



## MS AKT Practice Paper 6

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 been experiencing hot flushes and vaginal dryness. She has not had a menstrual period for the past 6 months. There is no relevant family history and she has had no other medical problems. She had a cone biopsy for early cervical intra-epithelial neoplasia 10 years ago. Her symptoms are intolerable to her and she would like to have hormone replacement therapy (HRT).

What is the most appropriate management?

- A. Continuous combined oestrogen and progestogen HRT
- B. Cyclical combined oestrogen and progestogen HRT
- C. HRT is contra-indicated
- D. Oestrogen only HRT
- E. Topical oestrogen (vaginal)

2. A 72 year old man is confused. His wife reports that on several occasions in recent weeks he has forgotten to meet friends with whom he has made arrangements. He has also not passed on messages that have been given to him. He recently went for a walk and phoned his wife in an agitated state to say that he was lost. She reports the confusion has gradually worsened over several months. He takes simvastatin for primary heart disease prevention.

He has no symptoms of an acute illness. There are no focal neurological findings.

What is the most appropriate class of drug therapy to slow the progression of his symptoms?

- A. 5-Hydroxytryptamine (5-HT) antagonist
- B. Acetylcholinesterase inhibitor
- C. Dopamine agonist
- D. Gamma aminobutyric acid (GABA) inhibitor
- E. Serotonin reuptake inhibitor



- 3.** A 17 year old girl has had heavy periods for the last year. They typically last 5–7 days and occur every 29 days. She passes clots as well as fresh blood. During a period she has to change her tampon eight times a day and sometimes requires a sanitary towel as well. Menarche occurred aged 13 years. She is sexually active and does not bleed after sex, or in between periods.

Abdominal examination is normal.

What is the most appropriate next investigation?

- A.** Endocervical and high vaginal swabs
- B.** Full blood count
- C.** Serum prolactin level
- D.** Thyroid function tests
- E.** Transvaginal and pelvic ultrasound scan

- 4.** 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



- 5.** A full term newborn boy is discharged home 48 hours after birth. The next day, his 2 year old sibling develops a florid chickenpox rash. His mother has detectable varicella antibodies. The newborn remains clinically well.

What is the most appropriate management decision?

- A.** Admit for observation
- B.** Check the newborn's antibody status for varicella antibodies
- C.** No action is necessary
- D.** Treat with Aciclovir
- E.** Treat with zoster immune globulin

- 6.** A 37 year old woman who is 10 weeks pregnant has experienced excessive vomiting for 1 week. The fundal height is consistent with 16 weeks' gestation.

Her temperature is 37.2°C, pulse 100 bpm and BP 180/110 mmHg.

What is the most likely diagnosis underlying the clinical presentation?

- A.** Gastroenteritis
- B.** Missed abortion
- C.** Molar pregnancy
- D.** Pre-eclampsia
- E.** Pregnancy-induced hypertension



- 7.** A 38 year old woman notices fresh vaginal bleeding. She is 10 weeks pregnant, having conceived following in vitro fertilisation. She has been otherwise well.

Her BP is 120/75 mmHg and pulse 70 bpm. She has mild suprapubic tenderness and her uterus is palpable in her abdomen. Vaginal examination reveals that the cervical os admits a finger.

What is the most likely diagnosis?

- A.** Complete miscarriage
- B.** Ectopic pregnancy
- C.** Inevitable miscarriage
- D.** Missed miscarriage
- E.** Molar pregnancy

- 8.** A 35 year old woman has started to bleed heavily following a normal vaginal delivery and delivery of the placenta. She had gestational hypertension and was induced at 40 weeks' gestation.

What is the most appropriate initial management?

- A.** Carboprost
- B.** Ergometrine
- C.** Oxytocin
- D.** Misoprostol
- E.** Tranexamic acid



- 9.** A 69 year old woman attends her GP with constant dribbling of urine. She has had to wear pads continuously for the last 12 months. She had radiotherapy for carcinoma of the cervix when she was 48 years old.

Her temperature is normal. Her bladder is not palpable or tender and neurological examination is normal.

What is the most likely cause of her symptoms?

- A.** Detrusor overactivity
- B.** Neurogenic bladder
- C.** Stress incontinence
- D.** Urinary infection
- E.** Vesicovaginal fistula

- 10.** A 40 year old woman is admitted with a seizure. She is a primigravid woman, at 28 weeks' gestation. She had epigastric pain and blurred vision preceding the seizure.

Her BP is 155/105 mmHg. Reflexes are brisk with two beats of ankle clonus. Her urinalysis shows protein 2+.

What intravenous drug is the most appropriate immediate treatment?

