

# PTS 3a Mock SBA Series 2021

## Paper 1- [Answers]- Version 3



### Marking instructions:

- Award **1 mark for each question** on the paper
- Multiple 'correct' answers may exist, a mark is awarded for the **single best answer**
- There are **100 marks** in total
- There is **no identified 'pass mark'**

### Disclaimer:

The following paper has been **written for students by students** and **bears no reflection on the real exam**. This is a **learning tool** that has **not been reviewed by the University of Sheffield** and therefore the **use of this paper** for learning is **at the student's discretion**.

Please **do not share** this document on **google drives** or **directly to future 3a students**, this takes away from their opportunity to complete the mock SBA in the run up to their exams when it has maximal impact as a revision resource. **This mock paper will be edited, updated and repeated in future years**. Thank you.

### Chief Exam Editor

*Andrew Maud*

### SBA Question Contributors

*Ella Kulman*

*Katharine Meadows*

*Qaiys Qaoud*

*Charlotte Pickavance*

*Hannah Lunt*

*Natalie Menic*

*Bryony Cushen*

*Melanie Coulson*

*Sally Mather*

*Emma Willian*

# Summary of Topics Assessed- Paper 1

<p><b>Paediatrics- 1.1</b></p> <ol style="list-style-type: none"> <li>1. Haemolytic anaemia</li> <li>2. Infectious Mononucleosis</li> <li>3. Rubella</li> <li>4. Leukaemia</li> <li>5. Congenital adrenal hyperplasia</li> <li>6. Febrile convulsions</li> <li>7. Cranial nerve palsy</li> <li>8. Infectious mononucleosis</li> <li>9. Leukaemia</li> <li>10. Haemolytic anaemia</li> </ol>	<p><b>Paediatrics- 1.2</b></p> <ol style="list-style-type: none"> <li>11. Haemophila investigation</li> <li>12. Haemophilia pathophysiology</li> <li>13. Kawasaki investigations</li> <li>14. Septic arthritis management</li> <li>15. Lymphoma monitoring</li> <li>16. 'B' symptoms of lymphomas</li> <li>17. Perthes disease age range</li> <li>18. DDH risk factors</li> <li>19. Bilious vomiting in neonates</li> <li>20. Down's syndrome</li> </ol>	<p><b>Psychiatry- 2.1</b></p> <ol style="list-style-type: none"> <li>21. EUPD presentation</li> <li>22. Schizotypal PD presentation</li> <li>23. Delirium management</li> <li>24. Pharmacology- Phenelzine</li> <li>25. Bipolar management</li> <li>26. Pharmacology- Lithium toxicity</li> <li>27. Alcohol detoxification</li> <li>28. Delirium tremens treatment</li> <li>29. Delirium and UTI</li> <li>30. Serotonin syndrome</li> </ol>
<p><b>Psychiatry- 2.3</b></p> <ol style="list-style-type: none"> <li>31. Depression presentation</li> <li>32. Delirium features</li> <li>33. Down's syndrome features</li> <li>34. Depression treatment</li> <li>35. Agoraphobia presentation</li> <li>36. Panic disorder presentation</li> <li>37. Types of stimulant drugs</li> <li>38. Benzodiazepine indications</li> <li>39. Mechanism of action of benzodiazepines</li> <li>40. Neuroleptic malignant syndrome investigation results</li> </ol>	<p><b>Obs&amp;Gynae- 3.1</b></p> <ol style="list-style-type: none"> <li>41. Ovarian CA risk factors</li> <li>42. Red degeneration fibroid</li> <li>43. PID management</li> <li>44. Assessing foetal growth</li> <li>45. UTI in pregnancy</li> <li>46. Stress incontinence</li> <li>47. Raised CA125</li> <li>48. Fibroids</li> <li>49. PID</li> <li>50. Placental Abruption</li> </ol>	<p><b>Obs&amp;Gynae- 3.2</b></p> <ol style="list-style-type: none"> <li>51. Endometriosis diagnosis</li> <li>52. Endometriosis management</li> <li>53. Ectopic pregnancy diagnosis</li> <li>54. Ectopic pregnancy risk factors</li> <li>55. Ovarian cyst</li> <li>56. Ovarian torsion</li> <li>57. IUGR</li> <li>58. Physiology of labour</li> <li>59. Management of primary amenorrhoea</li> <li>60. Pathology of androgen insensitivity syndrome</li> </ol>

# Summary of Topics Assessed- Paper 1

<p><b>Sexual Health- 4.1</b></p> <ul style="list-style-type: none"><li>61. Chlamydia- presentation and management</li><li>62. Chlamydia- diagnosis</li><li>63. Secondary syphilis- presentation</li><li>64. Hypoactive sexual desire disorder</li><li>65. Syphilis- diagnosis</li><li>66. Complications of chlamydia in pregnancy</li><li>67. Congenital syphilis</li><li>68. Dyspareunia</li><li>69. Retrograde ejaculation</li><li>70. Hypospadias</li></ul>	<p><b>Neurology- 7.1</b></p> <ul style="list-style-type: none"><li>71. Migraine- features</li><li>72. Migraine- prophylactic management</li><li>73. TIA- risk score</li><li>74. TIA- investigation</li><li>75. Parkinson's disease- features</li><li>76. Parkinsonism- pharmacology</li><li>77. MND- management</li><li>78. Meningitis- causes</li><li>79. Meningitis- prophylaxis</li><li>80. Spinal cord compression</li></ul>
<p><b>General Medicine - WC1</b></p> <ul style="list-style-type: none"><li>81. Non-epileptic attack- presentation</li><li>82. Orthostatic hypotension- interpreting BP</li><li>83. Aortic dissection- presentation</li><li>84. Pulmonary Embolism- interpreting CXR</li><li>85. Pericarditis- management</li><li>86. Pharmacology- N-acetylcysteine</li><li>87. Pharmacology- heparin</li><li>88. B12 deficiency anaemia- interpreting FBC</li><li>89. MI- management</li><li>90. IDA- hand signs</li></ul>	<p><b>General Medicine- TB1</b></p> <ul style="list-style-type: none"><li>91. T2DM- complications</li><li>92. Graves disease</li><li>93. Hypertension- management</li><li>94. Microcytic anemia- interpreting FBC</li><li>95. Chronic Myeloid Anemia</li><li>96. Osteoarthritis</li><li>97. Crystal arthritis</li><li>98. IBD- investigations</li><li>99. Acute liver failure- causes</li><li>100. Pharmacology- dual antiplatelet therapy</li></ul>

Question 1- Correct Answer: (C) Normocytic anaemia.

*This boy is likely to have haemolytic uraemic syndrome. HUS involves a triad of findings: AKI, thrombocytopenia and a normocytic anaemia (microangiopathic haemolytic anaemia) (C). Acute bloody diarrhoea should be treated as a medical emergency and requires urgent action. Erythrocytosis (A) = high RBC levels. It can be caused by smoking, drinking alcohol or conditions such as Polycythaemia Vera. Low WCC (B) e.g. neutrophilia can be a complication of chemotherapy or can be caused by viral infection e.g. Hep B/C, HIV, medications (anti-psychotics, carbimazole) or autoimmune disorders. A raised ALP (D) is often seen in hepatobiliary pathology, disorders of bone mineralisation e.g. osteomalacia/Ricket's, Vit D deficiency, or primary bone tumours or bone metastases. A raised TSH (E) could be a sign of hypothyroidism.*

Question 2- Correct Answer: (C) she has infectious mononucleosis.

*A maculopapular, pruritic rash develops in around 99% of patients who take amoxicillin whilst they have Infectious Mononucleosis (C). Although penicillin allergy/anaphylaxis (A, E) should not be ruled out, as the patient stated that she had NKDA then the most likely cause of this is due to having infectious mononucleosis. Contact dermatitis (B) is due to a type 4 hypersensitivity reaction. The patient would present with a rash that is likely linked to an allergen e.g. nickel in jewellery/watches, creams, cosmetics, rubber etc. Often the pattern of contact dermatitis can give clues to the allergen. Shingles (D) is caused by VZV, it is characterised by a blistering rash and pain in a dermatomal distribution. It is treated with aciclovir 800mg 5 x a day for 7 days.*

Question 3- Correct Answer: (A) 1 year and 3 years old.

*Children receive the MMR vaccine at 1 year and 3 years (A). Knowing the childhood vaccination schedule is important and can be examined. There are approximately only 5 cases of Rubella in the UK each year.*

- 8w = 6 in 1 (DTaP, IPV, Hib, Hep B), Men B, Rotavirus.
- 12w = 6 in 1 (DTaP, IPV, Hib, Hep B), PCV, Rotavirus.
- 16w = 6 in 1 (DTaP, IPV, Hib, Hep B), Men B.
- 1y = Hib/Men C, PCV booster, **MMR**, Men B booster.
- 3y 4m = DTaP/IPV, **MMR**.
- 12-13y = HPV.
- 14y = Tetanus, diphtheria, polio. Men ACWY.
- Influenza vaccine is also offered to all children of primary school age and those in Y7. It is also offered from 6m to those at high risk.

Question 4- Correct Answer: (B) Blood film and bone marrow biopsy.

