



## 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)

**Correct answer: B) Cyclical combined oestrogen and progestogen HRT**

**Justification:** The most appropriate management is cyclical combined oestrogen and progestogen hormone replacement therapy (HRT). Cyclical combined HRT involves the sequential administration of both oestrogen and progestogen, which helps prevent endometrial hyperplasia and reduces the risk of uterine cancer in women with an intact uterus. By combining oestrogen and progestogen, cyclical HRT manages menopausal symptoms while minimising potential risks associated with unopposed oestrogen therapy.

**NICE guideline [NG23] Published: 12 November 2015 Last updated: 07 November 2024**

**<https://www.nice.org.uk/guidance/ng23/chapter/Recommendations>**



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

**Correct answer: B) Acetylcholinesterase inhibitor**

**Justification:** The most appropriate class of drug therapy to recommend is acetylcholinesterase inhibitors. Given the progressive nature of his symptoms and the absence of focal neurological findings, the most likely diagnosis is Alzheimer's disease. Acetylcholinesterase inhibitors work by increasing the availability of acetylcholine in the brain and are commonly used in the management of Alzheimer disease and other types of dementia. While they do not cure dementia, they may help improve cognitive function and slow the progression of symptoms in some patients.

**NICE guideline [NG97] Published: 20 June 2018**

<https://www.nice.org.uk/guidance/ng97/chapter/Recommendations>



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

**Correct answer: B) Full blood count**

**Justification:** The most appropriate next investigation is a full blood count (FBC). Heavy menstrual bleeding, or menorrhagia can cause anaemia due to chronic blood loss. A full blood count helps assess her haemoglobin levels and MCV. TFTs should only be checked if there are symptoms of a thyroid disorder. Imaging is only required if the uterus is palpable on abdominal examination.



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

**Correct answer: B) Foreign body**

**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.



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

**Correct answer: C) No action is necessary**

**Justification:** The most appropriate management decision is no action is necessary. The newborn remains clinically well, and the mother has detectable varicella antibodies, indicating likely passive immunity transfer to the newborn. The fact that the newborn is clinically well also supports a conservative approach with no specific treatment or observation required.



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

**Correct answer: C) Molar pregnancy**

**Justification:** The most likely diagnosis is molar pregnancy. This is the classic presentation of molar pregnancy as the underlying diagnosis with large for gestation uterus and severe early onset pre-eclampsia as a secondary phenomenon. Molar pregnancy can present with exaggerated symptoms of pregnancy such as excessive vomiting and rapidly increasing uterine size due to the proliferation of abnormal trophoblastic tissue. Additionally, elevated blood pressure can occur as a result of gestational trophoblastic disease-induced hypertension. Missed abortion must be diagnosed with an ultrasound and Pregnancy Induced Hypertension occurs after 20/40. Gastroenteritis would have normal-low BP, not raised.



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

**Correct answer: C) Inevitable miscarriage**

**Justification:** The most likely diagnosis is inevitable miscarriage. Cervix is wide open, this suggests impending miscarriage of a multiple gestation. Miscarriages are more common with multiple pregnancy, and in vitro-fertilisation increases the likelihood of multiple pregnancy. The uterus is palpable even at 10 weeks suggests this may be the case. Inevitable miscarriage refers to an ongoing miscarriage where cervical dilation has already occurred, and vaginal bleeding is present. The combination of vaginal bleeding, cervical dilation, and palpable uterus suggests that the process of miscarriage is underway and cannot be prevented.





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

**Correct answer: C) Oxytocin**

**Justification:** The most appropriate management for postpartum haemorrhage following delivery of the placenta in a woman with gestational hypertension is oxytocin, as it can help to contract the uterus and reduce bleeding.

Carboprost, and misoprostol may also be used if oxytocin is ineffective, but they can cause adverse effects and should be used with caution. Ergometrine can exacerbate hypertension and is essentially contra-indicated in hypertension. Tranexamic acid may also be used as an adjunct therapy to help control bleeding, but it should not be used as the sole treatment. However, the specific management will depend on the severity of the bleeding and other clinical factors, and close monitoring of the patient is essential.



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

**Correct answer: E) Vesicovaginal fistula**

**Justification:** The most likely diagnosis is vesicovaginal fistula. Vesicovaginal fistula occurs when an abnormal connection forms between the bladder and the vagina, allowing urine to leak continuously into the vaginal vault. The history of radiotherapy increases the risk of tissue damage and subsequent fistula formation. The absence of fever, palpable or tender bladder, and normal neurological examination findings make other causes less likely.



