

# PTS 3a Mock SBA Series 2020

## Paper 4- [Answers]- Version 1



### 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:

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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 and repeated in future years**. Thank you.

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# Summary of Topics Assessed- Paper 4

<p><b>Paediatrics- 1.7</b></p> <ol style="list-style-type: none"> <li>1. Management of ADHD</li> <li>2. Diagnosis of ADHD</li> <li>3. Treatment of Viral Induced Wheeze</li> <li>4. Red Flags for Viral Induced Wheeze</li> <li>5. Clinical Presentation of Necrotising Enterocolitis</li> <li>6. Diagnosis of Necrotising Enterocolitis</li> <li>7. Causes of Cyanotic Heart Disease</li> <li>8. Treatment of Glue Ear</li> <li>9. Complications of Inguinal Hernias'</li> <li>10. Risk Factors for Cyanotic Heart Disease</li> </ol>	<p><b>Paediatrics- 1.8</b></p> <ol style="list-style-type: none"> <li>11. Diagnosis/ management- acute asthma</li> <li>12. Management- chronic asthma</li> <li>13. Diagnosis / management of Meningococcal septicaemia / meningitis</li> <li>14. Meningococcal septicaemia signs</li> <li>15. Impetigo</li> <li>16. Cryptorchidism</li> <li>17. Anaphylaxis management</li> <li>18. Intussusception features</li> <li>19. Intussusception investigations and management</li> <li>20. Infective gastroenteritis</li> </ol>	<p><b>List 2.11</b></p> <ol style="list-style-type: none"> <li>21. Features of lithium toxicity</li> <li>22. Mood stabilisers used for bipolar disorder</li> <li>23. Side effects of antidepressants</li> <li>24. Management of delirium</li> <li>25. Management of borderline personality disorder</li> <li>26. Management of alcohol dependency</li> <li>27. Diagnosis of delirium</li> <li>28. Monitoring requirements of lithium</li> <li>29. Management of alcohol withdrawals</li> <li>30. Diagnosis of serotonin syndrome</li> </ol>
<p><b>List 2.44</b></p> <ol style="list-style-type: none"> <li>31. Epidemiology of dementia</li> <li>32. Features of early Alzheimer's disease</li> <li>33. Management of GAD</li> <li>34. Investigations of GAD</li> <li>35. Delirium tremens features</li> <li>36. Serotonin syndrome</li> <li>37. Management of opioid overdose</li> <li>38. Features of lithium toxicity</li> <li>39. Features of Wernicke's encephalopathy</li> <li>40. Management of Wernicke's encephalopathy</li> </ol>	<p><b>Obs&amp;Gynae- 3.7</b></p> <ol style="list-style-type: none"> <li>41. Primary amenorrhoea</li> <li>42. Secondary amenorrhoea</li> <li>43. Perineal tear</li> <li>44. Shoulder dystocia</li> <li>45. ToP methods</li> <li>46. HELLP syndrome</li> <li>47. Preterm labour</li> <li>48. Termination of pregnancy statutory grounds</li> <li>49. Placental abruption</li> <li>50. Placenta praevia</li> </ol>	<p><b>Obs&amp;Gynae- 3.99</b></p> <ol style="list-style-type: none"> <li>51. Blood test in infertility</li> <li>52. Secondary amenorrhoea with breast discharge</li> <li>53. Hypothalamic-pituitary-gonadal axis</li> <li>54. Problems with breastfeeding</li> <li>55. Presenting features of ovarian tumours</li> <li>56. Treatment- cervical cancer</li> <li>57. Cyclical pelvic pain</li> <li>58. Causes of hirsutism</li> <li>59. Amenorrhoea associated with anorexia nervosa</li> <li>60. Management of puerperal psychosis</li> </ol>

# Summary of Topics Assessed- Paper 4

<p><b>GP/Public Health- 6.11</b></p> <ul style="list-style-type: none"> <li>61. Radiological findings in heart failure</li> <li>62. Investigations of heart failure</li> <li>63. Mental Capacity Act, 2005</li> <li>64. Gillick competence</li> <li>65. MMR vaccine</li> <li>66. Screening tool for depression</li> <li>67. Notifiable diseases</li> <li>68. Domestic abuse and safeguarding children</li> <li>69. Domestic abuse - acute management</li> <li>70. Screening for alcohol abuse</li> </ul>	<p><b>Neuro- 7.3</b></p> <ul style="list-style-type: none"> <li>71. Cluster headache treatment</li> <li>72. Status epilepticus management</li> <li>73. Differential diagnostic features seizure vs syncope</li> <li>74. Pharmacologic management of epilepsy</li> <li>75. Myasthenia gravis diagnosis</li> <li>76. Normal pressure hydrocephalus diagnosis</li> <li>77. Seizure differentiation</li> <li>78. Hydrocephalus pathophysiology and anatomy</li> <li>79. Post-ictal GCS calculation</li> <li>80. Symptoms of Multiple sclerosis</li> </ul>
<p><b>General Medicine- WC4</b></p> <ul style="list-style-type: none"> <li>81. Presenting complaint of diarrhoea</li> <li>82. Presenting complaint of jaundice</li> <li>83. Presenting complaint of weight gain</li> <li>84. Management of delirium tremens (indication for BDZs)</li> <li>85. Indication for Propranolol (Management of hyperthyroidism)</li> <li>86. GUM microbiology interpretation</li> <li>87. Murmur on clinical examination</li> <li>88. Management of UC</li> <li>89. Meningitis microbiology interpretation</li> <li>90. Presenting complaint of weight gain (PCOS)</li> </ul>	<p><b>General Medicine- TB4</b></p> <ul style="list-style-type: none"> <li>91. Diagnosis of acromegaly</li> <li>92. Primary adrenal insufficiency sick day rules</li> <li>93. Diagnosis of Hodgkin's lymphoma</li> <li>94. Appendicitis treatment</li> <li>95. IBS treatment</li> <li>96. Risk factors for subarachnoid haemorrhage</li> <li>97. Prevention of migraines</li> <li>98. Management of a STEMI</li> <li>99. Presentation of cholecystitis</li> <li>100. ECG of AF</li> </ul>

Question 1- B Lisdexamfetamine

*Lisdexamfetamine is the correct answer, it is the second line choice of medication for ADHD in school aged children (over 6 years old). Dexamfetamine (A) can be used in the treatment of ADHD however, is usually offered if a patient is intolerable to the side effects of Lisdexamfetamine. Propranolol, Sertraline and Zopiclone are not used in the management of ADHD.*

Question 2- E, A 14 year old struggles to complete her homework and often takes longer than her classmates to complete work

*Whilst (E) could point towards a diagnosis of ADHD, it does not appear on the DSM-V criteria. It is also too vague to guide a diagnosis. The answer does not explain why the child struggles to complete her homework/tasks : this could be due to ADHD but is not made clear enough to be established as a symptom of 'inattention'. Answers (A,B,C,D) all appear on the DSM-V 6 criteria:*

- *Answers questions prematurely*
- *Always on the go, spontaneously moving around*
- *Losing important things, Forgetful*
- *Cannot play quietly*

Question 3- B Inhaled Salbutamol

*Viral Induced Wheeze is very common in infants, the first line treatment is Salbutamol inhaler given via a spacer (B), the parents should also be reassured that this will clear up however, if a viral wheeze is present, symptomatic treatment should be given. Steroids are not proven to be helpful in viral induced wheeze. IV salbutamol, should only be given in severe asthma attacks, and not in viral induced wheeze.*

Question 4- C, the child becomes lethargic and floppy

*Red flags for viral induced wheeze include: central cyanosis, the infant becoming floppy, tracheal tug, costal recession or the child is too breathless to feed/finish a sentence. A respiratory rate of 30-35 is normal for a 15 month old child, it may also be normal for a child to be clingy and 'off feeding' when they are unwell. The child may develop a cough as part of the viral infection attributed to their wheeze.*

Question 5- E Vesicular Rash

*NEC is not associated with a Vesicular Rash, common signs and symptoms include:*

- *Abdominal distension*
- *Vomiting*
- *Visible intestine loops lacking Peristalsis*
- *Rectal Bleeding*
- *Lethargy*
- *Feeding intolerance*

*Treatment: Broad spectrum antibiotics*

#### Question 6- B Abdominal X- Ray

*Abdominal X-Ray is most appropriate for diagnosing NEC, important diagnostic criteria include*

- *Dilated Bowel Loops*
- *Bowel wall oedema*
- *Pneumotitis Intestinalis: gas within the wall of the intestine*

*Ultrasound can be used if the X-Ray is inconclusive. An ABG can be used to determine Metabolic Acidosis which is associated with advanced NEC.*

#### Question 7- D Transposition of the Great Arteries

*The correct answer is Transposition of the great arteries, other cyanotic heart defects include:*

- *Tetralogy of Fallot*
- *Tricuspid Atresia*

*Remember it like (all of the big/ main cyanotic heart diseases begin with T) the rest are acyanotic. Patent ductus arteriosus is considered an acyanotic heart disease but if uncorrected can become cyanotic. In TGA, the Aorta arises from the Right side of the heart and Pulmonary Artery from the left. This means systemic circulation is supplied with deoxygenated blood leading to cyanosis. In order for TGA to be viable with life there must be 'mixing' of blood through: an open Foramen ovale, ductus arteriosus or VSD. Encouragement of these openings can be done with Prostaglandin Antagonists*

#### Question 8- B Grommets

*Glue ear, may resolve by itself (this can take up to 3 months). If treatment is required it is most commonly Grommets or Temporary hearing aids. Broad spectrum antibiotics may be given if the glue ear causes the development of an ear infection but are not used in the treatment of the condition itself. Neither structural surgery nor manual drainage are used in the management of glue ear.*

