Peer Teaching Society Phase 4 SAQ Paper 2 2024 - [ANSWERS]

Marking Instructions

- There is **no identified 'pass mark'**
- Each question should state the **number of marks** it is worth and what needs to be answered to obtain the mark
- There is **200 marks** in total

Disclaimer

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Summary of Topics Assessed:

Q1	Gynaecology	Cervical Cancer
Q2	Respiratory	Community Acquired Pneumonia
Q3	Haematology	Leukaemia
Q4	Endocrinology	Graves' Disease
Q5	Obstetrics	Antepartum Haemorrhage
Q6	Geriatrics	Delirium
Q7	Urology	Prostate Cancer
Q8	Paediatrics	Down's Syndrome
Q9	Renal	Polycystic Kidney Disease
Q10	Acute & Emergency	Burns / Smoke Inhalation
Q11	General Surgery	Hernias
Q12	Ophthalmology	Age Related Macular Degeneration
Q13	Paediatrics	Non-Accidental Injury
Q14	Orthopaedics	Osteoarthritis
Q15	Dermatology	Psoriasis
Q16	Psychiatry	Bipolar Disorder
Q17	Infection	Hepatitis B
Q18	Neurology	Epilepsy
Q19	Rheumatology	Gout
Q20	Cardiology	Arrhythmias

QUESTION 1

Shannon, a 25 year old female has just attended her first cervical smear.

a. **What is the aim of the cervical cancer screening programme? [2 marks]**
   Screen for HPV *(1 mark)*
   Screen for abnormal cells indicative of pre-invasive (dyskaryosis) disease ‘cervical intraepithelial neoplasia’ *(1 mark)*
   (NOT detecting cervical cancer)

b. **How regularly are routine smears conducted? [2 marks]**
   Every 3 years in 25-49 year olds *(1 mark)*
   Every 5 years in 50-64 year olds *(1 mark)*

Shannon’s results are available: HPV detected, cytology normal.

c. **How should she be managed? [1 mark]**
   She should have a repeat screen at 12 months

d. **Aside from HPV, list 3 risk factors for the development of cervical cancer [3 marks]**
   Any 3 of:
   - Multiple sexual partners
   - Younger age at first intercourse
   - Non-attendance at smears
   - Immunosuppression
   - Oral contraceptives
   - Higher parity
   - Tobacco use
   - Deprivation

e. **Name one concerning finding on cervical examination that could suggest malignancy [1 mark]**
   1 of: ulceration / visible mass/ inflammation/ bleeding

At her smear appointment, Shannon mentions to the Nurse Practitioner that she has been experiencing some fishy-smelling, grey discharge.

f. **What is a possible factor that can increase the chance of Shannon developing this discharge? [1 mark]**
   Any 1 of:
   - Excessive vaginal cleaning (douching, use of vaginal washes)
   - Multiple sexual partners
   - Smoking
   - Recent antibiotic treatment
   - Copper coil

   (she likely has bacterial vaginosis)

[10 marks]

QUESTION 2

Irene is a 70 year old lady who lives at home with her daughter, son-in-law and grandchildren. Irene is normally able to help out taking her grandchildren to school and with the cooking at home. Over the weekend her daughter notices that she has become slightly confused. She is forgetting the names of the grandchildren and has been putting food items back in the wrong cupboards. On Monday morning they call the GP and explain the situation. Given Irene has no focal symptoms the GP asks them to drop in a urine sample and then books the next available appointment for Wednesday.

a. **Irene's daughter drops off the sample. What is the appropriate urine test to do on this sample? [1 mark]**
   (Urine) culture / (Urine) MC&S / (Urine) microscopy, culture & sensitivities

   (Urine dip not given: NICE does not recommend doing urinary dipsticks in women over the age of 65 as it is unreliable)

On Tuesday night Irene becomes very short of breath and has to stop twice to get up the stairs at home. Her family are concerned about her and call an ambulance. The paramedics discover that her oxygen saturations are 86% on room air and put her on oxygen. They suspect community-acquired pneumonia and use the CURB65 to establish whether to take Irene into hospital.

b. **Fill out the table below with the criteria of the CURB65 score. [4 marks]**

C	New onset/ worsening confusion
U	Urea >7(mmol/L)
R	Respiratory rate ≥30
B	Blood pressure Systolic <90mmHg or diastolic ≤60mmHg *(both needed for 1 mark)*
65	Age ≥65

When Irene arrives in hospital the F2 on call decides to do some blood tests. They want to check the bloods that are commonly associated with new confusion (a "confusion screen").

c. **Name three blood tests that would be requested as part of this. [3 marks]**
   Any 3 of:
   - FBC
   - CRP/ESR
   - Folate
   - B12
   - U&Es
   - HbA1c
   - Calcium
   - LFTs
   - TFTs

A CXR is performed and shows consolidation in the left lower zone. Irene is diagnosed with a community acquired pneumonia and is admitted to hospital to be treated with IV antibiotics.

d. **Name one likely causative organism of a community acquired pneumonia? [1 mark]**
   Streptococcus pneumoniae / Legionella / Mycoplasm pneumoniae / Haemophilus influenzae

Once Irene has been treated she is discharged back home. Her GP is asked to repeat a Chest XRay at about 6 weeks regardless of whether she is still symptomatic.

e. **Why is the GP asked to repeat this investigation? [1 mark]**
   as she is at a higher risk of malignancy (due to her age) / to investigate for lung cancer

[10 marks]

