would cause a definite prolongation of the PT, a lesser prolongation of the APTT, but would not normally affect fibrinogen levels or platelet count.

Bone metastases

Bony metastases is incorrect. This would not explain prolonged coagulation parameters and the decreased fibrinogen.

Question 142

An 82-year-old woman with atrial fibrillation develops a sudden arterial occlusion of her right arm owing to a brachial embolism.

Which of the following is a likely finding?

- **A.** A large, single, intact brachial vein on the medial side of the artery
- **B.** Intact circulation distal to the occlusion within the ulnar artery
- **C.** Intact sensation in the hand
- **D.** Poor capillary return in the fingers
- **E.** Return of circulation with systemic heparinisation

Correct Answer: D- Poor capillary return in the fingers

Explanation:

An occlusion of the brachial artery due to embolism is likely to result in significant symptoms, including pallor affecting the hand and poor capillary return.

Intact circulation distal to the occlusion within the ulnar artery

Intact circulation distal to the occlusion within the ulnar artery is incorrect. The artery bifurcates into the ulnar and radial arteries; a proximal occlusion would therefore reduce flow in the ulnar artery.

A large, single, intact brachial vein on the medial side of the artery

A large, single, intact brachial vein on the medial side of the artery is incorrect. The brachial veins are venae comitantes, accompanying the brachial artery. The artery gives off its profunda branch near the upper end of the humeral shaft, where it accompanies the radial nerve.

Intact sensation in the hand

Intact sensation in the hand is incorrect. Occlusion of the brachial artery will lead to significant distal loss of sensation.

Return of circulation with systemic heparinisation

Return of circulation with systemic heparinisation is incorrect. This patient is likely to require embolectomy.

Question 143

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A 73-year-old woman who has recently started anti-tuberculous therapy is referred to the anti-coagulation clinic, as despite recent increases in her warfarin dose, the INR had continued to fall progressively from 2.5 to 1.3.

Which of the following medications is most likely to have been responsible?

- **A.** Ethambutol
- **B.** Isoniazid
- **C.** Pyrazinamide
- **D.** Rifampicin
- **E.** Streptomycin

Correct Answer: D- Rifampicin

Explanation:

Rifampicin is a potent CYP450 enzyme inducer; as such it is likely to be responsible for increasing the extent of warfarin metabolism and consequent fall in INR.

Pyrazinamide

Pyrazinamide is incorrect. Pyrazinamide does not have significant drug interactions mediated by the p450 system.

Ethambutol

Ethambutol is incorrect. Ethambutol is primarily an inhibitor of CYP1A2 and 2E1 and has lesser inhibitory effects on 2A6, 2C9, 2C19, 2D6 and 3A4; as such it may increase the INR rather than decrease it.

Isoniazid

Isoniazid is incorrect. Isoniazid is an inhibitor of 2C19 and 3A4, as warfarin is metabolised by the 2C9 isoenzyme isoniazid is unlikely to alter INR.

Streptomycin

Streptomycin is incorrect. Streptomycin is the prototype aminoglycoside, and its adverse effects are predominantly to cause nephrotoxicity and ototoxicity. Streptomycin does not significantly alter P450 enzyme activity.

Question 144

An 81-year-old man with a 20-year history of type II diabetes mellitus visits his general practitioner (GP) for a routine check-up. His GP carries out a thorough check for diabetes mellitus and discovers peripheral and autonomic neuropathy. The man comments that at times he feels that he is short of breath upon exertion and that he has some swelling of his ankles. The GP does an electrocardiogram that shows left bundle branch block (LBBB).

What is the most likely cause in this case?

- **A.** Ischaemic heart disease
- **B.** Mitral stenosis
- **C.** Pericarditis
- **D.** Pulmonary embolism
- **E.** Tricuspid stenosis

Correct Answer: A- Ischaemic heart disease

Explanation:

LBBB occurs in ischaemic heart disease. A patient with symptoms suspicious of myocardial infarction and new (or presumed new) LBBB denotes a ST elevation myocardial infarction that requires urgent reperfusion therapy.