#### Question 9 B, The Hernia has become strangulated

*Strangulation of an inguinal Hernia is an emergency and needs to be repaired immediately. Risk factors for an unrepaired strangulated hernia include sepsis and mortality. Male patients are not at a higher risk of complications from Hernias than Females, however inguinal Hernias are more common in male infants. Right sided inguinal hernias are more common than left sided due to patency of the processus vaginalis, however they are not an indication for immediate repair. Reducible hernias are safer than Irreducible hernias which require prompt repair*

#### Question 10- E, William's Syndrome

*William's Syndrome is generally associated with Supravalvular Aortic Stenosis, which is not a cause of cyanotic heart disease.*

Question 11 – Correct answer B: Intravenous aminophylline

*This question is testing your recognition of how severe Tom's asthma exacerbation is, using the clinical information given, alongside your knowledge of how to manage an acute asthma exacerbation – both very important topics for exams and real life. Tom is suffering from a severe exacerbation of asthma, as he is tachypnoeic and not able to complete sentences. He has no features of life-threatening asthma. Included in the first-line management of severe attacks are (A) high flow O<sub>2</sub> (if SpO<sub>2</sub> <94%), (B) corticosteroids, (D) nebulised ipratropium and (E) nebulised salbutamol. Nebulised magnesium can be added if the SpO<sub>2</sub> <92% in severe attacks but that is not an option given. Second-line treatments, namely IV salbutamol, IV aminophylline or IV magnesium, can be given if the patient is unresponsive to your initial management, but this question is asking about the initial treatment. Your role as a junior doctor would be to initiate the appropriate first-line management and then get senior help.*

Question 12- Correct Answer C – adding oral montelukast

*This question is testing your knowledge of the treatment pathway for non-acute asthma. There are NICE guidelines and BTS guidelines for asthma treatment for children and adults, both of which are acceptable for exams, however most clinicians tend to use the BTS guidelines (they are also simpler to understand!). BTS guidance is used here.*

*Every child with asthma should be on a regular inhaled corticosteroid (beclomethasone in Karim's case) and a PRN short-acting B<sub>2</sub> agonist (salbutamol in Karim's case). His asthma is clearly uncontrolled, with multiple weekly exacerbations requiring reliever therapy. Karim is 4 years old. Therefore, the next step in the BTS guidance is an oral leukotriene receptor antagonist, such as montelukast (C).*

*A course of prednisolone (A) would be appropriate for an acute exacerbation of asthma, not poorly-controlled chronic disease. Inhaled salmeterol, a long-acting beta agonist, would be appropriate if Karim was 5 years or older (B). Increasing his inhaled beclomethasone would be appropriate if montelukast was ineffective (D). Increasing his inhaled salbutamol dose is not appropriate as it does not address the underlying inflammation associated with asthma and therefore does not work to prevent him suffering from further exacerbations (E).*

Question 13- Correct Answer C – Intravenous cefotaxime

*This question is asking about your recognition of the correct diagnosis (Meningococcal meningitis + Meningococcal septicaemia) through CSF interpretation and blood culture interpretation, alongside your knowledge of the correct treatments.*

*The CSF results imply bacterial meningitis: raised protein (due to bacteria being present), low glucose (due to utilisation by bacteria), and high white cells with a neutrophilia (due to host response to bacteria). Blood cultures show gram negative diplococci – this should always trigger you to think of Meningococcus (*Neisseria meningitidis*) in this context. The only other time gram negative diplococci might turn up in exams are for *Neisseria gonorrhoeae* (gonorrhoea) infections. The patient has Meningococcal septicaemia as the blood cultures are growing the bacteria, implying growth of bacteria in the blood. This is different and distinct to Meningococcal meningitis - You can have one without the other. In this case, she has both. If, for example, Sam had gram negative diplococci growing in her blood but her LP results were fine, she would have Meningococcal septicaemia and NOT meningococcal meningitis (and vice-versa).*

*The answer is (C) cefotaxime because in-hospital first-line treatment of Meningococcal meningitis / Meningococcal septicaemia is a 3<sup>rd</sup> generation cephalosporin. Amoxicillin (A) is incorrect as this is added*

empirically for children <3 months with bacterial meningitis to cover for *Listeria* – Sam is older and we know her diagnosis is not *Listeria*. Benzylpenicillin (B) is used for ?Meningococcal septicaemia / ?Meningococcal meningitis outside of hospital – if Sam was at the GP, this would be the correct answer. Aciclovir (E) is used to treat viral meningitis, and we know from the LP results and blood cultures the diagnosis is most likely bacterial. Dexamethasone (D) is added to the first dose of empirical antibiotics for suspected meningitis, to reduce the complication rate from Pneumococcal meningitis. It has no benefit in Meningococcal disease. As we know Sam has Meningococcal meningitis and we are not treating empirically, dexamethasone is not appropriate.

#### Question 14- Correct answer- E – Raised, palpable lesions

This question is asking about one of the classic features of Meningococcal septicaemia – a non-blanching, flat purpuric rash. Purpura is a general term given to a non-blanching red/purple lesion caused by bleeding into mucous membranes or skin.

Purpura can be broken down into petechiae (lesions up to 2mm in size) and ecchymoses (aka bruises, larger extravasations of blood). Purpuric rashes are caused by bleeding into skin/ mucous membranes, so the causes can be broken down into 1) low platelets (e.g. ITP, leukaemias, DIC) and 2) normal platelet count (e.g. vasculitis, Meningococcal sepsis, trauma). A key feature with a Meningococcal rash is that it is classically non-palpable / flat. This can help differentiate from another not-uncommon cause of a purpuric rash in children, Henoch-Schlongein Purpura (HSP), a type of vasculitis where the lesions are classically raised and palpable. Despite this clinical difference, if a non-blanching purpuric rash is seen in a child it is treated as Meningococcal septicaemia until proven otherwise.

A classic feature of the Meningococcal rash is that it may start anywhere, with as little as one petechial lesion, and spread rapidly (A). Despite looking non-alarming at this stage, urgent treatment is still needed and hence it is important to thoroughly search for this rash in all unwell children. The lesions may vary in size from petechiae to ecchymoses; the bleeding is caused by skin necrosis and endothelial damage in response to *Meningococcus* which can worsen as the disease progresses (B). The rash does not blanch, (meaning it does not fade when you apply pressure): this is a classic feature of any purpuric rash (C). The rash is, by definition, purpuric, because it is caused by bleeding into skin and mucous membranes (D).

Crucial to note is that this rash is seen with Meningococcal septicaemia, not Meningococcal meningitis. It is caused by a response to *Meningococcus* in the blood, i.e. septicaemia, and is distinct from meningitis. However, its presence should alert you to search for meningitis as this could also be present if *Meningococcus* has found its way into the CNS.

#### Question 15- Correct answer- E – Topical antibiotics are always recommended

Impetigo is a contagious bacterial infection normally caused by *S. Aureus* (D), but it may also be caused by Group A *Streptococcus*.

It classically begins on the face (C) with erythematous (red from inflammation) macules (flat areas of altered colour) that then progress to vesicles (raised, clear fluid-filled lesions <0.5cm), pustules (pus-containing lesions <0.5cm) or bullae (raised, clear fluid-filled lesions >0.5cm); as these rupture, the rash crusts over in a classical 'honey' colour (A). It is highly contagious and kids should miss school until the lesions have dried out (B).

Topical antibiotic treatment is not always recommended, therefore the correct answer is (E). According to NICE, if the lesions are localised and non-bullous, a short course of hydrogen peroxide cream is

recommended or, if this is unsuitable, e.g. the lesions are near the eye, then topical antibiotic creams such as fusidic acid are given. If the rash is widespread and non-bullous, then topical or oral antibiotics are recommended first-line. If there are any bullae or the child is unwell / at risk of complications from infections, then oral antibiotics should be offered first-line. Oral antibiotics in impetigo could be flucloxacillin, or clarithromycin if penicillin-allergic.

Question 16- Correct answer- D – Travis' cryptorchidism is termed 'impalpable'

Cryptorchidism (i.e. undescended testes) can either be 1) retractile (the testis is not present in the scrotum but can be manipulated into the scrotum before retracting again), 2) palpable (the testis can be palpated in the groin but cannot be manipulated into the scrotum) or 3) impalpable (no testis can be felt, and may lie in the inguinal canal, intra-abdominally, or be absent). Travis' is impalpable (D).

Cryptorchidism is common, affecting 5% of term males, and is more common in premature infants as descent occurs in the 3<sup>rd</sup> trimester (E).

Descent may continue during infancy and by 3 months only around 1-2% of males are affected with little change after this. For this reason, Travis does not need referral to a surgeon – the optimal management would be to repeat the testicular examination at his 6-week baby exam at the GP and refer if the testis is still undescended at 3 months of age. Orchiectomy, the surgical removal of a testis, is not the preferred management for most cases of cryptorchidism (C).

Most children will undergo orchidopexy (surgical placement of the testis in the scrotum) (A). This has the benefits of 1) improving fertility, 2) a potential reduced risk of malignancy, as any malignant changes will be easier to identify if the testis is in the scrotum rather than intra-abdominally, and 3) cosmetic and psychological benefits.

Travis does not need hormonal testing and karyotyping (B). He has one testis, implying that he has developed a male phenotype. Hormonal testing and karyotyping are reserved when there are bilateral impalpable testes.

Question 17- Correct answer- A - Intravenous adrenaline is the most important initial pharmacological treatment

Anaphylaxis is defined as a life-threatening hypersensitivity reaction, characterised by acute onset airway, breathing and circulation problems alongside skin and mucosal changes (C).

It is a type I hypersensitivity reaction where IgE antibodies, present on mast cells, are bound by an antigen (from an allergen, e.g. nuts, seafood, drugs) which causes the release of preformed mediators such as histamine and tryptase, alongside the formation of new prostaglandins (D). This can only happen once mast cells have been sensitised to an allergen, e.g. have bound to IgE in the past – this sensitisation is clinically silent (E).