*In this presentation you would be worried about acute lymphoblastic leukaemia and therefore should do a blood film and bone marrow biopsy (B) to investigate this. Autoantibodies and RF (A) would be helpful if we thought this could be more of a rheumatological or autoimmune picture. Although CXR (C) are often useful, in this cause it would be unlikely to help us confirm the diagnosis and radiation exposure in children should be minimised where possible. Cytogenetic testing (D) involves looking at the chromosomes and so would be done if we suspected a genetic/inherited condition e.g. Turner syndrome. Cytogenetic testing is also sometimes done in chronic myeloid leukaemia to look for the Philadelphia chromosome but this is uncommon in paediatrics. Viral throat swabs (E) are done if an URTI was suspected.*

Question 5- Correct Answer: (B) Congenital adrenal hyperplasia.

*This baby is likely to be having a salt-losing adrenal crisis due to having congenital adrenal hyperplasia (B). CAH is an autosomal recessive disorder where there is reduced production of cortisol and aldosterone (therefore less sodium retention and increased potassium excretion). In an adrenal crisis they may present with metabolic acidosis. Bowel obstruction (A) would likely present with abdominal distension, pain, vomiting and constipation. DKA (C) is very important to be aware of, particularly in the paediatric population as it can be the first presentation of T1DM. Patients may be unconscious on presentation and an arterial blood gas would show a metabolic acidosis and hyperkalaemia but not necessarily hyponatraemia. Remember the DKA triad: 1. Acidaemia, 2. Hyperglycaemia, 3. Ketonaemia. Severe diarrhoea and vomiting (D, E) could lead to the presentation of a very unwell child but the arterial blood gas would show a metabolic alkalosis.*

Question 6- Correct Answer: (E) Reassurance, parent education and referral to paediatrics.

*Simple febrile seizures often don't require pharmacological treatment but can be worrying for the parents and so good reassurance and education on what to do should another seizure occur is good practice (E). Children who have had a first seizure may need referral to paediatrics. The patient is not hypoxic and so high flow O2 and an urgent referral would be unnecessary (A). Urgent IV Lorazepam (B) is indicated in the management of status epilepticus. PRN Buccal Midazolam (C) would also be unnecessary given that this is the first presentation but if the child continued to have seizures it may be considered. Regular paracetamol (E) would not be needed, it could be given on a PRN basis if the child was in pain or still feverish but regular paracetamol would not work prophylactically to reduce the risk of further febrile convulsions.*

Question 7- Correct Answer: (C) Oculomotor nerve palsy.

*Ptosis and a 'down and out' eye is likely to be due to a third nerve palsy (C). Abducen's nerve (Cn6) palsy (A) would present with an adducted eye - turned inward towards the nose. Bell's palsy (B) effects the Cn7 (facial nerve) and is characterised by a complete unilateral facial weakness, including the forehead (note that in a stroke the forehead is spared), it is normally acute in onset. The Ophthalmic nerve (CnV(i)) (D) is a branch of the trigeminal nerve and provides sensory innervation to the skin, mucous membranes and sinuses of the upper face. Strabismus (E) is a condition in which the eyes do not properly align when looking at an object, if not corrected can result in amblyopia.*

Question 8- Correct Answer: (B) EBV

*Infectious mononucleosis (glandular fever) is caused by EBV in 90% of cases. Less frequent causes include CMV (A) and HHV-6 (C). HHV-6 is also known to cause Roseola Infantum. HIV (D) can lead to acquired immunodeficiency syndrome (AIDS). RSV (E) commonly causes respiratory tract infections.*

Question 9- Correct Answer: (E) Testes and CNS

*The testes and CNS (E) are recognised as areas which are protected from chemotherapeutic agents (due to the existence of the blood brain barrier for CNS). The other answers are the incorrect combination.*

**Question 10- Correct Answer: (C) penicillamine.**

Penicillamine (C) is not typically used in the treatment of sickle cell disease – it is used as a copper chelating agent in Wilson’s disease. A lot of people with Sickle Cell disease will be on prophylactic penicillin (D) as the vast majority will have had a splenectomy. Stem cell transplantation (E) is a curative treatment for Sickle cell disease but is not often done due to the significant risks involved.

Hydroxycarbamide (B) is used to prevent vaso-occlusive complications of sickle cell disease. Blood transfusions (A) can be given if the patient is suffering from severe anaemia or to reduce the proportion of Hbs.

**Question 11- Correct Answer (A)- Clotting screen**

This baby has a clotting disorder and is bleeding into the muscles and joints. The correct answer is clotting screen, which generally includes prothrombin time (PT), activated partial thromboplastin time (APTT), and fibrinogen. This can tell you if there is a problem with the way the blood is clotting, and therefore guide further investigation to find the cause (e.g. haemophilia A, haemophilia B, or von Willebrand disease). Although potentially useful further down the line, or to work out if a girl is a carrier, DNA analysis is not a first line investigation. White cell count, inflammatory markers (e.g. CRP), and rheumatoid factor may be useful to exclude other causes of joint pain e.g. septic arthritis or juvenile idiopathic arthritis, these are not the most likely diagnoses.

Note: as it is an X-linked recessive disorder, only boys develop haemophilia A/B (often presents as easy bruising, bleeding into muscles or joints, and extensive bleeding after surgery), whereas both boys and girls can develop von Willebrand disease (often presents as bleeding from mucous membranes e.g. nosebleeds, heavy periods, and bleeding gums). This can be remembered by von **W**illebrand = **W**omen too.

**Question 12- Correct Answer (B)- Factor VIII**

In haemophilia A, there is a factor VIII deficiency. Factor IX deficiency is seen in haemophilia B. Fibrin is the final product of the coagulation cascade, where it becomes cross-linked to form a clot. Tissue factor is the first component of the extrinsic pathway and is released when there is cellular injury. Von Willebrand deficiency is seen in von Willebrand disease, another clotting disorder.

Note: severity of haemophilia A can be assessed by looking at % factor VIII functionality and severity of bleeding:

<b>Severity</b>	<b>% factor VIII</b>	<b>Bleeding tendency</b>
Mild	>5-40%	bleed after surgery
Moderate	1-5%	bleed after minor trauma
Severe	<1%	spontaneous joint/muscle bleeds

Question 13- Correct Answer (E)- Transthoracic echocardiogram

The correct answer is transthoracic echocardiogram. This child has Kawasaki disease, and there is risk of cardiac complications including pericardial effusion, myocardial disease, valve damage or coronary artery aneurysm. These are important to rule out, and can be done by echo.

An ECG is less able to show these abnormalities. CT kidneys-ureter-bladder would be useful to look for renal stones or renal malformation; head CT would show cranial abnormalities or brain haemorrhages; and pulmonary angiogram would be used in suspected pulmonary embolism. None of these investigations are indicated.

Note: assessing how a child is behaving can be extremely helpful in deciding how unwell they are: if a child is chatty and playing, they probably aren't dangerously sick. This is really useful to put in the notes when seeing patients.

The CRASH & BURN mnemonic can be used for Kawasaki disease - Conjunctivitis, Rash, Adneopathy, Strawberry tongue, Hands (palmar erythema, swelling), Burn (fever >5 days).

Question 14- Correct Answer (a)- Admit for prolonged antibiotics and close monitoring

This boy has septic arthritis of his right hip. This requires investigation with joint aspiration to identify the organism, and then a prolonged course of antibiotics, rest and analgesia. He is severely unwell and needs admitting to hospital for treatment and monitoring.

Chemotherapy would be the treatment choice for a malignant cause such as lymphoma. Routine referral to rheumatology would be useful if this was suspected rheumatological condition, such as juvenile idiopathic arthritis. Supportive care with analgesia and rest is the treatment choice for transient synovitis, although he is much more unwell than this condition would present. Surgical fixation with pins is used for slipped upper femoral epiphysis (SUFE).

Note: most commonly, septic arthritis will result from haematological spread from a bacterial infection elsewhere in the body, although it can occur following a skin wound such as chickenpox scar.

Question 15- Correct Answer (D)- Positron emission tomography (PET)

The correct answer is a positron emission tomography (PET) scan. This uses a radioactive tracer to show the areas of high uptake and therefore areas of active malignancy.

A blood film would be used for the diagnosis of leukaemia or other haematological conditions, but is not useful for the monitoring of lymphoma. Chest x-ray might be useful to show if there is mediastinal spread. Dual energy x-ray tomography (DEXA) is used to assess bone mineral density e.g. for the diagnosis of osteoporosis. Repeat lymph node biopsy is unnecessary provided the first sample identified the cell type to guide treatment, and would be a painful procedure with no benefit.

Note: non-Hodgkin lymphoma is more common in childhood, whereas Hodgkin lymphoma is more common in adolescence.

Question 16- Correct Answer (D)- Unexplained fever

B symptoms include: unexplained fever, unexplained weight loss, and drenching sweats (particularly at night). Enlarged lymph nodes, fatigue, and pruritus are also possible symptoms of lymphoma, but are not 'B' symptoms associated with B-cell abnormalities. Weight gain is not seen, and instead a patient would be likely to have lost weight.

Note: 'B' symptoms can also be seen in HIV.

Question 17- Correct Answer (D)- 5-10 years

Perthes disease is most common in boys aged 5-10.