- 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

**Correct answer: D) Magnesium sulfate**

**Justification:** The most appropriate immediate treatment for this patient is magnesium sulfate. She is presenting with features of severe pre-eclampsia and eclampsia, which require urgent management to prevent maternal and foetal complications. Magnesium sulfate is the first-line treatment for preventing seizures in women with severe pre-eclampsia and eclampsia. Diazepam and phenytoin are not recommended for the prevention of seizures in pre-eclampsia/eclampsia. Hydralazine is a second-line agent for the control of hypertension, and levetiracetam is an antiepileptic drug that is not routinely used in the management of pre-eclampsia/eclampsia.



**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

**Correct answer: E) Scarlet fever**

**Justification:** The most likely diagnosis is scarlet fever. Scarlet fever is a bacterial infection caused by Group A Streptococcus. It typically presents with a high fever, sore throat, and a characteristic sandpaper-like rash that starts on the trunk and spreads to the extremities. The cheeks may look flushed with often a pale area around the mouth. Measles can cause fever and rash, but typically presents with a cough, runny nose, and red, watery eyes. Parvovirus infection can cause a rash, but it is typically milder and not associated with a fever. Kawasaki disease can also cause a fever and rash, but it usually presents with conjunctivitis, swollen lymph nodes, and redness and later peeling of the hands and feet. Rhinovirus infection can cause a runny nose, but is not typically associated with fever or rash.



- 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

**Correct answer: C) Delirium**

**Justification:** The most likely diagnosis is delirium. Delirium is a common acute confusional state characterised by disturbances in attention, awareness, and cognition. The sudden onset of symptoms, including perceptual disturbances and disorganised thinking, coupled with the absence of prior psychiatric history, suggests an underlying medical or physiological cause. In this case, his age, sensory impairments, and acute onset of symptoms make delirium the most likely diagnosis.



- 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

**Correct answer: A) Copper-containing intrauterine device**

**Justification:** The most appropriate method of contraception after unprotected sexual intercourse is emergency contraception. The options for emergency contraception include the copper-containing intrauterine device (IUD) and emergency contraceptive pills. The copper containing IUD is highly effective up to 5 days post UPSI (nearly 100% effective) and is therefore the most appropriate option at this stage. COCP and high dose progestogens can also be used but are less effective. Depot and Mirena are not licenced for emergency contraception.



- 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

**Correct answer: B) Hydrolysed formula**

**Justification:** The best management option is hydrolysed formula. These symptoms suggest a potential allergic reaction to cow's milk protein, prompting the need for an alternative formula that is less allergenic.

Hydrolysed formula contains proteins that are broken down into smaller fragments, making them less likely to trigger an allergic response compared to intact cow's milk protein. Goat's milk is not recommended for infants as it has similar protein structures to cow's milk and can cause similar allergic reactions. Lactose-free formula is not necessary unless the infant has a diagnosed lactose intolerance, which is rare in infants. A latex-free teat may be needed if the infant has a latex allergy, but this is not relevant in this case. Soya milk is not recommended for infants under 6 months of age, as it may also cause an allergic reaction and may contain phyto-oestrogens.



- 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

**Correct answer: C) Olanzapine**

**Justification:** In this context olanzapine would be appropriate as it would act as both antipsychotic and sedative medication. Diazepam and zuclopenthixol decanoate are not the treatments of choice for mania. Lithium carbonate is a standard treatment for bipolar disorder, but it may take several days to become effective and is not appropriate for the acute management of severe mania. Sodium valproate is not prescribed to women of child-bearing age. Valproate is highly teratogenic and evidence supports that use in pregnancy leads to neurodevelopmental disorders (approx. 30–40% risk) and congenital malformations (approx. 10% risk). Valproate must not be used in women and girls of childbearing potential unless the conditions of the Pregnancy Prevention Programme are met and only if other treatments are ineffective or not tolerated, as judged by an experienced specialist.

