NEUROLOGY
Questions&Answers

Q-1

A 58 year old man has visual hallucinations of animals walking around his room. He is amused by them but is conscious that they are not real. He is noted to have functioning levels of awareness and attention and a decline in problem solving ability. Signs of mild parkinsonism are also seen. What is the SINGLE most likely diagnosis?

A. **Frontotemporal dementia**
B. **Lewy body dementia**
C. **Delirium tremens**
D. **Alzheimer's disease**
E. **Huntington's disease**

ANSWER:
Lewy body dementia

EXPLANATION:
The most important features of Lewy body dementia that differentiate it from the other forms of dementia is the:
• Visual hallucinations
• Fluctuating course with lucid intervals
• Signs of mild Parkinsonism

Typical presentation of lewy body dementia
• Dementia is usually the presenting feature, with memory loss, decline in problem solving ability and spatial awareness difficulties.
• Characteristically there are fluctuating levels of awareness and attention.
• Signs of mild Parkinsonism (tremor, rigidity, poverty of facial expression, festinating gait). Falls frequently occur.
• Visual hallucinations (animals or humans) and illusions. → *This is particularly important to differentiate lewy body from other types of dementia in the PLAB exam*
• Sleep disorders including rapid eye movement sleep disorder, restless legs syndrome

Q-2

A 67 year old female who was initially admitted to hospital for hip replacement surgery is incidentally found to be confused and drowsy by the ward nurse. The ward nurse also discovers that she has been receiving a continuous infusion of 5% dextrose in sodium chloride 0.45% intravenously since her admission into hospital. The fluid was immediately stopped following this discovery and bloods were taken for a test. Laboratory values show:

Sodium 120 mmol/L
Potassium 4.8 mmol/L
Urea 6.2 mmol/L
Creatinine 89 micromol/L
Bicarbonate 23 mmol/L
Chloride 100 mmol/L

What is the SINGLE most likely cause of this patient's symptoms?

A. **Osmotic shrinkage of the brain**
B. **Cerebral oedema**
C. **Cerebral demyelination**
D. **Cytotoxicity**
E. **Reye's syndrome**

ANSWER:
Cerebral oedema

EXPLANATION:
This patient has hyponatraemia leading to cerebral oedema. Cerebral oedema is defined as an excess in the accumulation of fluid in the intracellular or extracellular spaces of the brain and there are various causes for this phenomenon, but there are typically four types that can be seen in clinical practice. The important type to concentrate on for this question is the osmotic type.

When plasma is diluted, such as in hyponatraemic states, it creates an abnormal pressure gradient between the brain's internal environment and the serum. This causes the movement of water into the brain. This patient has clear hyponatraemia as evidenced by her lab values. An important cause of hyponatraemia is hhigh blood sugar and iatrogenic administration of a hypotonic solution. This patient has been receiving a hypotonic solution and 5% of intravenous dextrose for an extended period of time. This would naturally increase her blood glucose levels and dilute her intracellular volume leading to hyponatraemia. For this reason sodium chloride 0.9% is usually used instead of hypotonic solutions.

Osmotic shrinkage of the brain describes the end result of osmotherapy whereby the ovlume of intracranial fluid is reduced by shifting fluid out of the brain and into the serum. An example of this type of therapy is administering intravenous mannitol to reduce intracranial pressure. This answer is incorrect as it is the opposite of what the question asks for.

Cerebral demyelination describes any condition that causes the myelin sheath of neurons to become damaged. Although a presenting symptom of demyelination is

weakness, this answer is not corect since this patient does not present with the host of signs and symptoms that can be seen in demyelinating diseases which can be anything from diplopia to speech problems. A common iatrogenic cause of cerebral demyelination is central pontine myelinolysis which is caused by rapid correction of low blood sodium levels.

Cytotoxicity is incorrect since the stem gives no clue as to any cytotoxic drug that this patient might have taken. An importat cytotoxic drug to remember for the exam is isoniazid, which can lead to cerebral oedema.

Reye's syndrome describes a rapidly progressive encephalopathy which usually presents with liver toxicity, personality changes, confusion and even seizures. The cause is unknown, but viral infections are thought to play a role. This answer is incorrect since there is no clue in the stem that alludes to the patient having had a viral infection nor are her liver function test results included.

