

MS AKT Practice Paper 5

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

This practice paper comes with and without the answer options.

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

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

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1. A 52 year old woman has a right-sided wide local excision and sentinel lymph node biopsy for a 25-mm invasive oestrogen-receptor-positive breast cancer. There are clear surgical margins. Three sentinel lymph nodes are removed and all contain metastatic cancer.

What is the most appropriate next management step?

- A. Adjuvant chemotherapy
- B. Axillary node clearance
- C. CT scan of chest, abdomen and pelvis
- D. Mastectomy
- E. Tamoxifen

Correct Answer: B

Justification: Seeking the awareness that SNB is diagnostic not therapeutic if 3 nodes are involved. Therefore more surgery is needed.



2. A 53 year old woman has had a non-productive cough for 3 months. She has felt fatigued and has gained weight around her face and abdomen. She is an ex-smoker with a 30 pack year smoking history. She has multiple purple, wide striae on her abdomen. She has bruising on her arms. Her BP is 179/100 mmHg.

Investigations:

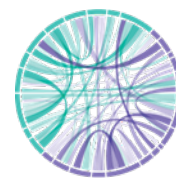
CT scan of chest: 3 cm lesion in the left lung apex

What is the most likely histological diagnosis?

- A. Adenocarcinoma
- B. Sarcoidosis
- C. Small cell carcinoma
- D. Squamous cell carcinoma
- E. Tuberculosis

Correct Answer: C

Justification: The patient's presentation is consistent with Cushing's syndrome, given the symptoms of weight gain around the face and abdomen, the purple and wide striae, bruising, and hypertension. When Cushing's syndrome is caused by a lung tumour, it is usually due to the ectopic production of adrenocorticotrophic hormone (ACTH) by the tumour. Given the combination of a 30 pack year smoking history, a small lesion in the left lung on the CT scan, and a presentation consistent with ectopic ACTH production (Cushing's syndrome), the most likely histological diagnosis is small cell carcinoma



3. A 65 year old man has left leg claudication at 100 metres due to left superficial femoral artery stenosis. His ankle brachial pressure index (ABPI) is 0.84. He has been given lifestyle advice.

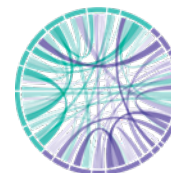
What is the most appropriate additional initial management?

- A. Above knee femoral-popliteal reversed vein bypass graft
- B. Balloon angioplasty
- C. Below knee femoral-popliteal bypass graft
- D. Commence vasodilator medication
- E. Supervised exercise programme

Correct Answer: E

Justification: All patients with claudication should be offered a structured exercise programme before considering angioplasty, surgical intervention or vasodilator therapy. Intervention by surgery or angioplasty would only be considered if the patient has followed a structured exercise programme without a satisfactory improvement in their symptoms. Vasodilator therapy is only considered if the exercise programme has failed to improve the symptoms satisfactorily and the patient prefers not to be considered for angioplasty or bypass surgery.

<https://www.nice.org.uk/guidance/cg147/chapter/recommendations#management-of-intermittent-claudication>



4. A 41 year old man is admitted with an acute myocardial infarction. His father **died** of a myocardial infarction aged 52 years.

Investigations:

Fasting glucose	8.2 mmol/L	(3.0–6.0)
Cholesterol (fasting)	9.2 mmol/L	(3.5–6.5)
Triglycerides (fasting)	1.9 mmol/L	(<2.3)
HDL cholesterol	1.0 mmol/L	(>1.2)

What is the most likely cause of his hyperlipidaemia?

- A. Chylomicronaemia
- B. Diabetes mellitus
- C. Familial combined hyperlipidaemia
- D. Heterozygous familial hypercholesterolaemia
- E. Polygenic hypercholesterolaemia

Correct Answer: D

Justification: This is because the commonest genetic lipid disorder listed which would give this profile.

5. A 6 year old boy has mild abdominal pain, a non blanching rash on his lower extremities (see image) and arthralgia. He had an upper respiratory tract infection two weeks ago and has now recovered. His temperature is 36.8°C, pulse 95 (80–120) bpm, BP 110/72 (97–115/57–76) mmHg, respiratory rate 23 (20–25) breaths per minute and oxygen saturation 96% breathing air.

Urinalysis: protein 2+

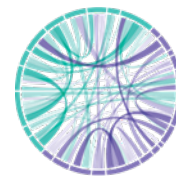


What is the most likely diagnosis?

- A. Acute lymphoblastic leukaemia
- B. IgA vasculitis
- C. Immune thrombocytopenic purpura
- D. Meningococcal septicaemia
- E. Post streptococcal glomerulonephritis

Correct Answer: B

Justification: The most likely diagnosis is IgA vasculitis, also known as Henoch-Schönlein purpura (HSP). IgA vasculitis is a systemic vasculitis characterized by IgA immune complex deposition in small blood vessels, resulting in inflammation and damage primarily affecting the skin, joints, gastrointestinal tract, and kidneys. The non-blanching rash (palpable purpura), arthralgia, abdominal pain and recent upper respiratory tract infection, is classic for IgA vasculitis. Additionally, the presence of proteinuria on urinalysis suggests renal involvement, which is common in HSP. He is well and afebrile, reducing the likelihood of meningococcal septicaemia. Post streptococcal glomerulonephritis does not present with a rash. Immune



thrombocytopenic purpura does not present with abdominal pain and proteinuria. This would be a very rare presentation of ALL

6. A 2 year old girl has four weeks of a smelly discharge from her left nostril, sometimes tinged with blood. More recently, she has had a persistent sneeze. She is normally fit and well.

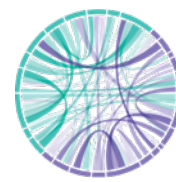
She has mucoid discharge in her left nostril.

What is the most likely diagnosis?

- A. Allergic rhinitis
- B. Foreign body
- C. Sinusitis
- D. Unilateral choanal atresia
- E. Unilateral nasal polyp

Correct Answer: B

Justification: The most likely diagnosis is foreign body. Children, especially toddlers, are prone to inserting foreign objects into their nostrils out of curiosity, which can lead to chronic nasal discharge and irritation. The presence of mucoid discharge suggests an inflammatory response to the foreign body. Unilateral choanal atresia is rare and normally discharge is odourless. Nasal polyps are rare in children. Sinusitis might be accompanied by symptoms such as headache and facial pain. The most likely reason for a unilateral smelly discharge is a foreign body even in the absence of history of foreign body insertion.