- A.** Diazepam
- B.** Hydralazine
- C.** Levetiracetam
- D.** Magnesium sulfate
- E.** Phenytoin



**11.** A 3 year old girl has had a fever and a runny nose for 2 days.

She is alert but miserable. Her temperature is 39.6°C, pulse 150 bpm (95-140), BP 105/62 mmHg (90/50-120/80), respiratory rate 36 breaths per minute (20-30) and oxygen saturation 97% in air. She has a red throat and looks flushed with a flat, erythematous rash across her trunk and face that feels rough. There is no rash around her mouth.

What is the most likely diagnosis?

- A.** Kawasaki disease
- B.** Measles
- C.** Parvovirus infection
- D.** Rhinovirus infection
- E.** Scarlet fever

**12.** An 80 year old man has been shouting in the middle of the night for 5 days. He lives alone and has been telling his neighbours that he has seen people trying to steal from him, but there is no evidence for this. He has no past psychiatric history. He is partially sighted and deaf.

He cannot sustain a conversation and there is disorganisation to his thoughts with distractibility.

What is the most likely diagnosis?

- A.** Alzheimer dementia
- B.** Anxiety disorder
- C.** Delirium
- D.** Lewy body dementia
- E.** Schizophrenia



- 13.** A 20 year old woman seeks contraceptive advice. She had unprotected sexual intercourse 4 days ago. Her last menstrual period was 16 days ago. She has a 28 day cycle. She has been using condoms reliably as her method of contraception until this incident.

What is the most appropriate method of contraception?

- A.** Copper-containing intrauterine device
- B.** Ella-One® (ulipristal acetate postcoital contraception)
- C.** Intrauterine progestogen system (Mirena coil)
- D.** Levonelle® (levonorgestrel) postcoital contraception
- E.** Postcoital contraception not appropriate

- 14.** A 6 month old baby vomited and developed an erythematous rash over her lips and chin, within minutes of being given formula milk for the first time. The rash took 1 hour to subside. The following week, the mother dripped a couple of drops of formula milk onto the baby's arm. The baby develops an erythematous rash over the arm within 1 minute of this.

The mother is returning to work and does not wish to continue breastfeeding or expressing milk.

What is the best management option?

- A.** Goat's milk formula
- B.** Hydrolysed formula
- C.** Lactose free formula
- D.** Latex free teat
- E.** Soya milk formula





- 15.** A 28 year old woman is elated in mood. She has not slept for 7 days and has been attending all-night parties. She is sexually disinhibited and believes that she is a member of the royal family. She was previously fit and well and has no past psychiatric history.

A urine drug screen is negative.

What is the most appropriate medication to prescribe?

- A.** Diazepam
- B.** Lithium carbonate
- C.** Olanzapine
- D.** Sodium valproate
- E.** Zuclopenthixol decanoate

- 16.** A 19 year old man develops painful muscle spasms in his neck. He has been an inpatient for 3 days on the psychiatric ward for treatment of psychosis. He has been taking haloperidol 5 mg orally twice daily since yesterday.

What is the most appropriate immediate treatment?

- A.** Baclofen
- B.** Diazepam
- C.** L-dopa
- D.** Olanzapine
- E.** Procyclidine



- 17.** A 60 year old man believes that the government has been monitoring him for 10 years, despite him repeatedly writing to the Prime Minister to ask for this to stop. His beliefs are present whatever his mood. He has never heard voices when nobody else is around.

What is the most likely diagnosis?

- A.** Anankastic personality disorder
- B.** Delusional disorder
- C.** Depression with psychosis
- D.** Paranoid schizophrenia
- E.** Schizoid personality disorder

- 18.** 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/m<sup>2</sup>.

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



**19.** 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

**20.** The father of an 18 year old woman reports that she is socially isolated and anxious. She has recently dropped out of college. She has never been very sociable, has few friends and struggles to understand other people's feelings. She has always had difficulties expressing herself and often speaks to herself when alone. She has always struggled with changes in routine.

What is the most likely diagnosis?

- A.** Anxious (avoidant) personality disorder
- B.** Autism spectrum disorder
- C.** Generalised anxiety disorder
- D.** Prodromal phase of schizophrenia
- E.** Social phobia



- 21.** A 5 year old girl has a rash over her arms that has been gradually worsening over the past month. Her mother reports that she seems more tired than usual.

She has a petechial rash over both forearms with some petechiae over her left anterior chest wall. She is pale and has hepatosplenomegaly.

What is the most appropriate management option?

