

Neurology - ANSWERS

SAQ 1

A 7 year old boy is brought to ED by his concerned mother. She states he had URTI symptoms for the past two days, and is now drowsy and dehydrated. Examination reveals a febrile child (38.3C) who responds to pain only. You notice a non-blanching rash on his legs and suspect meningitis.

- a. Complete the following table regarding common organisms causing bacterial meningitis in different age groups. (4 marks)

Age group (years)	Two common causative organisms
Neonates	<i>Listeria, E coli, Group B Strep</i>
Infants and toddlers	<i>Strep pneum, Neisseria, HiB</i>
Young adults	<i>Neisseria, Strep pneum</i>
Elderly	<i>Neiss, strep pneum, listeria</i>

- b. You decide to do an LP. List 4 contraindications to lumbar puncture in any patient. (4 marks)

Local infection over site
Signs of increased ICP (Cushings, papilloedema)
Osteogenesis imperfecta
Abnormal conscious state
Anticoagulants, bleeding diathesis
Focal neurological deficits
Thrombocytopaenia

- c. The mother asks you whether there are risks involved in the procedure. List four complications of lumbar puncture you will discuss with her. (4 marks)

Spinal abscess/haematoma
Damage to nerve/vessel of lumbar spine
Post lumbar puncture headache
Persistent CSF leak
Tonsillar herniation

- d. Complete the following table regarding LP results in bacterial and viral meningitis. (6 marks)

	Bacterial meningitis	Viral meningitis
Opening pressure	<i>High/low/normal</i>	<i>High/low/normal</i>
Appearance	<i>Turbid</i>	<i>clear</i>
Protein level	<i>High/low/normal</i>	<i>High/low/normal</i>
Glucose	<i>High/low/normal</i>	<i>High/low/normal</i>
Gram stain	<i>Positive</i>	<i>Negative</i>
WCC	<i>>500 most PMNs</i>	<i><1000 most lymphocytes</i>

SAQ 2

A 72 year old female presents to ED with acute hemiparesis of the left arm for 40 minutes. She has no other medical history.

- a. List six differential diagnoses for her presentation. (6 marks)

CVA – R ACA territory, R MCA possibly

Intracranial mass – tumour, etc
Todd paresis
Migraine (hemiplegic)
Metabolic – hypoglycaemia, hyponatremia
MS
Cranial/cervical trauma
Factitious disorder
Meningitis/encephalitis

- b. Briefly outline four factors regarding the use of thrombolytics in acute stroke. (4 marks)

Most strokes involve thrombus rather than haemorrhage
Early thrombolysis may reduce ischaemic insult and improve functional outcome
There is insufficient evidence to draw firm conclusions about the effect of thrombolytic drugs in unselected patients with acute ischaemic stroke
Even if thrombolysis is successful/useful, the number of patients likely to benefit is 1:500 – 1:1000

- c. List five contraindications to thrombolysis in acute stroke. (5 marks)

Age >80
Resolving neurological deficits
Seizures
Low BGL or hyperglycaemia (BGL >22)
Large deficit >1/3 MCA territory
UTH >185/110
Unknown time of onset
Low platelets

- d. The CT shows a hyperdense MCA. The patient has no pre-existing contraindications to thrombolysis. Would you thrombolysed this patient? Justify your answer. (2 marks)

Either way – as long as give reasons for or against.
For: experts from many fields support its use. Any disability reduction is significant given stroke burden.
Against: no benefit shown in severe strokes. Only two trials showed benefit, and these were less severe strokes. Not many pts eligible for it (5%) and potential benefit in appx 2.3%.

SAQ 3

A 55 year old male is brought in by ambulance complaining of a severe headache, vomiting, and blurred vision. On examination, his BP is 260/145, similar in both arms. His GCS is 14/15. A CTB is normal.

- a. Define malignant hypertension. (2 marks)

Acute hypertension with end organ damage. Rare if DBP is <130 mmHg.