Adrenaline stabilises mast cells, preventing the release of histamine and also 1) agonises alpha-1 receptors to vasoconstrict, increasing blood pressure and agonises beta-2 receptors in the airways to bronchodilate, relieving breathing problems. **However, adrenaline should be given intramuscularly:** this is easier and quicker than fiddling about with cannulas when you cannot waste time, and IV adrenaline is highly potent where even a small amount too much can overdose the patient. Therefore the correct answer is (A). You should give IM adrenaline, and repeat if no changes. A senior doctor would give IV adrenaline if IM has had no effect.

*Steroids and antihistamines will reduce the inflammation and combat the histamine-induced vasodilation respectively, but they take a couple of hours to work so adrenaline is your immediate priority (B).*

Question 18- Correct answer- C – intussusception

*The clinical features described are classic of intussusception (C): paroxysmal episodes of colicky abdominal pain, where the child is inconsolable and draws their legs up to their abdomen, alongside features of intestinal obstruction. Intussusception is caused by invagination of the proximal bowel into the distal bowel (most commonly ileum into the caecum). This causes intestinal obstruction and is the most common cause of obstruction in infants after the neonatal period. It is most common between 3 months and 2 years. As it is causing obstruction, there is distension of the abdomen. It may cause vomiting and constipation, but these are not the main clinical features compared to the pain. The classical 'redcurrant jelly stool' in intussusception is not as common as the other clinical features, it occurs late in the disease and often first seen after a rectal examination. Intussusception is an important diagnosis because, as the obstruction worsens, mesentery is stretched leading to venous obstruction. This then causes strangulation of the bowel, leading to necrosis of the bowel, generalised peritonitis and shock over time – which has likely happened in our case.*

*It is less likely to be appendicitis (A) as there is no anorexia (a feature very suggestive of appendicitis), the pain is not constant and has not moved to the right iliac fossa, and James does not appear to have constant abdominal pain aggravated by movement.*

*It is not infantile colic (B) as this is a benign condition which gradually resolves after 3-12 months, although it is associated with paroxysmal inconsolable crying and drawing up of the legs, there are no other worrying features such as distension or constipation.*

*It is not pyloric stenosis (D) as this presents around 2-8 weeks old, with episodes of worsening vomiting (ending with projectile vomiting) and loss of interest in feeding.*

*It is less likely to be volvulus (E) as this most commonly presents in the first few days of life, with bilious vomiting and pain that is less classical in description than intussusception.*

Question 19- Correct answer- D – Operative reduction is the management of choice in most patients

*Intussusception refers to invagination of proximal bowel into distal bowel, leading to intestinal obstruction. It is the most common cause of intestinal obstruction in infants after the neonatal period. The most common site of invagination is the ileum telescoping into the caecum, causing small bowel obstruction. This will cause distended small bowel on an abdominal X-ray (B).*

*The investigation of choice is an ultrasound abdomen. If you see the intussusception head on, you will see a 'target sign' or 'doughnut sign' appearance of the proximal bowel in the distal bowel, confirming the diagnosis (A).*

*Intravenous fluids are crucial as, due to the obstruction, fluid pools in the abdomen which leads to shock. This needs to be replaced (C).*

*Operative reduction is not the management of choice, therefore the correct answer is (D). Instead, rectal air insufflation is preferred. This refers to the instillation of air into the large intestine through a soft tube placed in the rectum. This creates pressure within the intestine and pushes the invagination of intestine back to normal. Operative reduction could be done if there is peritonitis or rectal air insufflation has failed.*

Question 20- Correct answer- B - Her parents should be instructed to purchase some oral rehydration solution sachets and feed them to her often and in small amounts.

*Rachel is suffering from infective gastroenteritis. This is suggested by sudden onset diarrhoea and vomiting, after visiting a restaurant, with no other worrying features of note. The main concern in gastroenteritis is dehydration and the potential for shock to ensue. For this reason, it is crucial to assess a patient's volume status. Rachel has dry mucous membranes, is thirsty and light-headed. These are all features of dehydration. More worrying features representing shock would be appearing unwell, lowered conscious level, confusion, agitation, poor urine output, mottled skin, prolonged capillary refill time, hypotension (but this is a late sign in children), tachycardia and tachypnoea.*

*As she is not shocked, she does not need admission for IV fluids (C).*

*She is dehydrated and the optimal management of this in the context of gastroenteritis is oral rehydration solution (B). These provide the correct balance of electrolytes and fluid, where the focus is letting the body get over the infection whilst maintaining hydration.*

*Loperamide and other anti-diarrhoea medication should not be used in gastroenteritis: they take the focus away from maintaining hydration, are ineffective and prolong excretion of the causative organism (A).*

*Antibiotics are not needed for gastroenteritis unless there is suspicion of sepsis, the patient is immunocompromised or the infection has spread elsewhere (D).*

*Blood tests are not needed here, especially in children, as the management is clear and Rachel is not particularly unwell (E). If she were to be admitted for IV fluids then blood tests would be appropriate.*

Question 21- Correct Answer D- Hypo-reflexia

*Hypo-reflexia is NOT a sign of lithium toxicity. All the other options are signs of lithium toxicity. Lithium is known to reduce suicide rates but has a narrow therapeutic range so one must watch out for toxicity.*

*NICE CKS says "the lithium dose is usually adjusted to achieve a plasma level of 0.6 mmol/L to 1 mmol/L."*

*Signs of lithium toxicity include increasing diarrhoea, vomiting, anorexia, muscle weakness, lethargy, dizziness, ataxia, lack of coordination, tinnitus, blurred vision, coarse tremor of the extremities and lower jaw, muscle hyper-irritability, choreoathetoid movements, dysarthria, and drowsiness.*

*Severe lithium toxicity occurs at serum lithium concentrations of approximately 2 mmol/L and above.*

*Signs include, hyper-reflexia and hyperextension of limbs, syncope, toxic psychosis, seizures, polyuria, renal failure, electrolyte imbalance, dehydration, circulatory failure, coma, and occasionally death.*

*If lithium toxicity is suspected, do an urgent lithium level immediately and seek specialist advice. People on lithium should be made aware that episodes of diarrhoea or vomiting, or any form of dehydration, will lead to sodium depletion and therefore increased plasma lithium levels (as the kidney treats sodium and lithium similarly so it reabsorbs lithium if there is sodium depletion). Patients should also maintain their fluid intake, particularly after sweating (for example, after exercise, in hot climates, or if they have a fever), long periods of immobility, or chest infections.*

Question 22- Correct Answer B- Chlorpromazine

*Chlorpromazine (typical antipsychotic) is not used as a prophylactic in the long term management of bipolar disorder. All the other medications are used in the long term management of mania with Lithium being the first line as it is the most effective in long-term treatment for bipolar disorder. However, it is teratogenic and has a narrow therapeutic range. Because of its high teratogenic risk, Valproate should not be offered to women or girls of childbearing potential; this includes young girls who are likely to need*

treatment into their childbearing years. Olanzapine can be used for the long-term management of bipolar disorder in patients whose manic episode responded to olanzapine therapy in the past. Carbamazepine may be used under specialist supervision for the prophylaxis of bipolar disorder in patients unresponsive to a combination of other prophylactic drugs; it is used in patients with rapid-cycling manic-depressive illness (4 or more affective episodes per year).

Question 23- Correct Answer E- Sertraline

Hyponatraemia (usually in the elderly) has been associated with all types of antidepressants; however, it has been reported more frequently with SSRIs (sertraline, fluoxetine, citalopram, etc.) than with other antidepressants. Hyponatraemia should be considered in all patients who develop drowsiness, confusion, or convulsions while taking an antidepressant.

Metformin and Amlodipine are not known to cause hyponatraemia. While Ramipril should be given with caution in someone with a low-sodium diet, BNF doesn't mention hyponatraemia as an adverse effect of it otherwise. Whilst confusion and drowsiness are possible side effects of co-codamol, the presence of hyponatraemia in this patient makes the cause more likely to be Sertraline as co-codamol is not known to cause hyponatraemia.

Question 24- Correct Answer E- Orientation, reassurance and a quiet environment

John is exhibiting signs of hyperactive delirium. Typically, patients with hyperactive delirium present with agitation, hallucinations, wandering and aggression. Old age, change of environment, significant comorbidities are all risk factors for delirium. There are many things that can contribute to delirium including infection, drugs (starting or withdrawing), metabolic and neurological causes.

First line management for hyperactive delirium is non-pharmacological such as orientation, reassurance, quiet environment, continuity of staff and environment, providing hearing aids/glasses, etc. You would also try to treat the underlying cause/s of delirium.

Taking no action would be inappropriate as the patient is obviously distressed. Whilst NG tube insertion may increase nutrition this isn't the main issue in this scenario. If verbal and non-verbal de-escalation techniques have failed, the person is a danger to themselves or others, or the benefits outweigh the risks, then a short course of haloperidol or lorazepam as an alternative if haloperidol is contraindicated can be used. Haloperidol should be avoided with patients with Parkinson's disease/parkinsonism, Lewy-body dementia, or a prolonged QT interval.

Question 25- Correct Answer B- Dialectical behavioural therapy

This is a patient with emotionally unstable personality disorder (EUPD) aka borderline personality disorder. ICD 10 says EUPD is "Personality disorder characterized by a definite tendency to act impulsively and without consideration of the consequences; the mood is unpredictable and capricious. There is a liability to outbursts of emotion and an incapacity to control the behavioural explosions. There is a tendency to quarrelsome behaviour and to conflicts with others, especially when impulsive acts are thwarted or censored. Two types may be distinguished: the impulsive type, characterized predominantly by emotional instability and lack of impulse control, and the borderline type, characterized in addition by disturbances in self-image, aims, and internal preferences, by chronic feelings of emptiness, by intense and unstable interpersonal relationships, and by a tendency to self-destructive behaviour, including suicide gestures and attempts."

NICE says - "For women with borderline personality disorder for whom reducing recurrent self-harm is a priority, consider a comprehensive dialectical behaviour therapy programme."