**Clinical guideline [CG185] Published: 24 September 2014 Last updated: 21 December 2023**

<https://www.nice.org.uk/guidance/cg185/chapter/Recommendations>





- 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

**Correct answer: E) Procyclidine**

**Justification:** Dystonic reactions are common side effects of antipsychotic medications like haloperidol and typically manifest as involuntary muscle contractions, particularly in the neck region. These reactions are due to an imbalance between dopamine and acetylcholine levels in the substantia nigra caused by dopamine blockade. Anticholinergic agents, such as Procyclidine, help alleviate dystonic symptoms by blocking the excessive cholinergic activity thought to contribute to the muscle spasms.



- 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

**Correct answer: B) Delusional disorder**

**Justification:** The most likely diagnosis is delusional disorder. The delusions have not escalated or changed for significant period and are considered to be "non-bizarre" i.e. situations that are not real but also not impossible. These beliefs began 10 years old so this is not a personality disorder as symptoms were not present since late adolescence. There are no other symptoms commonly seen in schizophrenia, such as hearing voices or experiencing disorganised speech and behaviour.



- 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

**Correct answer: E) Premature ovarian failure**

**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.



**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

**Correct answer: A) Duodenal atresia**

**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.



- 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

**Correct answer: B) Autism spectrum disorder**

**Justification:** The most likely diagnosis is Autism Spectrum Disorder (ASD). Her history of social isolation, anxiety, difficulty understanding others' feelings, limited social interactions, struggles with self-expression, and difficulty with changes in routines are characteristic features of ASD. The presence of repetitive behaviours, such as talking to herself when alone, further supports this diagnosis. Individuals with ASD often have challenges in social communication and interaction, as well as restricted and repetitive patterns of behaviour, interests, or activities.



- 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

**Correct answer: E) Urgently referral to paediatric assessment unit**

**Justification:** The most appropriate management option is to refer her urgently to the paediatric assessment unit. The presence of a petechial rash, hepatosplenomegaly, and tiredness in a child should raise suspicion of a serious underlying condition, such as leukaemia or other haematological disorders. Urgent referral to the paediatric assessment unit is necessary to ensure prompt diagnosis and treatment. Intramuscular benzylpenicillin sodium is not appropriate in this case, as it is unlikely to address the underlying condition. Prednisolone is also not appropriate, as it is not indicated for the management of petechial rash and hepatosplenomegaly. Referral to a general paediatric clinic is not urgent enough, given the severity of the symptoms, and a full blood count and blood film should be taken urgently, but this should be done in the context of urgent referral to the 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

**Correct answer: A) Alprostadil**

**Justification:** The most appropriate next medication is Alprostadil. These clinical findings are consistent with congenital heart disease. The loud single second heart sound and systolic murmur suggest a possible ventricular septal defect (VSD) or patent ductus arteriosus (PDA). The grunting and cyanosis, along with the low oxygen saturation that does not improve with high flow oxygen, suggest that the baby is experiencing significant respiratory distress. Alprostadil, a prostaglandin E1 analogue, helps maintain ductal patency and allows adequate systemic perfusion until definitive management, such as surgical correction or catheter-based intervention, can be undertaken. Ibuprofen and indomethacin are both nonsteroidal anti-inflammatory drugs that are used to treat patent ductus arteriosus, but they are not appropriate in this case as they would cause closure of the ductus arteriosus, exacerbating the baby's symptoms. Sildenafil is a medication used to treat pulmonary hypertension, which can occur in neonates with congenital heart defects, but it is not the most appropriate initial medication in this case. Surfactant is a medication used to treat respiratory distress syndrome, which is not the primary diagnosis in this case.



**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

**Correct answer: E) Toddler diarrhoea**

**Justification:** The most likely diagnosis is toddler diarrhoea. Toddler diarrhoea is a common condition in children between 6 months and 5 years of age, characterised by chronic, non-bloody, watery diarrhoea with no signs of malabsorption or growth failure. It typically occurs during the daytime and is associated with the intake of large amounts of fruit juice, high-fibre foods, and other carbohydrates. It is usually self-limiting and resolves by the age of 5 years.





**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

**Correct answer: C) Liver function tests**

**Justification:** The most appropriate investigation in this case is liver function tests. The persistent itching and scratch marks suggest obstetric cholestasis, a liver disorder that occurs in pregnancy. Liver function tests are important to assess the degree of hepatic dysfunction, and elevated serum bile acids would confirm the diagnosis. Other investigations such as anti-mitochondrial antibody, iron studies, thyroid function tests, and urea and electrolytes would not be helpful in diagnosing obstetric cholestasis.