QUESTION 3

A father brings his 2-year-old son Billy to the GP surgery. Billy has been unusually tired and is now refusing to walk. On examination, you note that Billy has several bruises and is very pale.

a. **What is the most common type of leukaemia in children? [1 mark]**
   Acute lymphoblastic leukaemia

b. **With what type of adult leukaemia is the Philadelphia chromosome most commonly associated with? [1 mark]**
   Chronic myeloid leukaemia

c. **What are the other 2 main types of leukaemia? [2 marks]**
   Acute myeloid leukaemia
   Chronic lymphocytic leukaemia
   (need to be written in full for each mark)

d. **The presence of a Philadelphia chromosome in children with the most common form of leukaemia is only 3%. What is the genetic mutation of the Philadelphia chromosome? [1 mark]**
   Translocation of chromosomes 9 and 22

e. **Apart from the Philadelphia chromosome, what other chromosomal abnormality predisposes children to this form of leukaemia? [1 mark]**
   Trisomy 21

f. **Name 2 investigations which could be done to confirm Billy's leukaemia? [2 marks]**
   Any 2 of: FBC, peripheral blood film, bone marrow biopsy

g. **Billy is prescribed allopurinol. What complication of treatment is this trying to prevent, and what electrolyte abnormality is the oncologist trying to avoid? [2 marks]**
   Complication of treatment = Tumour lysis syndrome
   Electrolyte abnormality = Hyperuricemia

[10 marks]

QUESTION 4

A 46 year old teacher is seen in clinic complaining of weight loss, sweating and palpitations. She has no previous relevant history. On examination you detect a diffusely enlarged thyroid gland.
Investigations reveal:

T4 of 75 nmol L-1 (reference range 10-25 nmol L-1)
TSH < 0.01 µmolL-1 (reference range 0.2-5 µmolL-1)

a. **Name 3 signs you might detect on examination other than those mentioned above. [3 marks]**
   Any 3 of:
   - Fine tremor
   - Palmar erythema / warm, sweaty hands
   - Tachycardia / Atrial fibrillation
   - Pretibial myxedema
   - Lid retraction/ Lid lag
   - Exophthalmos

b. **Further blood tests show that this patient has Grave's Disease. What antibody is raised in patients with this condition? [1 mark]**
   TRAb / TSH Receptor Antibody

c. **As part of her management, the patient is prescribed carbimazole. What is the most serious side-effect that a patient may develop on carbimazole? [1 mark]**
   Bone Marrow Suppression / Pancytopenia / Agranulocytosis

d. **What clinical signs would you tell the patient to be aware of that may alert her to the development of this condition? [2 marks]**
   (Tell the patient to seek medical advice immediately if they develop) *any 2 of:* bruising / mouth ulcers / sore throat / fever / malaise / non-specific illness

e. **After some further blood tests, the endocrinologist decides to put the patient on a 'block and replace' medication regimen. In addition to carbimazole, what is the other medication used in this regimen? [1 mark]**
   Levothyroxine

After 12 months, the endocrinologist stops the patient's medications to see if her Grave's has gone into remission. Unfortunately, her free T4 levels increase and she starts to develop symptoms again.

f. **Name 2 options that can be offered for definitive management? [2 marks]**
   Radioiodine therapy
   Thyroidectomy

[10 marks]

QUESTION 5

Betty is a 42 year old lady, who is 32 weeks pregnant with her second child. She is transported by ambulance in severe constant 9/10 abdominal pain, which came on suddenly, and heavy PV bleeding, for the last 25 minutes.
O/E her uterus is tense + tender.
HR 132 bpm BP is 98/62
There is evidence of foetal distress on CTG monitoring.

a. **What is the most likely diagnosis? [1 mark]**
   Placental abruption

b. **Name 2 risk factors for this condition [2 marks]**
   Any 2 of:
   - Placental abruption in previous pregnancy (**)
   - Pre-eclampsia + other hypertensive disorders
   - Abnormal lie of baby eg transverse
   - Age of mother >40yrs
   - Polyhydramnios
   - Abdominal trauma
   - Smoking
   - Cocaine use
   - Bleeding in first trimester
   - Underlying thrombophilias
   - Multiple pregnancy

c. **What would your top differential be if Betty was not experiencing any pain? [1 mark]**
   Placenta praevia
   (Vasa praevia after ROM)

d. **What immediate management does she require? [3 marks]**
   Any 2 of:
   - Get senior help / 2222 / emergency bleep obstetrics
   - A:Protect airway
   - B: 15L of 100% oxygen through a non-rebreather mask
   - C:
     - Insert two large bore (14G) cannulas
     - Take bloods: group + save, FBC, clotting screen, U&E, LFT
     - Activate major haemorrhage protocol
     - Give warmed fluids
     - Consider TXA
   - D: Monitor patient's GCS

e. **What is the definitive management? [1 mark]**
   Emergency Caesarean Section

f. **Betty's child is delivered and the paediatrician on standby assesses the newborn baby using the Apgar score at 1, 5 and 10 minutes, due to a low score. Name two of the five features of the Apgar score. [2 marks]**
   Appearance / body colour
   Pulse rate
   Grimace / reflex irritability
   Activity / muscle tone
   Respiratory effort

[10 marks]

QUESTION 6

Rita is a 86 year old lady who has been brought to A&E by her daughter with a new confusion and agitation. She has a palliative diagnosis of breast cancer and has recently started taking morphine to manage her pain. She has been given a prognosis of a few months.