Q-3

A 50 year old man, known case of hypertension and deep vein thrombosis, presents to the Emergency Department with a sudden onset of vision loss in his right eye. It is painless and lasted for approximately 5 minutes. He describes the vision loss as a 'black curtain coming down'. On examination, there is a bruit on his neck. What is the SINGLE most likely condition?

A. Retinal vein thrombosis
B. Retinal artery occlusion
C. Amaurosis Fugax
D. Optic neuritis
E. Acute angle glaucoma

ANSWER:
Amaurosis fugax

EXPLANATION:
Remember to focus on causes of unilateral vision loss. Know how to differentiate all the above options. The bruit in theneck is the examiner's way of telling you that this man has atherosclerosis which is a risk factor for amaurosis fugax.

For amaurosis fugax, this is a classic case stem: sudden, painless, unilateral vision loss and description of a "black curtain coming down".

Retinal vein thrombosis and retinal artery occlusion presents as painless unilateral vision loss but their duration would be much longer if not permanent

Optic neuritis would have clues in the stem of multiple sclerosis.

Acute angle glaucoma would produce a painful vision loss and keywords such as "haloes" would be seen.

Amaurosis Fugax
• Painless transient monocular visual loss (i.e. loss of vision in one eye that is not permanent)

• It is indicative of retinal ischaemia, usually associated with emboli or stenosis of the ipsilateral carotid artery

Presentation:
• Sudden, unilateral vision loss; “black curtain coming down”
• Duration: 5-15 minutes; resolves within < 24 hours
• Associated with stroke or transient ischaemic attack (TIA) and its risk factors (i.e. hypertension, atherosclerosis)
• Has an association with giant cell arteritis

Q-4

A 43 year old smoker presents with double vision. She tires easily, has difficulty climbing stairs, and reaching for items on shelves. On examination, reflexes are absent but elicited after exercise. The power in shoulder abduction after repeated testing is 4+/5 from 3/5. What is the SINGLE most likely pathology associated with this patient’s diagnosis?

A. Thyrotoxicosis
B. Thrombotic even
C. Diabetes
D. Cerebral vascular event
E. Lung cancer

ANSWER:
Lung cancer

EXPLANATION:
This is a diagnosis of Lambert-Eaton syndrome. A key difference from myasthenia gravis is that on examination the patient has increased strength on repetition of power. It is also a paraneoplastic disorder closely associated with small cell lung cancer. Because Lambert-Eaton and myasthenia gravis present similarly, the case stem usually would provide you with an investigation or examination clue, including autoantibodies and/or EMG results. Note that thyrotoxicosis is associated with myasthenia gravis not Lambert-Eaton.

Lambert-Eaton syndrome
Presentation:
- Young, female patients; mostly autoimmune
- Proximal weakness at the pelvic girdle / shoulder girdle
- Weakness improves with exercise as well as reflexes
- Cranial nerve involvement: dysphagia, dysarthria, ptosis, diplopia
- Associated with small cell lung cancer

Diagnosis:
- EMG: decreased amplitude in CMAP after single supramaximal stimulus but increases after exercise
- Edrophonium test: may be positive but not as prominent as in myasthenia gravis
- Look for tumor: CT/MRI of chest, abdomen, pelvis + tumor markers

Treatment:
- Treat tumor – first line
- Consider methylprednisolone and IV immunoglobulin

Q-5

A 45 year old chronic alcoholic presents to A&E with an ataxic gait, hallucinations and is confused. He is given chlordiazepoxide. What is the SINGLE most appropriate medication to be given with chlordiazepoxide?

A. Acamprostate
B. Thiamine
C. Diazepam
D. Disulfiram
E. Haloperidol

ANSWER:
Thiamine

EXPLANATION:
This man is suffering from Wernicke's encephalopathy.

Wernicke's encephalopathy is a neuropsychiatric disorder caused by thiamine deficiency which is most commonly seen in alcoholics. A classic triad of confusion, ophthalmoplegia and ataxia may occur.

Treatment is with urgent replacement of thiamine

If not treated Korsakoff's syndrome may develop as well. This is termed Wernicke-Korsakoff syndrome and is characterised by the addition of antero- and retrograde amnesia and confabulation in addition to the above classic triad.