Other causes of LBBB are:

- Aortic stenosis
- Dilated cardiomyopathy
- Acute myocardial infarction
- Extensive coronary artery disease
- Primary disease of the cardiac electrical conduction system
- Longstanding hypertension leading to dilatation of aortic roots and subsequent aortic regurgitation
- Lyme disease
- Side effects of some types of cardiac surgery (eg reconstruction of aortic roots).
- Diagnostic criteria of LBBB on the electrocardiogram:
- The heart rhythm must be supraventricular in origin
- The QRS duration must be ≥ 120 ms
- There should be a QS or rS complex in lead V1
- There should be a notched ('M'-shaped) R wave in lead V6
- The T wave should be deflected opposite the terminal deflection of the QRS complex ('appropriate T wave discordance with bundle branch block'). A concordant T wave may suggest ischaemia or myocardial infarction.
- There are partial blocks of the left bundle branch: 'left anterior fascicular block' and 'left posterior fascicular block'. This refers to bifurcation of the left bundle branch.

Pulmonary embolism

Pulmonary embolism is incorrect. Pulmonary embolism is associated with right ventricular strain and hypertrophy with partial or complete right bundle branch block (RBBB).

Mitral stenosis

Mitral stenosis is incorrect. Mitral stenosis is associated with right ventricular strain and hypertrophy with partial or complete right bundle branch block (RBBB).

Causes of RBBB:

- Atrial septal defect
- Brugada syndrome
- Right ventricular hypertrophy
- Pulmonary embolism
- Ischaemic heart disease
- Rheumatic heart disease
- Myocarditis
- Cardiomyopathy
- Hypertension.

Pericarditis

Pericarditis is incorrect. Pericarditis is not associated with bundle branch block.

Tricuspid stenosis

Tricuspid stenosis is incorrect. Tricuspid stenosis is associated with right ventricular strain and hypertrophy with partial or complete right bundle branch block (RBBB).

Question 145

A 76-year-old patient is attending the day unit for blood transfusion. She has a history of chronic lymphocytic leukaemia (CLL). She is very short of breath and feels permanently lethargic. She is currently receiving a fludarabine-based treatment regime. A recent Hb has been measured at 74 g/l. Her low Hb is thought to be a result of both bone marrow failure and a degree of autoimmune haemolyticanaemia.

Investigations:

Investigation	Result	Normal Value
Haemoglobin	74 g/l	115 - 155 g/l
White Blood Cell Count (WCC)	97 x 10^9/l	4 - 11 x 10^9/l
Platelets	132 x 10^9/l	150 - 400 x 10^9/l
Sodium (Na^+)	141 mmol/l	135 - 145 mmol/l
Potassium (K^+)	5.2 mmol/l	3.5 - 5.0 mmol/l
Creatinine	142 mmol/l	50 - 120 µmol/l

Which one of the following is true with respect to the best way to replace her red cells?

A. She can receive whole blood
B. She can receive whole blood with prednisolone cover
C. She may receive whole blood through a white cell filter
D. She should receive irradiated red cells

E. She should receive whole blood with chlorpheniramine cover

Correct Answer: D- She should receive irradiated red cells

Explanation:

This lady has CLL and has been receiving a fludarabine based regimen. This is a purine analogue. All patients who receive this type of drug need to receive irradiated blood products. Fludarabine will reduce the recipient's T-cells, making them at risk of transfusion-associated graft-versus-host disease. Irradiation of blood products will reduce this risk.

She can receive whole blood with prednisolone cover

She can receive whole blood with prednisolone cover is incorrect. Nobody receives whole blood nowadays. It is always separated into individual components, namely red blood cells and platelets.

She can receive whole blood

She can receive whole blood is incorrect. Hardly anyone now needs to receive whole blood. It is always separated into individual components, namely red blood cells and platelets.

She may receive whole blood through a white cell filter

She may receive whole blood through a white cell filter is incorrect. Nobody receives whole blood nowadays. It is always separated into individual components, namely red blood cells and platelets.

She should receive whole blood with chlorpheniramine cover

She should receive whole blood with chlorpheniramine cover is incorrect. Nobody receives whole blood nowadays. It is always separated into individual components, namely red blood cells and platelets.

Question 146

A 75-year-old man is admitted from his residential home with right lower lobe pneumonia confirmed on chest X-ray. He has a history of ischaemic heart disease and moderate chronic obstructive pulmonary disease (COPD).

On examination, he is pyrexial 38.2 °C, hypotensive at 80/60 mmHg, with a heart rate of 120/min. O_2 saturation is 90% on 60% FiO_2. You confirm lower zone consolidation on auscultation.