7. A 2 day old boy with trisomy 21 develops recurrent vomiting. The vomit is green in colour. He feeds eagerly but vomits forcefully soon after every feed.

His abdomen is slightly distended, but soft. His anus is patent.

What is the most likely cause of the vomiting?

- A. Duodenal atresia
- B. Gastro-oesophageal reflux
- C. Hirschsprung disease
- D. Midgut volvulus
- E. Pyloric stenosis

Correct Answer: A

Justification: The most likely cause is duodenal atresia. Duodenal atresia is the commonest cause of upper GI obstruction in children with trisomy 21/Down syndrome and involves a complete obstruction or narrowing of the duodenal lumen. This leads to the accumulation of gastric contents and bile, which are then forcefully expelled through vomiting. The characteristic green colour of the vomit is due to the presence of bile and implies obstruction beyond ampulla of Vater.

8. A 34 year old woman has a recurrent itchy rash which lasts for several hours before resolving (see image). She has not identified any triggers. She is systemically well. She is a firefighter and says that she does not want any treatments that may affect her level of alertness.



What is the most appropriate treatment to control her symptoms?

- A. Oral chlorphenamine maleate
- B. Oral loratadine
- C. Oral prednisolone
- D. Topical aqueous cream
- E. Topical hydrocortisone

Correct Answer: B

Justification: The image shows urticarial weals. Initial treatment for this should be a non-sedating H1-antihistamine. The correct answer is thus B (oral loratadine). Chlorphenamine maleate is a sedating antihistamine, which is more likely to cause adverse effects; this patient also specifically requested treatment that would not affect her level of alertness. Prednisolone is effective for severe, acute urticaria but should not be used first-line. Aqueous cream is a soap substitute and has no role in the management of urticaria. Topical corticosteroids are ineffective for urticaria so hydrocortisone is not indicated here.

[Urticaria | Health topics A to Z | CKS | NICE](#)



9. A 33 year old man has 1 month of bilateral ankle pain and a rash on his shins. He feels generally lethargic and has lost 1 kg in weight. His temperature is 37.2°C. He has swelling in both ankles and several tender round lesions on both shins. His chest is clear.

Investigations:

Calcium 2.75 mmol/L (2.2–2.6)

CRP 28 mg/L (<5)

What additional investigation is most likely to help confirm the diagnosis?

- A. Chest X-ray
- B. CT scan of abdomen and pelvis
- C. Serum ACE
- D. Serum parathyroid hormone
- E. Serum protein electrophoresis

Correct Answer: A

Justification: There is no definitive diagnostic investigation for probable sarcoid. The clinical picture fits and the next step would be to obtain radiological evidence of hilar adenopathy which will be present in ~50% of cases. Serum ACE may be elevated but has a high false negative and false positive rates. CT scan abdomen and pelvis is not indicated. Serum PTH will be suppressed but this will not help identify the cause. The serum protein electrophoresis would exclude myeloma but patient is too young for this to be probable.



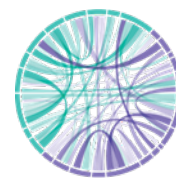
- 10.** A 55 year old woman has had a left parotid swelling for 30 years. Over the past 3 months the swelling has increased in size from 3 cm to 5 cm. She had fine needle aspiration of the lump 6 years ago but she declined surgery at that time. She has no pain, but there is slight facial weakness. There are no other abnormalities on examination of the head and neck.

What is the most likely explanation of the recent enlargement?

- A. Parotid adenoma
- B. Parotid carcinoma
- C. Parotid lymphoma
- D. Reactive lymphadenopathy
- E. Stone in the parotid duct

Correct Answer: B

Justification: This is because this is a classic history of malignant transformation in a pleomorphic salivary adenoma.



- 11.** A 63 year old man has 9 weeks of hoarse voice and 2 months of cough. He smokes 20 cigarettes per day and drinks 25 units of alcohol per week. His symptoms have not responded to oral amoxicillin.

His temperature is 37.2°C, pulse 80 bpm, respiratory rate 16 breaths per minute and oxygen saturation 95% breathing air. His chest is clear. There are no palpable neck lumps. Oral cavity appearance is normal.

Investigation:

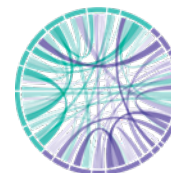
Chest X-ray (4 weeks ago): normal

What is the most appropriate next step in management?

- A. CT scan of chest
- B. MR imaging of head and neck
- C. Repeat chest X-ray
- D. Spirometry
- E. Urgent ENT referral

Correct Answer: E

Justification: NICE guidance suggests that a suspected cancer pathway referral for laryngeal cancer (appointment within 2 weeks) should be considered in people aged 45 and over with persistent unexplained hoarseness or an unexplained lump in the neck. This patient fits the criteria, and the most likely diagnosis is laryngeal cancer given presentation, age and risk factors (smoking, alcohol consumption). Source: NICE Clinical Knowledge Summaries: Head and neck cancers - recognition and referral (2015)



- 12.** A 48 year old woman develops nausea and abdominal pain 2 days after a total abdominal hysterectomy.

Her pulse is 110 bpm and BP 80/40mmHg. Her abdomen is distended and tender. Her urine output for the past 6 hours has been 100 mL.
The on-call surgical doctor has been contacted.

What is the most appropriate immediate management?

- A.** Blood transfusion
- B.** Intravenous 0.9% sodium chloride
- C.** Intravenous adrenaline / epinephrine
- D.** Intravenous morphine
- E.** Urethral catheterisation

Correct Answer: B

Justification: This is a post-operative bleed. IV fluids should be commenced and the surgeon should be called immediately. A-E assessment and treatment.



- 13.** A 28 year old man has sudden onset right-sided chest pain and dyspnoea.
His oxygen saturation is 98% breathing air.

Investigation:

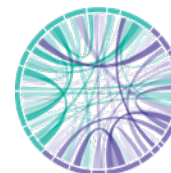
Chest X-ray: Right pneumothorax with a 4 cm rim of air measured at the hilum. There is no mediastinal shift.

What is the most appropriate initial management?

- A.** Admit for observation
- B.** Arrange CT scan of chest
- C.** Insert a chest drain with underwater seal and suction
- D.** Perform aspiration
- E.** Refer to thoracic surgeons for urgent pleurodesis

Correct Answer: D

Justification: Primary pneumothorax >2cm or with symptoms can be treated with aspiration or an ambulatory device if available. Secondary pneumothorax would require chest drain for pneumothorax greater than 2cm.



- 14.** A 45 year old woman has 3 months of weight loss, dizziness, nausea and lethargy.