Wernicke's Encephalopathy	**Wernicke's-Korsakoff syndrome (or just Korsakoff syndrome)**
Triad of: 1. Confusion 2. Ataxia 3. Ophthalmoplegia	Addition of: 1. Amnesia 2. Confabulation

Q-6

A 42 year old lady presents with a history of double vision, ptosis and facial numbness. Which anatomical site is the most likely to be affected?

A. Cerebral cortex
B. Trigeminal nerve
C. Oculomotor nerve
D. Brainstem
E. Basal ganglia

ANSWER:
Brainstem

EXPLANATION:
A brainstem lesion makes the most sense here as the oculomotor nerve arises from the anterior aspect of mesencephalon (midbrain) while trigeminal nerve arises from pons. The involvement of oculomotor nerve could explain the double vision and the involvement of the trigeminal nerve explains the facial numbness.

Q-7

A 25 year old woman presents with a severe headache. She had migraines for the last 14 years but has been symptom free for the last year. There are no other neurological signs. She has no other medical history of note. Her observations are stable. What is the SINGLE most appropriate investigation for this woman?

A. **Computed tomography of head**
B. **Lumbar puncture**
C. **Ophthalmoscope**
D. **Magnetic resonance imaging of head**
E. **No further investigation required**

ANSWER:
No further investigation required

EXPLANATION:
This young lady is likely having a recurrence of her migraine. It is not stated in the stem whether the headache is of a similar type to her previous migraines but one can assume given there are no neurological signs and no mention of neck stiffness or photophobia. Since this is likely a migraine, no further investigations are required. If there were signs of neck stiffness, photophobia or if the headache was described as the worst headache of her life, obtaining a CT scan of the head would be the choice to rule out a subarachnoid haemorrhage.

COMPARISON OF HEADACHES, TENSION VS MIGRAINE VS CLUSTER

	Tension headache	**Migraine**	**Cluster headache**
Location	Bilateral	Unilateral or bilateral Around 60% to 70% are unilateral	Strictly unilateral
Pain characteristic	Tightening/pressing/dull	Throbbing/pulsating Gradual onset	Variable Focused on one eye Onset and resolution is often abrupt
Pain intensity	Mild to moderate	Moderate to severe	Very severe
Other symptoms	None	Photophobia Phonophobia Nausea Vomiting Aura (Visual symptoms, sensory symptoms, speech disturbance)	Ipsilateral autonomic features like a red/watery eye, constricted pupil, unilateral facial sweating, drooping eyelid, rhinorrhoea Recurrences affect the same side
Duration	Around 30 minutes continuously, can be longer	4 to 72 hours	15 minutes to 3 hours May occur from 1 time every 2 days to 8 times a day
Patient appearance	Able to do daily activities	Prefers to sit in a dark, quiet room	Restless during an attack
Management	Aspirin NSAIDS Paracetamol	NSAIDS Triptan	Oxygen 100% for 10 to 20 minutes Subcut or nasal triptans Refer to specialist if the first bout of attack as may need neuroimaging
Prophylaxis	Acupuncture	Beta-blockers (propanolol) or topiramate	Verapamil

Q-8

A 36 year old woman presents to clinic with intermittent episodes of dizziness that lasts 1 day each time for the past 6 months. Recently, she has experienced ringing and increased pressure in her eres. Her husband noticed that she has had to increase the volume of her television. MRI head is normal. What is the SINGLE most likely diagnosis?

A. **Benign paroxysmal positional vertigo**
B. **Vestibular schwannoma**
C. **Vestibular neuronitis**
D. **Cervical spondylosis**
E. **Meniere's disease**

ANSWER:
Meniere's disease

EXPLANATION:
This is a classic case of Meniere's disease. All four clues are present: dizziness, tinnitus, deafness, and increased feeling of pressure in the ear. For PLAB 1, know how to differentiate between Meniere's with options A to C. These topics frequently appear on the neurology component of the exam. Note that option B is ruled out due to the normal MRI. In option C, the case would need to give a history of bacterial or viral infection. In option D, there would be other manifestations, such as weakness or paresthesia of the limbs.