The main indication for medication in patients with personality disorders is the development of comorbid mental illness. NICE guidelines on the treatment of borderline personality disorders advise that medication should not be used in an attempt to treat borderline personality disorders. Therefore, sertraline shouldn't be used here unless there were indications the patient had depression. Similarly, olanzapine would be used if the patient had comorbid psychotic symptoms.

It is important to base the assessment of personality on information, preferably from a number of sources, and the premorbid functioning of an individual.

Family therapy is recommended for young patients with eating disorders.

#### Question 26- Correct Answer C- Disulfiram

Disulfiram (trade name Antabuse) is a deterrent drug which results in an increase in serum acetaldehyde if alcohol is consumed. This causes diaphoresis, palpitations, facial flushing, nausea, vertigo, headache, hypotension, and tachycardia. This aggregation of symptoms is known as the disulfiram-alcohol reaction and discourages alcohol intake. The reaction is proportional to both the dose of disulfiram and alcohol. Disulfiram is not an anti-craving drug and does not modulate the neurobiological mechanism of addiction. In Mr Nair's case, disulfiram may help him stay abstinent.

The preferred medication for assisted withdrawal from alcohol is benzodiazepine (chlordiazepoxide or diazepam) and is not appropriate here. Benzodiazepines should only be used for managing alcohol withdrawal and not as ongoing treatment for alcohol dependence.

Acamprosate or naltrexone are the pharmacological options available for managing alcohol dependence which are usually offered alongside psychological intervention/s or if psychological interventions by themselves are insufficient. These could be used in him but I just wanted to illustrate the discouraging nature of disulfiram and what the disulfiram-alcohol reaction is and felt it would be more appropriate here.

#### Question 27- Correct Answer E- Hypoactive delirium; oxycodone, oxybutynin and morphine

Bob is showing signs of hypoactive delirium. It is more common than hyperactive delirium and is much easier to miss. It can also be confused with depression. Symptoms include lethargy, slowness with everyday tasks, excessive sleeping, inattention, etc. The risk factors for hypoactive and hyperactive delirium are the same. An easy way to remember causes of delirium is "PINCH ME" which refers to pain, infection, nutrition, constipation, hydration, medication, electrolytes.

Here, the most likely cause of his delirium is constipation and the medications contributing to this are morphine, oxycodone and oxybutynin, all of which can cause constipation as a side effect. Constipation is not a known side effect from isosorbide mononitrate.

#### Question 28- Correct Answer E- TFT and U&Es and eGFR

The long-term adverse effects of lithium include hypothyroidism, hyperthyroidism, hyperparathyroidism, nephrotoxicity, renal tumours, rhabdomyolysis. This explains why NICE recommends monitoring someone who is taking lithium by measuring weight, urea and electrolytes (U&E), estimated glomerular filtration rate (eGFR), calcium, and thyroid function tests (TFT) every 6 months. These should be measured more often if there is evidence of impaired renal function.

*An additional learning point is that initial adverse effects of lithium therapy include nausea, diarrhoea, vertigo, muscle weakness, and a 'dazed' feeling. These effects often resolve with continued therapy. Fine hand tremors, polyuria, and polydipsia may persist.*

Question 29- Correct Answer D- Inpatient assisted withdrawal with chlordiazepoxide

*NICE guidelines say “consider inpatient or residential assisted withdrawal if a service user meets one or more of the following criteria. They drink over 30 units of alcohol per day, have a score of more than 30 on the SADQ, have a history of epilepsy, or past experience of withdrawal-related seizures or delirium tremens during previous assisted withdrawal programmes, need concurrent withdrawal from alcohol and benzodiazepines, regularly drink between 15 and 30 units of alcohol per day AND have significant psychiatric or physical comorbidities (for example, chronic severe depression, psychosis, malnutrition, congestive cardiac failure, unstable angina, chronic liver disease) or a significant learning disability or cognitive impairment”. Community-based assisted withdrawal would be useful if the patient didn't meet the criteria for inpatient assistance.*

*The preferred medication for assisted withdrawal is a benzodiazepine (chlordiazepoxide or diazepam). This patient seems to have suffered from a withdrawal-related seizure and hence inpatient assisted withdrawal would be the most appropriate management plan. In the above patient's case, you should also offer parenteral thiamine followed by oral thiamine to prevent Wernicke-Korsakoff syndrome. Cognitive behavioural therapy may be useful for harmful drinkers and people with mild alcohol dependence. Behavioural couples therapy may be useful for harmful drinkers and people with mild alcohol dependence who have a regular partner who is willing to participate in treatment.*

*An easy way to remember signs of alcohol dependence is “PR COST TO REWIRE” referring to:*

- *PR: Prominence/Primacy of drink taking behaviour. Drink is PRIORITY (over clothes for kids, etc).*
- *CO: Subjective awareness of COMPULSION to drink.*
- *ST: STEREOTYPED pattern of drinking*
- *TO: increased TOLERANCE*
- *RE: gets RELIEF from drinking*
- *WI: repeated WITHDRAWAL symptoms*
- *RE: rapid REINSTATEMENT after a period of abstinence*

Question 30- Correct Answer E- Serotonin syndrome

*This is an example of a patient with serotonin syndrome. Serotonin syndrome also known as serotonin toxicity is relatively uncommon, however it can be life threatening. It is an adverse drug reaction caused by excessive central and peripheral serotonergic activity. It can occur within hours or days following the initiation, dose escalation, or overdose of a serotonergic drug, the addition of a new serotonergic drug, or the replacement of one serotonergic drug by another without allowing a long enough washout period in-between, particularly when the first drug is an irreversible MAOI or a drug with a long half-life. Severe toxicity, which is a medical emergency, usually occurs with a combination of serotonergic drugs, one of which is generally an MAOI.*

*The characteristic symptoms of serotonin syndrome fall into 3 main areas, although features from each group may not be seen in all patients. The areas are neuromuscular hyperactivity (such as tremor, hyperreflexia, clonus, myoclonus, rigidity), autonomic dysfunction (tachycardia, blood pressure changes, hyperthermia, diaphoresis, shivering, diarrhoea), and altered mental state (agitation, confusion, mania). The patient above is displaying symptoms in all three areas and takes sertraline (an SSRI) and has also*

recently started taking cocaine, which also increases serotonin. Hence serotonin syndrome is the most likely diagnosis.

Treatment consists of withdrawal of the serotonergic medication and supportive care; specialist advice should be sought. Be aware when prescribing SSRIs of the need to ask about cocaine use to avoid concurrent use of multiple serotonergic drugs.

Hyponatraemia has been associated with all types of antidepressants; however, it has been reported more frequently with SSRIs than with other antidepressants. Hyponatraemia should be considered in all patients who develop drowsiness, confusion, or convulsions while taking an antidepressant.

Neuroleptic malignant syndrome is a rare but potentially life-threatening idiosyncratic reaction to neuroleptic drugs. Signs include fever, muscular rigidity, altered mental status and autonomic dysfunction. It is usually associated with potent neuroleptics (antipsychotics) such as haloperidol and fluphenazine. It can develop in a more gradual way than serotonin syndrome.

Delirium tremens is a medical emergency. It is a hyperadrenergic state resulting from alcohol withdrawal. Delirium tremens usually begins 24-72 hours after alcohol consumption has been reduced or stopped. The symptoms differ from usual withdrawal symptoms in that there are signs of altered mental status such as hallucinations, confusion, delusions, severe agitation, seizures.

Wernicke-Korsakoff syndrome is a spectrum of disease resulting from thiamine deficiency, usually related to alcohol misuse.

#### Question 31- Correct Answer B- Alzheimer's disease

The correct answer is Alzheimer's disease which accounts for 50-75% of dementia cases. Alzheimer's disease is characterised by neurofibrillary tangles, existing within neurones made from tau, and plaques of beta amyloid which occur between neurones.

Vascular dementia accounts for up to 20% of dementias and is due to multiple infarcts in the brain.

Typical cardiovascular risk factors are relevant here and include smoking, hypertension, and diabetes.

Dementia with Lewy bodies accounts for 10-15% of dementias and is characterised by early onset movement disorder (parkinsonism) and often visual hallucinations.

Frontotemporal dementia accounts for 2% of dementias. It is more likely to affect younger people aged 45-65 years and have features such as behaviour change and disinhibition due to frontal lobe pathology.

Creutzfeldt Jakob disease is an incredibly rare cause of dementia but highlights the wide array of dementia causes e.g. HIV-associated dementia, Korsakoff's dementia, among others. Creutzfeldt Jakob disease is characterised by a rapidly progressive dementia with myoclonus and early neurological involvement.

#### Question 32- Correct Answer B- Faecal incontinence

Faecal incontinence is not a feature of Alzheimer's disease (AD) in its early stages. Incontinence can be caused by AD but is seen in the later stages. Incontinence at diagnosis of dementia may alert you to a different diagnosis e.g. normal pressure hydrocephalus (triad of ataxia, urinary incontinence, and dementia). Anxiety is common in AD and makes up the spectrum of behavioral and psychological symptoms of dementia (BPSD). Forgetting names of family members, lack of orientation to surroundings and short-term memory loss all also occur in early AD.

#### Question 33- Correct Answer D- Lorazepam

Lorazepam is the correct answer. Benzodiazepines should not be used for more than 2-4 weeks due to the risks of addiction and side effects such as drowsiness.

Cognitive behavioural therapy should be used as the first line intervention for GAD and is effective over a long time. Duloxetine is an SNRI which can be used for GAD, as is citalopram (an SSRI). Propranolol can be used for GAD with panic attacks as it can reduce signs of autonomic activation such as hand tremors.

Question 34- Correct Answer D- Syphilis serology

Tertiary syphilis can present as an organic cause of mental illness but its features are similar to psychosis, rather than GAD.

NICE recommends performing a full blood count and iron studies as anaemia can present with fatigue and palpitations which can mimic GAD. An ECG and thyroid function tests are also recommended to exclude organic causes of palpitations. 24-hour urinary metanephrines is an initial investigation to rule out a pheochromocytoma which is an important cause of GAD with panic attacks due to the release of adrenaline from this benign tumour.