She has a BP of 100/70 mmHg lying and 75/50 mmHg standing.

Investigations:

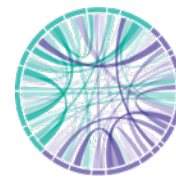
Sodium	125 mmol/L	(135–146)
Potassium	6.1 mmol/L	(3.5–5.3)
Urea	8.5 mmol/L	(2.5–7.8)
Creatinine	100 µmol/L	(60–120)

What is the most likely diagnosis?

- A.** Addison disease
- B.** Congenital adrenal hyperplasia
- C.** Conn syndrome
- D.** Cushing syndrome
- E.** Hypopituitarism

Correct Answer: A

Justification for correct answer(s): The clinical features are 'classical' for Addison disease, and the electrolytes are typical of combined glucocorticoid and mineralocorticoid deficiency.



15. A 59 year old man has had 6 months of difficulty getting an erection. He has had numbness in his feet and intermittent dizziness when he stands up for the last year. He has type 2 diabetes mellitus and had a thyroidectomy 2 years ago for thyrotoxicosis. He takes aspirin, atorvastatin, insulin and levothyroxine.

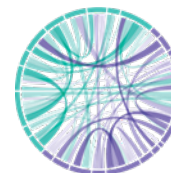
His BP is 140/90 mmHg lying and 110/80 mmHg standing. His peripheral pulses are all palpable.

What is the most likely cause of his erectile dysfunction?

- A. Autonomic neuropathy
- B. Benign prostatic enlargement
- C. Drug side effects
- D. Hypothyroidism
- E. Vascular disease

Correct Answer: A

Justification: Diabetes mellitus causing an autonomic neuropathy is the most likely cause of erectile dysfunction.



- 16.** A 60 year old man has had persistent dull lower back pain for 3 months. He was previously a keen hill walker, but is now breathless walking on the flat. His BP is 152/82 mmHg. He is tender over his lumbar vertebrae. His urinalysis is normal.

Investigations:

Haemoglobin 90 g/L (130-175)

White cell count $3.2 \times 10^9/L$ (3.0-10.0)

Platelets $70 \times 10^9/L$ (150-400)

Creatinine 190 $\mu\text{mol/L}$ (60-120)

Adjusted calcium 2.8 mmol/L (2.2-2.6)

Albumin 35 g/L (35-50)

Total protein 92 g/L (60-80)

Chest X-ray:

normal X-ray of lumbar spine: generalised osteopenia, multi-level vertebral collapse

What initial investigation is most likely to help establish the diagnosis?

- A. Plasma parathyroid hormone
- B. Serum prostate specific antigen
- C. Serum protein electrophoresis
- D. Serum vitamin D
- E. Thyroid function tests

Correct Answer: C

Justification: The clinical presentation strongly suggests multiple myeloma. One of the key diagnostic tests for multiple myeloma is the serum protein electrophoresis, which is used to detect the presence of abnormal proteins (monoclonal proteins or M proteins) in the blood. These abnormal proteins are produced by the malignant plasma cells in the bone marrow.

17. A 91 year old woman has a small skin lesion on her left cheek that has been gradually increasing in size over the past year (see image). She has advanced vascular dementia and ischaemic heart disease. She lives in a nursing home and no longer recognises her daughter, who visits regularly and is her next-of-kin. She is unable to hold a conversation about her health. The nursing manager of the nursing home requests an opinion from the GP.



What is the most appropriate next step in management?

- A. Discuss the diagnosis with the patient's daughter
- B. No further action
- C. Prescribe a topical steroid
- D. Refer urgently to dermatology clinic
- E. Removal of lesion by GP under local anaesthetic

Correct Answer: A

Justification: This is a basal cell carcinoma. At the age of 91 years there is a reasonable case for no further action (slow-growing non-metastasising lesion) or for excision under local anaesthetic. The decision-making should involve the daughter.



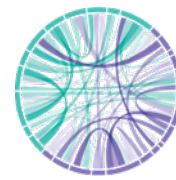
18. A 70 year old man has felt tired for 6 months. He has hypertension and open angle glaucoma. He takes amlodipine, latanoprost eye drops, ramipril, simvastatin and timolol eye drops. His pulse rate is 46 bpm and regular. Examination is otherwise normal.

Which drug is the most likely cause of the clinical findings?

- A. Amlodipine
- B. Latanoprost
- C. Ramipril
- D. Simvastatin
- E. Timolol

Correct Answer: E

Justification: Timolol maleate, as a Beta blocker, may cause bradycardia and tiredness. The other options are not likely to have these adverse effects.



- 19.** A 45 year old man thinks that he is dead and that he does not exist. He says that he feels miserable most of the time. His wife left him for another man 5 months ago. He has increased his alcohol intake over 4 months to three pints of lager every day. He also occasionally smokes cannabis. He has lost 7 kg in weight over 3 months.

What is the most likely psychiatric diagnosis?

- A.** Alcohol-induced psychosis
- B.** Delusional disorder
- C.** Depressive episode with psychotic symptoms
- D.** Psychosis secondary to illicit drug use
- E.** Schizophrenia

Correct Answer: C

Justification: The most likely psychiatric diagnosis is depressive episode with psychotic symptoms. His belief that he is dead and non-existent, coupled with feeling miserable most of the time, suggests distorted perception, characteristic of psychotic symptoms. Moreover, his recent stressful life event - his wife leaving him - could contribute to the development of depressive symptoms. While substance use may exacerbate psychotic symptoms, the primary presentation aligns more closely with depressive episodes, evidenced by significant weight loss and persistent low mood.



- 20.** A 23 year old man attends his GP with 2 months of low mood, lack of pleasure, persistent tiredness, poor sleep, poor appetite and low self-esteem. He sometimes has thoughts of taking his life, with no specific plans. There is no past psychiatric history.
The GP diagnoses depression and starts an antidepressant.

What is the most appropriate follow-up?

- A. Admit to psychiatric unit
- B. GP review in 1 month
- C. GP review in 1 week
- D. Referral to a community psychiatric nurse
- E. Referral to a psychiatrist

Correct Answer: C

Justification: Depression is not severe/treatment-resistant enough for psychiatry teams to take this case. If antidepressants are started in a patient who is suicidal, they should be followed up in a week. (NICE guidance)

<https://cks.nice.org.uk/topics/depression/management/initial-management/#:~:text=The%20NICE%20guideline%20advises%20early,early%20stages%20of%20antidepressant%20treatment.>



- 21.** A 25 year old woman has recurrent episodes of sudden onset of excessive sweating, dry mouth, 'butterflies' in her stomach, difficulty breathing and a fear that she is going to die. These symptoms have been occurring twice weekly for the past two years.