Meniere's disease
Presentation:
• Dizziness, tinnitus, deafness, increased feeling of pressure in the ear.
Note: Vertigo is usually the prominent symptom
• Episodes last minutes to hours
• MRI is normal
• Usually a female >> male ; 20-60 years old
• Typically symptoms are unilateral but bilateral symptoms may develop after a number of years

Treatment:
• Acute attacks: buccal or intramuscular prochlorperazine. Admission is sometimes required

Q-9

An 81 year old man is brought into clinic by his son who is concerned that his father doesn't seem to be himself. His wife died 3 years ago and has been depressed since. The son notes that his father has become increasingly forgetful, leaving taps running or the stove on when not in use. At times, he cannot articulate what he wants to say and is easily confused. CT brain reveals mild, diffuse cortical atrophy. Which of the following is the SINGLE most likely medication to be started first?

A. **Donepezil**
B. **Memantine**
C. **Haloperidol**
D. **Olanzapine**
E. **Amitriptyline**

ANSWER:
Donepezil

EXPLANATION:
Alzheimer's disease is a frequent neurology topic for PLAB 1. The main clues usually have an elderly patient undergoing a memory change with some inability to perform day to day tasks. Depending on the severity of the patient, they may have language deficits, executive dysfunction, and cortical atrophy on CT brain. Know the guidelines for pharmacological treatment. Acetylcholinesterase inhibitors donepezil, galantamine and rivastigmine are first line. Memantine is second line and for severe cases. This patient is not suffering from hallucinations; therefore, options C and D are ruled out. While the patient does have depression and would be placed on antidepressants, amitriptyline is contraindicated as it has anticholinergic side effects.

ALZHEIMER
Presentation:
- Elderly > 65 years
- Early
  - Memory loss (recent → distant)
  - Difficulty finding words,
- Followed by
  - Progressive language deficits
  - Inability to make decisions
  - Confusion
- Late
  - Disoriented
  - Behavioural changes
  - Hallucinations

Diagnosis:
- CT or MRI brain
- Hexamethylpropyleneamine oxime (HMPAO) single-photon emission computed tomography (SPECT) to differentiate Alzheimer's from Pick's disease and other pathology
- Mini-mental state exam – assess the severity of cognitive dysfunction and when to start medication

Treatment:
- Acetylcholinesterase inhibitors:
  - Donepezil
  - Galantamine
  - Rivastigmine - first line, mild to moderate
- Memantine - second line, severe cases

Q-10

A 41 year old women presents to clinic with vertigo, vomiting, and a feeling of aural fullness. The attacks of vertigo can last for several hours. She also states that she has difficulty hearing. She had a similar attack last year. Recently, she has experienced ringing in her ears. MRI scan was done and was found to be normal. What is the SINGLE most likely diagnosis?

A. **Benigh paroxysmal positional vertigo**
B. **Vestibular neuronitis**
C. **Vestibular schwannoma**
D. **Cervical spondylosis**
E. **Meniere's disease**

ANSWER:
Meniere's disease

EXPLANATION:
This is a classic case of Meniere's disease. All four clues are present: dizziness, tinnitus, deafness, and increased feeling of pressure in the ear.

It is important to remember that in Meniere's disease, the attacks can last for several hours at a time, which differentiates it from benign paroxysmal positional vertigo.

Q-11

A 55 year old man presents to clinic with shortness of breath and increased daytime sleepiness. He drinks 25 units of alcohol weekly. On examination, his BMI is 35 kg/m^2, blood pressure is 150/70 mmHg, and respiratory exam was normal. His wife complains that he snores loudly at night. What is the SINGLE most appropriate investigation likely to confirm his diagnosis?

A. **Polysomnography**
B. **Pulse oximetry**
C. **Electroencephalogram (EEG)**
D. **Multiple sleep latency test**
E. **Epworth sleepiness scale**

ANSWER:
Polysomnography

EXPLANATION:
This is a diagnosis of obstructive sleep apnoea syndrome. In PLAB 1, this topic would overlap between neurology and respiratory medicine. The typical PLAB 1 clues: a middle-aged to elderly male who works at the office, obese, with history of hypertension and/or diabetes, and "snoring loudly at night". Note that the respiratory exam in uncomplicated obstructive sleep apnoea would be normal unless the case also presents with a history of asthma exacerbation or respiratory failure type II. Beware of what the PLAB 1 question is asking: initial test is pulse oximetry but the definitive investigation is polysomnography (gold standard). Multiple sleep latency test is the definitive investigation for narcolepsy.