a. **Name 2 'Activities of Daily Living' you would enquire about as part of your social history [2 marks]**
   Any 2 of:
   - Bathing / showering
   - Toileting
   - Getting dressed / grooming
   - Walking
   - Eating meals / feeding
   - Transferring / moving from bed to chair / standing from sitting

After examining Rita and performing some basic bedside investigations, you determine that constipation is contributing to Rita's new confusion.

b. **Name 3 other causes of delirium you would investigate for? [3 marks]**
   Any 3 of:
   - Pain
   - Infection / pneumonia / UTI / meningitis / encephalitis
   - Poor Nutrition
   - Dehydration
   - Metabolic disturbance / hypoglycaemia / hypercalcaemia / hyponatraemia / hypercalcaemia
   - Hypothermia
   - Hypoxia
   - Sleeplessness / insomnia
   - Hepatic impairment
   - Renal impairment
   - Stroke
   - Environmental changes / visual disturbance / hearing disturbance / new hospital admission
   - Drugs / opioids / corticosteroids / anticholinergics / benzodiazepines
   - Alcohol withdrawal
   - Nicotine withdrawal
   - Brain tumour / brain metastasis

c. **Name 1 non-pharmacological intervention used in the prevention and treatment of delirium [1 mark]**
   Any 1 of:
   - Reduce polypharmacy
   - Promote good sleep hygiene
   - Promote nutrition / encourage eating
   - Avoid dehydration
   - Monitor for sensory deficits / hearing aids / glasses
   - Encourage early mobilisation

- Reorient patient frequently
- Have a clock in view
- Ask NoK to bring familiar items / have familiar items to hand
- Encourage family (or friends) to visit
- Encourage cognitively stimulating activities
- Try and have same nursing staff / healthcare professionals looking after patient

d. **Given the likely cause of her constipation, which type of laxative should be avoided? [1 mark]**
Bulk-forming
Most likely cause = opioid-induced

e. **Given the likely cause of her constipation, what should be offered? [1 mark]**
Offer an osmotic laxative and a stimulant laxative *(as per NICE)*

After a few days of treatment, Rita's delirium settles and she wishes to discuss the future. She says that she would not like resuscitation to be attempted if her heart was to stop.

f. **What document could be used to make this a legally binding decision? [1 mark]**
Advance decision to refuse treatment
(*Write in full for mark as opposed to ADRT, DNACPR is not a legally binding document)*

You decide to discuss Rita's thoughts about being admitted to hospital again in the future, as well as what treatment would be acceptable to her.

g. **What document could be used to record her thoughts on these matters? [1 mark]**
ReSPECT form

[10 marks]

QUESTION 7

John is a 76 year old man who attends the GP reporting lower urinary tract symptoms (LUTS). He has hypertension and high cholesterol, which he takes amlodipine and simvastatin for respectively, and had a knee replacement 1 year ago. Otherwise, he is generally fit and well.

a. **In terms of LUTS, name 2 voiding and 2 storage symptoms that you would enquire about [2 marks]**
   Voiding: hesitancy / weak or intermittent urinary stream / splitting / spraying / straining / incomplete emptying / terminal dribbling *(Any 2 for 1 mark)*
   Storage: urgency / frequency / nocturia / urinary incontinence / feeling the need to urinate again immediately after *(Any 2 for 1 mark)*

b. **Which validated screening tool is used to evaluate LUTS and give a symptom score? [1 mark]**
   International Prostate Symptom Score

c. **Other than prostate cancer, name 2 factors that can increase a PSA level? [2 marks]**
   Any 2 of:
   - BPH
   - Prostatitis
   - UTI
   - (Vigorous) exercise
   - Ejaculation
   - Receiving anal sex
   - Digital rectal exam
   - Prostate biopsy
   - Catheterisation
   - Urological surgery
   - Urinary retention

d. **Which zone of the prostate is primarily affected in prostate cancer? [1 mark]**
   Peripheral zone

e. **What imaging is used as the first-line investigation for suspected prostate cancer? [1 mark]**
   Multiparametric MRI *(MRI alone is not sufficient)*

f. **Prostate cancer is diagnosed through biopsies of prostatic tissue, which are used to calculate a 'Gleason score'. How is the Gleason score calculated? [2 marks]**
   The two most common tumour patterns across all samples are graded based on their differentiation
   The sum of the two grades is the Gleason score

g. **What is the most common metastatic site in prostate cancer? [1 mark]**
   Bone

[10 marks]

QUESTION 8

You are the Paediatric Registrar and you are asked to review a 3 month old baby boy who has been brought in by his mum. She states that over the past 3 weeks he has been having these strange episodes where he becomes irritable, looks to be struggling to breath and his lips turn blue. She states these last for a few minutes at a time.

a. **What is the name for these episodes? [1 mark]**
   Tet spells

b. **What is the most likely underlying cause of these episodes? [1 mark]**
   Tetralogy of Fallot

c. **What are the components of this condition? [2 marks]**
   Pulmonary stenosis, Right Ventricular Hypertrophy, Ventricular Septal Defect, Overriding aorta
   (0-1 correct answers = 0 marks; 2-3 correct answers = 1 mark; 4 correct answers = 2 marks)

Upon further examination, you notice that he has single palmar creases, a short neck and looks to have reduced muscle tone.