- A.** Full blood count and blood film and review within 48 hours
- B.** Intramuscular benzylpenicillin sodium and immediate ambulance
- C.** Oral prednisolone and review in 3 days
- D.** Routine general paediatrics outpatient appointment
- E.** Urgently referral to paediatric assessment unit

- 22.** A 6 hour old boy, born at term, is grunting and cyanosed. He has been struggling to feed.

His temperature is 36.8°C, pulse 190 bpm (120-160), respiratory rate 60 breaths per minute (30-60) and oxygen saturation 82% breathing air. His oxygen saturation does not improve significantly breathing high flow oxygen. He has a loud single second heart sound and a systolic murmur.

He is treated with intravenous fluids and antibiotics.

What is the most appropriate next medication?

- A.** Alprostadil
- B.** Ibuprofen
- C.** Indomethacin
- D.** Sildenafil
- E.** Surfactant



**23.** A 3 year old boy has had diarrhoea for 6 months. He has 4-5 watery stools per day that contain visible pieces of sweetcorn and other vegetables. He is thriving and developing well.

What is the most likely diagnosis?

- A.** Coeliac disease
- B.** Gastroenteritis
- C.** Inflammatory bowel disease
- D.** Lactose intolerance
- E.** Toddler diarrhoea

**24.** A 28 year old primigravida attends the antenatal clinic at 35 weeks' gestation. She has 2 weeks of persistent itching of her palms, soles and abdomen. Her pregnancy has been uncomplicated to date, and she is feeling good foetal movements.

She has red scratch marks on her abdomen with no rash.

What is the most appropriate diagnostic investigation?

- A.** Anti-mitochondrial antibody
- B.** Iron studies
- C.** Liver function tests
- D.** Thyroid function tests
- E.** Urea and electrolytes



- 25.** A 28 year old woman is admitted with a sudden onset of abdominal pain and vaginal bleeding. She is 38 weeks pregnant.

Her pulse is 120 bpm and BP 110/80 mmHg. She has a tender abdomen. The fetal heart rate is 170 bpm.

What is the most likely diagnosis?

- A.** Necrosis of a fibroid
- B.** Placenta praevia
- C.** Placental abruption
- D.** Pre-term labour
- E.** Uterine rupture

- 26.** A 2 year old boy has had diarrhoea and vomiting, decreased food and fluid intake and fewer wet nappies for 3 days. He is unable to tolerate oral or nasogastric fluids. He is estimated clinically to be 5% dehydrated.

Investigations:

Sodium	136 mmol/L	(133–146)
Potassium	4.5 mmol/L	(3.5–5.0)
Chloride	104 mmol/L	(95–106)
Bicarbonate	25 mmol/L	(22–29)
Urea	6.0 mmol/L	(2.5–6.5)
Creatinine	30 µmol/L	(21–36)
Blood glucose	4 mmol/L	

What is the most appropriate intravenous fluid for maintenance of hydration?

- A.** 0.18% sodium chloride + 4% glucose
- B.** 0.45% sodium chloride + 5% glucose
- C.** 0.9% sodium chloride
- D.** 0.9% sodium chloride + 5% glucose
- E.** PlasmaLyte



- 27.** A 23 year old woman has barricaded herself with her baby in the bathroom, shouting that it is unsafe to come out because the house is infected. She thinks that someone is trying to kill her and her baby. Her mood has not been low at any stage. She is four days post-caesarean section, and her physical recovery has been uncomplicated. She was not on any medication during her pregnancy. She drinks 20 units of alcohol a week.

She is orientated in time and place.

What is the most likely diagnosis?

- A.** Alcohol withdrawal
- B.** Delirium
- C.** Obsessive-compulsive disorder
- D.** Post-natal depression
- E.** Puerperal psychosis

- 28.** 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



- 29.** A 30 year old man says that he has never really felt happy. He has no friends and he prefers solitary activities. He has never wanted a sexual relationship. He describes feeling as if he has 'always lived in a shell'. He works as an information technology specialist.

What is the most likely diagnosis?

- A.** Anxious [avoidant] personality disorder
- B.** Dissocial personality disorder
- C.** Dysthymia
- D.** Schizoid personality disorder
- E.** Schizotypal disorder

- 30.** A 29 year old woman has had intermittent vaginal bleeding since a levonorgestrel-releasing intrauterine system (Mirena<sup>®</sup> coil) was inserted 6 weeks ago.

What is the most appropriate investigation?

- A.** Cervical smear
- B.** Colposcopy
- C.** High vaginal swab
- D.** No investigation required
- E.** Transvaginal pelvic ultrasonography





**31.** A 28 year old woman has back pain. She is in the third trimester of pregnancy. She is advised that ibuprofen is contra-indicated.

What potential complication can occur in the fetus with this medication?