Obstructive sleep apnoea syndrome
Presentation:
- Middle aged to elderly male
- Increased daytime sleepiness, fatigue, sleep disruption
- Snoring loudly at night
- Associated with hypertension, diabetes, obesity

Diagnosis:
- Pulse oximetry, overnight study of breathing pattern (initial investigation)
- Polysomnography (gold standard)

Treatment:
- Conservative: weight loss and reduce alcohol consumption
- Continuous positive airway pressure (CPAP)

Q-12

A 58 year old man has a progressively worsening headache and confusion. He had a fall three days ago after slipping and hitting his head in the garden. He has a history of alcohol abuse. What is the SINGLE most appropriate investigation?

A. X-ray skull
B. Electrocardiogram
C. Computed tomography brain scan
D. Magnetic resonance imaging brain scan
E. Electroencephalogram

ANSWER:
Computed tomography brain scan

EXPLANATION:
The likely cause of his confusion and worsening headache is a subdural haemorrhage. A CT scan is diagnostic.

Subdural haematoma may be acute or chronic. In the chronic subdural haematoma, symptoms may not be apparent for several days or weeks. Symptoms of subdural haematomas are: fluctuating level of consciousness, ± insidious physical or intellectual slowing, sleepiness, headache, personality change and unsteadiness.

Chronic subdural haematoma occurs in the very old or in severe alcoholics. A shrunken brain is rattled around the head by minor trauma, tearing venous sinuses. Over several days or weeks, mental function deteriorates as haematoma forms. CT scan is diagnostic, and surgical evacuation provides dramatic cure.

Remember in PLAB, chronic subdural haematoma usually presents as an elderly, on anticoagulation or an alcoholic who may have history of fall. Slow onset of symptoms compared to epidural haematoma.

DIFFERENTIATING TYPES OF TRAUMATIC BRAIN INJURY

Extradural (epidural) haematoma	**Subdural haematoma**	**Subarachnoid haemorrhage**
• Often associated with skull fracture and middle meningeal artery injury • Lucid intervals (Patient goes back to doing what he was doing before falling unconscious again)	**Chronic Subdural haematoma** • Usually elderly, on anticoagulation or alcoholic • History of minor fall with minor head injury • Slow onset of symptoms compared to epidural haematoma **Acute Subdural haematoma** • Less commonly asked in the	• Aneursym formation is the most common aetiology • Usually spontaneously in the context of a ruptured cerebral aneurysm but may be seen in association with other injuries when a patient has sustained a traumatic brain injury • Association with polycystic

	exam • Probable reason is that it is difficult to differentiate from epidural as both have lucid intervals • Think bigger trauma. Sicker patient • Patient is barely awake during the lucid intervals *In reality, we do not rely on clinical features to differentiate epidural haematoma from acute subdural haematoma because both of them will get a CT scan!*	kidney disease, Ehlers Danlos syndrome and other connective tissue disease • Hallmark – THUNDERCLAP HEADACHE • Meningeal irritation (neck stiffness, photophobia)

Q-13

A 69 year old man presented to clinic with worsening balance and difficulty walking over the past year. Recently, he has been prone to falling more frequently and his wife notes he forgets to turn off the stove or water taps. He has also started to have urinary urgency and incontinence. On examination he is walking with a cane and has difficulty turning. What is the SINGLE most likely diagnosis?

A. Parkinson's disease
B. Normal pressure hydrocephalus
C. Alzheimer's disease
D. Dementia with Lewy bodies
E. Frontotemporal dementia (Pick's disease)

ANSWER:
Normal pressure hydrocephalus

EXPLANATION:
This is a classic presentation: gait disturbance, sphincter compromise, and dementia. Note to differentiate normal pressure hydrocephalus (NPH) with the rest of the dementias on the list of options above. They are frequent neurology topics for PLAB 1. NPH has a much slower progressive memory loss than Alzheimer's.

Normal pressure hydrocephalus
Presentation:
• TRIAD: gait disturbance, sphincter compromise (urinary urgency +/- incontinence), cognitive dysfunction
• Most common in elderly
• CT / MRI brain: enlarged lateral and third ventricles

Diagnosis:
• Clinical diagnosis with CT/MRI brain signs of enlarged lateral and third ventricles
• Lumbar infusion test (intrathecal infusion test) - new NICE guidelines option

Treatment:
• Cerebrospinal fluid (CSF) shunting: ventriculoperitoneal, ventriculopleural, or ventriculoatrial

Q-14

A 66 year old patient wakes up with slurred speech and right sided weakness. He is brought to the hospital by his wife. A computed tomography was ordered and shows a cerebral infarction. What is the SINGLE most appropriate treatment to be given?

