



Royal College of  
General Practitioners

## **MRCGP**

### **Applied Knowledge Test**

#### **50 sample questions with answers**

The following 50 questions are in single-best-answer, extended matching and free-text formats to demonstrate the formats that are currently used in the AKT.

Some of these questions relate to current best practice. They should be answered in relation to national UK guidance and not according to an individual's local arrangements.

In the live test of three hours and ten minutes duration, all 200 items will be used in calculating your score. Marks will not be deducted for incorrect answers; your total score on the test will be the number of correct answers you give. You are therefore advised to attempt all items.

## 1. Post-myocardial infarction

A 58-year-old woman had an ST-segment-elevation myocardial infarction two months ago. She has made a good recovery but has low mood and a poor sleep pattern with early morning wakening. She wishes to try medication as her symptoms are affecting her ability to work.

**Which is the SINGLE MOST appropriate antidepressant drug? Select ONE option only.**

- A Amitriptyline
- B Fluoxetine
- C Lofepramine
- D Mirtazapine
- E Venlafaxine

Answer: B (Fluoxetine)

SSRIs are safer in ischaemic heart disease than tricyclic antidepressants and fluoxetine is the first line choice.

Content Guide reference: [Cardiovascular problems](#)

## 2. Weakness

A 35-year-old woman has noticed increasing weakness and numbness in her legs and arms over the past few days, and today she is feeling short of breath on exertion. Six weeks ago she had diarrhoea while on holiday abroad and stool culture confirmed infection with *Campylobacter jejuni*. She was treated with ciprofloxacin and recovered fully.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Drug-induced neuropathy
- B Guillain-Barré syndrome
- C Motor neurone disease
- D Myasthenia gravis
- E Multiple sclerosis

Answer: B (Guillain-Barré syndrome)

Guillain-Barré syndrome is an acute ascending polyneuropathy eventually affecting the respiratory muscles which usually occurs following an infection.

Content Guide reference: [Neurological](#)

### 3. Emergency contraception

A 26-year-old woman had unprotected sexual intercourse 12 hours ago. She is mid-cycle and this is the first occasion in this cycle. She wishes to start the combined oral contraceptive pill today in addition to Levonelle emergency contraception.

**Which is the SINGLE MOST appropriate length of time, if any, that she needs extra precautions to prevent pregnancy? Select ONE option only.**

- A 2 days
- B 7 days
- C 9 days
- D 16 days
- E No additional contraceptive precautions necessary

Answer: B (7 days)

The rules for quick start contraception are clearly outlined in the 2010 Faculty of Sexual Health and Reproductive Healthcare guidance, but vary depending on the type of emergency contraception and the subsequent contraceptive choice.

The AKT regularly tests understanding of contraception and this area remains difficult for many candidates. If this is an area of potential weakness, it would be worth addressing this in your training.

Content Guide reference: [Women's health](#)

#### 4. Skin rash

This nine-year-old boy has been unwell for the past few days and developed a rash affecting his trunk and limbs yesterday. He has no underlying medical problems and is feeling better today. His mother has used a cream recommended by the pharmacist.



Which is the **SINGLE MOST** appropriate management option? Select **ONE** option only.

- A No additional treatment
- B Oral aciclovir
- C Topical aciclovir
- D Topical fusidic acid
- E Topical mupirocin

Answer: A (No additional treatment)

The boy has chickenpox and no additional treatment is required as he is recovering and has no underlying medical problems.

Content Guide reference: [Infectious diseases](#)

## 5. Investigation of deafness

A 56-year-old man has a two-year history of deafness affecting his right ear. He has had intermittent episodes of vertigo, tinnitus and vomiting each lasting a few hours. The whispered voice test is diminished in his right ear. You perform tuning fork tests.

**Which is the SINGLE MOST likely result of the tuning fork tests?  
Select ONE option only.**

	Rinne's – conduction results	Weber's – ear localisation
A	Air > bone	Left
B	Air > bone	Right
C	Bone > air	Left
D	Bone > air	Right
E	Air same as bone	Equal

Answer: A (Rinne's AC>BC; Weber's localises to L)

The history suggests Ménière's disease which causes sensorineural deafness. Air conduction is better than bone conduction and sounds localise to the unaffected ear.

Content Guide reference: [Ear, nose and throat](#)

## 6. Lethargy

A 50-year-old man has become increasingly tired and lethargic over the past six months and has developed erectile dysfunction. His wife comments that he looks tanned even in the winter months. His serum ferritin and transferrin levels are significantly raised, but his haemoglobin is normal.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Addison's disease
- B Chronic active hepatitis
- C Diabetes mellitus
- D Haemochromatosis
- E Hypothyroidism

Answer: D (Haemochromatosis)

Haemochromatosis is an inherited disorder which increases absorption of dietary iron which accumulates gradually in the liver, pancreas, skin, joints, heart or endocrine glands causing serious tissue damage. Ferritin and transferrin are raised.