What is the most likely diagnosis?

- A.** Dissociative disorder
- B.** Generalised anxiety disorder
- C.** Hypochondriasis
- D.** Panic disorder
- E.** Somatisation disorder

Correct Answer: D

Justification: The most likely diagnosis is Panic Disorder. Panic Disorder is characterised by the presence of recurrent panic attacks, which are sudden and intense periods of fear or discomfort that reach a peak within minutes. Her symptoms, including palpitations, sweating, and difficulty breathing, are typical features of panic attacks. The duration and frequency of her episodes occurring twice weekly for the past two years, are consistent with the diagnostic criteria for Panic Disorder.



- 22.** A 75 year old woman has low back and pelvic pain made worse by walking. She has weakness of hip flexion bilaterally.

Investigations:

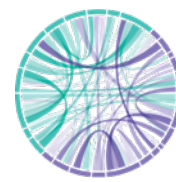
Haemoglobin	137 g/L	(115–150)
Calcium	2.0 mmol/L	(2.2–2.6)
Phosphate	0.75 mmol/L	(0.8–1.5)
Alkaline phosphatase	250 IU/L	(25–115)
CRP	<5 mg/L	(<5)

What is the most likely diagnosis?

- A. Fibromyalgia
- B. Osteomalacia
- C. Paget's disease of the bone
- D. Polymyositis
- E. Spinal stenosis

Correct Answer: B

Justification: Back and pelvic pain is a common presenting symptom of osteomalacia. The changes in calcium, phosphate and Alkaline phosphatase are classical of osteomalacia and no changes would be seen in fibromyalgia or spinal stenosis. The CRP would be elevated in polymyositis. Paget's disease of the bone would give an elevated alkaline but would not explain hypocalcaemia or proximal muscle weakness.



23. A 75 year old woman has 6 weeks of painless muscle weakness affecting her shoulders and thighs. She has a pale mauve discolouration of her eyelids, diffuse erythema over the metacarpophalangeal joints dorsally, and reduced power (3/5) in arm abduction and hip flexion.

Investigations:

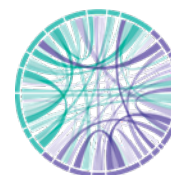
CRP	70 mg/L	(<5)
Rheumatoid factor	negative	
Antinuclear antibody	1:320	(<1:20)

What is the most appropriate blood test to help establish the diagnosis?

- A. Anti-acetylcholine receptor antibodies
- B. Anti-neutrophil cytoplasmic antibodies
- C. Anti-smooth muscle antibodies
- D. Creatine kinase
- E. Erythrocyte sedimentation rate

Correct Answer: D

Justification: The presentation of the 75-year-old woman with painless muscle weakness affecting her shoulders and thighs, the described skin findings (mauve discoloration of the eyelids, which is characteristic of heliotrope rash, and erythema over the metacarpophalangeal joints dorsally, known as Gottron's papules or sign), and the clinical findings of muscle weakness are consistent with dermatomyositis. Creatine kinase (CK) is a muscle enzyme that is often elevated in inflammatory myopathies, including dermatomyositis. An elevation in CK can help confirm muscle inflammation and damage.



- 24.** A 69 year old man has 3 months of stiffness in both knees at the end of the day. He also has intermittent, sharp pain in his left knee that occurs when he is walking or playing tennis. The pain resolves with rest. He has hypertension and takes lisinopril.

There is reduced range of movement in both knees. His left knee has crepitus, a small effusion and tenderness to palpation along the joint line. His BMI is 28 kg/m².

Investigations:

Creatinine 77 µmol/L (60–120)

He is given advice on weight loss and exercise.

What is the most appropriate additional treatment?

- A. Oral chondroitin sulfate
- B. Oral co-codamol
- C. Oral hydroxychloroquine sulfate
- D. Topical capsaicin
- E. Topical ibuprofen

Correct Answer(s): E

Justification: These are typical clinical features of OA. If pharmacological treatments are needed to manage osteoarthritis, it should be used alongside non-pharmacological treatments and to support therapeutic exercise. For patients with knee osteoarthritis a topical non-steroidal anti-inflammatory drug (NSAID) should be offered first line.

NICE guideline [NG226] Published: 19 October 2022

<https://www.nice.org.uk/guidance/ng226/chapter/Recommendations>



25. A 70 year old man has a sharp stabbing pain in his jaw and cheek that lasts for seconds. He reports that the pain is triggered when brushing his teeth, cold wind and touching his face.

What is the most appropriate treatment?

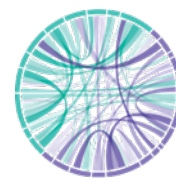
- A. Carbamazepine
- B. Indometacin
- C. Morphine
- D. Prednisolone
- E. Pregabalin

Correct Answer: A

Justification: The symptoms described suggest the diagnosis of trigeminal neuralgia. Carbamazepine is the first-line treatment for this condition and is therefore the most appropriate option among the choices
giv<https://cks.nice.org.uk/topics/trigeminal-neuralgia/en>

Clinical guideline [CG173] Published: 20 November 2013 Last updated: 22 September 2020

<https://www.nice.org.uk/guidance/cg173/chapter/Recommendations>



26. A 79 year old man has difficulty breathing. He had a carotid endarterectomy 2 hours ago.

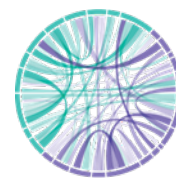
His pulse is 120 bpm, BP 92/52 mmHg and oxygen saturation 97% breathing high-flow oxygen by mask. His neck is swollen and he appears anxious and distressed, with loud stridor.

What is the most likely explanation for his deterioration?

- A.** Acute superior vena caval obstruction
- B.** Anaphylactic reaction
- C.** False aneurysm between carotid artery and jugular vein
- D.** Haemorrhage compressing the airway
- E.** Surgical emphysema

Correct Answer: D

Justification: This is a known complication of carotid endarterectomy. Primary haemorrhage causes airway obstruction.



27. A 53 year old woman has 4 months of lower abdominal pain and bloating. She has no urinary or bowel symptoms. She has normal periods with a regular cycle. Her abdomen is distended, but there is no tenderness or masses on palpation.

Investigations: CA125 50 U/mL (<35).

What is the most appropriate initial radiological investigation to perform?