A. Aspirin
B. Alteplase
C. Warfarin
D. Streptokinase
E. Dipyridamole

ANSWER:
Aspirin

EXPLANATION:
The answer here is aspirin 300 mg.

The history and examination are convincing for a stroke. Before any treatment can happen we need to exclude a haemorrhagic stroke with the help of imaging. This was done in this question which showed an ischaemic stroke.

The other options are less likely to be the appropriate next course of action.

Alteplase → The window period to administer alteplase is 4.5 hours of onset of stroke symptoms. If we cannot be certain of this period, we cannot proceed to give alteplase. Firstly, there was no time given in the stem. Secondly, the patient woke up to symptoms of a stroke. The ischaemic event could have happen anytime during the night.

Warfarin → anticoagulants should not be started until brain imaging has excluded haemorrhage, and usually not until 14 days have passed from the onset of an ischaemic stroke

Streptokinase → Note that the NHS prefers alteplase over streptokinase. So streptokinase is almost never the right answer.

Statins → Statins need to be offered but this is not the most appropriate next course of action. There is no urgency in giving statins.

Dipyridamole → Can be given, but it is usually only given If clopidogrel is contraindicated or not tolerated. In such case we would give a combination of modified-release dipyridamole and low dose aspirin.

Stroke management
Summary of management of acute stroke:

- blood glucose, hydration, oxygen saturation and temperature should be maintained within normal limits
- aspirin 300mg orally or rectally should be given as soon as possible if a haemorrhagic stroke has been excluded
- Thrombolysis should only be given if it is administered within 4.5 hours of onset of stroke symptoms and haemorrhagic stroke has been excluded by imaging (Alteplase is currently recommended by NICE)

Post management stroke

- Aspirin 300 mg daily for 2 weeks is given immediately after an ischaemic stroke is confirmed by brain imaging.
- Clopidogrel 75 mg daily is then given long-term
- If clopidogrel is contraindicated or not tolerated, give a combination of modified-release dipyridamole and low dose aspirin.
- Ensure a statin has been offered.

KEY POINTS FOR MANAGEMENT OF TRANSIENT ISCHAEMIC ATTACK (TIA) AND STROKE

TIA	Stroke
Aspirin immediately (give 300 mg), and continue daily *(Most would reduce to 75 mg/swap to clopidogrel after 2 weeks)* **Clopidogrel (75 mg daily)** is the preferred long-term antiplatelet for secondary prevention • If clopidogrel is contraindicated or not tolerated, give a combination of modified-release dipyridamole (200 mg twice daily) and low dose aspirin • And again if this is not tolerated use either aspirin or dipyridamole alone Ensure a **statin** (usually Atorvastatin 80 mg) has been offered as soon as possible after a TIA. Also ensure good blood pressure control (but not in the first 48 h) *Note: For those already taking low-dose aspirin regularly, you do not have to increase thedose to 300 mg. Just continue the current dose of aspirin until reviewed by a specialist.*	**Aspirin 300 mg daily for 2 weeks** is given immediately after an ischaemic stroke is confirmed by brain imaging **Clopidogrel 75 mg daily** is then given long-term for secondary prevention • If clopidogrel is contraindicated or not tolerated, give a combination of modified-release dipyridamole (200 mg twice daily) and low dose aspirin • And again if this is not tolerated use either aspirin or dipyridamole alone Ensure a **statin** (usually Atorvastatin 80 mg) has been offered Also ensure good blood pressure control (but not in the first 48 h) *Note: After a haemorrhagic stroke, blood pressure control is still critical but antiplatelets and statins are not recommended unless there are clear other indications* Both NICE and SIGN recommend that thrombolysis be given as soon as possible for ischaemic strokes, but definitely within 4.5 hours Treatment after 4.5 hours has no significant benefit.

Further points to note:

After a TIA, early recurrent strokes are common. Around 10 to 15% have a second TIA/CVA during the first week and it is often within the first 48 hours. This is the reason behind ensuring that phyicians use the ABCD2 score. This identifies those at high risk of progression to a stroke in the next 7 days.