Neonates (0-28 days) and babies 3-6 months are unlikely to be mobilising and therefore will not present with limp. It is important to rule out non-accidental injury in any unexplained injury, especially in babies unable to mobilise. Most important differential diagnoses of limp in children 1-3 years include missed developmental dysplasia of the hip, septic arthritis, transient synovitis, trauma and leukaemia. In children 11-16 years, differentials include slipped upper femoral epiphysis, reactive arthritis, and mechanical/overuse injuries (sports related).

Note: unlike in slipped upper femoral epiphysis, where obesity is a risk factor, there is no association between Perthes and being obese.

Question 18- Correct Answer (C)- Male

The correct answer is being male. Females are 6x more likely to have developmental dysplasia of the hip (DDH). Breech birth, high birth weight, oligohydramnios, and prematurity are all risk factors.

Note: DDH is screened for in the 6-8 week baby check using Barlows and Ortolani tests.

Question 19- Correct Answer (B)- Down syndrome

This baby has duodenal atresia. This is a rare disorder with increased risk in children with Down syndrome. The treatment is surgical, with a duodenoduodenostomy.

Cystic fibrosis is associated with meconium ileus, another cause of bilious vomiting in neonates. This typically presents 24-48 hours after birth with bilious vomiting and abdominal distention, on x-ray there may be fluid levels seen in the bowel, and is treated with surgical decompression with/without serosal resection. Edwards and Patau syndromes do not have any common bowel associations. Von Willebrand disease is a clotting disorder.

Note: Down syndrome is also associated with Hirschprung's disease, which typically presents either with delay or failure to pass meconium after birth, or with recurrent constipation and abdominal distention in older children.

Question 20- Correct Answer (C)- Hypertonia

The correct answer is hypertonia, in Down syndrome, children commonly show hypotonia. Brushfield spots (increased pigmentation) in the iris, delayed motor milestones, small ears and upslanted palpebral fissures are all common features of Down syndrome.

Note: Other features include round face, flat occiput, epicanthic folds, protruding tongue, short stature and learning difficulties. Congenital heart defects are seen in 40%, hearing impairment in 75%, and obstructive sleep apnoea in 50-75%.

Question 21 - Correct answer B - Emotionally unstable personality disorder.

*The ICD-11 describes EUPD as problems in the functioning of aspects of self i.e. self-worth and direction, as well as an inability to maintain close relationships, all over a period of time.*

*Anankastic reflects a personality with set rules and ideals that the person believes everyone should follow. Histrionic is more to do with a need to have attention and acting in a dramatic and narcissistic way to achieve this. Paranoid involves features of being antisocial and paranoid. Schizoid is wrong as this involves being anti-social, aloof, indifferent and not complying to social norms.*

Question 22 - Correct answer E - schizotypal personality disorder.

*This is a person with a history of 'magical thinking' and delusions of reference. However, the delusions and other symptoms are not firm enough to meet the criteria for delusional disorder or schizophrenia. Schizoid PD is more to do with being anti-social, indifferent, and isolated.*

Question 23 - Correct answer C - Ensure the patient is on a busy ward to keep him socialised and active.

*This is a case of delirium. Risk factors in the stem are elderly and recent surgery. Delirium can be Hypoactive, as in this case, and the majority of cases, Hyperactive, or mixed. Treatment focuses on managing the cause – hence temporary catheterization or urinalysis if appropriate. It also focuses on re-orienting the patient by providing visual cues such as clocks or calendars, and ensuring the patient has any aids they need such as hearing aid or glasses. Keeping the patient on a busy ward may worsen his symptoms, as a quiet, well-lit living space is ideal in managing delirium.*

Question 24 - Correct answer C - Phenelzine.

*This is to avoid the 'cheese effect' of eating tyramine-rich foods with a Monoamine oxidase inhibitor antidepressant, as it can lead to a build up of tyramine and hypertension. Phenelzine is an example of a MAO inhibitor. Haloperidol is an antipsychotic, Mirtazapine is a NaSSA antidepressant, sertraline is an SSRI antidepressant, and Valproate is an anti-epileptic/mood stabiliser.*

Question 25 - Correct answer E - Valproate.

*The first line treatment for an acute manic or mixed episode in Bipolar affective disorder is an atypical antipsychotic. For a depressive episode it's an atypical antipsychotic plus an SSRI, usually Olanzapine and Fluoxetine. However, for long term maintenance, Lithium is the first line. Valproate, another mood stabiliser, can be added in if this doesn't work. This should be avoided in women of childbearing age unless there is no other option. See NICE guidelines: page 11 for long term management.*

<https://www.nice.org.uk/guidance/cg185/resources/bipolar-disorder-assessment-and-management-pdf-35109814379461>

Question 26 - Correct answer B - fine tremor.

*This patient has Lithium levels above 1.5mmol/L which indicates toxicity. All of these are signs of Lithium toxicity, except B. A fine tremor is generally regarded as a side effect of Lithium in the therapeutic range, whereas a coarse tremor would develop if it was in the toxic range.*

Question 27 - Correct answer B- Chlordiazepoxide.

*A long acting benzodiazepine is the first line drug for alcohol detox. Midazolam is a rapid-acting Benzo, which could be prescribed in status epilepticus or as an adjunct in a confused and agitated psychiatric patient, so Chlordiazepoxide should be used for detoxification as it is long acting.*

*Acamprosate and Disulfiram should be started for maintenance of alcohol detoxification, once it is established. They should be started at 6-12 months after abstinence is started, to prevent relapse.*

*Thiamine should also be used during detoxification, but this is to replenish low B1 stores, to prevent the development of Wernicke's encephalopathy and subsequently Korsakoff's associated with the low B1 levels due to excess alcohol consumption, rather than to initiate the detoxification.*

Question 28 - Correct answer A -IV Pabrinex and high dose Benzodiazepine.

*This woman is suffering from Delirium Tremens due to alcohol withdrawal. The treatment for this is IV Pabrinex (Vitamin B1, to prevent the onset of Korsakoff's syndrome) with a high dose Benzodiazepine.*

*Thiamine is another (oral) form of Vitamin B1, but the B1 needs to be an IV infusion in the case of delirium tremens. Lithium is mostly used as a maintenance drug in bipolar affective disorder. Olanzapine is an antipsychotic used to treat schizophrenia. 1-1 nurse observations may also be appropriate as an adjunct to treatment, but the best answer in this situation is A.*

Question 29 - Correct answer A - Delirium secondary to urinary tract infection.

*Delirium is an acute, transient, global organic disorder of CNS functioning resulting in impaired consciousness and attention, which relates to this patient's history. Risk factors are a UTI – nitrites and leukocytes in his urine, raised CRP – possible sign of infection, and low O2 with normal CO2 – type 1 respiratory failure (hypoxia.)*

*Dementia would have a longer history, and would not have a rapid deterioration due to acute infection. The symptoms may represent a manic episode, but are not very convincing as there is no pressure of speech or thought or grandiose delusions suggestive of a manic episode, and other answers fit better.*

*The first rank symptoms of schizophrenia are 3rd person auditory hallucinations and/or thought echo, passivity phenomenon (believing thoughts or actions are being controlled by an external force), thought alienation, encompassing withdrawal, broadcast, or insertion, and delusional perception which means assigning a false meaning to a real stimulus. It does not appear the patient is experiencing any of these. Although panic attacks may present with agitation, as well as a sense of impending doom, a crushing chest pain, tingling extremities and physical signs such as tachypnoea, these symptoms started before he arrived at the hospital.*

Question 30 - Correct answer E - Serotonin syndrome.

Based on the history, it is likely that the patient recently started an SSRI – the first line for depression. From the options available, this then lead to Serotonin Syndrome, which is high serotonin levels leading to the classic triad of neuromuscular excitability, autonomic dysfunction (hypo or hypertension), and altered mental state

Septic shock would not present with hypertension, but rather hypotension.

Delirium would present with either a hypo or hyperactive state, or mixed - meaning the patient would be agitated and confused, or withdrawn and quiet, and the physical symptoms would be unlikely unless unrelated.

Lithium toxicity would present with symptoms like drowsiness and confusion, a **coarse** tremor, and vomiting. Although some symptoms of serotonin syndrome and lithium toxicity can overlap, the stem leans more towards serotonin syndrome due to the recent initiation of anti-depressants.

Neuroleptic malignant syndrome is a potential complication of antipsychotic medications and would present with a change in mental state, rigidity, fever, and autonomic dysfunction. Again, some symptoms can overlap however there is no evidence of antipsychotic use in the stem.

Question 31 - Correct Answer - C – Mild-Moderate depression

Depression- the 3 core symptoms of depression are:

- 1.) Low mood for at least 2 weeks
- 2.) Anhedonia (lack of interest in things that were previously enjoyable)
- 3.) Anergia (lack of energy)

Additional symptoms of depression include: lack of appetite, poor quality sleep, poor concentration, reduced self-worth, suicidal thoughts, agitation, slow movements. In mild-moderate depression patients experience some of the symptoms of depression which subsequently causes minor functional impairment. In severe depression patients experience most of the symptoms of depression which subsequently causes marked functional impairment. In the context of this patient, Miss Jones had been feeling 'lower than usual' for 'over a month'; she 'stopped attending netball practice' which she 'used to love', she complained of feeling 'tired all the time' and has been finding it 'increasingly difficult to concentrate'. This therefore fits best with a picture of mild-moderate depression rather than severe depression (E).