Content Guide reference: [Metabolic and Endocrine](#)

## Viruses

- |   |                    |   |                             |
|---|--------------------|---|-----------------------------|
| A | Adenovirus         | F | Herpes simplex virus        |
| B | Cytomegalovirus    | G | Human papilloma virus       |
| C | Echovirus          | H | Respiratory syncytial virus |
| D | Epstein-Barr virus | I | Rotavirus                   |
| E | Hepatitis B virus  | J | Rubella virus               |

**For each clinical condition, select the SINGLE MOST likely causative virus from the list of options.**

7. Hepatocellular carcinoma

8. Warts

Answers: 7 E (Hepatitis B)  
8 G (Human papilloma virus)

Hepatocellular carcinomas is associated with hepatitis B infection and warts are caused by human papilloma virus.

This is an example of an extended matching question where the same option list is used for two or more consecutive questions, which are presented on sequential screens as Question 1 of 2 and 2 of 2. Each option can be used more than once.

Content Guide reference: [Infectious diseases](#)



## 9. Visual disturbance

A 20-year-old woman notices bright lines of light in both visual fields followed shortly afterwards by a partial loss of her vision. Her visual symptoms resolve after one hour but she has slight nausea.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Acute glaucoma
- B Migraine
- C Optic neuritis
- D Retinal detachment
- E Vitreous detachment

Answer: B (Migraine)

Visual aura and nausea are typical of migraine which can occur without a headache. Her age and the short-lived nature of the visual symptoms tends to exclude the other options.

Content Guide reference: [Eye problems](#)

## Risk of hip fracture

A cohort study evaluated the relationship between dietary calcium supplementation and hip fractures in post-menopausal women. 100 women took calcium supplements and 100 women took placebo tablets.

Over the three year period, five women had hip fractures in the calcium group and ten women had hip fractures in the placebo group. The 95% confidence interval is 0.18 to 1.4.

**10. What is the RISK of a hip fracture in the TREATED group? Select ONE option only.**

- A 0.01
- B 0.05
- C 0.1
- D 0.5
- E 1.0

**11. What is the RISK RATIO? Select ONE option only.**

- A 0.01
- B 0.05
- C 0.1
- D 0.5
- E 1.0

Answers: 10 B (0.05)  
11 D (0.5)

Five women out of 100 had a hip fracture when taking calcium supplements.  $5/100 = 0.05$

$5/100$  for the treated group and  $10/100$  for the placebo group, so the ratio is 0.5.

Any calculations in the AKT are arithmetically very simple and are included so that candidates demonstrate their understanding of different statistical terms and measures.

Content Guide reference: [Research, statistics and epidemiology](#)

## 12. Epidemiological measures

Which is the **SINGLE MOST** appropriate epidemiological measure to estimate the rate at which the new cases of papilloma virus infection occur among students on a college campus? Select **ONE** option only.

- A Case fatality
- B Incidence
- C Median survival
- D Mortality
- E Prevalence

Answer: B (Incidence)

Incidence is the term used to describe the rate of occurrence of new cases. Candidates should be familiar with common statistical terms and definitions, and understand when they should be used.

Content Guide reference: [Research, statistics and epidemiology](#)

### 13. Drug dose calculation

A three-year-old girl has recurrent urinary tract infections and the paediatrician has recommended trimethoprim prophylaxis at a dose of 2 mg/kg at night.

She weighs 12.5 kg and trimethoprim suspension is available as 50 mg/5mls.

**What volume of suspension (in mls) should the child's mother give her every evening?**

**Type your answer in the following text box. Use figures NOT words. Percentages and fractions are NOT acceptable.**

mls

Answer: 2.5 mls

The child weighs 12.5 kg and the dose is 2 mg per kilogram, so she needs a once daily dose of 25 mg. If trimethoprim suspension contains 50 mg in 5 mls it will contain 25 mg in 2.5 mls.

Drug calculations are common and important, and will be tested in every AKT. The information given makes the calculation straightforward and calculators are not necessary.

Content Guide reference: [Pharmaco-therapeutics](#)

#### 14. Side effects of rheumatological drugs

**MATCH EACH** drug to the **MOST LIKELY** side effect. All four drugs must be correctly matched to score **ONE** mark.

- A. Diclofenac
- B. Hydroxychloroquine
- C. Infliximab
- D. Methotrexate

Side effect	Most likely causative drug
Bone marrow suppression	
Stroke	
Retinopathy	
Septicaemia	

Answer: A Stroke - diclofenac  
B Retinopathy - hydroxychloroquine  
C Septicaemia - infliximab  
D Bone marrow suppression - methotrexate

The AKT will test knowledge of commonly used drugs and their potential side effects. Diclofenac has an increased stroke risk and methotrexate is associated with bone marrow suppression. Candidates sometimes worry that more than one answer may be correct because other drugs *might* affect the bone marrow but methotrexate is the **MOST LIKELY** from the *listed* options.

Cytokine modulators such as infliximab have been associated with infections, sometimes severe, including tuberculosis, septicaemia and hepatitis B re-activation. Although GPs do not initiate these drugs, you need to be able to recognise potentially life threatening complications which may present in primary care.

Although retinopathy is rare, people taking long-term hydroxychloroquine should have an annual vision check.