d. **What is now your top differential for the underlying causes of this condition and name the most common genetic mutation which causes this? [2 marks]**
   Down's syndrome
   Trisomy 21 / 3rd copy of chromosome 21

e. **What is the first line screening test for this in pregnancy and what results would suggest this condition? [2 marks]**
   Combined test
   Thickened nuchal translucency, reduced PAPPA, raised beta-HCG *(all 3 needed for 1 mark)*

f. **What test would you offer a pregnant woman to confirm the provisional diagnosis from the screening tests during pregnancy? [1 mark]**
   Chorionic Villus Sampling / Amniocentesis

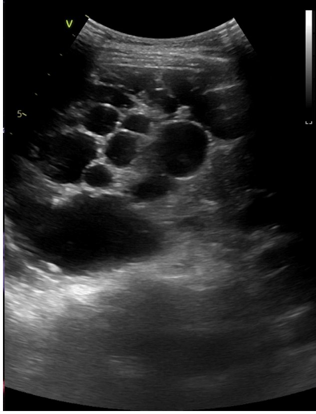
g. **You discuss with the mother that some babies with this condition can experience developmental delays. What age would you advise her would be considered as a delay in development for walking? [1 mark]**
   Not walking by 18 months

[10 marks]

QUESTION 9

You are a GP and Simon, a 52 year old, comes into your clinic complaining of fatigue, foamy and bloody urine and oedema in his legs. Upon further questioning, he also reports some pain in his back and flanks. On examination, you palpate his kidneys which seem abnormally large.

You arrange for ultrasound scanning and the following image is obtained:



Case courtesy of Herberth Vinicio Vargas, Radiopaedia.org, rID: 160897

a. **What is the most likely cause of his enlarged kidneys? [1 mark]**
   Polycystic Kidney Disease

b. **What is the most common inheritance pattern for this condition? [1 mark]**
   Autosomal Dominant

c. **What is the role of Tolvaptan in this condition? [1 mark]**
   Reduce the growth rate of the cysts

d. **What acute neurological condition can this condition cause? [1 mark]**
   Subarachnoid haemorrhage

You do a set of investigations and find he has a Hb of 84 and eGFR of 18.

e. **What stage of kidney disease is this gentleman at? [1 mark]**
   Stage 4

f. **Name the most common cause of chronic kidney disease in the UK [1 mark]**
   T2DM

g. **What is the most likely cause of this patient's low Hb and explain the mechanism which causes this? [2 marks]**
   Anaemia of Chronic Kidney Disease / Renal anaemia
   Lack of / decreased EPO production

h. **Simon's kidney function continues to deteriorate, name 2 forms of renal replacement therapy he can be considered for? [2 marks]**
   Any 2 of: Haemodialysis, Peritoneal dialysis, Renal transplant

[10 marks]

QUESTION 10

Jane is taken by ambulance to A&E having been involved in a serious house fire. From across the bay it is clear that she is in intense pain and has extensive burns. On closer inspection, her entire left and right arms are burnt, as well as her anterior torso. She weighs approximately 70kg.

a. **According to the 'Wallace rule of nines' approximately what percentage of the total body surface area is burnt? [1 mark]**
   36%
   (9% for each arm = 18% + 18% for anterior torso)

b. **The Parkland formula (below) is used to calculate the fluid requirement in burns. Assuming all the burns are at least second degree, calculate Jane's total fluid requirement in the first 24 hours. How much should be given in the first 8 hours since the burn? [3 marks]**
   Parkland Formula: 4ml x body weight (kg) x total body surface area affected (%)
   4 x 70 x 36 = 10080ml = 10.80L
   Give 5.04L in the first 8 hours

   (10.80L of crystalloid solution - Hartmann's - in the first 24 hours. 50% of this should be given in the first 8 hours ince the burn and the remaining 50% over the following 16 hours)
   NB: score 2 marks if incorrect TBSA% calculated in part a but correct logic used in part b

Your registrar asks you to assess for inhalation injury.

c. **Name 2 features you would assess for in your history and examination that would be suspicious for potential smoke inhalation [2 marks]**
   Any 2 of:
   - Burning sensation in the nose / throat
   - Productive cough
   - Stridor
   - Dyspnoea
   - Rhonchi
   - Wheezing
   - Hoarse voice
   - Accessory muscle usage
   - Tachypnoea
   - Cyanosis
   - Odynophagia
   - Headache
   - Delirium
   - Hallucinations
   - Decreasing consciousness / comatose
   - Convulsions / seizures
   - Hypertonia
   - Facial burns / loss of facial or intranasal hair
   - Soot in mouth or sputum

d. **What effect does carbon monoxide have on the oxyhaemoglobin dissociation curve and how does this cause symptoms of carbon monoxide poisoning? [4 marks]**
   Carbon monoxide has a greater affinity for haemoglobin than oxygen (so readily binds to Hb)
   Causing the curve to <u>shift to the left</u>
   Left shift → increased affinity of haemoglobin for oxygen / so haemoglobin holds onto oxygen more tightly
   Reducing the release of oxygen to tissues, causing hypoxia and the associated symptoms
   (eg inadequate oxygenation to brain because oxygen held tightly to Hb instead → headaches / confusion / decreased consciousness)

[10 marks]

QUESTION 11

Dennis is a 67 year old man who is known to have an inguinal hernia. Usually, the hernia disappears on lying flat, however he noticed on waking that the hernia remained protruded. He is overweight and has type 2 diabetes mellitus, which is well controlled on metformin and gliclazide. He has just retired after a long career working on building sites.