Question 35- Correct Answer C- Lilliputian

Lilliputian hallucinations is the correct answer. This is characterised by seeing lots of small people. The name comes from Gulliver's Travels. This is typically seen in delirium tremens.

Extracampine hallucinations refer to hallucinations outside the realm of physical possibility. These are not seen in delirium tremens. They are more suggestive of schizophrenia and other psychotic illnesses. Olfactory hallucinations and gustatory hallucinations may be seen in temporal lobe epilepsy and are not commonly seen in delirium tremens. Passivity phenomenon is not a hallucination, but a delusion that one is under control by an external agency. It is highly suggestive of schizophrenia or other psychotic illnesses.

Question 36- Correct Answer B- Fluoxetine and phenelzine

The correct answer is fluoxetine and phenelzine because the combination of a selective serotonin reuptake inhibitor (SSRI) such as fluoxetine with a mono-amine oxidase inhibitor (MAOI) such as phenelzine is most associated with serotonin syndrome.

Amitriptyline is a tricyclic antidepressant and lithium is used in bipolar disorder. Combining these does not cause serotonin syndrome. Lorazepam is a benzodiazepine and citalopram an SSRI. This combination is not associated with serotonin syndrome. Olanzapine is an atypical antipsychotic and haloperidol a typical antipsychotic. Combining these might cause neuroleptic malignant syndrome which is clinically similar to serotonin syndrome; it has a more gradual onset. Phenelzine, a MAOI, when combined with tyramine rich products such as cheese and cured meats can cause a hypertensive crisis. This is an important drug reaction but is different from serotonin syndrome. MAOIs are infrequently used because of this effect.

Question 37- Correct Answer D- Naloxone

The history is very suggestive of an opiate overdose. The antidote to acute opiate poisoning is naloxone.

Flumazenil is the antidote used in benzodiazepine poisoning which can present with respiratory depression and reduced consciousness, however the needle marks point towards an opiate overdose.

Acetylcysteine is the antidote to paracetamol poisoning. Naltrexone is used for the chronic management of opiate dependence. Cyproheptadine is used to treat serotonin syndrome.



Question 38- Correct Answer B- Lithium

Lithium is the correct answer. It has a narrow therapeutic window so is easy to overdose on. Overdose causes all the described symptoms but most specifically can cause dysarthria, dizziness, and a coarse tremor.

Sodium valproate is also potentially dangerous in overdose. In overdose it is neurotoxic so causes confusion, it can also cause nausea and vomiting. Even though this patient is vomiting, the coarse tremor points towards lithium toxicity though. Lamotrigine overdose causes drowsiness, nausea and vomiting and ataxia. This sounds like lithium poisoning, but a coarse tremor is not seen with lamotrigine poisoning. Lorazepam overdose causes respiratory depression primarily. Olanzapine overdose causes central nervous system depression and an anticholinergic effect.

Question 39- Correct Answer C- Ophthalmoplegia, gait disturbance, confusion

Ophthalmoplegia, gait disturbance and confusion is seen in Wernicke's encephalopathy which is caused by thiamine deficiency in harmful alcoholic drinkers due to reduced absorption and intake.

Confabulation, amnesia, and loss of insight are seen in Korsakoff's dementia, a result of Wernicke's encephalopathy if left untreated.

Bradykinesia, resting tremor, and postural instability are seen in patients with Parkinson's disease. Urinary incontinence, dementia and gait disturbance points towards normal pressure hydrocephalus. Scanning speech, intention tremor, and nystagmus are Charcot's neurological triad sometimes seen in multiple sclerosis. This is not to be confused with Charcot's triad which involves ascending cholangitis, RUQ pain and fever.

Question 40- Correct Answer A- B1

B1 (thiamine) is the correct answer. Deficiency in this vitamin leads to a brain injury which is characterised by the triad of ophthalmoplegia, ataxia and confusion. This is known as Wernicke's encephalopathy. Patients will need prompt administration of pabrinex (B vitamins).

B6 deficiency results in peripheral neuropathy, B12 deficiency results in subacute degeneration of the spinal cord. Vitamin C deficiency causes scurvy which is characterised by poor wound healing, bleeding gums and lethargy. Vitamin D deficiency causes osteomalacia in adults and rickets in children.

Question 41- Correct Answer B - Bicuspid aortic valve

This patient has Turner's Syndrome – as recognised by the primary amenorrhoea, short stature and webbed neck. Therefore, the correct answer is bicuspid aortic valve. The other cardiac complication of Turner's to remember is coarctation of the aorta – if you know those two associations, along with infertility due to underdeveloped ovaries, you've pretty much got Turner's Syndrome learnt.

ASD, VSD and tetralogy can all be found in Down Syndrome, not Turner's.

Question 42- Correct Answer A – High FSH and LH

*This is premature ovarian failure (menopausal symptoms and secondary amenorrhoea <40 years). As there is no negative feedback from the ovaries, FSH and LH levels are very high.*

*B – low FSH and LH, low T3/T4 is hypothyroidism, which is more likely to make periods heavier than to make them stop.*

*C – low FSH and LH, low GnRH, high prolactin is prolactinoma (hint hint the prolactin bit). The anterior pituitary secretes high levels of prolactin which suppresses GnRH secretion, thereby reducing FSH and LH. This does cause amenorrhoea, but would cause slightly different symptoms than this menopause style picture – it could potentially cause galactorrhoea (milky discharge), acne, hirsutism and potentially bitemporal hemianopia.*

*D – normal FSH and LH could imply any physical uterine abnormality, such as Asherman’s syndrome which is where adhesions form within the uterus after a surgery. However, this would not present with the systemic symptoms this woman is also experiencing.*

*E – normal FSH and high LH is PCOS, which wouldn’t present with this clinical picture. They would likely have a more abnormal previous menstruation history and other symptoms such as obesity or hirsutism.*

Question 43- Correct Answer B – Second degree

*This is a second degree tear, which involves the fascia and muscles of the perineum but does not extend into the anal sphincter muscles.*

*First degree tear – perineal skin only*

*Second degree tear – fascia and muscles of perineum*

*Third degree (A) tear – fascia and muscles of perineum, and <50% of external anal sphincter involved*

*Third degree (B) tear – fascia and muscles of perineum, and >50% of external anal sphincter involved*

*Third degree (C) tear – fascia and muscles of perineum, and both external and internal anal sphincters involved*

*Fourth degree tear – both external and internal anal sphincters completely torn, and anal epithelium involved*

Question 44- Correct Answer A – C5-C6

*C5-C6 is the correct location of injury for Erb’s palsy. This is where there is arm paralysis or weakness after birth trauma, typically shoulder dystocia. It may resolve on its own, need physio or need surgery.*

*E – C8-T1 is Klumpke’s palsy, which can also occur in a difficult birth, although is less common than Erb’s. The rest are all part of the brachial plexus, where the injury happens, but are incorrect.*

Question 45- Correct Answer B – Mifepristone and misoprostol

*For gestations of less than 7 weeks medical methods are the most effective. Mifepristone (antiprogesterone) is used first, followed by misoprostol (prostaglandin) 36-48 hours later. It can also be used in the 7-9 weeks band, and in the 13-24 weeks band. (Obstetrics and Gynaecology, Impey and Child, p 122).*

*A – dilatation and evacuation is usually performed above 13 weeks, although medical management is still preferred.*

*C – mifepristone is not used alone*

*D – misoprostol may be used alone when mifepristone is not available, but is not first line*

*E – suction curettage is usually used between 7 and 13 weeks*

Question 46- Correct Answer B – High platelet count

High platelet count would not been seen, as platelets will be low. This is HELLP syndrome, which is a maternal complication of pre-eclampsia. There is haemolysis (H), elevated liver enzymes (EL) and low platelets (LP).

A – there would be elevated liver enzymes due to the liver damage, this causes the epigastric pain and abnormal clotting

C – haemolysis causes anaemia, resulting in low haemoglobin

D – fibrinogen would be low as DIC has likely occurred, using up the fibrinogen

E – lactic dehydrogenase is raised due to the haemolysis

If you remember what HELLP stands for than the rest follows!

Question 47- Correct Answer E – Vaginal progesterone

At 21 weeks gestation with a TVUS cervical length of <25mm and no previous preterm birth/trauma needs vaginal progesterone. This decreases the activity of the myometrium and prevents cervix remodelling.

A – antenatal steroids are used after 24 weeks developing fetal lungs and preventing RDS.

Betamethasone or dexamethasone can be used. This patient's gestational age is too early, and the first line is to prevent the contractions.

B – this would be used if the patient had a previous preterm birth or any cervical trauma (for example cone biopsy to take out abnormal cells). It is a stitch in the cervix, and also used when the TVUS cervical length is <25mm.

C – magnesium sulphate is used for its neuroprotective effect on the neonate within 24 hours of delivery, reducing the risk of cerebral palsy. It is not used much in the UK (more in the US), and is used <34 weeks.

D – nifedipine is a tocolytic, used from 24-33+6 weeks when delivery is imminent. It is used for 24 hours to allow the steroids time to act or time for transferring the mother to an appropriate centre.

Question 48- Correct Answer C – Pregnancy is <24 weeks and would involve risk (greater than if pregnancy terminated) of injury to physical or mental health of pregnant woman's partner

C is incorrect as it states grounds for a TOP in England include considering the risk for the pregnant woman's partner – this statement is almost correct, as it should say existing children rather than partner. All other options are part of the statutory grounds for TOP in England.

Question 49- Correct Answer B – Placental abruption

Placental abruption is the most likely diagnosis due to the key features of a painful antepartum haemorrhage and a woody abdomen. This is an obstetric emergency, and she will need an emergency caesarean if severe (which it is in this case due to the woody abdomen).