(A) Cyclothymia- is a type of bipolar affective disorder characterised by hypomania and minor depression. There are no indicators in the history of episodes of manic episodes this option is unlikely.

(B) Generalized anxiety disorder- This is characterized by ongoing, uncontrollable, widespread worry, that is excessive and inappropriate, which is not evident in this case

(D) Seasonal affective disorder- this reoccurs annually at the same time each year. It is the first time that the patient has experienced this combination of symptoms before.

Question 32- Correct Answer - D - Preserved consciousness

*The likely diagnosis is delirium secondary to UTI. Preserved consciousness- In delirium, the patient usually has impaired consciousness, compared to a patient with dementia where there is often no impairment of consciousness.*

*ICD-10 criteria for delirium:*

- 1.) Impairment of consciousness and attention*
- 2.) Global disturbance in cognition*
- 3.) Psychomotor disturbance*
- 4.) Disturbance of sleep-wake cycle*
- 5.) Emotional disturbances*

Question 33 - Correct Answer - C - Bicuspid aortic valve

*Bicuspid aortic valve is a characteristic feature of Turner's syndrome*

*Medical problems associated with Down's syndrome:*

- *Heart defects (Tetralogy of Fallot, atrioventricular septal defect (seen most commonly in Down's children), ventricular septal defect and atrial septal defects)*
- *Hearing loss*
- *Visual disturbance (cataracts, strabismus, keratoconus)*
- *GI problems (oesophageal/ duodenal atresia, Hirschsprung's disease, coeliac)*
- *Hypothyroidism*
- *Haematological malignancies (AML, ALL)*
- *Increased incidence of Alzheimer's disease*

Question 34 - Correct Answer - D - Prescribe a course of sertraline

*Prescribe a course of sertraline- Sertraline is the pharmacological management of choice in this patient. Sertraline is an SSRI (selective serotonin reuptake inhibitor) and SSRIs are the 1<sup>st</sup> line pharmacological management option for depression.*

*Prescribe a course of amitriptyline- Amitriptyline is a tricyclic antidepressant and is a possible 2<sup>nd</sup> line pharmacological management for depression. NICE CKS recommends avoiding tricyclic antidepressants or venlafaxine if there is a history, or likelihood, of overdose as they can be very toxic in overdose.*

*Prescribe a course of duloxetine- Duloxetine is a SNRI (serotonin and noradrenaline reuptake inhibitor) and is a possible 2<sup>nd</sup> line pharmacological management for depression.*

*Prescribe a course of Isocarboxazid- Isocarboxazid is a MAOI (monoamine oxidase inhibitor) and is a possible 2<sup>nd</sup> line pharmacological management for depression.*

*Refer to secondary care psychiatry- This is not appropriate at this stage, referral to psychiatry is reserved for those either with:*

- 1.) High suicide risk*
- 2.) Unresponsive to treatment*
- 3.) Recurrent depression that has been unsuccessful to manage in primary care*

Question 35 – Correct answer – A – Agoraphobia

*Agoraphobia- Definition: fear of public spaces or fear of entering a public space from which immediate escape would be difficult in the event of a panic attack*

*ICD-10 criteria for agoraphobia*

- *Marked and consistently manifest fear in, or avoidance of, at least 2 of: Crowds, Public spaces, Travelling alone, Travelling away from home*
- *Symptoms of anxiety in the feared situation with at least 2 symptoms present together + 1 symptom of autonomic arousal*
- *Significant emotional distress due to the avoidance, or anxiety symptoms.*
- *Recognized as excessive or unreasonable.*
- *Symptoms restricted to (or predominate in) feared situation*

*Anxious [avoidant] personality disorder- Features: Certainty of being liked is needed before becoming involved with people, Restriction to lifestyle in order to maintain security, Inadequacy felt, embarrassment potential prevents involvement in new activities, Social inhibition*

*Generalized anxiety disorder- Definition: Syndrome of ongoing, uncontrollable, widespread worry about many events or thoughts that the patient recognizes as excessive and inappropriate. Symptoms must be present on most days for at least 6 months.*

*Panic disorder- Definition- Recurrent, episodic, severe panic attacks, which are unpredictable and not restricted to any particular situation or circumstance.*

*Social phobia- Definition: Fear of social situations which may lead to humiliation, scrutiny by other people, criticism or embarrassment.*

Question 36 – correct answer – D – Panic disorder

*Panic disorder- ICD-10 criteria for panic disorder*

*A.) Recurrent panic attacks that are not consistently associated with a specific situation or object, and often occur spontaneously. The panic attacks are not associated with marked exertion or with exposure to dangerous or life-threatening situations*

*B.) Characterized by ALL of:*

- *Discrete episode of intense fear or discomfort*
- *Starts abruptly*
- *Reaches a crescendo within a few minutes and lasts at least some minutes*
- *At least 1 symptom of autonomic arousal*
- *Other symptoms of anxiety*

*Agoraphobia- Definition: Fear of public spaces or fear of entering a public space from which immediate escape would be difficult in the event of a panic attack.*

*Anxious personality disorder- features:*

- *Certainty of being liked needed before becoming involved with people*
- *Restriction to lifestyle in order to maintain security*
- *Inadequacy felt*
- *Embarrassment potential prevents involvement in new activities*
- *Social inhibition*

*Generalized anxiety disorder- Definition: Syndrome of ongoing, uncontrollable, widespread worry about many events or thoughts that the patient recognizes as excessive and inappropriate. Symptoms must be present on most days for at least 6 months.*

*Social phobia- Definition- Fear of social situations which may lead to humiliation, scrutiny by other people, criticism or embarrassment.*

Question 37 – Correct answer – C – Ecstasy (MDMA)

*Ecstasy- This is a stimulant drug. Cocaine, methamphetamine, MDMA, khat, nicotine are stimulant drugs. Stimulant drugs speed up the messages travelling between the brain and the body. And so, they typically increase the pulse and breathing rate, elevate blood pressure, suppress the appetite and dilate the pupils.*

*Anabolic steroids- These are taken to increase muscle bulk and enhance sporting performance. They are slow to act, and do not cause an immediate buzz like other stimulants. Whilst they may be considered a stimulant, ecstasy would be a more appropriate answer as a psychoactive stimulant.*

*Cannabis- This is a cannabinoid. These can have stimulant, depressant and hallucinogenic effects and so may not be the single best answer.*

*Heroin- This is an opiate. It is an opium-related painkiller/depressant. Alcohol is an example of a legal depressant.*

*LSD- This is a hallucinogen. LSD and ketamine are chemical-based hallucinogens; magic mushrooms (psilocybin) and peyote cactus are plant-based hallucinogens. Cannabis and ecstasy can also have hallucinogenic properties.*

Question 38 – Correct answer – B – Depression

*The first line pharmacological treatment for depression is a SSRI (selective serotonin reuptake inhibitor) such as sertraline. All of the other options are common indications for prescribing a benzodiazepine (short-term prescription).*

Question 39 – Correct answer – B – They facilitate and enhance the binding of GABA to the GABA<sub>A</sub> receptors

*[Benzodiazepines]- Benzodiazepines target the  $\gamma$ -aminobutyric acid type A (GABA<sub>A</sub>) receptor --> GABA<sub>A</sub> is the main inhibitor neurotransmitter in the brain --> benzodiazepines facilitate and enhance the binding of GABA to the GABA<sub>A</sub> receptors --> results in desired anxiolytic effect*

*[Antipsychotics]- Antipsychotics block the postsynaptic dopamine D<sub>2</sub> receptors --> blocks the 4 main dopaminergic pathways of the CNS (mesolimbic, mesocortical, nigrostriatal, Tuberohypophyseal) --> blockage of the mesolimbic pathways results in the desired antipsychotic effect. It's effects on the other pathways results in side effects.*

*[MAO (monoamine oxidase) inhibitors]-Inactivates the monoamine oxidase enzymes --> these enzymes oxidize dopamine, noradrenaline, serotonin and tyramine --> inhibition of this oxidation results in increased concentrations of these monoamines --> antidepressant effect*

*[NARI (noradrenaline reuptake inhibitor)]-Highly specific noradrenaline reuptake inhibitor --> increased concentration of noradrenaline. Useful in ADHD, narcolepsy, major depressive disorder.*

*[SSRI]-SSRIs inhibit the reuptake of serotonin from the synaptic cleft --> increases the concentration of serotonin in the synaptic cleft --> desired antidepressant effect*

Question 40 – Correct answer – E – Raised creatine kinase

Results you would expect to find in neuroleptic malignant syndrome:

- Raised CK (creatin kinase) --> due to muscle rigidity
- Raised white cell count
- Deranged LFT's
- Acute renal failure --> abnormal U&E's
- Metabolic acidosis --> low pH, low HCO<sub>3</sub>

Question 41 - Correct Answer B – Breastfeeding

Breastfeeding (B) is protective against ovarian cancer as it temporarily inhibits ovulation.