Matching questions are presented in a drag and drop format so it is important to be confident of how to use the on-line software. An online tutorial is available on the AKT website and the same tutorial will be delivered at the start of the AKT. All four listed side-effects have to be correctly placed to gain one mark.

Content Guide reference: [Pharmaco-therapeutics](#)

Content Guide reference: [Musculo-skeletal](#)

## 15. Management of skin lesions

The parents of a six-year-old child are concerned about the multiple skin lesions that have spread on his face over the past 12 weeks.



Which is the **SINGLE MOST** appropriate management option? Select **ONE** option only.

- A No treatment necessary
- B Oral flucloxacillin
- C Topical aciclovir
- D Topical fusidic acid
- E Topical hydrocortisone 1%

Answer: A (No treatment necessary)

This child has molluscum contagiosum, a self-limiting illness, for which the listed alternative options are inappropriate.

Interpretation of clinical photographs is frequently necessary in the AKT. Knowing when treatment is not required is an important element of general practice and will be tested.

Content Guide reference: [Skin problems](#)

## 16. Visual disturbance

A 63-year-old man with poorly controlled hypertension, suddenly loses his vision in his left eye and his visual acuity on the left is reduced to hand movements only. Visual acuity on the right is 6/6.

Fundoscopy of the left eye shows flame-shaped retinal haemorrhages spreading out from the disc.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Acute glaucoma
- B Central retinal artery occlusion
- C Central retinal vein occlusion
- D Retinal detachment
- E Vitreous haemorrhage

Answer: C (Central retinal vein occlusion)

The history and clinical findings are typical of central retinal vein occlusion, with hypertension as the underlying risk factor.

Content Guide reference: [Eye problems](#)

## Disorders of glucose metabolism

- A Gestational diabetes
- B Impaired fasting glycaemia
- C Impaired glucose tolerance
- D Maturity Onset Diabetes of the Young (MODY)
- E Normal
- F Prediabetes
- G Type 1 diabetes
- E Type 2 diabetes

For the patient described, select the **SINGLE MOST** likely diagnosis from the list of options.

17. A 47-year-old overweight woman had a screening blood test because of her family history of type 2 diabetes. Her result is as follows:

HbA<sub>1c</sub> 40 mmol/mol

18. A 15-year-old obese boy has significant glycosuria on more than one occasion. He is well with no symptoms. His father and brother both have diabetes.

Random blood glucose 12 mmol/L  
Blood ketones negative

Answer: 17 E (Normal)

This woman has an HbA<sub>1c</sub> at the upper limit of the WHO normal range. The AKT tests understanding of diagnostic threshold values. NICE and SIGN guidelines, and the RCGP elearning website are frequently used reference sources

Answer: 18 D (Maturity Onset Diabetes of the Young (MODY))

This boy has persistent glycosuria and a strong family history of diabetes. Any child who is unwell presenting with symptoms of diabetes should be admitted. This child is well, blood ketones are negative and the question asks for the **MOST LIKELY** diagnosis rather than 'the potentially most serious'.

The most likely diagnosis is MODY which should be discussed with a duty paediatrician as his management will be coordinated by secondary care.

Content Guide reference: [Metabolic and Endocrine](#)



## 19. Child development

Specialist referral is **MOST APPROPRIATE** for which **TWO** of the following children? Select **TWO** options only.

- A A four-week-old boy whose mother reports he does not smile
- B A four-month-old girl who cannot grasp an object when it is placed in her hand
- C A four-month-old boy who cannot sit unsupported
- D A two-year-old girl who cannot hop
- E A three-year-old boy who cannot combine words into a simple sentence

Answers: B (A four-month-old girl who cannot grasp an object when placed in her hand)  
E (A 3-year-old boy who cannot combine words into a simple sentence)

This question highlights the need for an understanding of normal and delayed child development.

Although GPs in training may not have much experience of key childhood developmental milestones, awareness of these is an essential part of being a GP.

The exam board have regularly fed back to candidates that this is an area that will continue to be tested.

This is an example of a multiple best answer question, where more than one correct answer has to be correct to score one mark. If you attempt to move on after only marking one answer, there is a screen warning to prompt you to look again.

Content Guide reference: [Children and young people](#)

## 20. Consent for disclosure of medical information

Which **TWO** of the following statements are the **MOST APPROPRIATE** considerations when providing information to third parties such as insurers? Select **TWO** options only.

- A Disclose all information written in the medical record
- B Do not disclose the content of the report to your patient
- C Ensure the patient has sufficient information about the likely consequences of disclosure
- D Relevant information can be withheld under certain circumstances
- E Use the proforma provided by the third party
- F Patient consent can be automatically assumed by receipt of the insurers' request

Answers: C (Ensure the patient has sufficient information about the likely consequences of disclosure)  
D (Relevant information can be withheld under certain circumstances)

This issue is covered in more detail in GMC 2009 guidance on confidentiality.