A – miscarriage is defined as before 24 weeks; if this abruption results in fetal demise this will be a stillbirth

C – this is likely to present with less severe bleeding, and is usually accompanied by previous uterine surgery, most notably a previous caesarean section – this is Janine's first pregnancy

D – this also has previous uterine surgery as a risk factor, and the bleeding would be intermittent and painless

E – this would be bleeding on rupture of the membranes

Question 50 - Correct Answer D – Multiple pregnancy

*Multiple pregnancy is not a risk factor for placenta praevia. It is a risk factor for vasa praevia and placental abruption. The rest are risk factors for placenta praevia.*

Question 51 – Answer E - Day 28

*Progesterone concentrations in the blood show marked variations depending on cycle timing. The serum progesterone level will peak 7 days after ovulation has occurred. Therefore, in a 35-day cycle, the follicular phase will be 21 days (ovulation on day 21). Therefore, the progesterone level will be expected to peak on day 28 (21 + 7).*

*TIPS: To calculate day of ovulation, take length of menstrual cycle and minus by 14 days. E.g. In a 38-day cycle, ovulation will be on day 24 (38-14).*

Question 52 – Answer E - Prolactin

*Prolactin should be tested in this patient. Prolactinomas are fairly common in women of reproductive age. Prolactinomas are pituitary tumours secreting prolactin. They are usually benign and can be microscopic or be associated with a mass on MRI. Some prolactinomas can co-secrete other pituitary hormones, particularly growth hormones.*

*Prolactinomas can present with:*

- *Galactorrhoea*
- *Menstrual disturbance*
- *Amenorrhoea*
- *Infertility*

Question 53 - Answer C - Panhypopituitarism

*The female reproductive cycle is controlled by the hypothalamic-pituitary-gonadal axis. This patient has reduced synthesis of pituitary hormones, TSH, LH and FSH. This patient needs further investigation for possible hypopituitarism.*

*In healthy women, a low oestrogen should stimulate the pituitary and hypothalamus to increase gonadotrophin production (via reduced negative feedback). In this case, the low oestrogen is not accompanied by an increase in LH or FSH, which shows that the problem lies in the region of the hypothalamus of pituitary.*

*Weight loss is not mentioned here which makes the history less likely to be due to anorexia nervosa. Low T4 due to hypothyroidism should lead to high TSH levels. PCOS can lead to amenorrhoea, however, histories related to acne and hirsutism should be present as well. In premature menopausal women (<40 yrs), there is elevated FSH, and also menopausal symptoms.*

Question 54 – Answer B - Advise her to continue breastfeeding

*Management of mastitis focuses on relieving pain with simple analgesia and warm compresses and encouraging complete emptying of the breast after feeding.*

*The woman should be encouraged to continue breastfeeding as this improves milk removal and prevent nipple damage. If pain prevents her from breastfeeding, she should be encouraged to express breast milk by hand or pump until breastfeeding can be resumed.*

*Antibiotics are only recommended if the lady has an infected nipple fissure, symptoms do not improve or are worsening after 12-24 hours despite effective milk removal or bacterial culture is positive. First line is flucloxacillin. IV antibiotics are rarely indicated for mastitis.*

Question 55 – Answer C - Galactorrhoea

*Features of ovarian neoplasms may include:*

- *Hirsutism due to testosterone secretion*
- *Acute abdomen due to ovarian torsion*
- *Rupture or haemorrhage*
- *Thyrotoxicosis as in struma ovarii, and*
- *Amenorrhoea*

*Galactorrhoea/ hyperprolactinaemia are not presenting features of an ovarian tumour as prolactin is released from the pituitary.*

Question 56 – Answer B - Cone biopsy

- *Cone biopsy is correct as his woman wishes to preserve her fertility, in order to have children in the future. In women who do not want children, a hysterectomy with lymph node clearance is recommended.*
- *Cisplatin chemotherapy and radiotherapy are incorrect, as they are only used for later stage cervical cancers.*
- *Laser ablation is incorrect, since it is only used for cervical intraepithelial dysplasias.*
- *Radical trachelectomy is incorrect, as it can lead to impairment of fertility.*

Question 57 – Answer C - Haematocolpos

*This is a typical description of haematocolpos – an accumulation of the blood in the vagina, usually due to an imperforate hymen.*

Question 58 - Answer C - Ovarian hyperthecosis

*Ovarian hyperthecosis accounts for most of the cases of hyperandrogenaemia in postmenopausal women, although its prevalence in younger women is much lower, affecting less than 1% of women with elevated androgens in their reproductive years.*

*Ovarian hyperthecosis describes the presence of luteinised theca cell nests in the ovarian stroma. When compared with the closely related condition PCOS, hyperthecosis is associated with more severe hyperandrogenism and virilisation. Testosterone concentrations are much higher than in PCOS and may exceed 7 nmol/L.*

Question 59 – Answer A - Anorexia nervosa

*This pattern of suppressed gonadotrophins with low oestradiol is commonly seen in anorexia nervosa. It can also be seen with panhypopituitarism, but in this scenario, the thyroid function tests (which are normal) make this unlikely.*

- *Hypothyroidism usually would result in other symptoms, such as fatigue, feeling cold and weight gain, which are not present. The thyroid function tests here represent normal thyroid function.*
- *PCOS is often associated with symptoms and signs related to excess androgens, which are not present here, making this diagnosis less likely. An elevated LH:FSH of 3:1 or more is supportive of the diagnosis, but here is not present.*
- *Premature menopause is defined as the absence of menstrual periods for 12 consecutive months before the age of 40. As this lady has presented with a history for 6 months, this diagnosis cannot be made.*

Question 60 – Answer A - Arrange urgent admission

*The mother may be suffering from puerperal psychosis and needs urgent admission to allow psychiatric evaluation. Whilst there is not a full complement of psychotic features, there are a number of pointers towards significant mental health problems:*

- *Poor interaction with the baby: this is very unusual, including in women with postnatal depression*
- *“talking in an incoherent fashion about the future”*
- *Stating that the baby “has been brought into a bad world” is odd and somewhat worrying*

*For these reasons, the mother should have an urgent psychiatric evaluation. Fluoxetine is also best avoided due to a long half-life.*

Question 61- A - Bat wing opacities

*Bat wing opacities are a representation of alveolar oedema.*

*Bilateral calcified pleural plaques are seen in asbestosis.*

*Bilateral hilar lymphadenopathy is seen in sarcoidosis.*

*Pericardial effusion is not easily detected on chest x-rays and not typically seen in heart failure. It is more common in conditions such as infective pericarditis, acute kidney injury, acute myocardial infarction and severe chronic anaemia.*

*Tracheal stenosis is seen in chronic inflammatory disease, neoplasia, trauma or extrinsic lesions such as an intrathoracic goitre.*

*Mnemonic to remember radiological findings in heart failure: ABCDE*

*A - alveolar oedema, B - Kerley B lines, C- cardiomegaly, D - dilated upper lobe veins, E - pleural effusion*

Question 62- D - serum natriuretic peptide measurement

*A measure of NT-proBNP can be done in General Practice to assess the best course of management for a patient with heart failure.*

*Levels >2000 ng/L: urgent specialist referral for echocardiogram (within 2 weeks)*

*400-2000 ng/L: specialist referral for echocardiogram within 6 weeks*

*<400 ng/L: normal, consider alternative diagnoses*

*12-lead ECG or Troponin measurement can be performed to exclude other cardiac conditions if there is an atypical presentation.*

*Echocardiogram is not routinely performed in primary care settings.*

*Blood pressure measurement would not be useful in assessing the course of management.*

Question 63- C - The person is assessed as lacking capacity if they can only retain the information for a short period of time

*There are 4 parts to the test to assess mental capacity:*

- 1. The patient is able to understand the information relevant to their decision*
- 2. The patient is able to retain the information relevant to their decision long enough to be able to do the next 2 steps*
- 3. The patient is able to weigh the benefits and harms of their decision*
- 4. The patient is able to communicate their decision by any possible means*

Question 64- B - Consent the patient

*Although the patient is under the age of 16, she is deemed to be mentally competent. Gillick competence states that a young person is able to make decisions regarding their medical treatment if they are deemed to be mentally competent.*

*As she has been deemed mentally competent, it would be wrong to ignore her wishes and contact her parents.*

*Proxy consent is the process by which people with the legal right to consent to medical treatment for themselves or for a minor or a ward delegate that right to another person. This is an emergency situation and we can assume that she has presented alone, there is no time to arrange for a proxy decision maker. The medical professional cannot provide consent on behalf of a patient.*

*Not proceeding with treatment could have fatal consequences.*

*Proceeding without consent would be unlawful given that she is alert and mentally competent.*

Question 65- D - MMR

*The symptoms and signs described form the prodromal phase of measles. The red spots with white centres on the buccal mucosa are a characteristic sign in measles called Koplik's spots. These signs often appear a day or two before the characteristic maculopapular rash.*

*The MMR vaccine covers measles, mumps and rubella.*

*DTaP covers diphtheria, tetanus and pertussis (whooping cough), none of which present like this. Hib covers Haemophilus influenzae B, which can cause multiple infections, including epiglottitis. MenB covers group B meningococcal bacteria, including Neisseria meningitidis. This patient is not presenting with symptoms of meningitis. Rotavirus causes a GI viral infection.*

Question 66 - A - Ask him to fill out the PHQ-9 questionnaire

*The next step in this patient's management is to assess his risk of having depression. The PHQ-9 questionnaire is used as a screening tool for depression in primary care settings.*

*An FBC and thyroid function tests would be useful to explore alternative diagnoses if the patient scored low on the PHQ-9.*

*A diagnosis of depression would need to be made before considering prescribing medication like Sertraline or referring him for CBT or to a psychiatrist.*

Question 67- C - Notify Public Health England

*The patient's clinical presentation is characteristic of measles and given her personal history, she is unlikely to have received her MMR vaccines.*

*Measles is a notifiable disease and must be reported to Public Health England. The notification must not be delayed by waiting for test results and must be sent based on clinical suspicion.*

*An FBC and inflammatory markers would not be useful or diagnostic in this case.*

*The patient does not appear to be septic or severely ill and therefore, there is no need for hospital admission at the moment.*