a. **What is the definition of a hernia? [1 mark]**
   Protrusion of part or whole of an organ or tissue through the wall of the cavity that normally contains it

b. **What is the difference between a direct and an indirect inguinal hernia in terms of how they enter the canal? [2 marks]**
   In direct inguinal hernias, the bowel enters the inguinal canal 'directly' through a weakness in the posterior wall of the canal, whereas..
   In indirect inguinal hernias, the bowel enters the inguinal canal via the deep inguinal ring

c. **Which type is more commonly seen in infants and what is the pathophysiological basis behind this? [2 marks]**
   Indirect inguinal hernia
   (Occur because of a) patent processus vaginalis

d. **What happened to the hernia this morning? [1 mark]**
   (it has become) incarcerated / irreducible

e. **Whilst safety netting, you discuss the two main emergency complications Dennis is at risk of in regards to his hernia. What are these two complications? [1 mark]**
   Obstruction and strangulation

Elective surgical repair of his inguinal hernia is scheduled. He is first on the operating list.

f. **What advice should Dennis be given with regards to his diabetes medication on the day of surgery? [2 marks]**
   Omit morning dose of gliclazide
   Take metformin as normal

   (No clinical need to omit metformin as he is first on the operating list for a quick procedure, gliclazide can however cause hypoglycaemia so should be omitted)

At the surgical follow up clinic, he says he is recovering well from surgery, although has noticed a change in sensation on his leg and external genitalia. On examination, you confirm reduced sensation on his upper anteromedial thigh.

g. **Which nerve is likely to have been damaged intra-operatively? [1 mark]**
   Ilioinguinal

[10 marks]

QUESTION 12

Bob is a 64 year old gentleman who has come into your GP clinic with a same day appointment. Over the last 2 days Bob has noticed that he has been struggling to read small text, and he is starting to worry. Today his central vision is particularly affected. On his walk to the practice, he said the lines on the zebra crossing looked wavy. You suspect Bob may have developed age related macular degeneration (ARMD).

a. **Name the 2 types of ARMD and the key difference in pathophysiology? [4 marks]**
   Wet and dry / neovascular and non-neovascular
   In wet ARMD there is retinal neovascularisation from the choroid
   Which leak and cause oedema and faster vision loss than dry

You refer Bob for specialist assessment. The specialist suspects Bob has the more severe type of ARMD.

b. **Give the medication, and its route that can be used to help Bob. [2 marks]**
   Anti-vascular endothelial growth factor / ranibizumab / aflibercept / bevacizumab
   Intravitreal injection

The specialist happens to be investigating the link between smoking and developing ARMD. They have been collecting a smoking history and diagnosis of all patients who attend their clinic. The results are as follows:

	ARMD	**No ARMD**
Smoker	**40**	**20**
Non-Smoker	**160**	**180**

c. **What type of study design is being described above? [1 mark]**
   Cross sectional

d. **What is the odds ratio of those with ARMD having smoked? [2 marks]**
   2.25

   Odds of those with ARMD having smoked = 40/160 = 1/4
   Odds of those without ARMD having smoked = 20/180 = 1/9
   1/4 divided by 1/9 = 2.25
   OR
   (40 x 180) / (160 x 20) = 2.25

e. **The specialist is collecting data only from their ophthalmology clinic. Which type of bias does this leave the study open to? [1 mark]**
   Selection / sampling

[10 marks]

QUESTION 13

A 7 week old baby is brought to A&E by his parents with a history that he rolled off the couch. On examination, he is conscious but irritable and has cold peripheries. His temperature is 37.1°C and no neck stiffness. He has a boggy swelling on the left side of his scalp, some bruising to his chest and extensive nappy rash. He is the first child born to his parents and was born at term by normal vaginal delivery.

a. **What is the most likely cause of skull swelling? [1 mark]**
   Skull fracture

b. **What is the most likely mechanism for this and what feature of the history makes you suspicious of this? [2 marks]**
   Trauma / non-accidental injury
   The child is physically unable to roll of the couch (they are too young) / inconsistent mechanism of injury

c. **Name 2 immediate investigations that should be undertaken to identify the cause? [2 marks]**
   Any 2 of:
   - FBC
   - Coagulation screen
   - LFTs
   - Cranial CT
   - Skeletal survey
   - Cranial ultrasound

d. **The parents are keen to take the child home. As the FY1 in A&E, what would you do? [1 mark]**
   Any 1 of:
   - Seek senior advice immediately
   - Inform the patients that due to the nature of the injury they need a senior review
   - Ask that they wait for senior review
   - Arrange admission to a paediatric ward (place of safety)

e. **The ophthalmologist is called to see the child. Name 1 feature they are looking for [1 mark]**
   Retinal haemorrhages

f. **Name 3 other professionals outside the hospital that might be involved in the investigation of this situation [3 marks]**
   Social workers / social services
   Health visitors
   GP
   Police

[10 marks]

[END OF PAPER]

QUESTION 14

A 75-year old overweight lady called Margaret presents with increasing pain in the right groin. The pain is worse at the end of the day, especially on a Monday, when she goes out to town. She also gets pain in the right knee at a similar time.

a. **What is the most likely diagnosis? [1 mark]**
   Osteoarthritis (of the right hip)

b. **You decide to arrange an x-ray, name 2 features that you would be likely to see in this diagnosis [2 marks]**
   Any 2 of:
   - Loss of joint space
   - Osteophytes
   - Subchondral cysts
   - Subchondral sclerosis

c. **Name 3 management options you may suggest she tries at this stage [3 marks]**
   Any 3 of:
   Non-pharmacological: weight loss / exercise / physiotherapy / appropriate footwear / social prescribing programme
   Pharmacological: Topical or oral NSAID / paracetamol / intra-articular corticosteroids