SECONDARY PREVENTION AFTER STROKE OR TIA

Stroke – A syndrome of the sudden onset of focal neurological loss of presumed vasculaer origin lasting more than 24 hours

Transient Ischaemic Attack – A syndrome of the sudden onset of focal neurological loss of presumed vascular origin lasting less than 24 hours

The following are important notes to remember as part of secondary prevention in stroke or TIA once it is confirmed:

- **Lower BP**
  - Aim for target Blood Pressure of 130/80
    - *Note: Don not start controlling BP in first 48 hours as this may cause extension of stroke*
  - Age ≥ 55 or black patient of any age start a calcium channel blocker
  - Age < 55 start ACE inhibitor or Angiontensin-(II) receptor antagonists if ACE inhibitor not tolerated
  - Add ACE inhibitor, calcium channel antagonist, or thiazide diuretic if target not achieved with initial choice
    - *Note: BP management for secondary prevention in stroke and TIA is unlikely to be asked during the exam as SIGN and NICE guidelines differ slightly. SIGN recommends using thiazides and ACE inhibitors in all, even if normotensive.*
- **Lower Cholesterol**
  - Aimfor 40% reduction in non-HDL cholesterol
  - Statins to be taken daily lifelong after TIA or ischaemic stroke
    - Note: Statins for all regardless of baseline cholesterol
    - 80 mg atorvastatin recommended by both NICE and SIGN
- **Use antiplatelet or anticoagulation treatment in ischaemic stroke/TIA**
  - This largely depends if atrial fibrillation is present
  - Atrial fibrillation present:
    - Use an anticoagulation: Warfarin, Dabigatran, Rivaroxaban, Apixaban, Edoxaban (Warfarin Target INR range 2.0-3.0)
      - *Note: In the acute setting:*
        - *If TIA and imaging has excluded haemorrhage, start anticoagulation immediately*
        - *If disabling ischaemic stroke, differ anticoagulation treatment for 14 days from onset. In the interim, aspirin 300 mg daily can be used*
  - Atrial fibrillation absent:
    - Give clopidogrel 75 mg OD for long-term prevention of ischaemic events
      - If intolerant of Clopidogrel, give Aspirin 75 mg OD plus Dipyridamole MR 200 mg BD
        - And again if this is not tolerated use either aspirin or dipyridamole alone
    - *Note: For acute treatment of ischaemic stroke give 300 mg of Aspirin for 2 weeks*
- **Lifestyle advice**
  - Low salt diet
  - Low cholesterol diet
  - Weight loss
  - Alcohol reduction
  - Smoking cessation

Lastly, always consider carotid endarterectomy as secondary prevention in ischaemic stroke

- Carotid duplex is done as part of work up at TIA clinic to consider carotid endarterectomy if internal carotid artery is stenosed (stenosis is ≥ 50% in men, ≥ 70% in women)
  - Guidelines recommend this should be done within 2 weeks of admission (SIGN & NICE)

Special key notes from SIGN guidelines regarding secondary prevention after haemorrhagic strokes:

- BP conrrol is important
- Do not offer antiplatelets, unless at high risk of a cardiac event
- Statins are not recommended

Q-15

A 26 year old man was found on the street to be unsteady and drunk by police. On admission to Emergency, he had a sudden onset of headache with severe intensity. The headache is localized to his occipital area and is continuous. On examination, his GCS is 15/15, afebrile and no focal neurological signs. What is the SINGLE most likely diagnosis?

A. Subdural haemorrhage
B. Subarachnoid haemorrhage
C. Epidural haemorrhage
D. Cluster headache
E. Viral meningitis

ANSWER:
Subarachnoid haemorrhage

EXPLANATION:
Note for the exam, the keywords for subarachnoid haemorrhage (SAH): “worst headache of my life”, “headache of severe intensity”, “thunderclap headache”, “sudden onset”, occipital”. The other main clue in this stem is the patient was found drunk. Excess alcohol consumption is one main risk factor leading to SAH.