- b. List four medications with dose and route that may be used to control the hypertension in THIS patient. For each medication, state its mechanism of action on blood pressure, and EITHER a positive or negative effect of that medication. (4 marks)

GTN – 5-20microg/min. Venous>arteriolar dilation. Can cause reflex tachycardia.
Esmolol – 50microg/kg/min. Ultrashort Beta blocker. No intrinsic SNS activity.
Labetalol – 10-20mg bolus. Alpha/beta blocker
Hydralazine – 5-10mg IV. Arteriolar vasodilation. Reflex tachycardia can occur.
SNP – 1-4mcg/kg/min. Venous>arteriolar dilation. Can affect raised ICP and excessive hypotension.

- c. State your end point for BP reduction and justify it. (2 marks)

Reduce BP by 25% and then slow reduction. Too rapid reduction of BP may lead to infarction of heart, kidneys, brain, etc.

SAQ 4

A 26 year old female with a history of chronic back pain presents with increased pain and difficulty walking. She states she had a viral illness two days prior to presentation, and since then noticed weakness in both legs.

- a. List four differential diagnoses for her presenting symptoms. (4 marks)

**Cauda equine
*Guillain Barre syndrome
Hypokalaemic paralysis
Viral myalgia*

- b. Complete the following table comparing cauda equina syndrome and Guillain Barre syndrome. (7 marks)

Symptom	Cauda equina	Guillain Barre
Rapidity of onset	Hours	Hours to days
Pattern of paralysis	Paraparesis/quadraparesis	Symmetrical ascending
Other system involvement	Bowel/bladder dysfunction	Respiratory involvement
Paraesthesia	Perineal sensory loss	Bilateral paraesthesia
Urgency of management	Immediate tx	Immediate tx
Back pain	Common	Less commonly
Cause of condition	Disc bulge/compression	Autoimmune

- c. You diagnose likely Guillain Barre syndrome. State two tests you will perform on this patient with justification. (2 marks)

** ABG – baseline, respiratory involvement common
*Spirometry – as above
Campylobacter serology
Myelography/nerve conduction studies.*

SAQ 5

A 2 year old boy with a history of epilepsy presents in status epilepticus for 40 minutes. The child has no IV access and is still actively seizing. His airway is patent and he has been brought to the resuscitation room. BGL is 4.8.

Outline your approach to the management of his status epilepticus. (5 marks)

IV access?

Yes – Lorazepam 0.1mg/kg

If still seizing after 10 mins, further dose of lorazepam as above

If still seizing after 10 mins, phenytoin 20mg/kg IV over 20 mins

If still seizing 20 mins after phenytoin, RSI with thiopentone

No – midazolam 0.5mg/kg buccal or diazepam 0.5mg/kg PR

SAQ 6

A 24 year old female presents with a sudden onset headache. She has a history of migraines and is a current smoker. She mentions that her father had a haemorrhagic stroke ten years ago. You suspect a subarachnoid haemorrhage.

- a. List five risk factors for cerebral aneurysm. (5 marks)

Family history of aneurysm

Smoking

HTN

Heavy drinking

Female gender (F:M 6:1)

- b. What is the most common type of cerebral aneurysm? (1 mark)

Saccular aneurysm (90%) vs fusiform

- c. You decide to do a CT to investigate her headache. What is the sensitivity of CT for detecting acute SAH in each of the following timeframes? (3 marks)

Within 12 hours of symptom onset 98%

Within 24 hours of symptom onset 93%

Within 5 days of symptom onset 50%

- d. A CT scan is negative for acute haemorrhage. You discuss a lumbar puncture with the patient, who asks if this is necessary. How do you answer her? (2 marks)

We (think we) know that only 1 in 10 of patients presenting with thunderclap headache have a SAH. Of these, CT has 98% sensitivity in the first 12 hours. Therefore risk of missed SAH if no LP done is 0.2%.

This is acceptable to some patients who prefer not to have a LP and is similar to the miss rate for MI etc.

- e. What is the mortality rate for acute SAH? (1 mark)

50% overall mortality.

- f. State a medication you would give for a confirmed SAH, why you would give it, and the dose. (2 marks)

Nimodipine 60mg po – to prevent or reduce vasospasm after SAH, which can lead to increased ischaemia.

- g. State a validated prognostic scale for SAH. (1 mark)

None – there are two prognostic scales (Hunt and Hess, World Federation of Neurological Surgeons) – but neither are validated.