- A. CT scan of abdomen and pelvis
- B. Hysterosalpingogram
- C. MR scan of abdomen and pelvis
- D. Ultrasound scan of abdomen and pelvis
- E. X-ray of abdomen

Correct Answer(s): D

Justification: The most appropriate initial radiological investigation for a woman presenting with lower abdominal pain and bloating, especially when there's a raised CA125, is an ultrasound scan of the abdomen and pelvis.

Ultrasound scan of the abdomen and pelvis (Option D) is an initial investigation to look for ovarian cysts, tumors, fibroids, and other pelvic pathologies. It's non-invasive and does not use ionizing radiation, making it a safe first-line modality for assessing pelvic pathology. If the ultrasound findings are inconclusive or suggest a malignant pathology, further imaging like CT or MRI may be warranted.

Clinical guideline [CG122] Published: 27 April 2011 Last updated: 02 October 2023

<https://www.nice.org.uk/guidance/cg122/chapter/Recommendations>



- 28.** A 17 year old girl has delayed menarche and short stature. She has had recurrent ear infections as a child. Her height is below the 5th centile for her age. She has a broad chest and widely spaced nipples.

Investigations:

FSH 70 U/L (2–8)

LH 40 U/L (1–11)

What investigation is most likely to confirm the underlying diagnosis?

- A. Karyotyping
- B. MR scan of pituitary fossa
- C. Serum oestradiol
- D. Thyroid function tests
- E. Ultrasound scan of pelvis

Correct Answer: A

Justification: The clinical picture provided suggests Turner syndrome. The characteristic findings include delayed menarche, short stature, recurrent ear infections, broad chest with widely spaced nipples, and elevated FSH and LH levels due to gonadal dysgenesis.

The definitive diagnostic test for Turner syndrome is a chromosomal analysis by karyotyping.



29. A 32 year old woman has had amenorrhoea for 6 months. Before this, she had a normal menstrual cycle. Her menarche was at age 14 years. Her BMI is 18.5 kg/m².

Investigations:

FSH 30 U/L (2-8)

LH 20 U/L (1-11)

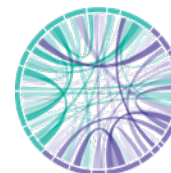
These results were confirmed 1 month later.

What is the most likely explanation for these findings?

- A. Anorexia nervosa
- B. Hypogonadotrophic hypogonadism
- C. Polycystic ovarian syndrome
- D. Pregnancy
- E. Premature ovarian failure

Correct Answer: E

Justification: The most likely explanation is premature ovarian failure (POF). POF refers to the cessation of ovarian function before the age of 40, leading to amenorrhoea and infertility. Elevated FSH and LH levels indicate loss of negative feedback from ovarian steroids, and therefore decreased ovarian reserve and diminished ovarian function. The woman's age, history of normal menstrual cycles, and BMI within normal range are consistent with the diagnosis of premature ovarian failure.



- 30.** A 28 year old man has had a painful red eye for five days. He has redness around the border of the sclera and cornea and the eye is watery. Fluorescein staining is normal. The pupil is irregular.

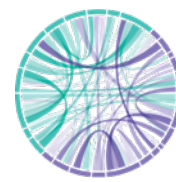
What is the most likely diagnosis?

- A.** Acute closed angle glaucoma
- B.** Acute conjunctivitis
- C.** Anterior uveitis
- D.** Corneal abrasion
- E.** Dendritic ulcer

Correct Answer: C

Justification: None of the others cause an irregular pupil, the cornea is clear unlike glaucoma, abrasion and dendritic ulcer

<https://cks.nice.org.uk/topics/uveitis/diagnosis/assessment/>



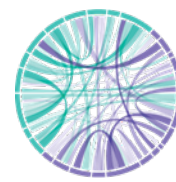
31. A 72 year old man has three episodes of painless visual loss in his right eye over a two week period. Each episode lasts 20–30 minutes. The symptoms affect his right eye only. He has hypertension, hyperlipidaemia and ischaemic heart disease.

Which artery is most likely to be affected causing his presentation?

- A. Basilar artery
- B. Left internal carotid artery
- C. Left posterior cerebral artery
- D. Right internal carotid artery
- E. Right posterior cerebral artery

Correct Answer: D

Justification: The patient's symptoms of transient painless visual loss in one eye, lasting 20-30 minutes, are suggestive of transient monocular blindness, also known as amaurosis fugax. Amaurosis fugax is often due to emboli from atherosclerotic plaques in the carotid artery. These emboli typically originate from the ipsilateral internal carotid artery. Since the symptoms are in the right eye, it is likely due to a lesion in the right internal carotid artery.



32. An 80 year man has worsening nausea and occasional vomiting. He has advanced Parkinson's disease and takes levodopa. He also takes codeine for muscle pain along with lactulose.

His BP is 140/85 mmHg. His abdomen is soft with normal bowel sounds.

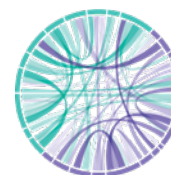
What is the most appropriate treatment of his nausea and vomiting?

- A. Add domperidone
- B. Add oral haloperidol
- C. Add oral metoclopramide
- D. Increase dose of levodopa
- E. Switch codeine to tramadol

Correct Answer: A

Justification: Nausea and vomiting is a common symptom in PD patients requiring palliation. It is a result of levodopa and exacerbated by opiates in this case. Haloperidol and metoclopramide should be avoided due to their anti-dopaminergic activity. Domperidone is a safe anti-emetic which works on peripheral dopamine receptors. There is no indication to change the levodopa dose. Changing to a weaker opiate is likely to make pain worse without any benefit on nausea symptoms.

<https://cks.nice.org.uk/topics/parkinsons-disease/management/confirmed-parkinsons-disease/>



33. A 30 year old woman has 3 weeks of bilateral loin pain and dark urine. This was preceded by a sore throat. She had a similar less severe episode 2 years ago.

Her temperature is 37.1°C, pulse 80 bpm, BP 153/90 mmHg and JVP + 3 cm above the sternal angle. She has ankle oedema. Heart sounds are normal and chest is clear. Urinalysis shows blood 3+, protein 3+.

Investigations:

Sodium	136 mmol/L	(135–146)
Potassium	4.8 mmol/L	(3.5–5.3)
Urea	18 mmol/L	(2.5–7.8)
Creatinine	250 µmol/L	(60–120)

Anti-neutrophil cytoplasmic antibody is negative

Urinary albumin:creatinine ratio 192.2 mg/mmol (<3.5)

Midstream urine: no growth

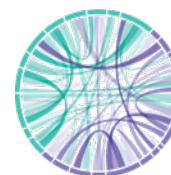
Ultrasound scan of kidneys: normal sized unobstructed kidneys

What is the most appropriate diagnostic investigation?