Six months later Margaret continues to complain of pain and is stopping her from her weekly trip to town, which was the highlight of her week. She is referred to the specialist orthopaedic clinic.

d. **What procedure may be offered now? [1 mark]**
   Total hip arthroplasty / hemiarthroplasty

Sometime later, Margaret undergoes this procedure and it goes entirely to plan. A few hours postoperatively, the nurses on the ward are concerned about how drowsy Margaret is. Her observations are as follows:
HR 86 ; BP 132/78 ; sats 90% on 4L oxygen ; RR 7 ; temperature 37.1

e. **What are you concerned about, and how would you manage this? [2 marks]**
   Opioid overdose
   Manage with naloxone

f. **Name 1 additional clinical feature you would expect to find whilst doing an A-E assessment of Margaret? [1 mark]**
   Pinpoint pupils
   Shallow breathing
   Decreased GCS / GCS <15

[10 marks]

QUESTION 15

Henrietta is a 36 year old lady who is known to have chronic plaque psoriasis. She works at a local spa and lives with her husband, two children and her elderly father, who has ankylosing spondylitis.

a. **Name 3 features of skin lesions that are suggestive of chronic plaque psoriasis? [3 marks]**
   Any 2 of:
   - Found on extensor surfaces / elbows + knees / trunk / scalp
   - Symmetrically distributed
   - Raised
   - Clearly defined plaques / clear delineation
   - Pink or red / erythematous/ violet or grey in pigmented skin
   - Silvery scales
   - Itch
   - May become fissured / painful (in certain sites)
   - 1cm - a few cm in diameter
   - Auspitz sign / pinpoint bleeding points if scale is removed

b. **Which type of psoriasis presents with a "rain drop appearance" - multiple small scattered scaly papules? [1 mark]**
   Guttate psoriasis

c. **Name 1 reason for referral to a dermatologist in psoriasis? [1 mark]**
   Any 1 of:
   - Suspected generalised pustular psoriasis *(emergency)*
   - Suspected erythrodermic psoriasis *(emergency)*
   - Uncertainty about diagnosis
   - Extensive involvement / more than 10% of body surface area affected
   - Moderate or severe disease
   - Resistance to topical drug treatments in primary care
   - Intolerance to topical drug treatments in primary care
   - Significant impact on physical, psychological or social wellbeing

Henrietta also mentions that over the last few weeks, coinciding with a psoriasis flare, she has noticed that some of her joints have been more painful than usual. You wonder if this could be psoriatic arthritis.

d. **If she had psoriatic arthritis, when would you expect her pain to be at its worst? [1 mark]**
   Morning

e. **What is the difference between the terms 'oligoarthritis' and 'polyarthritis'? [2 marks]**
   Oligoarthritis affects 4 or fewer / affects 2-4 joints
   In polyarthritis, more than 4 joints are involved

f. **Psoriatic arthritis is highly associated with psoriatic nail changes. Name 1 finding that Henrietta may have [1 mark]**

Nail pitting / leukonychia / nail ridging / nail crumbling / oil-drop sign or oil-drop discolouration / salmon patch / onycholysis / subungal hyperkeratosis / splinter haemorrhages

g. **Which gene is associated with both inflammatory bowel disease and inflammatory joint diseases, such as psoriatic arthritis and ankylosing spondylitis? [1 mark]**
   HLA B27

[10 Marks]

QUESTION 16

Maggie is a 21-year-old female who has been brought to the GP by her mother. Her mother informs the GP that Maggie does not usually behave in this way, but has been acting 'strange' over the last week or so, with a very elevated mood compared to normal. She has been staying out late every night and returning home with lots of loose money, and not attending her work shifts. Maggie states that she is 'the best in the world' at poker and that she no longer needs to work. Her mother also informs the GP that Maggie suffers from depression, and recently started sertraline for this. With this information, the GP suspects that Maggie is having a manic episode.

a. **What condition does this information suggest Maggie may suffer from? [1 mark]**
   Bipolar disorder

b. **Name two clinical signs/symptoms that are associated with mania. [2 marks]**
   2 of:
   - Pressured speech
   - Racing thoughts / Flight of ideas
   - Grandiose delusions / Auditory Hallucinations
   - Inflated self-esteem
   - Euphoria / Extreme irritability
   - Partaking in risky behaviour / Disinhibition (e.g. gambling, reckless sexual behaviour)
   - Decreased need for sleep / restlessness / increased energy and activity
   - Distractibility / Poor concentration

c. **Name one difference between mania and hypomania. [1 mark]**
   One of:
   - In mania sx must have lasted for at least **1 week**, whereas in hypomania they have only lasted for **4 days**.
   - A manic episode includes **psychotic features** (delusions/hallucinations) whereas a hypomanic episode does not.
   - A manic episode is severe enough to cause **marked impairment in social or occupational functioning** *or* **necessitate hospitalisation**, whereas a hypomanic episode is not this severe.

d. **From the information given, what may have triggered Maggie's manic episode? [1 mark]**
   Sertraline/SSRI recently started

e. **The GP assesses Maggie's risk to herself and others to judge the urgency of admission or referral needed. What might they consider? [1 mark]**
   Any 1 of:
   - Does Maggie have any dependents (children, family members) at risk of neglect?
   - Is there a risk to the public / does Maggie have a history of violence / is she currently experiencing aggressive thoughts?
   - Is Maggie consuming alcohol/recreational drugs currently?