*Azithromycin is an antibiotic and would not be appropriate for the treatment of measles which is a viral illness.*

Question 68 - B - Discuss your concerns regarding her child's safety and seek consent to disclose their information to social services

*Calling the police would be a drastic measure at this stage as there is no immediate risk to the patient or her child. It might also impact the trust and rapport between the GP and their patient.*

*Documenting the conversation in the patients' notes for future use or giving her a leaflet for the domestic abuse helpline is helpful but does not do anything to help the patient or safeguard the child presently.*

*It would be very inappropriate to ignore this matter as the patient and her child are both at risk of abuse.*

Question 69 - D - excuse yourself from the consultation room so you can go outside and call the police

*Asking the husband to wait outside or asking the patient if everything is okay might alert the husband (who could potentially be abusing his wife) that something is wrong or that he might be in trouble.*

*It is absolutely crucial to maintain both the trust of the patient and her safety. Therefore, you cannot let her go back home with her husband. At the same time, confronting the patient's husband might compromise your and your patient's safety. Therefore, the most appropriate course of action would be to call the police without his knowledge.*

Question 70- B - Assess his AUDIT score

*Assessing the patient's AUDIT score will help you decide whether he has been abusing alcohol and whether he can be managed in the community. Admitting him for inpatient care without first assessing his AUDIT score would not be appropriate.*

*Assessing suicide risk is always useful, however, this patient has not reported low mood or presented with self-harm and therefore, the AUDIT score would be more useful to do before assessing his suicide risk.*

*Giving him information about the local AA group would be useful, however, does not help manage his present situation.*

*Naltrexone is a drug used in alcohol detoxification and is used to prevent relapse in formerly alcohol-dependent patients. This patient has not abstained long enough to qualify for this medication. Furthermore, it needs to be initiated under specialist supervision and not in a primary care setting. AUDIT is a more detailed questionnaire than cage. AUDIT-C is the shortened version and comprises the following 3 questions. If the patient scores more than 3, you must complete the full questionnaire.*

- 1. How often do you have a drink containing alcohol?*
- 2. How many units of alcohol do you drink on a typical day when you are drinking?*
- 3. How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year?*

Question 71 - Correct Answer (B) - (High flow oxygen)

*This patient's presentation of sudden onset retro-orbital pain with excessive lacrimation and redness is consistent with a cluster headache.*

*Cluster headaches are typically characterised by unilateral and severe headaches often associated with autonomic symptoms such as ptosis, miosis, conjunctival injection and excessive lacrimation. These headaches often affect patients in 'clusters' of 6-12 weeks followed by a period of remission.*

*Although first-line treatment for an acute attack is sumatriptan and high flow oxygen, sumatriptan is contraindicated in this patient as he has a history of coronary artery disease. High flow oxygen has been shown to reduce the intensity and duration of an acute attack.*

*Propranolol can be used for prophylactic management in patients suffering from migraines.*

*Carbamazepine is an anticonvulsant medication indicated as first-line treatment for trigeminal neuralgia.*

*Verapamil is a non-dihydropyridine calcium channel blocker that is often used in migraine and cluster headache prophylaxis – not acute management.*

Question 72 - Correct Answer (D) - (IV Lorazepam)

*This patient is in status epilepticus. Despite the definition of status epilepticus being a seizure that lasts >30 minutes, most medical teams will intervene after 5 minutes.*

*IV Lorazepam is the most appropriate drug to stop status epilepticus.*

*Buccal midazolam is most commonly given within the community to stop seizures – this patient is in hospital with full access to seizure controlling drugs.*

*Sodium valproate is an anti-epileptic drug and is not indicated for acute seizure control.*

*An EEG or CT head would not be useful or appropriate in this situation.*

Question 73 - Correct Answer - (A) - (Confusion after recovery)

*A collateral history about the patient immediately prior to, during, and after the fall can be very useful in differentiating whether it is due to syncope or seizure.*

*Post-ictal confusion is most likely as a result of a seizure.*

*The remaining 4 could be as a result of either syncope or a seizure and thus are not specific for distinguishing a diagnosis*

*Triggers for syncope include emotion, pain or exercise. Syncope usually preceded by nausea, pallor, sweating (pre-syncope). It usually lasts seconds and may have brief tonic-clonic movement of limbs.*

*Recovery is rapid.*

*Seizures usually have identifiable triggers e.g. light, stress, alcohol and may have an aura. Tonic-clonic movements, urinary incontinence, tongue-biting may occur during the seizure. Amnesia and confusion are common in the post-ictal period.*

Question 74 - Correct Answer - (D) - (Lamotrigine)

*Sodium valproate is contraindicated in women of child bearing age*

*Phenytoin would only be used for short-term treatment*

*Propranolol can be used as a prophylactic medication for migraines – not epilepsy*

*Lorazepam is used for acute seizure control – not seizure prophylaxis*

*Therefore lamotrigine is the correct answer.*

Question 75 - Correct Answer - (E) - (Myasthenia Gravis)

*Myasthenia gravis (MG) is a chronic autoimmune condition characterised by muscle fatigability, which is why this patient starts to slur her speech after talking. Respiratory muscles can also be affected causing breathlessness. Thymoma occurs in 15% of MG patients (thymic hyperplasia occurs in 75% of patients) and this is the large anterior mediastinal mass visualised on CT CAP. MG like other neuromuscular diseases will show a restrictive picture on spirometry. Traditionally, the diagnosis can be confirmed with either an ice test or Tensilon test.*

*All the other answers are causes of chronic breathlessness, however, they are incorrect because they do not fit the clinical picture and do not show a large anterior mass on imaging.*

Question 76 - Correct Answer - (D) - (normal pressure hydrocephalus)

*The most likely diagnosis is normal pressure hydrocephalus.*

*Symptoms of the disease include urinary incontinence, dementia and gait disturbance.*

*Alzheimer's disease - Patients would have memory problems, but ataxia and urinary incontinence would be unlikely presenting symptoms.*

*Cauda equina syndrome - Patients would have urinary incontinence along with saddle anaesthesia and bilateral sciatica, but no memory disturbance.*

*Cerebellar lesion - Ataxia may be present, but memory problems or incontinence are not cerebellar signs.*

*Viral encephalitis - Patients may present with confusion, but this would be of acute onset often with associated fever and headache. Urinary incontinence would not be typical of the disease.*

Question 77 - Correct Answer - (D) - (Myoclonic seizure)

Head trauma is a common cause of isolated seizures. It can lead to many different types, including generalised myoclonic seizures: brief, involuntary jerking movements typically seen in the limbs or facial muscles, without loss of consciousness.

Clonic seizures can be thought of as regularly repeating myoclonus (usually at a rate of 2-3 per second). This does not fit our patient, Aiden only had one episode which lasted a few seconds.

Absence seizures do not usually affect motor function and instead cause the patient to blank out for a few seconds.

Atonic seizures are also known as 'drop attacks' as they cause a brief loss of muscle tone which may cause patients to fall.

In tonic seizures, tone is greatly increased which leads to stiffness, usually on both sides of the body.

Question 78 - Correct Answer - (E) - (Foramina of Monro)

The CSF flows from the two lateral ventricles --> foramina of Monro --> third ventricle --> cerebral aqueduct --> fourth ventricle --> foramina of Luschka & Magendie --> subarachnoid space.

Because her third and fourth ventricles are of normal size, the occlusion must be above them; Because there is marked dilation of the lateral ventricles, the occlusion must be below them. Therefore, the foramina of Monro is the only area between these two key areas.

Arachnoid granulations are specialized valves that absorb the CSF into the venous sinuses and would not be involved in such a pathology.

Question 79 - Correct Answer - (B) - (7)

The patient has an eye response score of 2, a verbal response score of 2 and a motor response score of 3.  $GCS = 2 + 2 + 3 = 7$ . A table used to calculate GCS is provided below:

Feature	Response	Score
<b>Best eye response</b>	Open spontaneously	4
	Open to verbal command	3
	Open to pain	2
	No eye opening	1
<b>Best verbal response</b>	Orientated	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No verbal response	1
<b>Best motor response</b>	Obeys commands	6
	Localising pain	5
	Withdrawal from pain	4
	Flexion to pain	3
	Extension to pain	2
	No motor response	1



Question 80 - Correct Answer - (E) - (Uhthoff's phenomenon)

*Heat sensitivity (Uhthoff's phenomenon) is a well-known occurrence in MS; small increases in the body temperature can temporarily worsen current or pre-existing signs and symptoms. Transient increases in the frequency or severity of clinical signs and symptoms as a result of elevated body temperature are experienced by 60 to 80 percent of individuals with MS.*

*Lhermitte's sign is a transient sensory symptom described as an electric shock radiating down the spine or into the limbs most often after flexion of the neck. Although most frequently encountered in MS, this symptom also can be seen with other lesions of the cervical cord.*

*Charcot's neurologic triad is the combination of nystagmus, intention tremor, and scanning or staccato speech. This triad is associated with multiple sclerosis, where it was first described; however, it is not considered pathognomonic for it.*

*Kernig's and Brudzinski's signs are associated with meningitis, not multiple sclerosis.*

Question 81- D (Intravenous fluids)

*This man is likely to have diarrhoea related to C.difficile colitis. His recent hospital admission due to pneumonia is a risk factor for C.diff, as well as probable antibiotic use. However, the priority here for his management is IV fluids as he is severely dehydrated: confusion, hypotension and tachycardia being the signs. CT abdo and NG tube insertion is not indicated here as a surgical cause e.g. bowel obstruction is of low suspicion. Loperamide is an anti-motility agent which can be used for diarrhoea but rehydration is the priority. Metronidazole or Vancomycin is the antibiotic of choice for C.diff associated diarrhoea and stool cultures should be taken.*

Question 82- C (Anti-mitochondrial)