If asked to provide information to third parties you should:

- be satisfied that the patient has sufficient information
- obtain written consent but if a patient refuses consent, or if it is not practicable to get their consent, information can still be disclosed if it is required by law or can be justified in the public interest.
- only disclose relevant factual information you can substantiate
- offer to show your patient a copy of any report you write, unless:
  - (i) they have already indicated they do not wish to see it
  - (ii) disclosure would be likely to cause serious harm
  - (iii) disclosure would be likely to reveal information about another person who does not consent

Content Guide reference: [Admin, ethical and regulatory](#)

## 21. Drug dose calculation

A five-year-old girl has an asthma exacerbation which you decide to treat with soluble prednisolone at a dose of 1.5 mg/kg once per day for three days initially.

She weighs 20 kg.

**What is the correct daily dose of prednisolone?**

Type your answer in the following text box. Use figures NOT words. Percentages, equations and fractions are NOT acceptable.

 mg

Answer: 30

A further drug dose calculation has been included to emphasise the importance of this topic.

In this case the girl weighs 20 kg. The dose is 1.5 mg per kilogram so the total daily dose of prednisolone is  $1.5 \times 20 = 30$  mg.

Content Guide reference: [Pharmaco-therapeutics](#)

## 22. Skin infections in children

An eight-year-old child has had a localised rash around the nose for two days.



Which is the **SINGLE MOST** appropriate **MINIMUM** number of days that this child be kept away from school once treatment has started?

Select **ONE** option only.

- A. 1
- B. 2
- C. 3
- D. 5
- E. 7

Answer: B (2 days)

Once treatment starts the earliest a child can return to school is 2 days provided there is a good response to treatment. Practical knowledge of incubation and quarantine periods will be required and is frequently asked by parents.

Content Guide reference: [Infectious diseases](#)

### 23. Liver disease

A 28-year-old man has had a flu-like illness with anorexia, nausea and fever for a week. He is jaundiced but abdominal and general examination is otherwise normal.

His liver function tests are as follows (normal ranges in brackets):

Bilirubin	98 $\mu\text{mol/L}$	(< 21 $\mu\text{mol/L}$ )
Aspartate aminotransferase (AST)	228 IU/L	(< 40 IU/L)
Alanine aminotransferase (ALT)	186 IU/L	(< 40 IU/L)
Alkaline phosphatase	652 IU/L	(35 – 104 IU/L)
Albumin	35 g/L	(35 – 50 g/L)
Total protein	73 g/L	(60 – 80 g/L)

#### **Part A**

**Which is the SINGLE MOST likely diagnosis? Select ONE option from A – E only.**

#### **Part B**

**Which is the SINGLE MOST appropriate SPECIFIC diagnostic test for this patient? Select ONE option from F - J only.**

- A Alcoholic liver disease
- B Cholelithiasis
- C Gilbert's syndrome
- D Hepatitis A
- E Primary biliary cirrhosis
  
- F Antimitochondrial antibodies
- G Blood alcohol level
- H Buccal smear
- I Hepatitis A IgM
- J Ultrasound liver and gallbladder

Answers: D (Hepatitis A)  
I (Hepatitis A IgM)

The history and pattern of liver function tests are consistent with hepatitis A, and the preceding history is consistent with this. Normal values will be given when there may be significant variation in normal values between laboratories, or for less familiar tests. For basic investigations, such as haemoglobin, candidates would be expected to know the normal range.

The correct diagnostic test is hepatitis A IgM (recent infection) rather than IgG. Anti-mitochondrial antibodies are usually positive in primary biliary cirrhosis.

This is an example of a two-part question where both parts have to be marked correctly to score one mark. These do not occur in every AKT, but if they do, the whole question will appear on one screen.

Content Guide reference: [Digestive problems](#)

### Risk assessment tools

- A ABCD<sup>2</sup>
- B CHAD<sub>2</sub>DS<sub>2</sub>VASC
- C Framingham
- D FRAX
- E QRisk
- F None of the above

**For the patient described, select the SINGLE MOST appropriate risk assessment tool, if any, from the list of options.**

24. A 54-year-old woman with type 2 diabetes has a sudden weakness of her left arm, which returns to normal within 20 minutes. Her blood pressure is 150/60, her pulse is 72 and regular, and her heart sounds are normal.
25. A 58-year-old man with a previous history of angina has a blood pressure of 180/80, a regular pulse of 84 and normal heart sounds.

You wish to assess his 10-year risk of future cardiovascular events.

Answer: 24 A (ABCD<sup>2</sup>)

The ABCD<sup>2</sup> score assesses stroke risk after TIA. CHAD<sub>2</sub>DS<sub>2</sub>VASC assesses risk of stroke in atrial fibrillation. Framingham and QRisk are used to assess cardiovascular risk for primary prevention. FRAX is used to calculate 10-year risk of fracture.

Answer: 25 F (None of the above)

This man has established coronary artery disease and so it is inappropriate to use a cardiovascular primary prevention risk tool.

Content Guide reference: [Cardiovascular problems](#)

## 26. Medical standards of fitness to drive

A 65-year-old retired man had a routine coronary artery angioplasty and stent insertion one week ago. He is now well and asymptomatic. He asks you for advice about driving his car.