- Are there potential harmful consequences of her current behaviour? E.g. employment risk, finances, personal relationships, sexual activity, risks posed by driving
- Does Maggie have any thoughts of harming herself?

f. **Maggie shared that yesterday she drove through a red light on her way to the casino because she 'didn't have time to waste'. The GP decides to apply Section 4 of the MHA. What is this and who is involved in this? [2 marks]**
   Allows emergency detainment for the purpose of assessment for a duration of up to 72 hours
   The application can be made by the nearest relative or an Approved Mental Health Professional (AMHP) and must be supported by one doctor.

g. **On the ward, Maggie is successfully treated with Olanzapine, and her acute manic episode resolves. For long-term management, Maggie is started on Lithium. How often should Lithium levels be checked when starting or changing dose? [1 mark]**
   Weekly, until concentrations are stable *(then every 3 months).*

h. **When checking lithium levels, when should the blood sample be taken (in relation to when the dose is taken)? [1 mark]**
   12 hours post-dose

[10 marks]

QUESTION 17

Jack is a 27 year old man who has just returned from a trip to Thailand with his friends. He presents with yellowing of the skin, abdominal pain and generally feeling fatigued and weak. He has no past medical history or relevant family history. Whilst abroad he had unprotected sex with multiple different partners, got a new tattoo and mostly ate at street markets. He has injected drugs in the past, some time ago. Given his history, you decide to screen for hepatitis B, amongst other infections.

a. **Which 2 serological markers are used initially in hepatitis B screening? [2 marks]**
   HBsAg and anti-HBc / hepatitis B surface antigen and hepatitis B core antibody

Full serological marker testing is performed, and the following results are obtained:

HBsAg	+++
Anti-HBs	NEGATIVE
HBeAg	+++
Anti-HBe	NEGATIVE
Anti-HBc	+++
IgM anti-HBc	+++
HBV DNA	+++

b. **How should his results be interpreted? [2 mark]**
   Acute hepatitis B

c. **Which marker gives a direct count of the viral load? [1 mark]**
   Hepatitis B virus DNA / HBV DNA

Jack recalls that some of his friends had vaccinations before they left for the holiday, possibly for hepatitis.

d. **What is injected in the hepatitis B vaccine? [1 mark]**
   HBsAg / hepatitis B surface antigen

e. **Which hepatitis B serological marker indicates immunity post vaccination? [1 mark]**
   Anti-HBs / hepatitis B surface antibody

f. **Which other type of viral hepatitis can be vaccinated against? [1 mark]**
   Hepatitis A

g. **Other than vaccination, suggest 2 methods that may reduce someone's risk of contracting hepatitis B? [2 marks]**
   Any 2 of:
   - Use condoms during sex / avoid unprotected sex
   - Avoid sharing needles / ensure tattoo needles are single use / ensure piercing needles are single use

- Avoid sharing razors
- Wash your hands thoroughly with soap and water after any potential exposure to blood
- Wear disposable gloves if in contact with blood or bodily fluids

[10 marks]

QUESTION 18

Imran is a 28-year-old male who presents to A&E with his colleague following a collapse at work (in a warehouse). You take a history and his colleague informs you that Imran suddenly became stiff all over and dropped to the ground. He then started jerking for 2 minutes, before stopping. He was not incontinent but he does have evidence of tongue biting, and he lost consciousness. On regaining consciousness, Imran felt drowsy and sluggish for about half an hour. Imran has never experienced an episode like this before.

a. **What type of seizure does the description suggest? [1 mark]**
Generalised tonic-clonic *(all needed for mark).*

b. **Name two investigations Imran should have performed. [2 marks]**
Both of:
Electroencephalogram (EEG) and neuroimaging (MRI).

c. **Other than epilepsy, suggest 3 possible causes for his seizures. [3 marks]**
3 of:
CNS infection / meningitis / encephalitis / cerebral abscess
Trauma / head injury
Intracranial haemorrhage / subarachnoid haemorrhage / intracerebral haemorrhage / haemorrhagic stroke
Alcohol intoxication / alcohol withdrawal / substance abuse
Anticonvulsants / antidepressants / antipsychotics / isoniazid / opioids / theophylline
Benzodiazepine withdrawal
Tumours / space occupying lesion / CNS neoplasia
Hypoxia / hypoglycemia / hyponatremia / hypernatraemia / hypercalcaemia / uraemia
Hepatic encephalopathy
Syncope
Nonepileptic seizures / pseudoseizures

d. **The A&E doctor has made an urgent referral to neurology for an epilepsy assessment. You have advised Imran to stop driving before this appointment. What other advice must you give to Imran while he waits for specialist assessment? [2 marks]**
2 of:
Avoid dangerous work/leisure activities (e.g. working heavy machinery or at heights, swimming)
Be mindful of safety at home (take showers instead of baths)
Advise about lifestyle factors that may lower seizure threshold (e.g. alcohol, recreational drugs, sleep deprivation)
Advise about how to recognise and manage a further seizure (e.g. video record any further episodes of possible seizures, first aid and safety guidance to avoid injuries from occurring, when to call an ambulance, who to contact if seizure occurs before diagnosis appointment with specialist)
Take a witness of the seizure to the specialist appointment if possible

e. **Unfortunately, Imran experiences another seizure before his specialist appointment. The seizure lasts for over 5 minutes, reaching status epilepticus. What is the first line treatment for status epilepticus in the community? [1 mark]**
   One of:
   Buccal midazolam
   Rectal diazepam

f. **The first line treatment for status epilepticus if IV access and resuscitation facilities are immediately available (in a hospital setting) is IV Lorazepam. Name one medication that can be administered intravenously as a second-line treatment if the seizures have not stopped after 2 doses of a benzodiazepine. [1 mark]**
   One of:
   Levetiracetam
   Phenytoin
   Sodium Valproate