A lot of the risks of ovarian cancer are related to an increased number of ovulations and therefore the following answers are incorrect;

- Clomifene (C), a drug used to treat subfertility, stimulates the ovaries to ovulate, and therefore increases risk of developing ovarian cancer.
- Early menarche (D) means potentially more menstrual cycles, and therefore more ovulations.
- Each pregnancy stops ovulation for the number of months gestation (i.e. usually 9 missed ovulations), therefore only one pregnancy (E) means she had more ovulations than if she was multiparous.

Risk of ovarian cancer increases with age (A), and peaks at 60 years old.

Question 42 - Correct Answer C – Red degeneration of fibroid

Red degeneration of fibroid (C) is due to ischaemia, infarction, and necrosis of a pre-existing fibroid due to a disrupted blood supply. It is more common in the second and third trimester due to the fibroid rapidly outgrowing the blood supply or the uterus changing shape and therefore kinking the arteries. This patient has a history of heavy periods and difficulty conceiving, which can both be attributed to fibroids, and as she is older it makes the presence of fibroids more likely.

Incorrect answers:

- A miscarriage (A) wouldn't present with fever or vomiting, and since she has not shown any signs of bleeding, this is unlikely. To rule out a threatened or inevitable miscarriage however you would need to do a speculum examination to examine the cervical os.
- A placental abruption (B) is unlikely due to gestational age (second trimester) and fever.
- A ruptured ectopic pregnancy (D) may present in the same way, but the investigation results ruled this out.
- A UTI (E) could present in the same way, however she hasn't complained of any LUTS so this makes red degeneration more likely.

Question 43 - Correct Answer D – Treat with broad-spectrum antibiotics for 14d, leave the coil in

The correct management plan in mild PID is to;

- Start antibiotics immediately, before the results of the swabs
- Prescribe doxycycline, metronidazole, and IM ceftriaxone (broad-spectrum management)
- Leave in a recently inserted coil. If there is no response within 48hrs to the antibiotics, remove the coil and prescribe any other necessary emergency contraceptives

You do NOT;

- Remove the coil (C) – you risk the patient becoming pregnant (as the coil was her emergency contraception), and there is no evidence to suggest that this is a reaction to the coil as her history suggests she might have PID
- Prescribe flucloxacillin (B) – it is ineffective against PID
- You remove the coil if there is no improvement after 72 hours, NOT 24 hours (A) - see link for CKS NICE guidelines
- Wait for the swab results (E) – if you suspect PID, you TREAT it!

<https://cks.nice.org.uk/topics/pelvic-inflammatory-disease/management/management/>

Question 44 - Correct Answer D – Mother's weight gain during pregnancy

Maternal weight gain (D) is NOT used to assess foetal growth as it is affected by many things. For example, hyperemesis gravidarum is diagnosed with a weight loss of >5% from pre-pregnancy weight, but this doesn't sensitively identify IUGR. Hydration status, change in diet, etc. all contribute to varying maternal weight.

Although some of the other measures are not used in normal practice (e.g. femur length (A)), they are still more useful and accurate than maternal weight gain. The best way of tracking foetal growth, however, is abdominal circumference (B) on ultrasound. Palpation of foetal head on abdominal examination is not the most precise method of assessing foetal growth, but can be used as a rough way of assessing growth for gestational age. Measuring the size of the uterus (symphysis fundal height) (C) is only useful in singleton pregnancies and after 24w gestation.

Question 45 - Correct Answer A – Cephalosporins

Cephalosporins (A) are the only class of antibiotics (out of the aforementioned) which are safe to use at any stage of pregnancy.

Incorrect answers;

- Nitrofurantoin (B) should be avoided in the 3<sup>rd</sup> trimester as there is a risk of haemolytic anaemia in neonate with G6PD deficiency
- Sulfonamides (C) are associated with kernicterus if used in the 3<sup>rd</sup> trimester
- Tetracyclines (D) cause permanent staining of baby's teeth and problems with skeletal development
- Trimethoprim (E) is a folate antagonist and so can cause neural tube defects if used in the 1<sup>st</sup> trimester

Question 46 - Correct answer C – Duloxetine

*This woman is suffering from stress incontinence. The first line intervention is 3 months of pelvic floor training. If this doesn't work, duloxetine or surgery can be offered. In this case, duloxetine would be the next best treatment.*

*Incorrect answers;*

- *Bladder retraining (A) is first line intervention for urge incontinence*
- *Pelvic floor exercises (B) are the first-line intervention for stress incontinence, but only for 3 months before something else is tried. Continuing for another 2 months is not the best option.*
- *Oxybutynin is the second line intervention for urge incontinence (D)*
- *Retropubic mid-urethral tape (E) is a surgical procedure for stress incontinence. This patient has made it clear she does not want to have surgery, ruling this option out.*

Question 47 - Correct Answer E- Vulval cancer

*Many benign and malignant conditions cause raised CA125, however vulval cancer (E) does not. Raised CA125 can be caused by adenomyosis (A), ascites (B), endometriosis (C), and menstruation (D) as well as breast cancer, ovarian cancer, ovarian torsion, endometrial cancer, liver disease, metastatic lung cancer and many more conditions.*

Question 48 - Correct Answer C – GnRH agonists

*GnRH agonists (A) are used before surgery to reduce the size of fibroids and make them less likely to bleed during surgery. They induce a menopause-like state which reduces the amount of oestrogen maintaining the fibroid.*

*Incorrect answers;*

- *COCP (A) is a medical treatment for fibroids <3cm, but is not used in preparation for surgery. In fact, COCP use is contraindicated for use before, during, and after surgery as it increases the risk of VTE.*
- *Endometrial ablation (B) is a surgical option for fibroids <3cm*
- *Mirena coil (D) is the first-line intervention for fibroids <3cm*
- *Uterine artery embolisation (E) is performed by interventional radiologists and involves starving the fibroids of oxygen.*

Question 49 - Correct Answer D – Fever >38°C

*Fever >38°C (D) in a patient with PID would point towards a severe infection, and therefore would require hospital admission.*

*Incorrect answers;*

- *Adnexal tenderness (A) is a normal sign of PID*
- *Dysuria (B) is a normal symptom of PID*
- *Endometriosis (C) is a differential for PID, but comorbidity does not mean the patient should be admitted*
- *Living far away from the hospital (E) would be an indication to admit a patient with an ectopic pregnancy but not PID.*

Question 50 - Answer A - placental abruption

*Placental abruption = most likely, presents with sudden onset severe blood loss and abdominal pain late in pregnancy, she is tachycardic and hypotensive, "woody" abdomen suggests large haemorrhage.*

*Vasa praevia = presents with blood loss during labour.*

*Placenta previa = more likely to have painless bleeding and a soft uterus.*

*Uterine rupture = presents during labour with a popping painful sensation, ceasing of uterine contraction and vaginal bleeding.*

Question 51 – Answer E - pelvic pain for the past five months

*According to NICE guidelines, in females over 17 years of age with chronic pelvic pain, endometriosis should be considered as a differential diagnosis if any of the other symptoms are present. For the pain to be chronic in nature, it must be cyclical or continuous for over six months. Infertility alone would not be a reason to suspect endometriosis, unless combined with chronic pelvic pain.*

Question 52 – Answer E - Progesterone Intrauterine Device

*Pharmacological management should be explored first therefore patient would not be advised to have a surgical procedure. (A) COCP should be avoided in patients aged over 35 that smoke more than 15 cigarettes a day (other situations to avoid in are VTE related risk factors e.g AF, stroke, vascular disease, Hx VTE). Therefore the appropriate 2nd line option would be IUD (E). After patients have tried NSAIDs with COCP or IUD, then we would consider GnRH antagonist (B) to suppress ovarian oestrogen production. Surgical options such as laparoscopy (D) to excise or ablate endometrial tissue or hysterectomy are definitive but should not be performed without trying hormonal treatment first.*

Question 53 – Answer C- repeat the beta hCG test after 48 hours.

*In cases with a pregnancy of unknown location it is important to obtain a baseline and repeat beta hCG in 48hrs. If after 48hrs you see... beta hCG doubling (intrauterine pregnancy), beta hCG rising but not doubling (indicates ectopic and needs further monitoring) beta hCG falls by half or more (miscarriage). The patients observations show that she is haemodynamically stable and hence urgent, invasive treatment such as laparoscopy (A) or laparotomy (B) are not current indicated.*

*Repeat ultrasound will not show anything that has not already been seen. If beta hCG doubles and therefore intrauterine pregnancy is suspected a repeat USS should be performed in 1-2 weeks to confirm.*

Question 54 – Answer B age >25 at presentation

*Factors associated with increased risk of ectopic pregnancy include smoking, multiple sexual partners, use of IUD, prior fallopian tube surgery, infertility and using in vitro fertilisation, age <18 at first sexual intercourse, black race, and age >35 at presentation.*

Question 55 – Answer A – admit her with a view to conservative management

*A patient with marked tenderness should not be allowed home.*

*The history, examination, and ultrasound scan all point towards a haemorrhagic cyst which needs to be managed conservatively. Most cysts presenting acutely will present with lower abdominal pain, but without signs of peritonism or systemic upset. The absence of vomiting, peritonism, and a fever make torsion and appendicitis unlikely, therefore no need to refer to the surgeons at this stage.*

*No further imaging is required at this stage.*

Question 56 – Answer D surgical detorsion

*Management with detorsion is highly recommended regardless of the actual appearance of the ovary and ensures preservation of ovarian function in most cases.*

*Salpingo-oophorectomy may be performed if the ovary is thought to be non-viable, there is involvement of the fallopian tube, or if malignancy is suspected. Involvement of the fallopian tube in the torsion of the adnexa may significantly damage the tube, which may need to be surgically removed (salpingectomy).*

*In younger patients oophoropexy, or shortening of an elongated utero-ovarian ligament, may be performed but this does not prevent recurrence.*

*If the cause of torsion is due to a mass or cyst, cystectomy is appropriate in a small group of patients.*

Question 57 – Answer A - interpregnancy interval of >60 months

*IUGR is the common result of maternal, placental, fetal or genetic factors. Maternal age of <16 or >35 increases the risk, as does a low BMI or a pre-pregnancy weight of >75kg.*

*Whilst a low interpregnancy interval of less than 6 months can increase the risk of IUGR, the interval would need to be >120 months to also pose a risk.*

Question 58 – Answer B - antibiotics should be given for 14 days.