**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

**Correct answer: C) Placental abruption**

**Justification:** The most likely diagnosis is placental abruption. Placental abruption occurs when the placenta separates prematurely from the uterine wall before delivery, leading to maternal and fetal complications including abdominal pain, vaginal bleeding, and fetal distress. The sudden onset of abdominal pain and vaginal bleeding along with the tender abdomen and tachycardia are suggestive of this diagnosis. The high fetal heart rate may indicate fetal distress. Prompt evaluation and management are necessary to optimise the chances of a successful outcome for both the mother and the baby.



- 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

**Correct answer: D) 0.9% sodium chloride + 5% glucose**

**Justification:** The most appropriate intravenous fluid is 0.9% sodium chloride + 5% glucose. This solution provides both electrolytes and glucose to replace ongoing losses and meet metabolic needs. The combination of sodium chloride and glucose helps maintain intravascular volume while providing energy substrate. Given the child's dehydration status and the need for both hydration and glucose supplementation, 0.9% sodium chloride + 5% glucose is the optimal choice for restoring and maintaining fluid balance. 0.18% sodium chloride + 4% glucose and 0.45% sodium chloride + 5% glucose solutions have lower sodium concentrations and may not adequately address the electrolyte needs for rehydration, especially in a child with ongoing losses and dehydration. While 0.9% sodium chloride is isotonic and suitable for replacing sodium and chloride losses, it lacks glucose, which is essential for providing energy substrate, especially in a child unable to tolerate oral intake. While PlasmaLyte is a balanced crystalloid solution containing electrolytes such as sodium, potassium, chloride, magnesium, and acetate, it also lacks glucose.



**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

**Correct answer: E) Puerperal psychosis**

**Justification: Puerperal psychosis is the most likely diagnosis in this case. Puerperal psychosis is a rare but serious mental illness that affects women in the days or weeks following childbirth. It typically presents with symptoms such as delusions, hallucinations, confusion, agitation, and a lack of insight into the illness. Risk factors include a personal or family history of mental illness, a difficult or traumatic childbirth, and lack of social support. Treatment often involves hospitalisation, medication, and support from mental health professionals. It is important to seek help quickly in order to provide the best possible outcome for both the mother and baby.**



- 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

**Correct answer: D) Panic disorder**

**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.



- 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

**Correct answer: D) Schizoid personality disorder**

**Justification: The most likely diagnosis is Schizoid Personality Disorder. Individuals with Schizoid Personality Disorder typically exhibit a pattern of detachment from social relationships and limited emotional expression. They often prefer solitary activities and have little interest in forming close interpersonal connections, which aligns with the man's description. His occupation as an information technology specialist also reflects a preference for tasks that involve minimal social interaction.**



- 30.** A 29 year old woman has had intermittent vaginal bleeding since a levonorgestrel-releasing intrauterine system (Mirena® 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

**Correct answer: D) No investigation required**

**Justification:** Some bleeding is common after IUS insertion for up to six months. The levonorgestrel hormone in the device can cause changes to the uterine lining, leading to irregular bleeding patterns as the body adjusts to the new contraceptive method. Reassurance and patient education regarding the expected side effects are most appropriate in this case.



**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

**Correct answer: C) Premature closure of ductus arteriosus**

**Justification:** In the third trimester of pregnancy, the use of ibuprofen is contraindicated due to its association with premature closure of the fetal ductus arteriosus. The ductus arteriosus is a blood vessel in the fetal heart that normally closes shortly after birth. However, during pregnancy, it allows blood to bypass the lungs since the fetus receives oxygen from the mother's blood. If ibuprofen is used in the third trimester, it can prematurely close the ductus arteriosus, leading to fetal complications such as pulmonary hypertension and heart failure.





**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

**Correct answer: C) Gross motor delay**

**Justification:** The best description of the development is gross motor delay. A child should be able to sit unsupported by 7 months of age; speak at least 2 words and feed themselves using fingers or build a tower of 2 bricks using a pincer grip by 12 months of age. The fact that she was born at 30 weeks' gestation i.e. 10 weeks premature, should be taken into consideration when assessing her development. Development may be delayed by approximately 10 weeks, but this does not explain the delay seen here. The delay is only in the sitting unsupported, which makes it gross motor delay.