[10 marks]

QUESTION 19

Tim is a 54 year old man who presents with a red, hot swollen knee. He is overweight and admits to an unhealthy and chaotic lifestyle, partly related to owning a chain of bars and restaurants in Sheffield city centre. He has hypertension, for which he is prescribed Ramipril. He is systemically well.
Tim's knee is aspirated and the synovial fluid is sent for microscopy and culturing.

a. **You consider crystal arthropathy within your list of differentials, complete the table below, comparing gout and pseudogout [6 marks]**

	Crystal Composition	Birefringence of Polarised Light Microscopy	Appearance on Polarised Light Microscopy
Gout	Monosodium urate	Negative	Needle shaped crystals
Pseudogout	Calcium pyrophosphate	Positive	Rhomboid-shaped crystals

Another differential for an acutely swollen joint is septic arthritis.

b. **What is the most common causative organism in septic arthritis? [1 mark]**
Staphylococcus aureus

A diagnosis of gout is ultimately made. A few weeks after the acute attack, the GP decides to prescribe prophylaxis, to try and prevent another flare.

c. **Name the two first-line treatment options for prophylaxis of gout, depending on comorbidities and name the class of these drugs. [2 marks]**
Allopurinol and Febuxostat
Xanthine oxidase inhibitors

d. **With regards to this new prescription, what should the GP advise Tim to do if he shows symptoms of another flare? [1 mark]**
Continue taking allopurinol / febuxostat in an acute attack

[10 marks]

QUESTION 20

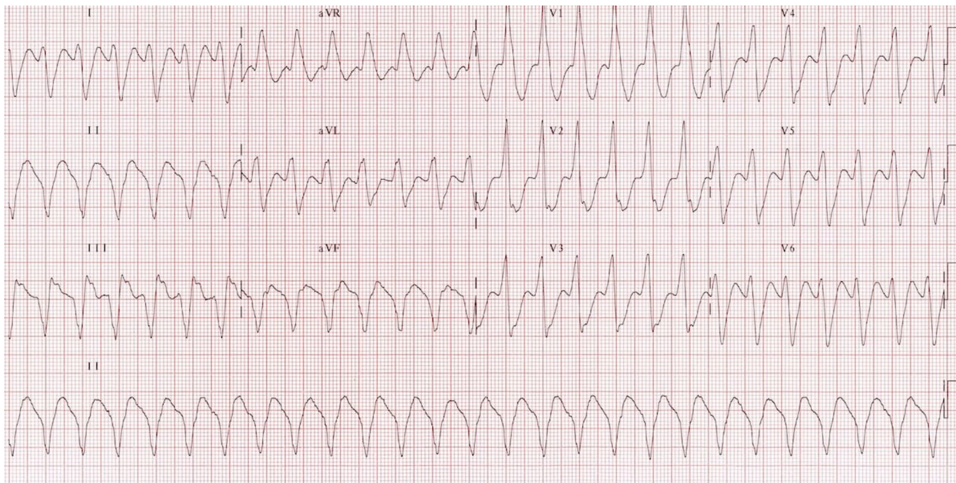
Robby is a 66 year old gentleman who comes into A+E complaining of pain in his chest, feeling very fatigued and dizzy. The nurse tells you his latest observations: HR 34, BP 82/43, Temp 36.7, RR 12, O2 Sats 95%.

a. **Name the medication and dose you would use to manage this patient [2 marks]**
   IV Atropine 500 mcg *(nb not mg)*

b. **If this first step was unsuccessful in relieving Robby's symptoms, what would be your next step? [1 mark]**
   An additional 500 mcg of IV Atropine

c. **Name a non-pharmacological management option for his symptoms [1 mark]**
   Transcutaneous pacing / Transvenous pacing

You manage to stabilise Robby. 2 hours later, one of the nurses pulls the emergency buzzer as Robby has collapsed. You conduct an A-E assessment and the nurse hands you the following ECG:



Life in the Fast Lane: Ed Burns and Robert Buttner: Mar 19, 2023, ECG library

d. **What is the most likely diagnosis? [1 mark]**
   Ventricular Tachycardia

e. **What type of arrhythmia is this? [1 mark]**
   Broad-Complex Tachycardia

f. **How do you define this? [1 mark]**
   QRS of more than 0.12s / 3 small squares on ECG

g. **What is your management of choice? [1 mark]**
   Deliver a shock / defibrillation

h. **Unfortunately, your attempts to manage this are unsuccessful and Robby dies in resus. Name the 2 reflexes you would check when verifying Robby's death [2 marks]**
   Pupillary / Corneal

[10 marks]

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- Please record your score - this will enable us to assess how easy or difficult the paper was. Note - All data collected is completely anonymous
- Inform us of any mistakes - Please let us know regarding any spelling mistakes or incorrect answers so we can amend this
- Ask for further clarification - If you have any further questions or want greater explanations, let us know and we'll get on it!

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We hope you found this paper beneficial for your learning. Good luck for your exams!

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