*Following RCOG guidelines, antibiotics should be given for 10 days following premature preterm rupture of membranes, or until the woman is in established labour, whichever is sooner. The presence of a pool of fluid in the vagina at sterile speculum examination is highly suggestive of membrane rupture, and when this is clearly observed no further diagnostic tests are required.*

Question 59 – Answer D - pregnancy test.

*Primary amenorrhoea and the absence of secondary sex characteristics is most commonly caused by low levels of FSH and LH and therefore a delay in puberty. Oestrogen is often measured in conjunction with FSH/LH to determine whether the problem is pituitary or ovarian. Conditions leading to reduced oestrogen and presenting with delayed puberty include PCOS, Turner's syndrome and primary ovarian insufficiency.*

*Another cause is androgen insensitivity syndrome i.e. a person is phenotypically female but genetically male. In this case the patient is likely to have high levels of testosterone.*

*A pregnancy test would be useful if the scenario suggested secondary amenorrhoea i.e. absence of menses for three months in a woman with previously normal menstruation, but is less important as this patient has never menstruated.*

*Thyroid-stimulating hormone (TSH): is indicated to rule out (primary) hypothyroidism, more commonly associated with secondary amenorrhoea.*

Question 60 – Answer E - Wolffian ductal structures develop.

*When the Wolffian ducts are exposed to testosterone during embryogenesis, male sexual differentiation occurs: the Wolffian duct develops into the rete testis, the ejaculatory ducts, the epididymis, the ductus deferens and the seminal vesicles. Without the stimulation from androgens, as in androgen insensitivity syndrome, this development will not occur.*

*Testes develop due to the influence of the SRY gene on the Y chromosome. This process does not require the presence of androgen, nor a functional androgen receptor, and therefore testicular development occurs. Mullerian structures include the fallopian tubes, uterus, cervix, and the upper one-third of the vagina, and these will not develop because they are under the influence of AMH which is independently secreted.*

Question 61 - Correct Answer D- Doxycycline 100mg PO BD for 7 days

*The most likely diagnosis is chlamydia, so the correct answer is doxycycline (D), which is first line treatment in non-pregnant patients. Azithromycin (A) used to be the first line for chlamydia, and is still used as a second line, but there are concerns about the development of resistant strains. Also, patients who have a positive chlamydia test are likely to have both rectal chlamydial infection, and co-infection with Mycoplasma genitalium (another STI which is azithromycin resistant, and not currently tested for). Doxycycline is better than azithromycin for both of these issues. Ceftriaxone (B) is used to treat gonorrhoea. This is less likely to be the diagnosis here, because it classically causes ‘purulent’ vaginal discharge, and doesn’t normally cause intermenstrual or post-coital bleeding. Clotrimazole (C) is used to treat thrush, which is not the most likely diagnosis here, because there is no itching or burning, and thrush causes superficial, not deep, dyspareunia. Discharge in thrush is white and cottage-cheese like. Metronidazole (E) is used to treat trichomonas, the most common symptoms of which are profuse, foul smelling, green discharge, and vulval itching.*

*Tip - learn the description of vaginal discharge in chlamydia, gonorrhoea, thrush, BV, trichomoniasis*

Question 62- Correct Answer C- First catch urine sample for NAAT

*Chlamydia is an obligate intracellular organism, so cannot be cultured (A), and would not be visible on microscopy (B, E). NAAT is therefore the most commonly used test - nucleic acids (DNA, RNA) which are specific to chlamydia are amplified and visualised, so their presence is diagnostic. The site of chlamydia infection is the urethra, so this has to be sampled. Urine will wash out organisms residing in the urethra, and these will be most concentrated (and easiest to identify) in the first urine that is passed. A urethral swab is also suitable (D), but urine NAAT is equally as sensitive, so the less invasive option is preferred (C). Note - gonorrhoea can be excluded by urine or urethral swab NAAT. If NAAT is positive for gonorrhoea, a urethral swab is needed for culture, to identify sensitivities before starting antibiotic treatment. If Gram negative diplococci are seen on microscopy, this is gonorrhoea, in the context of a urethral swab.*

Question 63- Correct Answer D- Secondary syphilis

*This presentation fits with the widespread rash, neurological symptoms and glomerulonephritis associated with secondary syphilis (D). The vulval lesion could have been a chancre, and the timings fit with the progression of syphilis (chancre presents 3 weeks from infection and lasts 2-6 weeks, secondary syphilis starts 6-8 weeks from infection). Genital warts (A) and herpes (B) are both potential causes of vulval lesions, but do not explain the systemic symptoms this patient has. Scabies (C) would cause a widespread rash, but would be very itchy, and wouldn’t cause systemic or isolated vulval symptoms.*

Question 64- Correct Answer D- Hypoactive sexual desire disorder

*This is hypoactive sexual desire disorder (D), because the issue lies with her interest in sex, not with the physiological response to arousal. Psychiatric conditions, and their treatments can increase the risk of HSDD. Depression alone can present with reduced libido, and can be associated with anxiety, but as the patient's libido reduced further after she started an SSRI, depression and GAD (A, C) are unlikely to explain it. In female sexual arousal disorder (B), patients lack the desire to have sex, and also experience vaginal dryness when they try to have sex. Sexual aversion disorder is characterised by disgust at even the thought of sex (E).*

Question 65- Correct Answer B- VRDL negative, TPHA positive

*There are 2 main tests used to diagnose syphilis. Cardiophilin based tests (eg VDRL) look for non-specific enzymes which are produced in active syphilis infection. These react with cardiophilin in the lab to give a positive result, and become negative after treatment. Specific treponemal antibody tests (TPHA) look for IgG, which remains after treatment to confer immunity. Therefore, the correct answer is B. PCR is only relevant for swabbing a chancre, which occurs in primary syphilis, so would not be present after treatment.*

Question 66- Correct Answer C- Neonatal meningoencephalitis

*Neonatal meningoencephalitis (C) is not caused by chlamydia, but can be caused by Group B Streptococcus, which is a vaginal commensal found in some mothers, or herpes viruses in infected mothers. The other answers are all neonatal complications of maternal chlamydia infection; if the infection ascends from the vagina, it causes chorioamnionitis (A), which can cause the membranes to rupture early (E). If a baby is delivered vaginally while the mother has active chlamydia infection, it can be transmitted and cause conjunctivitis (B) and pneumonia (D)*

Question 67- Correct Answer E- Ejection systolic murmur

*Congenital syphilis does not cause an ejection systolic murmur (E), although this can be a feature of tertiary syphilis. The other answers are all features of congenital syphilis*

Question 68- Correct Answer C- pelvic inflammatory disease

*Pelvic inflammatory disease (C) causes deep, not superficial dyspareunia. Genital herpes (A) can cause pain at the site of the lesion during sex, due to irritation from friction. Lichen sclerosus (B) is white patches of skin from on the vulva- it can lead to tightening of the introitus, and therefore cause pain on penetration, due to stretching. Thrush also causes superficial dyspareunia (D). Vaginismus (E) is a tightening of the vagina on penetration, and can often have an underlying psychological cause (eg fear of getting pregnant, previous sexual abuse, past traumatic PV examination). It causes superficial pain.*

Question 69- Correct Answer D- Erectile dysfunction

Erectile dysfunction (D) does not cause retrograde ejaculation, as it does not affect the internal urethral sphincter. The function of the internal urethral sphincter is to contract on ejaculation, and prevent retrograde ejaculation (hence why females only have an external urethral sphincter). Anything that damages the internal urethral sphincter, or the nerves controlling it, can cause retrograde ejaculation. Bladder neck surgery and TURP (A, E) can both directly damage the internal urethral sphincter. Some people are born with a poorly functioning internal urethral sphincter (B). The internal urethral sphincter is under autonomic control, so autonomic neuropathy can prevent it from contracting (C).