- A. CT scan of kidneys, ureters and bladder
- B. Cystoscopy
- C. MR renal angiography
- D. Renal biopsy
- E. Serum protein electrophoresis

Correct Answer: D

Justification: Renal biopsy is required for diagnosis and appropriate treatment. Although the patient has haematuria the picture is not one of bladder pathology. This is unlikely to be stones so a helical CT scan is not indicated. Renal artery stenosis would be uncommon in this age group and would not explain symptoms and signs. Although serum protein electrophoresis would be done this presentation does not fit with myeloma.



- 34.** A 61 year old woman is admitted with acute kidney injury. She has cervical carcinoma, which has recently been treated with radiotherapy. She takes tramadol and paracetamol. Her temperature is 37.2°C, pulse 84 bpm, BP 124/80 mmHg and JVP is +2 cm from the sternal angle.

Investigations:

Haemoglobin	98 g/L	(115–150)
White cell count	12 x 10 ⁹ /L	(3.8–10.0)
Platelets	188 x 10 ⁹ /L	(150–400)
Sodium	132 mmol/L	(135–146)
Potassium	5.6 mmol/L	(3.5–5.3)
Urea	36 mmol/L	(2.5–7.8)
Creatinine	592 µmol/L	(60–120)

Ultrasound scan of renal tract: bilateral hydronephrosis with good cortical thickness.

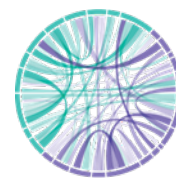
A urinary catheter is inserted that drains 50 mL of urine. Urinalysis shows blood 1+.

What is the most appropriate next management step?

- A. CT scan of kidney, ureter and bladder
- B. Intravenous 0.9% sodium chloride 500 mL
- C. Intravenous co-amoxiclav
- D. Intravenous insulin and glucose
- E. Nephrostomy insertion

Correct Answer: E

Justification: The patient's presentation and investigations indicate acute kidney injury (AKI) with raised creatinine, urea, and hyperkalemia (elevated potassium). The ultrasound shows bilateral hydronephrosis, suggesting an obstructive cause for the AKI. Given her history of cervical carcinoma and radiotherapy, one likely cause for this obstruction could be related to the treatment causing ureteric obstruction. This might have led to post-renal AKI. In this situation, the most appropriate management is to relieve the obstruction. Inserting a nephrostomy (percutaneous renal drainage) will help to bypass the obstruction and allow urine to drain externally. Once the obstruction is relieved, renal function can start to improve.



35. A 58 year old man has had 8 months of fatigue. He often has a brief sleep at work due to tiredness.

His pulse is 83 bpm and BP is 159/68 mmHg. His heart sounds are normal and his chest is clear. His BMI is 34 kg/m².

Investigations:

Haemoglobin 182 g/L (130-180)

MCV 87 fL (80-96)

White cell count $9.1 \times 10^9/L$ (4.0-11.0)

Thyroid stimulating hormone 3.0 pmol/L (0.4-5.0)

What investigation is most likely to establish the diagnosis?

- A. 24 hour urinary cortisol
- B. Bone marrow aspiration
- C. Echocardiography
- D. Polysomnography
- E. Serum free T4 and T3

Correct Answer: D

Justification: The clinical features of daytime somnolence and obesity suggest obstructive sleep apnoea. Hypertension commonly occurs. There are no other features to suggest he has Cushing's. The normal TSH excludes hypothyroidism. The polycythaemia is likely a result of nocturnal hypoxia rather than PRV. <https://www.nice.org.uk/guidance/ng202>



- 36.** In 2019, a study was started in which two groups of women (N = 1000 in total) who had surgery for breast cancer were followed up. The women were treated at two different oncology centres. One centre treated women with drug A, and the other with drug B. All women were assessed for recurrence in 2023.

What study design is described here?

- A. Case control
- B. Cross-sectional
- C. Prospective cohort
- D. Randomised control trial
- E. Retrospective cohort

Correct Answer: C

Justification: Given that the study started before the outcome (recurrence) occurred and followed the groups forward in time, it is a cohort study. The study isn't randomized, as the treatment seems to be based on the unit where they were treated and not by random allocation.

Given that they started the study in 2019 (prospectively) and followed the participants to 2023 to assess for the outcome, the correct answer is a prospective cohort.



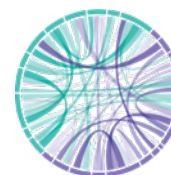
37. In a randomised controlled trial of a new influenza vaccine, 100 patients were randomly allocated to receive the vaccine and 100 to receive placebo. During follow up, 20 patients who had received the vaccine contracted influenza, compared with 30 patients who had received placebo.

What effect did the vaccine have on the relative risk of contracting influenza?

- A. Decreased by 10%
- B. Decreased by 33%
- C. Decreased by 67%
- D. Increased by 10%
- E. Increased by 50%

Correct Answer: B

Justification: $RR = (20/100)/(30/100) = 0.67$, which implies a 33% reduction in risk.



- 38.** A 50 year old man has had 2 months of abdominal and mid-thoracic back pain, diarrhoea and occasional nausea and vomiting. He has lost 5 kg in weight during that time.

Investigations:

Haemoglobin	135 g/L	(130–175)
White cell count	$4.2 \times 10^9/L$	(3.8–10.0)
Alkaline phosphatase	254 IU/L	(25–115)
Bilirubin	28 $\mu\text{mol/L}$	(<17)

Ultrasound scan of abdomen: no abnormality

What is the most appropriate next diagnostic imaging?

- A. Colonoscopy
- B. CT scan of abdomen
- C. Endoscopic retrograde cholangiopancreatography
- D. Upper gastrointestinal endoscopy
- E. X-ray of abdomen

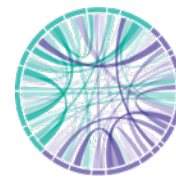
Correct Answer: B

Justification: This patient presents with mid-thoracic back pain, abdominal pain, gastrointestinal symptoms (diarrhoea, nausea, and vomiting), weight loss, elevated alkaline phosphatase, and elevated bilirubin. The combination of elevated alkaline phosphatase and bilirubin often suggests a hepatobiliary pathology.