Which of the following measurements would be most useful in predicting the severity of this patient's pneumonia?

A. CRP

B. Heart rate

C. $PaCO_2$

D. PaO_2

E. Urea

Correct Answer: E- Urea

Explanation:

Of the options listed, only urea is a component of the CURB-65 scoring system used to determine prognosis in pneumonia.

The risk of death at 30 days increases as the score increases:

• 0 – 0.7%

• 1 – 3.2%

• 2 – 13.0%

• 3 – 17.0%

• 4 – 41.5%

• 5 – 57.0%.

$PaCO_2$

$PaCO_2$ is incorrect. $PaCO_2$ is not a component of the CURB-65 scoring system.

CRP

CRP is incorrect. CRP is not a component of the CURB-65 scoring system.

Heart rate

Heart rate is incorrect. Heart rate is not a component of the CURB-65 scoring system.

PaO_2

PaO_2 is incorrect. PaO_2 is not a component of the CURB-65 scoring system.

Question 147

A 72-year-old woman presents to the Emergency Department with recurrent Herpes Zoster infection. She has a history of hypertension and chronic kidney disease with CKD-3 but is otherwise well.

Examination reveals marked hepatosplenomegaly, and her white blood count is significantly elevated at 52, (predominantly lymphocytes).

Which of the following is the most appropriate first line intervention?

A. Alemtuzumab

B. FCR combination chemotherapy

C. Ofatumumab

D. Rituximab

E. Stem cell transplantation

Correct Answer: B- FCR combination chemotherapy

Explanation:

Chronic lymphocytic leukaemia (CLL), the diagnosis here, is characterised by an accumulation of small mature lymphocytes in the bone marrow and peripheral blood. The presenting features are persistent lymphocytosis, lymphadenopathy and hepatosplenomegaly. Hypogammaglobulinaemia is often present at the time of the diagnosis and autoimmune haemolytic anaemia occurs in 25% of cases. FCR combination therapy with fludarabine, cyclophosphamide and rituximab is the initial option of choice.

Alemtuzumab

Alemtuzumab is incorrect. Alemtuzumab is an anti-CD52 antibody licensed for use in patients with CLL after relapse following fludarabine therapy or where fludarabine is unsuitable or not tolerated.

Ofatumumab

Ofatumumab is incorrect. Ofatumumab is a possible treatment combined with chlorambucil in patients with untreated CLL who are not suitable for fludarabine or bendamustine.

Rituximab

Rituximab is incorrect. Rituximab alone is not recommended for the treatment of CLL because of high risk of relapse or developing treatment resistance.

Stem cell transplantation

Stem cell transplantation is incorrect. Stem cell transplantation is the only curative option, although many patients are elderly with poor functional status and unable to undergo the procedure.

Question 148

An 80-year-old nursing home resident with a long-term urinary catheter presents to the Emergency Department with fevers, rigors and suprapubic pain. Urinalysis is positive for nitrites, white cells, blood and protein. He has had a 7-day course of oral co-amoxiclav from his GP for a suspected urinary infection, which he completed 4 days ago.

Which one of the following is the most likely reason for treatment failure?

- **A.** Biofilm formation
- **B.** Drug interaction
- **C.** Inappropriate antibiotic choice
- **D.** Infection with a multiresistant organism
- **E.** Non-compliance with medication

Correct Answer: A- Biofilm formation

Explanation:

This patient was diagnosed with a urinary tract infection 10 days before presentation and treated with an appropriate course of antibiotics. There is no note in the case however that the catheter was changed. Bacteria are able to form biofilm over a wide variety of surfaces, particularly prosthetic material, and this can lead to failure of antibiotic therapy. Source control is extremely important in any infection to allow antibiotics to have maximal impact, and this patient's catheter should consequently have been changed when the infection was initially diagnosed.

Infection with a multiresistant organism

Infection with a multiresistant organism is incorrect. Had the catheter been changed, then this would probably have been the best answer. Multidrug resistance is an increasing problem, with ESBL (extended spectrum beta-lactamase)-producing strains particularly relevant in urinary tract infections.

Drug interaction

Drug interaction is incorrect. It is important to check for drug interactions – particularly in an elderly patient in whom there may be significant polypharmacy – but the choice of antibiotic here is unlikely to have interacted significantly with other medications to the extent that treatment failure resulted.