Question 70- Correct Answer A- Circumcision

Circumcision (A) is contraindicated, because if the child has surgery to treat the hypospadias, the foreskin is used for this. Corrective surgery (B) is not needed in all cases, but is not contraindicated. Genetic testing and USS of the genitalia (C, E) may be required in severe cases, where there are ambiguous genitalia. Urinalysis is not contraindicated (D)

Question 71 - Correct Answer E - It typically lasts for less than 1 hour

A migraine is a primary headache which typically lasts for 4-72 hours (although occasionally may be less in children). It is often unilateral (D) and is associated with nausea (A), photophobia (B) and phonophobia (which is why the patient often is found sitting in a dark and quiet room). Common triggers of migraine can be remembered with the mnemonic CHOCOLATE **C**hocolate, **O**ral Contraceptive, **C**affeine, **A**lcohol(C), **T**ravel, **E**xercise).

Question 72 - Correct Answer - C - Propranolol.

Whilst prophylactic treatment for migraines can be topiramate (E) or propranolol (C), propranolol is preferred in female patients of child bearing age as topiramate may be teratogenic and can reduce the effect of hormonal contraceptives. Oral triptans (D), NSAIDs (A) and paracetamol (B) are commonly used for first line treatment for an acute migraine episode (not prophylaxis).

Question 73 - Correct Answer - A - ABCD2 Score

The ABCD2 score (A) estimates the risk of stroke after a suspected TIA. It includes scores for Age > 60 years, BP > 140/90mmHg, Clinical features of the TIA, Duration of the symptoms and Diabetes diagnosis. CHADSVASC is used in AF stroke risk (B). FRAX is the Fracture Risk Assessment tool (C). The TIMI Score estimates mortality for patients with UA or NSTEMI (D). Wells score is used for risk of DVT/PE (E).

Question 74 - Correct Answer C - When the carotid stenosis is > 70%

A carotid artery endarterectomy is recommended if a patient has suffered stroke/TIA in the carotid territory and they are not severely disabled. It should only be considered if carotid stenosis > 70%.

Question 75 - Correct Answer A- Hyperkinesia

Parkinson's disease normally has a feature of bradykinesia- not hyperkinesia (A) (this is more typical of a patient with e.g. Huntington's Disease). Other features of Parkinson's normally include rigidity, tremor, postural instability (E), hypomimia (B), pill rolling tremor (D), hypophonia (C), reduced blinking etc.

Question 76 - Correct Answer B - Haloperidol

Typical antipsychotics (e.g. haloperidol (B)) are known to be dopamine antagonists and can cause parkinsonism. The atypical antipsychotics (e.g. clozapine (A), olanzapine (C), quetiapine (D), risperidone (E)) often do not have extrapyramidal side effects including parkinsonism.

Question 77 - Correct Answer C - Riluzole

Amyotrophic lateral sclerosis (ALS) is the most common form of motor neuron disease. It has a very poor prognosis. Riluzole (C) is used in ALS to improve prognosis but this is often only by a few months.

Question 78 - Correct Answer B - Group B Streptococcus

*Group B strep (B) is the most common cause in neonates. Other common causes in children 0-3 months are E. coli (A) and Listeria monocytogenes. Haemophilus influenzae (c), neisseria meningitidis (D) and strep pneumoniae (E) are most common in children aged 3-6 months of age.*

Question 79 - Correct Answer E - Oral ciprofloxacin

*Whilst oral ciprofloxacin(E) or rifampicin can be used for close contact prophylaxis, ciprofloxacin is preferred.*

*IV ciprofloxacin (C) would be the incorrect method of delivery of this medication- it is given PO. If patients are in a pre-hospital setting (e.g. in a GP surgery) and meningococcal disease is actually suspected then IM benzylpenicillin (A) may be given, as long as this doesn't delay transit to hospital. IV cefotaxime (B) is often the recommended mx for inpatients with confirmed meningitis. Oral amoxicillin (D) is not indicated in the prophylaxis or management of meningitis.*

Question 80 - Correct Answer C - L5

*If the L5 nerve root is compressed it can foot drop due to weakness of the foot dorsiflexor muscles. This can cause difficulty in walking and the patient is more likely to fall.*

Question 81 - Correct Answer C - gradually sinks to the ground at the start of the attack

*Gradually sinking to the ground at the start of the attack is usually a feature of syncope. A non-epileptic attack typically involves a sudden drop, which may be abrupt enough to cause the patient injury.*

*A: arms flexing and extending is a common feature of NEAs, as is pelvic thrusting*

*B: eyes are usually closed, which may also be the case in syncope; eyes are typically open in epilepsy*

*D: prolonged seizures (often >30 minutes) are common in NEAs; epileptic seizures and syncope typically do not last >5 minutes*

*E: symptoms wax and wane in NEAs, as opposed to epilepsy, which typically follow set patterns (e.g. tonic-clonic)*

Question 82- Correct answer C- systolic drops 35, diastolic drops 15 within 3 minutes of standing

Postural (orthostatic) hypotension is defined as systolic drop >20mmHg when going from sitting/lying to standing. Patient should be lying or sitting still for 5 minutes and then their baseline measured. Get them to stand and measure their BP at 1 minute and 3 minutes. If there is a drop >20mmHg at either 1 min or 3 mins then they have postural (orthostatic) hypotension.

#### Question 83- A - aortic dissection

*Aortic dissection and myocardial infarction share many common features (e.g. sudden severe central chest pain, sites of radiation, sweaty appearance). However, aortic dissection is usually maximally painful at the time of onset, whereas MI tends to build in intensity from the onset. Migration of the pain caudally is also more suggestive of aortic dissection. A weak left-sided pulse suggests aortic dissection (this occurs due to involvement of the subclavian artery). While hypertension can be a risk factor for MI, it is the single biggest risk factor for aortic dissection (on examination, the patient may remain hypertensive, or may become hypotensive due to blood loss).*

*GORD chest pain tends to be related to lying down, meals, stooping and straining. They may have additional symptoms such as bloating, acid brash, or cough. Both GORD and aortic dissection can cause epigastric pain.*

*PE chest pain tends to be pleuritic, and may be accompanied by respiratory signs and symptoms or DVT signs. There are no PE RFs mentioned in the history.*

*Heart block can cause chest pain, but other symptoms are usually presyncopal symptoms, syncope, or SOB.*

#### Question 84- B - hyperinflation on CXR

*Hyperinflation is not associated with PE. Fleischner sign = dilated central pulmonary vessel. Other CXR PE signs include Westermarck sign (collapse of vasculature distal to PE) and Hampton's hump (wedge-shaped infarct). Hyperinflation, if present, is unlikely to be due to the PE. ECG features of PE are mainly sinus tachycardia and/or ST depression.*

#### Question 85 - E - NSAIDs

*This patient has classic features of pericarditis. NSAIDs are 1st line. Low-dose colchicine may be given (alone or in combination with an NSAID) for patients with recurrent or continued symptoms beyond 14 days.*

#### Question 86 - E - Replenishes body stores of glutathione

*Glutathione is needed to detoxify a toxic intermediary product of paracetamol metabolism (NAPQI). Therefore, when excessive paracetamol is ingested, hepatocellular stores of glutathione become depleted. NAPQI stays in its toxic form in the liver and causes hepatocyte death.*

*N-acetylcysteine replenishes glutathione stores so that NAPQI can be converted to a less toxic product, preventing hepatocyte damage.*

*blocks adenosine receptors = caffeine*

*competitively inhibits dihydrofolate reductase = methotrexate*

*inhibits xanthine oxidase = allopurinol*

*modulates sodium and calcium channels (in the CNS) = carbamazepine*

#### Question 87 - D - Protamine

*Protamine can be used to reverse heparin. It is fully effective against unfractionated heparin, and partially effective against LMWH.*

*Beriplex is used for most DOACs; dabigatran overdose is treated with idarucizumab.*

*Warfarin overdose is treated with vitamin K. If the haemorrhage is significant, they are given beriplex alongside it.*

*Bear in mind that reversal of heparin is not usually needed, as it has a short half-life, but if significant haemorrhage occurs (e.g. sufficient to cause hypotension, or intracranial hemorrhage), reversal is usually necessary.*

#### Question 88 - A - B12 deficiency anaemia

*B12 deficiency anaemia is a megaloblastic anaemia (low Hb, high MCV and MCH). It is commonly associated with thrombocytopenia and leukopenia, and may be sufficient to cause pancytopenia (platelets also low). Note that in 25% MCV will be normal due to co-existing iron deficiency.*

*Iron deficiency and thalassaemia are microcytic anaemias, rather than macrocytic.*

*MCV may be raised in sickle cell anaemia (due to severe reticulocytosis), but pancytopenia is unusual in other forms of anaemia than B12/folate deficiency. Additionally, in sickle cell, white cells are often high.*

#### Question 89 - B - ACEi + Beta Blocker + Statin + Aspirin + Clopidogrel

Post ACS management should include non-pharmacological: cardiac rehabilitation, lifestyle advice (smoking, diet, weight, exercise) and pharmacological advice. Post ACS medications can be remembered by "Block An ACS" (Beta blocker, ACEi, Aspirin, Clopidogrel, Statin).

(A)- this is medications you would expect to see in a patient with heart failure

(C)- ticagrelor is an appropriate alternative antiplatelet medication post ACS but this option lacks BP and cholesterol management drugs

(D)- long term oxygen therapy is not indicated, there is no history of respiratory disease. There are set criteria for prescribing someone oxygen and in particular they must not be a smoker as there is a significant fire risk with having oxygen at home making this option contraindicated.