**According to DVLA guidance, which is the SINGLE MOST appropriate advice with regard to driving? Select ONE option only.**

- A He may resume driving immediately
- B He may resume driving after a further week
- C He may resume driving one month after the angioplasty
- D He may resume driving six months after the angioplasty
- E He must inform the DVLA and await their decision before resuming driving

Answer: A (He may resume driving immediately)

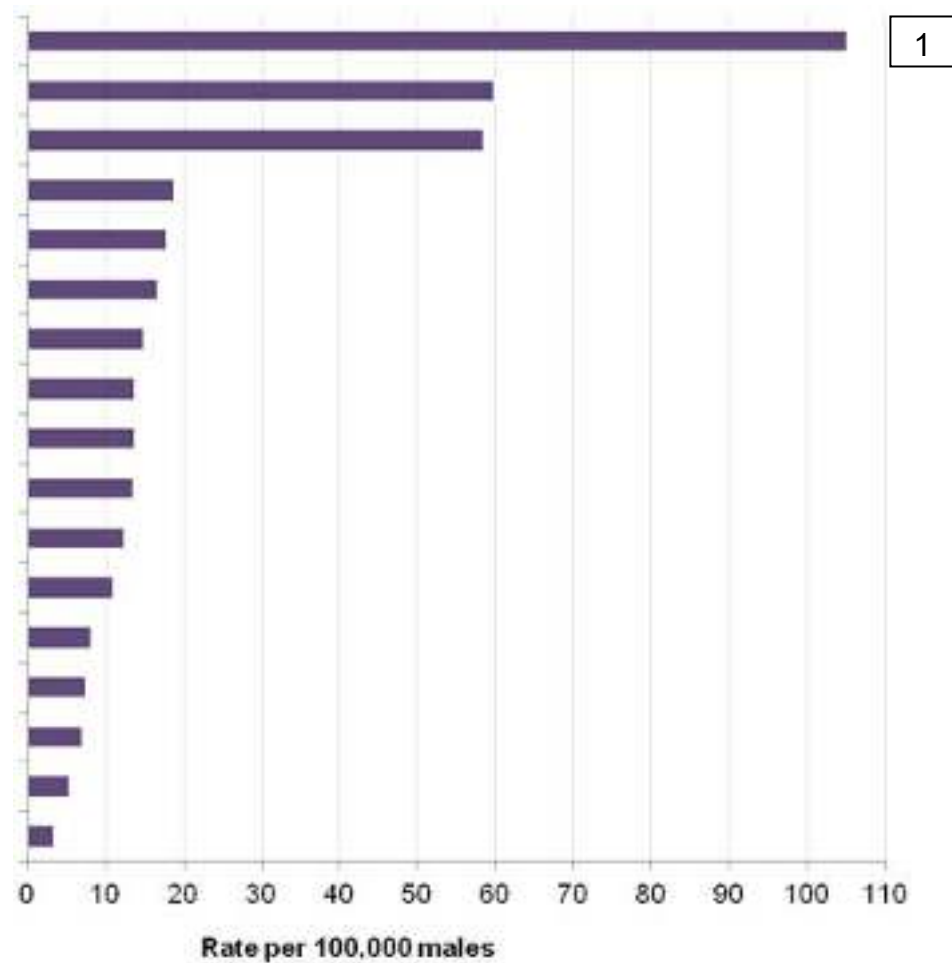
DVLA guidance is to stop driving for one week after the procedure. Candidates are not expected to know all the guidance for all medical conditions but it is important to be aware of common restrictions and legal requirements to give patients accurate advice, including when to check the current guidance. Remember there is a difference in guidance between car drivers, and goods and public service vehicle drivers.

Content Guide reference: [Admin, ethical and regulatory](#)



## 27. Data interpretation

The following graph shows age-standardised **INCIDENCE** rates for common cancers in males in the United Kingdom (2008-2010).



Which **SINGLE** cancer is represented by the bar labelled 1? Select **ONE** option only.

- A Bladder
- B Colorectal
- C Lung
- D Non-Hodgkin's lymphoma
- E Prostate

Answer: E (Prostate)

It is important to know about the epidemiology of common cancer, including an understanding of terms such as incidence, prevalence and mortality rates.

Research and statistics questions in the AKT are designed to test an understanding of data and different ways that they may be presented and interpreted.

Content Guide reference: [Research, statistics and epidemiology](#)

## 28. Statement of Fitness for Work (Form Med 3)

Which **SINGLE ONE** of the following statements applies to Form Med 3?  
Select **ONE** option only.

- A Advice on the statement is binding to employers
- B Assessment date can be retrospective based on written information
- C Can be completed by a doctor or practice nurse
- D Can only be used for a maximum period of one month
- E Should be used to certify a period of inpatient care

Answer: B (Assessment date can be retrospective based on written information)

Questions about certification are common in the 20 questions relating to the administrative aspects of UK general practice. Candidates should familiarise themselves with the current regulations about different types of certification as this will arise in daily work.

Content Guide reference: [Admin, ethical and regulatory](#)

## 29. Management of dyspepsia

A 43-year-old woman was diagnosed with a duodenal ulcer at gastroscopy. She has recently completed a course of *Helicobacter pylori* triple therapy. She comes to see you four weeks later and is symptom free.