**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

**Correct answer: D) Sertraline**

**Justification:** The most appropriate medication to prescribe is Sertraline. SSRIs are the first-line pharmacological treatment for depression due to their efficacy, safety profile, and tolerability. Sertraline is the recommended SSRI of choice in patients with established cardiac disease due to lack of effect on the QT interval and reduced drug interactions. Other non-pharmacological therapies should be trialled as well, depending on depression severity.

**NICE guideline [NG222] Published: 29 June 2022**

<https://www.nice.org.uk/guidance/ng222/chapter/Recommendations>



**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

**Correct answer: C) Family therapy**

**Justification:** Family therapy is the first-line treatment for children and adolescents with anorexia nervosa, as it focusses on the family as a whole rather than just the individual with the disorder. It aims to improve family communication and functioning, and to help family members understand and support the individual's recovery. Other types of therapy, such as cognitive-behaviour therapy or psychodynamic psychotherapy, may be used in conjunction with family therapy to address specific symptoms or issues.

<https://cks.nice.org.uk/topics/eating-disorders/management/confirmed-eating-disorder/> (updated 2024)



**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

**Correct answer: A) Alzheimer disease**

**Justification:** The most likely diagnosis is Alzheimer disease. Individuals with Down syndrome are at a significantly higher risk of developing Alzheimer disease at an earlier age compared to the general population. Cognitive decline, personality changes, and disorientation, are characteristic of the early stages of Alzheimer disease. The normal observations and negative urinalysis suggest that the symptoms are more likely due to a neurological disorder rather than an acute medical condition.



- 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

**Correct answer: C) Depressive episode with psychotic symptoms**

**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.



- 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

**Correct answer: B) Cognitive behaviour therapy**

**Justification:** The most appropriate treatment is Cognitive Behavioural Therapy (CBT). Arachnophobia, like other specific phobias, can significantly impact daily functioning and quality of life. CBT, particularly exposure therapy, involves gradual and controlled exposure to the feared stimulus in a safe environment. Through repeated exposure, the individual learns to confront and manage their fear reactions effectively. Given his otherwise well health and lack of prior psychiatric history, CBT offers a targeted and evidence-based approach to address his phobia and improve his ability to work in the cellar without undue distress. Prescription of potentially addictive benzodiazepines should be avoided. There is no evidence for the effectiveness of exploratory analytic therapy for phobias, even if the problem arose in childhood.



**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

**Correct answer: D) Physiological delay in descent**

**Justification:** The most likely diagnosis is physiological delay in descent. In newborns, the testes may not be palpable at birth due to physiological delay in descent, which is a normal variation. During foetal development, the testes descend from the abdomen into the scrotum, but this process may take several weeks to months after birth to complete. Physiological delay in descent does not necessarily indicate an abnormality and typically resolves spontaneously as the baby grows. However, if neither testis is palpable, urgent investigation is indicated to exclude less common but significant alternative diagnoses.



- 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

**Correct answer: A) Avoidant**

**Justification:** The features described are consistent with avoidant personality disorder, which is characterised by social inhibition, feelings of inadequacy and hypersensitivity to criticism, and a strong desire for affection and acceptance. People with this disorder tend to avoid social situations and have few close relationships, often relying heavily on a single attachment figure. They may also experience physical symptoms such as headaches and stomach aches when faced with stress or anxiety-provoking situations.





- 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

**Correct answer: C) Perthes disease**

**Justification:** The most likely diagnosis is Perthes disease. Perthes disease is a condition characterised by avascular necrosis of the femoral head, leading to hip joint pain, stiffness, and limited range of motion, especially during activity. Positive Trendelenburg test and gluteal wasting are common findings in Perthes disease due to weakness and dysfunction of the hip abductor muscles.



- 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

**Correct answer: D) Maternal blood group O positive**

**Justification:** The test result that suggests early haemolytic jaundice, as maternal blood group is O positive. Maternal blood group O positive can lead to early haemolytic jaundice in newborns in the presence of anti-A and/or anti-B antibodies in the maternal circulation. Incompatibility between the maternal antibodies and the newborn's blood group antigens can result in haemolysis of the newborn's red blood cells, leading to an increase in serum bilirubin levels and the development of jaundice.

- 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

**Correct answer: B) IgA vasculitis**



**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.**



**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

**Correct answer: C) Pure tone audiometry**

**Justification: Pure tone audiometry is recommended for children presenting with hearing difficulties, especially when these issues are impacting their school performance and behaviour.**