(E)- statins and lifestyle advice is appropriate but does not address the need for antiplatelet medication, ACE or BBLOCKERS.

#### Question 90 - A - koilonychia

*Koilonychia = thin spoon-shaped nail. Can also occur due to protein deficiency, diabetes, or connective tissue disease. Leukonychia = white streaks on the nails. Often due to simple trauma, but may be due to hypoalbuminaemia or CKD. Onycholysis = lifting of the distal nail plate, which appears white or yellow.*

*Seen in things such as psoriasis, fungal infection, trauma, and thyrotoxicosis.*

*Onychogryphosis = thick hard curved nail plate in the shape of a ram's horn. Due to ageing, psoriasis or trauma. Trachyonychia = rough nails. Characteristic of lichen planus.*

Question 91 – Answer D – Increased risk of infertility

*Pete is newly diagnosed with Type 2 diabetes Mellitus, and already has some neurovascular compromise in terms of his feet. Type 2 diabetes is a form of insulin resistance, usually presenting in those over 30> type 2 Diabetes has a more gradual onset and presents with symptomatic complications rather than hypoglycaemia, weight loss or DKA as seen in Type 1 diabetes*

*Male Infertility (D) is not a complication of Diabetes Mellitus - female infertility is increased in T1DM and male erectile dysfunction is seen, in type 2 diabetes, but there are no changes to male fertility. Diabetic Neuropathy (A) is a well-known complication, and already seen in this gentleman's case history. Diabetic Retinopathy (B), increased risk of infection (C) and increased risk of dementia (E) are all also associated with the disorder.*

Question 92 – Answer E – Cold Intolerance

*This woman is likely to have Graves' Disease, a form of hyperthyroidism, commonly presenting in pregnancy and associated with exophthalmos (bulging eyes). Graves Disease is an autoimmune disease of circulating autoantibodies which activate Thyroid Stimulating Hormone receptors and also cross react with orbital enlargement. Cold Intolerance (E) is a symptom of hypothyroidism, heat intolerance is the associated symptom in hyperthyroidism. Symptoms in this woman suggestive of Graves' disease are pregnancy (A) as this is a common time of presentation, increased appetite (B), tremor (C) a symptom of hyperthyroidism and exophthalmos (D), a symptom specific to Graves disease.*

Question 93 – Answer B – Ramipril

*This woman is categorised as having moderate hypertension. The first line treatment is lifestyle advice and change, however if, as in this case, this is effective, medical management is commenced. Lifestyle advice is to aim for a low sodium and high fibre diet, regular physical exercise, reduction of alcohol intake, smoking cessation, and weight reduction. The Combined oral contraceptive is not recommended in hypertension, as it may increase blood pressure and there is a risk of inducing severe hypertension. The Progesterone only contraceptive does not carry the same risk.*

*Ramipril (B) is the correct answer. This woman is under 55 years and Caucasian so should be initiated on either an ACE-Inhibitor or Angiotensin II receptor blocker. Answers A (amlodipine) and C (nifedipine) are calcium channel blockers, which would be indicated if starting therapy for an over 55 or at any age in a patient of Afro-Caribbean descent. Option D (labetalol) is first line management for Pre-eclampsia and option E (Bendroflumethiazide) is a Thiazide like diuretic, typically added as the third line management for hypertension.*

Question 94 - Answer B – Low HB, Low MCV

Gwendolyn is suffering from iron deficiency anaemia, due to low iron intake and increased iron loss through menstrual bleeding. Iron Deficiency anaemia is a microcytic anaemia – where mean cell volume and haemoglobin are reduced. It is the most common cause of anaemia. Iron sources in the vegetarian diet are leafy greens and pulses such as lentils and beans. Answer B gives these results. Sick cells (A) are only seen in sickle cell disease. C is a macrocytic anaemia, commonly caused by folate deficiency, however in this case we are told this is well supplemented and so is unlikely. A low Hb and a normal MCV is a normocytic anaemia, caused by combined deficiency anaemia, anaemia of chronic disease or after acute blood loss. Answer E Normal Hb means this is not anaemia, may be an infectious blood result.

Question 95 – Answer B – Philadelphia Chromosome

Charles is suffering from chronic myeloid leukaemia, causing anaemia which is causing the symptoms of tiredness. Other symptoms of chronic myeloid leukaemia are fever and sweats, weight loss, headache, bruising and bleeding and abdominal discomfort. Investigations for CML are blood count (Showing anaemia and raised WBC), a blood film, bone marrow aspirate and FISH (fluorescence in situ hybridisation) detection the cytogenetic abnormality – the Philadelphia Chromosome. Therefore, Answer B is correct. Answers A and D are made up. Answer C, trisomy 21 is diagnostic of Down's syndrome, whilst HLTV1 infection is the causative organism of Non-Hodgkin's lymphoma.

Question 96 – Answer D – Large joints or joints of the hand

Ruby is suffering from osteoarthritis, in the case affecting the small joints of her hands. Osteoarthritis is a degenerative condition, most commonly seen in post-menopausal women due to the loss of protective oestrogen. Another cause of osteoarthritis is uneven load bearing. The disease is commonly seen in large joints (Hip and knee) and in small joints of the hands (PIPJ, DIPJ, thumb joint) – answer D. Arthritis affecting large joints symmetrically (A) may be rheumatoid arthritis, it is not typical to see symmetrical joint involvement in osteoarthritis. Joint pain affecting the joints of the spine in ascending order (B) is seen in ankylosing spondylitis. Answer C, pain of the first metatarsophalangeal joint is typical of Gout. Answer E is also incorrect as osteoarthritis commonly also affects large joints.

Question 97 – Answer A – Positively Birefringent Crystals

This man is suffering from pseudogout. This is clinically very similar to gout, except pain is less severe and lifestyle history is different – seen in this case as the man is a vegetarian and therefore unlikely to have a high purine intake, the causative feature of gout. The SOCRATES is that of a history of crystal arthritis. Pseudogout can be familial. If this were gout, you would also expect serum uric acid to be raised. Pseudogout is caused by calcium pyrophosphate crystals which are seen as Positively Birefringent Crystals (Answer A) in joint fluid. Answer B is the crystal structure of urate crystals, as seen in gout. Answer C is a red herring. Answer D is descriptive of Staphylococcus aureus, as may be seen in septic arthritis. Answer E is a red herring.

### Question 98 – Answer C – Ileocolonoscopy

*This person is suffering from Inflammatory bowel disease, as indicated by the high-volume loose stool and frequency of diarrhoea, weight loss and fatigue. One can assume it is Crohn's disease due to the presence of mouth ulcers, showing disease is not confined to the colon, as in ulcerative colitis.*

*The definitive diagnostic test is Ileocolonoscopy to visually see the inflammation in the bowel and the biopsies to show inflammation – Answer C. Stool sample culture and microscopy (A) would be more appropriate if an infective diarrhoea was suspected. Answer B gives tests that are needed in the diagnosis of IBD, but are not definitive in diagnosis, in the same way as ileocolonoscopy is. Answer D can also be used in bowel investigations, especially where peristalsis and movement disorders are suspected. Trial of treatment (D) is not used in the diagnosis of inflammatory bowel disease.*

### Question 99 – Answer C – Staphylococcus Aureus

*Janet is presenting with acute liver failure. This disorder is defined as acute liver injury with encephalopathy and deranged coagulation in a patient with a previously normal liver. This disorder can be caused by a wide range of insults to the liver. However, Answer C, is not a recognised cause of acute liver failure. There are multiple viral causes of acute liver failure, including HSV and VZV, but bacterial cause is not a cause of acute liver failure in a previously healthy liver. Answers A, B, D and E can all cause acute liver failure.*

### Question 100 – Answer A – COX-1 and P2Y12

*Dual anti-platelet therapy is given after a myocardial infarction to decrease platelet aggregation and inhibit thrombus formation. It comprises of aspirin and a P2Y12 inhibitor, usually clopidogrel. Aspirin inhibits COX-1 receptors. The correct answer is therefore A.*

*Answers B and C are red herrings, with incorrect, made up numbered receptors. Glycoprotein IIb/IIIa inhibitors are cardiac drugs, such as abciximab are cardiac drugs, sometimes used in antiplatelet therapy, however not traditionally as first line DAPT. These are used as red herrings in answers D and E.*

## **Google Form- Scores and Feedback**

- **Record your score**- this enables us to calculate an average mark for the mock and gauge the difficulty of the paper as a whole. Please note all data collected is anonymous.
- **Inform us of mistakes**- from spelling mistakes to incorrect explanations, let us know where we've gone wrong so we can improve it.
- **Ask for further clarification**- maybe you want a clearer explanation of the difference between 2 answers or more justification of the single best answer, ask us and we'll get on it!

**Paper 1 Google Form-** <https://forms.gle/ebcvLpEdokGT4x7J6>

**I hope you found this mock beneficial for your learning, thanks for taking part.**

**Andrew Maud- PTS Assessments Coordinator 2020-21. [PTSassessments1@gmail.com](mailto:PTSassessments1@gmail.com)**