**Which is the SINGLE MOST appropriate management option? Select ONE option only.**

- A Continue proton pump inhibitor for a further one week
- B Check *Helicobacter pylori* serology
- C No follow up needed
- D Refer for barium meal
- E Repeat gastroscopy

Answer: C (No follow up needed)

Current guidance is that no follow-up is required if the patient is symptom free.

Content Guide reference: [Digestive problems](#)

### 30. The investigation of infertility

A 25-year-old woman has been infertile for three years. She has had recurrent pelvic pain due to endometriosis. Investigations in primary care are reported as follows:

Full blood count – normal  
Thyroid function – normal  
Sex hormone profile - normal  
Rubella serology – immune  
Day 21 progesterone – normal  
*Chlamydia* swab – negative  
Pelvic ultrasound - normal

Her partner's semen analysis is reported as normal.

A referral to secondary care is agreed and she asks what is likely to happen next.

**According to current guidelines, which is the SINGLE MOST appropriate NEXT investigation? Select ONE option only.**

- A Cervical cytology
- B Hysterosalpingogram
- C Hysteroscopy
- D Laparoscopy
- E Post-coital test

Answer: D (Laparoscopy)

This would enable assessment of the extent of her endometriosis and any further intervention that may be required.

Content Guide reference: [Women's health](#)

### 31. Asthma

An 18-year-old woman with asthma has become increasingly wheezy over the past two days. Her hay fever symptoms are also worse than usual. After a salbutamol nebuliser, her peak flow rate increases from 250 to 450 L/minute and she feels much better.

**Which is the SINGLE MOST appropriate NEXT management step?  
Select ONE option only.**

- A Continue usual maintenance inhaler regime
- B Nebulised salbutamol as required
- C Oral amoxicillin
- D Oral chlorphenamine
- E Oral prednisolone

Answer: E (Oral prednisolone)

Management of asthma and other chronic diseases such as diabetes will be tested widely in the AKT, as these form a large part of GP workload. Candidates may not be familiar with routine monitoring and management as this is often done in separate nurse-led clinics, and you need to ensure that you get sufficient experience in these topics.

Content Guide reference: [Respiratory problems](#)

### 32. Back pain

A 70-year-old woman attends for her repeat prescription of 100 mcg levothyroxine daily, which she has been taking for the past 30 years. The last record of any blood test was six years ago. She mentions a recent episode of quite severe localised back pain which has now settled to a dull ache around the L3 region. She has no neurological signs

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Lumbar stenosis
- B Osteomalacia
- C Osteomyelitis
- D Osteoporosis
- E Paget's disease

Answer: D (Osteoporosis)

A patient on replacement levothyroxine should be monitored regularly to ensure the dose is correct. Over-replacement is associated with osteoporosis, which is the most likely diagnosis in this scenario.

Content Guide reference: [Musculo-skeletal](#)

### 33. Contraception

Which **ONE** of the following is an **ABSOLUTE** contraindication to the use of medroxyprogesterone acetate as a contraceptive? Select **ONE** option only.

- A Diabetes mellitus
- B Breast cancer diagnosed in the previous five years
- C Past history of ovarian cysts
- D Previous ectopic pregnancy
- E Smoking

Answer: B (Breast cancer diagnosed in the previous five years)

Depo-Provera should not be used within 5 years of a diagnosis of breast cancer and even after that, should only be used if non-hormonal methods are unacceptable and there is no evidence of disease recurrence. Because parenteral progestogen contraceptives inhibit ovulation, they are protective against ovarian cysts and ectopic pregnancy.

Content Guide reference: [Women's health](#)



### 34. Management of chest pain

A 55-year-old man has had severe central chest pain radiating into his left arm for the past two hours. He has no previous significant medical history. His BP is 150/85, his chest is clear and his pulse is regular 90/min.

**In addition to aspirin, which is the SINGLE MOST appropriate NEXT drug for this patient? Select ONE option only.**

- A Amiodarone
- B Carvedilol
- C Diamorphine
- D Furosemide
- E Ramipril

Answer: C (Diamorphine)

Acute myocardial infarction requires adequate pain relief and the current BNF recommends slow intravenous injection. Therapeutics questions in the AKT are referenced to the current edition of the BNF and BNFC and you should be familiar with the introductory chapters on general prescribing information.

Content Guide reference: [Cardiovascular problems](#)

### 35. Constipation

An 80-year-old edentulous patient who lives alone and refuses meals on wheels, complains of constipation without rectal bleeding. Her weight is steady, abdominal and rectal examinations are normal and she is otherwise well.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Alzheimer's disease
- B Carcinoma of the colon
- C Diverticular disease
- D Hypothyroidism
- E Poor fibre intake

Answer: E (Poor fibre intake)

The most likely cause of this patient's constipation is dietary, and there are no indicators of more serious disease in her history and examination.

Content Guide reference: [Digestive problems](#)

### 36. Child growth

A family from Romania arrived in the UK six months ago and registered with the practice. Their eight-month-old baby daughter who was born in Romania has been seen by the health visitor regularly. Her routine measurements have fallen from the 50th centile growth line to below the 25th centile growth line over the past three months. She has a history of minor respiratory infections and recurrent gastroenteritis.