- A.** Acute kidney injury
- B.** Liver failure
- C.** Premature closure of ductus arteriosus
- D.** Preterm labour
- E.** Reye syndrome

**32.** A 15 month old girl has been able to sit unsupported for 1 month. She has a vocabulary of 4 separate words and can build a tower of 2 blocks using a pincer grip. She was born at 30 weeks' gestation.

What is the best description of her current developmental progress?

- A.** Fine motor delay
- B.** General developmental delay
- C.** Gross motor delay
- D.** Mild developmental delay
- E.** Normal development



- 33.** A 53 year old man has had 2 years of low mood, poor concentration and sleep. It is now affecting his job and interactions with family, and he has become socially reclusive. He had a myocardial infarction 2 years ago and has type 2 diabetes.

He is referred for cognitive behavioural therapy, but also wishes to start medication.

What is the most appropriate medication to prescribe?

- A.** Citalopram
- B.** Fluoxetine
- C.** Mirtazapine
- D.** Sertraline
- E.** Venlafaxine

- 34.** A 15 year old boy has had severe anorexia nervosa for one year. He is not acutely physically unwell.

His weight is 75% of the expected weight for his height, age and sex.

What is the most appropriate therapy?

- A.** Cognitive-analytic therapy
- B.** Cognitive-behaviour therapy
- C.** Family therapy
- D.** Non-directive counselling
- E.** Psychodynamic psychotherapy



- 35.** A 51 year old man with Down syndrome has 6 months of poor self-care, increased aggression and personality change. Recently, he has occasionally got lost on the way back from the local shop.

His temperature is 36.5°C, pulse 85 bpm and BP 127/89 mmHg. Urinalysis is negative.

What is the most likely diagnosis?

- A.** Alzheimer disease
- B.** Delirium
- C.** Depression
- D.** Hypothyroidism
- E.** Psychosis

- 36.** 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



- 37.** A 35 year old man has a fear of spiders. He is a pub landlord and this interferes with his ability to work in the cellar. He recalls having been bitten by a spider aged 6 years when on holiday in Africa. He has no previous psychiatric history and is otherwise well.

What is the most appropriate treatment?

- A.** Benzodiazepine
- B.** Cognitive behaviour therapy
- C.** Eye movement desensitisation and reprocessing
- D.** Psychoanalytic psychotherapy
- E.** Serotonin specific reuptake inhibitor

- 38.** A boy is born at 40 weeks' gestation with a male phenotype. At the newborn physical examination neither testis is palpable.

What is the most likely diagnosis?

- A.** Androgen insensitivity syndrome
- B.** Excess in utero oestrogen exposure
- C.** Klinefelter syndrome
- D.** Physiological delay in descent
- E.** Retractable testes



- 39.** A 17 year old girl attends her GP with her mother. She has had severe headaches, stomach aches and has vomited four times over 2 days.

She was invited to a close friend's birthday party but refused to attend. She is extremely shy and isolated, and has very few friends. She is always worried that others criticise her and is extremely sensitive to any rejection. She is also very attached to her mother.

What personality disorder is most likely?

- A.** Avoidant
- B.** Dependent
- C.** Paranoid
- D.** Schizoid
- E.** Schizotypal

- 40.** A 7 year old boy has been limping for the past 6 weeks but cannot remember any injury. His left leg is slightly painful when he runs but not at rest. He has not had any recent infection and is currently well.

On examination, there is a decreased range of movement at the left hip but no other abnormal findings. He is Trendelenburg test positive and there is some gluteal wasting.

What is the most likely diagnosis?

- A.** Osteomyelitis
- B.** Osteosarcoma
- C.** Perthes disease
- D.** Slipped upper femoral epiphysis
- E.** Transient synovitis



- 41.** A term newborn boy develops jaundice within 24 hours of birth. The total serum bilirubin is 130 mg/ dL, which requires phototherapy but not exchange transfusion. The baby's blood group is A positive.

What test result would suggest early haemolytic jaundice?

- A.** Conjugated serum Bilirubin 9.7 mg/dL
- B.** Direct Coombs test negative
- C.** Glucose 6 phosphate dehydrogenase (G6PD) enzyme normal
- D.** Maternal blood group O positive
- E.** Polycythaemia

- 42.** 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



**43.** A 6 year old boy's parents have noticed long-standing hearing difficulties. His teachers have commented on poor school performance and behaviour.

His speech is normal and there is no otalgia. The ear canals are narrow with non-occluding wax.

What is the most appropriate next step in management?

- A.** Aural olive oil drops
- B.** Grommet insertion
- C.** Pure tone audiometry
- D.** Referral for hearing aids
- E.** Review in 3 months