A CT scan of the abdomen would be the next most appropriate diagnostic imaging in this setting. This test can evaluate the liver, pancreas, and biliary tree in greater detail than an ultrasound. It can identify masses, stones, or other obstructions that may not have been evident on ultrasound. Furthermore, CT can visualize the entire abdomen and retroperitoneal structures, which may help explain the patient's back pain and identify any other potential pathologies.

Scenario: Referral for suspected gastrointestinal tract (upper) cancer Last revised in February 2021

<https://cks.nice.org.uk/topics/gastrointestinal-tract-upper-cancers-recognition-referral/management/referral-for-suspected-gastrointestinal-tract-upper-cancer/>



39. A 40 year old man has a temperature of 38.5°C. He is receiving cytotoxic chemotherapy for the treatment of acute myeloid leukaemia. His Hickman (central venous) line site is red and tender.

Investigations:

White cell count of $0.1 \times 10^9/L$ (3.0–10.0)

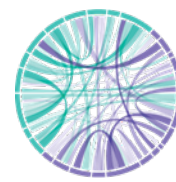
Blood cultures from both the Hickman line and peripheral blood yield clumps of Gram positive cocci.

What is the most likely causative organism?

- A. *Enterococcus faecalis*
- B. *Escherichia coli*
- C. *Micrococcus species*
- D. *Staphylococcus aureus*
- E. *Streptococcus pyogenes*

Correct Answer: D

Justification: This is because *streptococcus pyogenes* and *enterococcus faecalis* are gram positive cocci but in chains. *Staphylococcus aureus* causes line infections. *E. coli* is gram negative. *Micrococcus species* is much less likely.



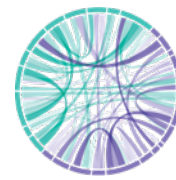
40. A 72 year old man has a persistent limp 6 weeks after a hip replacement. He has a positive Trendelenburg test.

Which hip muscle group is most likely to be affected?

- A. Abductors
- B. Adductors
- C. Extensors
- D. External rotators
- E. Flexors

Correct Answer: A

Justification: The purpose of the Trendelenburg Test is to identify the weakness of the hip abductors. A positive Trendelenburg sign usually indicates weakness in the hip abductor muscles: gluteus medius and gluteus minimus.



41. A 24 year old woman has 1 week of watery diarrhoea and abdominal cramping. She is a keen swimmer and there has been a recent outbreak of diarrhoeal disease amongst her swimming club. She is otherwise well.

A stool sample shows oocysts of cryptosporidium.

What is the most appropriate management?

- A. Arrange for flexible sigmoidoscopy
- B. Lactose-free diet
- C. No therapy required
- D. Oral ciprofloxacin
- E. Oral clarithromycin

Correct Answer: C

Justification: Self limiting illness typically and no treatment is needed.

<https://www.cdc.gov/cryptosporidium/treatment/index.html#:~:text=Cryptosporidiosis%20can%20be%20managed%20by,recover%20from%20cryptosporidiosis%20without%20treatment.>



- 42.** A 59 year old woman attends her GP for a monitoring blood test. She has type 2 diabetes mellitus and hypertension. She takes bendroflumethiazide, metformin, nifedipine, ramipril and simvastatin.

Investigations:

Sodium	139 mmol/L	(135–146)
Potassium	3.9 mmol/L	(3.5–5.3)
Urea	6.2 mmol/L	(2.5–7.8)
Creatinine	109 μ mol/L	(60–120)
Calcium	2.73 mmol/L	(2.2–2.6)

Which of her medications is most likely to contribute to these results?

- A. Bendroflumethiazide
- B. Metformin
- C. Nifedipine
- D. Ramipril
- E. Simvastatin

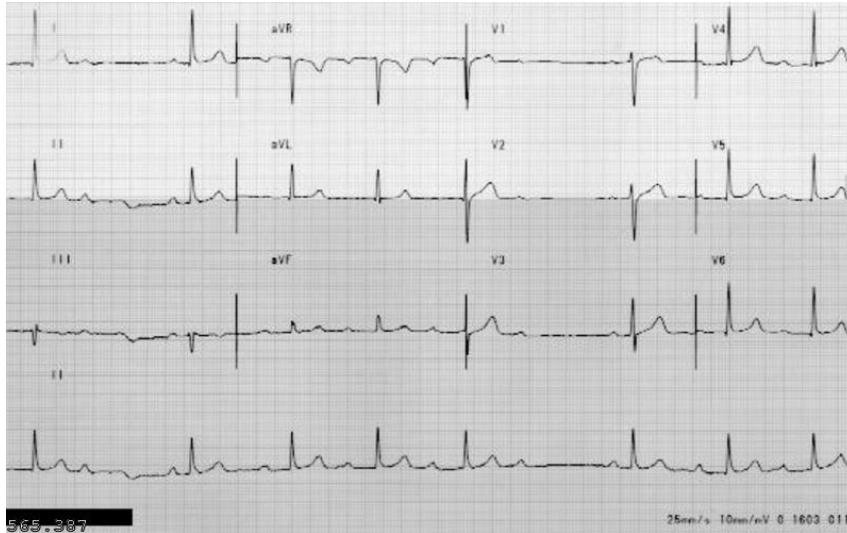
Correct Answer: A

Justification: Bendroflumethiazide increases renal calcium absorption which may lead to low level hypercalcaemia. The first action would be stop it and repeat the calcium.

43. A 72 year old woman is admitted after collapsing at home and falling down several stairs.

Her pulse is 55 bpm and irregular, and her BP is 165/88 mmHg.

Her ECG is shown (see image).



What is the best interpretation of the ECG?

- A. Atrial fibrillation
- B. Complete heart block
- C. First degree heart block
- D. Second degree heart block
- E. Sinus arrhythmia

Correct Answer: D

Justification: ECG shows second degree heart block (Wenkebach / Mobitz type 1). While not always a sign of pathological heart disease, in an older person with symptoms, this is most likely. It is generally asymptomatic but if patient bradycardic, dizziness and syncope can occur.



44. A 54 year old man attends his GP after he was found to have high BP at a routine medical examination at work. He is well and is not on any regular medication. His friend checked his BP at home and said it was normal.

His BP is checked twice and found to be 146/102 mmHg and 148/98 mmHg.

What is the most appropriate next step?

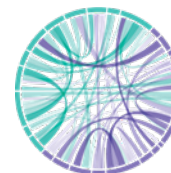
- A.** Arrange ambulatory BP monitoring
- B.** Arrange repeat BP measurement in 2 weeks
- C.** Prescribe a calcium-channel blocker
- D.** Prescribe an ACE inhibitor
- E.** Reassure patient that if his BP was normal when his friend measured it, no treatment is needed

Correct Answer: A

Justification: If clinic blood pressure is between 140/90 mmHg and 180/120 mmHg, ambulatory blood pressure monitoring (ABPM) to confirm the diagnosis of hypertension should be offered.