**Which ONE of the following is the most important INITIAL investigation? Select ONE option only.**

- A Chromosome analysis
- B Glucose-6-phosphate dehydrogenase level
- C Jejunal biopsy
- D Sweat test
- E Thyroid function test

Answer: D (Sweat test)

The sweat test which measures the concentration of chloride excreted in sweat is used to screen for cystic fibrosis which is the most likely diagnosis. The UK newborn screening programme includes cystic fibrosis in the heel prick test but it is important to remember that some children will have missed routine screening and immunisations.

Not infrequently, candidates will look for an investigation that is NOT featured in the given list of options. Candidates HAVE to choose which is the single most appropriate option from those listed.

Content Guide reference: [Children and young people](#)

### 37. Childhood illness

A seven-year-old girl has a fever associated with a sore throat and loss of appetite. She has small red ulcers in her mouth and itchy spots on the palms of her hands and soles of her feet.

**Which is the SINGLE MOST likely virus causing her symptoms? Select ONE option only.**

- A Cocksackie A
- B Herpes simplex
- C Measles
- D Parvovirus B19
- E Varicella-zoster

Answer: A (Cocksackie A)

This child has hand foot and mouth disease which is caused by various strains of coxsackievirus (usually A) or enterovirus

Content Guide reference: [Children and young people](#)

Content Guide reference: [Infectious diseases](#)

### 38. Tiredness

A 50-year-old woman, who has recently been diagnosed with hypertension, complains of pain in her knees. She feels tired and her memory is poor. She has lost her appetite recently and feels nauseated most of the time. Urinalysis is normal.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Chronic fatigue syndrome
- B Chronic renal failure
- C Coeliac disease
- D Cushing's syndrome
- E Hyperparathyroidism

Answer: E (Hyperparathyroidism)

The patient is most likely to have hyperparathyroidism which is associated with secondary hypertension and symptoms due to hypercalcaemia such as bone and joint pain, loss of appetite, nausea, tiredness and psychological symptoms (characterised by the classical description of 'stones, bones, abdominal groans and psychic moans').

Content Guide reference: [Metabolic and Endocrine](#)

### 39. Anal pain

For the past week, a 30-year-old woman has noticed fresh red blood on the toilet paper and experiences sharp pain around the anus when she defecates. Today she can feel a very tender lump at the anal margin.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Anal fissure
- B Ischio-rectal abscess
- C Prolapsed rectal mucosa
- D Rectal carcinoma
- E Thrombosed haemorrhoid

Answer: E (Thrombosed haemorrhoid)

The history is suggestive of a thrombosed haemorrhoid. Sharp pain without the lump is more likely to be an anal fissure.

Content Guide reference: [Digestive problems](#)

#### 40. Tiredness

A 35-year-old woman stopped the combined oral contraceptive pill six months ago because of increased blood pressure. Her periods have not returned, she feels generally tired and has put on weight. A pregnancy test is negative and her fasting blood glucose is 9.2 mmol/L.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Anaemia
- B Chronic active hepatitis
- C Coeliac disease
- D Cushing's disease
- E Hypothyroidism

Answer: D (Cushing's disease)

This woman has hypertension, amenorrhoea, tiredness, weight gain and hyperglycaemia all secondary to Cushing's disease. This is a rare condition but easily missed.

Content Guide reference: [Metabolic and Endocrine](#)

Content Guide reference: [Women's health](#)

## Causes of double vision

- A Berry aneurysm
- B Cerebral glioma
- C Drug-induced
- D Graves' disease
- E Multiple sclerosis
- F Myasthenia gravis
- G Stroke

**For each patient described, select the SINGLE MOST likely diagnosis from the list of options. Select ONE option only.**

- 41.** A 27-year-old woman who is a non-smoker, suddenly develops double vision. She had an episode of reduced visual acuity in her left eye whilst on holiday 18 months previously, for which no cause was identified. She has no other significant past medical history.
- 42.** A 35-year-old man who is a non-smoker, suddenly develops a severe headache and double vision. His right pupil is fixed and dilated.
- 43.** A 48-year-old woman has transitory double vision towards the end of most days. She smokes 10 cigarettes/day. She has vitiligo and hypothyroidism.

Answer: 41 E (Multiple sclerosis)

This patient has developed a nerve lesion affecting the ocular muscles after a previous episode most likely due to optic neuritis from multiple sclerosis.

Answer: 42 A (Berry aneurysm)

A sudden severe headache in a young person associated with a neurological deficit is most likely due to subarachnoid haemorrhage from a Circle of Willis aneurysm.

Answer: 43 F (Myasthenia gravis)

Fatiguability affecting extra-ocular muscle weakness and the association with other organ specific autoimmune disease is suggestive of myasthenia gravis.

Content Guide reference: [Eye problems](#)



#### 44. Study design

Several studies have reported on the risk of lung cancer and exposure to tobacco smoke. Researchers now wish to reach a summary conclusion about the overall findings.

**Which is the SINGLE MOST appropriate study design? Select ONE option only.**

- A Case control study
- B Cohort study
- C Correlation study
- D Descriptive study
- E Meta-analysis

Answer: E (Meta-analysis)

A study combining quantitative data from more than one study is a meta-analysis.