*This lady is likely to be suffering from Primary Biliary Cholangitis (inflammation of the bile ducts). Fatigue is one of the commonest presenting symptoms, accompanied by jaundice and pruritus. PBC is related to other autoimmune diseases, and her recent diagnosis of hypothyroidism is likely to be Hashimoto's Thyroiditis which is autoimmune in nature. Antimitochondrial antibodies are detected in up to 98% of cases.*

Question 83- A (Acute kidney injury)

*This man is likely to be suffering from Nephrotic Syndrome as seen by the generalised pitting oedema and heavy proteinuria. AKI is not a known complication of nephrotic syndrome. He is in a hypercoagulable state hence DVT/PE is likely. Hyperlipidaemia makes up the triad of nephrotic syndrome. Pleural effusions may occur due to fluid overload. He is immunocompromised due to loss of immunoglobulins in his urine, leading to increased risk of infection.*

Question 84- E (Lorazepam)

*This lady is likely to be suffering from Delirium Tremens, an acute confusional state secondary to alcohol misuse. This is evidenced by her confusion, visual hallucinations, tremor and agitation. In order to sedate the patient and also prevent seizures, a BDZ i.e. Lorazepam which is fast-acting is the drug of choice. (NICE 2017)*

Question 85- E (Propranolol)

*This lady is likely to be suffering from thyrotoxicosis. Propranolol is the drug of choice for symptomatic relief, followed by Carbimazole to reduce the levels of circulating thyroid hormones.*

Question 86- E (Spirochaete)

*This man is likely to be suffering from primary syphilis, as seen by the appearance of a chancre (single painless genital ulcer). His background of frequent sexual partners suggests this. The organism at fault is Treponema Pallidum, which is a spirochaete bacterium. A refers to Trichomonas Vaginalis, B refers to a generic Staphylococcus, C refers to Neisseria Gonorrhoea and D refers to Candida.*

Question 87- D (Hypertrophic Cardiomyopathy)

*This man is likely to be suffering from HCOM, the leading cause of sudden cardiac death in the young. He has a family history of sudden cardiac death which raises suspicion. HCOM can be asymptomatic or present with symptoms of angina, dyspnoea, syncope etc. The jerky pulse described is a bisferiens/biphasic pulse, which is a sign of aortic issues.*

Question 88- A (IV Hydrocortisone)

*This girl is likely to be suffering from an acute flare of Ulcerative Colitis. The first-line treatment in an acute severe flare-up is IV steroids i.e. hydrocortisone or methylprednisolone. 5-ASAs such as Mesalazine are used to induce remission in mild disease. Oral steroids e.g. Prednisolone are used to induce remission in moderate disease.*

Question 99- E (Streptococcus Pneumoniae)

*This child is likely to be suffering from meningitis, and based on the CSF film, is pneumococcal in nature. The classic Neisseria Meningitidis film would be gram negative diplococci.*

Question 90- D (Raised LH)

*This lady is likely to be suffering from PCOS, as evidenced by the hyperandrogenism (acne, facial hair) and oligomenorrhoea. It is likely that a TVUSS will show polycystic ovaries. Hypersecretion of LH results in increased testosterone levels which results in reduced production of sex hormone binding globulin. TSH may be raised in some women as they may suffer from hypothyroidism concurrently. FSH levels are usually low or normal in women with PCOS.*

Question 91 – Answer B – Oral glucose tolerance test

*This description is a typical presentation of acromegaly, a progressive condition caused by increased secretion of growth hormone. Answer (B) is correct. A glucose load should cause suppression of growth hormone normally, but in acromegaly there is failure of growth hormone suppression. If the lowest value growth hormone during the oral glucose tolerance test is >1ug/L, acromegaly is confirmed. You should not rely on growth hormone level (A) to diagnose acromegaly, as growth hormone secretion is pulsatile, so acromegalic levels and peaks in normal levels may overlap. Growth hormone is also raised in stress, anorexia, sleep, puberty and pregnancy. Whilst visual field testing (C) may be useful to test for bitemporal hemianopia caused by a pituitary adenoma, it is not useful for diagnosis. Thyroid hormone levels (D) and random blood glucose (E) are used to diagnose other endocrine conditions, and are not useful in diagnosing acromegaly.*

Question 92 – Answer C – double the dose of hydrocortisone

*This patient has primary adrenal insufficiency and she is taking hydrocortisone to maintain her cortisol levels, and fludrocortisone to maintain her aldosterone levels. Doses of hydrocortisone must be doubled (C) in febrile illnesses, and fludrocortisone doses do not have to be changed. This means that (C) is the correct answer, and (A), (B), (D), and (E) are incorrect. Doses of hydrocortisone also have to be doubled if the patient breaks a bone, or for other bodily stressors, such as a cold or diarrhoea.*

Question 93 – Answer E – Hodgkin’s lymphoma

*This question describes Hodgkin’s lymphoma (E), which classically presents with painless cervical lymphadenopathy, which feels like a rubbery lump in the neck, with B symptoms (night sweats, fever, weight loss). Other features may include painless mediastinal lymphadenopathy causing a cough, alcohol-related lymph node pain, hepatosplenomegaly and anaemia. Diagnosis of Hodgkin’s lymphoma is done by lymph node biopsy with histology showing Reed-Sternberg cells. None of the other answers would have Reed-Sternberg cells on biopsy, so they are incorrect. In addition to this, non-Hodgkin’s lymphoma (D) may present similarly, but would be more likely to present in an older adult. ALL (A) typically occurs in children and presents with bone marrow failure. CML (B) typically presents in older adults with anaemia and bruising but without infection. Myeloma (C) is a malignant disease of bone marrow plasma cells and presents with the acronym CRAB (hyperCalcaemia, renal failure, anaemia, bone lytic lesions).*

Question 94 – Answer D – Appendicectomy

*This question describes a case of appendicitis, with generalised abdominal pain moving to McBurney’s point. Appendicectomy (D) is the definitive treatment for appendicitis. IV fluids (B) and IV antibiotics (C) will also be useful, but are definitive treatments. You will probably make the patient nil by mouth (A) before surgery if you have time, but this is not a definitive treatment. A hysterectomy (E) is unlikely to be of benefit as this is most likely appendicitis, and ectopic pregnancy may be a differential but has been ruled out by the negative pregnancy test.*

Question 95 – Answer A – Buscopan

*Sandra is describing irritable bowel syndrome (IBS), with abdominal pain relieved by defecation associated with bloating, and made worse by stress and menstruation. Buscopan (A) is an antispasmodic medication which is commonly used to relieve pain in IBS. Metronidazole (B) is used to treat C difficile infections, which most commonly present with diarrhoea. Mesalazine (C) and prednisolone (D) can be used in the management of inflammatory bowel disease, which often present with more severe symptoms, such as weight loss, diarrhoea, bloody stools and extra-gut symptoms (clubbing, conjunctivitis, arthritis). Morphine (E) is a very strong pain killer for severe pain which would be inappropriate to prescribe first-line.*

Question 96 – Answer B – Asthma as a child

*Avanti is describing a thunderclap headache typical of a subarachnoid haemorrhage. This can also be associated with signs of meningism (e.g. photophobia – indicated by wearing sunglasses), nausea, and other focal neurological signs. The CT shows a white star shape typical of a subarachnoid haemorrhage. The risk factors for subarachnoid haemorrhage include Ehlers Danlos syndrome (A), smoking (C), excessive alcohol intake (D) and cocaine use (E). This leaves answer (B) as the incorrect answer, as asthma is not a risk factor for subarachnoid haemorrhage. Other risk factors that may come up in exam questions include polycystic kidney disease and coarctation of the aorta.*

Question 97 – Answer D – Topiramate

*This question describes a clear history of migraines. The first-line medication for prevention of migraines is usually beta blockers (C), but these are contraindicated in asthma, so the correct answer is Topiramate (D). Paracetamol (A), sumatriptan (B) and ibuprofen (E) can be used to manage a migraine once it has started, but are not used to prevent migraines.*

Question 98 – Answer A – aspirin and clopidogrel

*A history of crushing chest pain along with an ECG that shows ST elevation is suggestive of a STEMI. This question also states that Giovanni has a history of GTN use, suggesting that he has angina which is a risk factor for an MI. A STEMI needs treatment with dual antiplatelets (A). Oxygen (B) is only needed if saturations are less than 94%, so oxygen is not needed in this patient. Pain in a STEMI can be managed with morphine and nitrates, so paracetamol (C) is not indicated. Warfarin (D) plays no role in the management of a STEMI. This patient is having a STEMI so needs treating, so (E) is not an option.*

Question 99 – Answer B – intrascapular pain

*Biliary colic (severe RUQ pain in waves) and signs of inflammation (e.g. fever) point towards a diagnosis of cholecystitis. Patients with cholecystitis may also experience referred pain between the scapulae (B). The history of pain coming in waves is suggestive of biliary colic that occurs with gallstones. Gallstones are the most common cause of cholecystitis. A previous cholecystectomy (A) would prevent the formation of gallstones, and therefore does not point towards cholecystitis. The CRP is raised in cholecystitis (C). The presence of jaundice (D) would form Charcot's triad (fever, RUQ pain, jaundice) which is characteristic of cholangitis. It is the presence of jaundice that separates cholangitis from cholecystitis. A positive Murphy's sign is seen in cholecystitis (E).*

### Question 100 – Answer E – atrial fibrillation

*The hallmarks of AF on an ECG are an irregularly irregular rhythm, and no distinct p waves. This is therefore an ECG of atrial fibrillation (E). Tachycardia may also be a feature, but does not have to be present.*

*Approach to looking at an ECG: rhythm, rate, p waves, QRS, ST segment. This ECG is irregularly irregular as there is no pattern to the frequency of QRS complexes. This rules out (A) and (B). The rate of this ECG is quite difficult to calculate, as it is irregular. It is around 90 beats per minute (using 6x number of QRS complexes on rhythm strip). There are no obvious p waves. The QRS complex is narrow, which is normal. The ST segment looks normal, and there is no evidence of ST elevation, ruling out a STEMI (C). Atrial flutter would show a saw-tooth pattern (D).*

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

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