NICE guideline [NG136] Published: 28 August 2019 Last updated: 21 November 2023

<https://www.nice.org.uk/guidance/ng136/chapter/Recommendations>



- 45.** A 78 year old woman has a chest infection which is slow to clear despite several courses of broad spectrum oral antibiotics.

Investigations:

Haemoglobin 126 g/L (115 – 150)

White cell count $38 \times 10^9/L$ (3.8–10.0)

Lymphocytes $32 \times 10^9/L$ (1.1–3.3)

Platelets $124 \times 10^9/L$ (150 – 400)

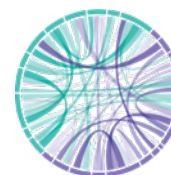
A large cervical lymph node is biopsied and shows a sheet of mainly small lymphoid cells with 5% larger cells.

What is the most likely diagnosis?

- A.** Chronic lymphocytic leukaemia
- B.** Myeloma
- C.** Non-Hodgkin lymphoma
- D.** Small cell lung carcinoma
- E.** Tuberculosis

Correct Answer: A

Justification: Patient has CLL with accumulation of non-functioning monoclonal with typical findings of lymphocytosis and lymphadenopathy. CLL diagnosed as high lymphocyte count in peripheral blood count. small lymphocytic lymphoma is considered to be the same disease but with different manifestation but is nodal and by definition has a peripheral lymphocyte count $<5 \times 10^9/L$.



- 46.** A 30 year old woman is admitted with 10 days of fever, rigors, breathlessness and back pain. She has a history of intravenous drug use. She is known to be hepatitis C IgG positive.

Her temperature is 40.1°C, pulse rate 114 bpm, BP 111/65 mmHg and oxygen saturation 96% breathing air. She has a systolic murmur at the left sternal edge. Her chest is clear. She has tenderness over the L1 to L3 vertebrae.

Investigations:

Haemoglobin	96 g/L	(115–150)
White cell count	$10.9 \times 10^9/L$	(3.8–10.0)
Platelets	$406 \times 10^9/L$	(150–400)

Urea	10.5 mmol/L	(2.5–7.8)
Creatinine	71 $\mu\text{mol/L}$	(60–120)

Aspartate aminotransferase	42 IU/L	(10–40)
Alkaline phosphatase	310 IU/L	(25–115)

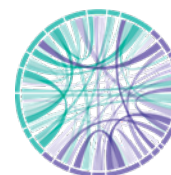
Urinalysis: blood 1+, protein 3+

What is the most likely diagnosis?

- A. Acute exacerbation of hepatitis C infection
- B. Infective endocarditis
- C. Opioid withdrawal
- D. *Pneumocystis jirovecii* pneumonia
- E. Pyelonephritis

Correct Answer: B

Justification for correct answer: The patient has a fever, murmur and risk factor for endocarditis (IV drug use). Lumbosacral back pain occurs in ~15% of cases. Anaemia is common and the urine dipstick suggests a possible underlying glomerulonephritis. Hepatitis C does not present in this acute fashion in someone with previous exposure and the LFTs fit with chronic hepatitis C infection. Disease is more indolent. Opiate withdrawal would not have this length of history or degree of fever. PCP would give more prominent hypoxia. Pyelonephritis would give loin pain, rather than back pain and history is normally shorter than 10 days.



47. A 68 year old man has worsening breathlessness on exertion. He takes a salbutamol inhaler as required. He has a 40 pack-year smoking history and stopped smoking completely 3 months ago. His oxygen saturation breathing air is 96%.

Investigations:

Spirometry: Pre-bronchodilator FEV1/FVC ratio: 0.63

Post-bronchodilator FEV1/FVC ratio: 0.64

Chest X-Ray: mild hyperinflation, heart-size normal, no focal lesion

What is the most appropriate next step in the management?

- A. Add beclometasone with formoterol and glycopyrronium (Trimbow) inhaler
- B. Add budesonide with formoterol (Symbicort) inhaler
- C. Add fluticasone inhaler
- D. Add ipratropium nebuliser
- E. Add umeclidinium with vilanterol (Anoro Ellipta) inhaler

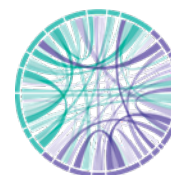
Correct Answer: E

Justification: This patient has confirmed COPD based on spirometry with no asthmatic features or steroid responsiveness. The most appropriate next step is to add a combination long-acting muscarinic antagonist (LAMA) and long-acting beta-agonist (LABA) inhaler, such as umeclidinium with vilanterol (Anoro Ellipta). Symbicort (ICS + LABA) is preferred for patients with asthmatic features and steroid responsiveness. Trimbow (ICS + LABA + LAMA) is generally recommended for patients who experience frequent exacerbations despite dual therapy with a LAMA and LABA. No indication for a nebuliser rather than an inhaler.

NICE guideline [NG115] Published: 05 December 2018 Last updated: 26 July 2019

<https://www.nice.org.uk/guidance/ng115/chapter/Recommendations>

Consistent with NICE CKS May 2025



48. A 68 year old man had an angioplasty of his left femoral artery 3 days ago. He has hypertension, chronic kidney disease, type 2 diabetes mellitus and peripheral arterial disease. He takes aspirin, metformin and ramipril. Metformin and ramipril were stopped before the procedure.

His temperature is 37.4°C, pulse is 80 bpm and BP is 146/80 mmHg. His urine output for the past 24 hours is 900 mL.

Investigations:

Pre-angiogram 3 days post angiogram

Sodium	137 mmol/L	134 mmol/L	(135–146)
Potassium	5.2 mmol/L	5.6 mmol/l	(3.5–5.3)
Urea	8.2 mmol/L	14.5 mmol/L	(2.5–7.8)
Creatinine	134 µmol/L	210 µmol/L	(60–120)

What is the most likely cause for the decline in his renal function?

- A. Cholesterol emboli
- B. Contrast associated acute kidney injury
- C. Diabetic nephropathy
- D. Renal artery stenosis
- E. Urinary tract infection

Correct Answer: B

Justification: In this scenario the timing suggests contrast associated acute kidney injury. This is more common in patients with pre-existing CKD. Cholesterol emboli would not enter the kidneys from femoral angiography. Diabetic nephropathy would not cause an acute decline in function.