Content Guide reference: [Research, statistics and epidemiology](#)

#### 45. Drug side effects

According to the current edition of the BNF, the following is a list of known side effects of clopidogrel.

**MATCH** each side effect of clopidogrel to the **MOST APPROPRIATE** column with regard to the predicted frequency.

- A. Acute liver failure
- B. Dyspepsia
- C. Pancytopenia
- D. Stevens-Johnson syndrome

Common	Very rare

Answers:   A    Very rare  
              B    Common  
              C    Very rare  
              D    Very rare

The AKT will test knowledge of therapeutics. It is not expected that the entire contents of the BNF be learned but you need to be aware of the relative frequency of side effects for common drugs.

Matching questions are presented in a drag and drop format so it is important to be confident of how to use the on-line software (see the online tutorial on the AKT website). All four listed side-effects have to be correctly placed to gain one mark.

Dyspepsia is common with clopidogrel, the other listed side effects are very rare. The introductory chapters of the BNF give the numerical definitions of the words 'common', 'rare' etc.

Content Guide reference: [Pharmaco-therapeutics](#)

**46. Topical corticosteroids**

1. Clobetasol propionate 0.05%
2. Clobetasone butyrate 0.05%
3. Hydrocortisone 0.5%
4. Hydrocortisone butyrate 0.1%

**Which of the following represents the order of preparations from LEAST to MOST potent steroid? Select ONE option only.**

- A 3,2,4,1
- B 3,4,1,2
- C 3,4,2,1
- D 4,2,3,1
- E 4,3,1,2
- F 4,3,2,1

**Answer:** A (3,2,4,1 (Hydrocortisone 0.5%, Clobetasone butyrate 0.05%, Hydrocortisone butyrate 0.1%, Clobetasol propionate 0.05%))

Hydrocortisone is a mild topical steroid, Clobetasone butyrate (Eumovate) is moderate strength, Hydrocortisone butyrate (Locoid) potent and Clobetasol propionate (Dermovate) very potent.

Rank ordering questions might have, as here, a list of potential orders to select from, or require the candidate to list in free text their suggested order.

Content Guide reference: [Skin problems](#)

#### 47. Drug interactions

Grapefruit juice should be avoided with which **ONE** of the following drugs?  
Select ONE option only

- A Aciclovir
- B Amoxicillin
- C Ramipril
- D Simvastatin
- E Warfarin

Answer: D (Simvastatin)

Grapefruit juice interferes with the metabolism of many common drugs, and it is important to warn patients about this.

Content Guide reference: [Pharmaco-therapeutics](#)

#### 48. Treatment of fungal nail infections

Which is the **SINGLE MOST** appropriate treatment for a *Trichophyton rubrum* toenail infection? Select ONE option only

- A Oral fluconazole
- B Oral griseofulvin
- C Oral terbinafine
- D Topical clotrimazole
- E Topical terbinafine

Answer: C (Oral terbinafine)

Terbinafine is the first line oral agent for treating *T. rubrum* nail infections. Fluconazole is less effective for dermatophyte infections but is sometimes used for yeast infections. Topical agents are not successful in any but the most superficial fungal nail infections.

Content Guide reference: [Skin problems](#)

#### 49. Abnormal blood results

A 56-year-old woman with type 2 diabetes has lost her appetite and developed pruritus over the past few days. On examination she is jaundiced but general and abdominal examination is otherwise normal.

She takes regular metformin and simvastatin, and has just finished a course of erythromycin for localised cellulitis.

Her liver function tests are as follows (normal ranges in brackets):

Bilirubin	112 µmol/L	(< 21 µmol/L)
Aspartate aminotransferase (AST)	56 IU/L	(< 40 IU/L)
Alanine aminotransferase (ALT)	72 IU/L	(< 40 IU/L)
Alkaline phosphatase	986 IU/L	(35 – 104 IU/L)
Albumin	35 g/L	(35 – 50 g/L)
Total protein	73 g/L	(60 – 80 g/L)

**Which is the SINGLE MOST LIKELY diagnosis? Select ONE option only.**

- A Alcoholic liver disease
- B Drug-induced cholestasis
- C Fatty liver disease
- D Gilbert's syndrome
- E Primary biliary cirrhosis

Answer: B (Drug-induced cholestasis)

The history and pattern of liver function tests are consistent with a cholestatic jaundice with a very high alkaline phosphatase. There are many drugs which can cause this adverse reaction including phenothiazines, flucloxacillin and erythromycin.

Content Guide reference: [Digestive problems](#)

## 50. Skin rash



A 34-year-old woman has developed this rash on her buttock over the past two days. It is sore to touch and she has no rash elsewhere. She says this has happened on at least three previous occasions and the rash is always in the same place.

**Which is the SINGLE MOST likely diagnosis? Select ONE option only.**

- A Chickenpox
- B Coxsackie virus infection
- C Dermatitis herpetiformis
- D Herpes simplex
- E Herpes zoster

Answer: D (Herpes simplex)

This recurrent vesicular rash is most likely due to herpes simplex, which can occur anywhere on the body, although is most common on the lips and genitals.

Content Guide reference: [Skin problems](#)