Inappropriate antibiotic choice

Inappropriate antibiotic choice is incorrect. Antibiotic guidelines will vary in different areas depending on local resistance patterns; however, in most guidelines co-amoxiclav would be a reasonable choice for a urinary tract infection in a male patient.

Non-compliance with medication

Non-compliance with medication is incorrect. This patient is in a nursing home, and therefore is likely to be receiving at least some degree of help with his medications, making non-compliance less likely.

Question 149

A 70-year-old man suffers a large stroke with left-sided hemiparesis, homonymous hemianopia, left-sided neglect, receptive dysphasia and poor left-sided coordination. Two weeks later his hemiparesis has improved significantly.

Which of the features of his stroke is most likely to hinder further progress in rehabilitation?

- **A.** Residual hemiparesis
- **B.** Receptive dysphasia
- **C.** Neglect

D. Poor coordination
E. Homonymous hemianopia

Correct Answer: B- Receptive dysphasia
Explanation:
Significant receptive dysphasia is likely to significantly hinder recovery from stroke due to difficulties complying with rehabilitation therapy. This may hinder recovery of other aspects of disability, as cooperation with the physiotherapist, occupational therapist, speech and language therapists and other MDT members is key.
Neglect
Neglect is incorrect. When patients are managed in a specialist stroke unit, recovery from neglect is excellent and most achieve a reasonable outcome with respect to function of the affected limb.
Residual hemiparesis
Residual hemiparesis is incorrect. Weakness can gradually improve and over time and, with the help of a physiotherapist, this can significantly improve in some patients.
Poor coordination
Poor coordination is incorrect. There is a good chance that coordination will improve with practice and physiotherapy.
Homonymous hemianopia
Homonymous hemianopia is incorrect. Whilst homonymous hemianopia will impact on activities such as driving, with suitable optometrist support it should not significantly impact on other activities of daily living.

Question 150

An 81-year-old male patient attends the cardiology clinic for his symptoms of fatigue and ankle oedema. Two-dimensional echocardiography shows significant ventricular wall thickening and marked dilatation of both atria. The left ventricular myocardium has a granular sparkling appearance. He is referred for holter monitoring and told he will have predominantly symptomatic treatment.

Which one of the following conditions is he most likely to have?

A. Amyloid heart disease
B. Constrictive pericarditis
C. Dilated cardiomyopathy
D. Hypertrophic cardiomyopathy
E. Ischaemic cardiomyopathy

Correct Answer: A- Amyloid heart disease

Explanation:

This gentleman has cardiac amyloid, characterised by heart failure with a restrictive filling pattern (demonstrated by the enlarged atria). The ventricles are often thick and appear hypertrophied, but in fact have poor systolic and diastolic function. The speckled appearance is very characteristic of amyloid but cannot be used alone to diagnose it. You reach the conclusion that this is amyloid because the echo findings are not consistent with the other answers. The echocardiographic appearances do help exclude the other conditions.

In the scenario a Holter test has been ordered. This could point to amyloid, in which bradycardia with 2:1 or complete heart block is common. However, equally, HCMs also have episodes of VT, which Holter monitoring is appropriate to diagnose.

Hypertrophic cardiomyopathy

Hypertrophic cardiomyopathy is incorrect. Hypertrophic cardiomyopathy (HCM) has asymmetrical left ventricular hypertrophy. This particularly involves the septum causing outflow tract obstruction. Other findings in HCM include systolic anterior motion of the mitral leaflets ('SAM').

Constrictive pericarditis

Constrictive pericarditis is incorrect. Constrictive pericaridits typically has apparently normal left systolic ventricular function but diastolic filling can be impaired; the ventricular filling is dependent on each other and there is often septal bounce seen on echo; the septum appears to bounce into the LV as the RV fills.

Dilated cardiomyopathy

Dilated cardiomyopathy is incorrect. Dilated cardiomyopathy will have globally enlarged ventricular dimensions with impaired ventricular contraction.

Ischaemic cardiomyopathy

Ischaemic cardiomyopathy is incorrect. Ischaemic cardiomyopathy results from long-term untreated ischaemia and has dilated ventricles with poor function and often regional wall motion abnormalities: the ischaemic areas contract more slowly and less well than the others. There may also be scarred and thin segments where infarction has occurred previously.