SUBARACHNOID HEMORRHAGE
Usually the result of bleeding from a berry aneurysm in the Circle of Willis

Presentation
• Sudden and severe occipital headache described as the “worst headache of my life”or “thunderclap headache”
• Neck stiffness or pain
• Vomiting, collapse, seizures

Associations
• Hypertension
• Polycystic kidney disease → Berry aneurysms are found in 10% of patients with autosomal dominant adult polycystic kidney disease
• Ehlers Danlos syndrome

Diagnosis
• CT brain
• Lumbar puncture
  o Only done if CT is inconclusive + no contraindications
  o The CSF of a lumbar puncture → bloody then xanthochromic (bilirubin)

Treatments for SAH are rarely or almost never asked in at this level. Save your brain space and memorize other important information.

Always remember to look from these keywords in the stem that will help you pick subarachnoid haemorrhage as the answer:

- ***Sudden*** *– Sudden onset*
- ***First*** *– First headache in a long time in a person who does not usually suffer with headaches*
- ***Worst*** *– Worst ever headache*

Q-16

A 68 year old man had a fall down the stairs. His daughter has brought him into the emergency department where he was having lucid intervals. Shortly after admission he becomes unconscious. What is the SINGLE most likely vessel affected?

A. Basilar artery
B. Bridging veins
C. Vertebral artery
D. Diploic vein
E. Middle meningeal artery

ANSWER:
Middle meningeal artery

EXPLANATION:
Lucid intervals followed by unconsciousness is typical for an epidural haemorrhage of which the middle meningeal artery is involved.

Extradural (epidural) haematoma
Often associated with skull fracture and middle meningeal artery injury. Involves arterial blood.

Features
• Features of raised intracranial pressure
• Patients may exhibit a lucid interval (note the lucid intervals as it is very commonly seen in PLAB)

Management
Surgical procedure: burr hole over pterion (to ensure that further haemorrhage escapes instead of expanding the clot further) followed by craniotomy and evacuation of the haematoma.

Q-17

A 65 year old female patient has become increasingly distressed. She cries all the time and has been forgetting to lock her doors at night and turn off the stove after she has used it. She is forgetful, having forgotten her son's birthday this year, which she has never done before. She also gets lost when she goes out, and has difficulty in finding her way back home. On occasion she puts her house keys in the microwave, and she does not appear to know how to use it to cook food anymore. She also has a prominent impairment of recent memory but has an intact immediate recall. She has no impairment in her level of consciousness. She has no significant past medical history of note and is not on any chronic medications. A mini mental state examination was done for her (MMSE) and she was scored 26 out of 30. What is the SINGLE most likely diagnosis for this patient?

A. **Alzheimer's disease**
B. **Bipolar affective disorder**
C. **Major depressive disorder**
D. **Mania**
E. **Schizophrenia**

ANSWER:
Alzheimer's disease

EXPLANATION:
The mini mental state examination (MMSE) is a commonly used set of questions for screening cognitive function. It does not make a diagnosis; it is only used to indicate the presence of cognitive impairment.

25-30 out of 30: normal
21-24 out of 30: mild
10-20 out of 30: severe
< 10 out of 30: severe impairment

This patient's MMSE score is therefore in the normal range however, (A) is still the most likely answer. Mini mental state examination (MMSE) are good cognitive screening tests but should not be used to diagnose dementia. They are primarily useful to assess who should be referred to specialist services.

Signs of Alzheimer's include:

- Memory lapses
- Forgetting names of people and places
- Inabilty to remember recent events
- Problems with planning and decision making
- Confusion
- Wandering, disorientation

(B) is incorrect. Bipolar affective disorder would present with periods of mood 'highs' alternating with periods of depression.

(C) is incorrect because while this patient is crying a lot, depression is often characterised by at least two weeks of low mood that is accompanied by low self-esteem, anhedonia and low energy.

(D) is incorrect. There is no euphoria or high energy levels mentioned.

(E) is incorrect. Schizophrenia is characterised by false beliefs, confusion and auditory hallucinations.

Q-18

A 50 year old diabetic woman presents with facial asymmetry to the GP surgery. The right hand corner of her mouth started drooping this morning with dribbling. She had pain behind her right ear yesterday but without any obvious rashes seen. She also complains of dryness in her right eye. On examination, she is unable to move her right side of her face or raise her right eyebrow. What is the SINGLE most likely diagnosis?

A. **Ramsay-Hunt syndrome**
B. **Bell's palsy**
C. **Multiple sclerosis**
D. **Stroke**
E. **Parotid tumour**

ANSWER:
Bell's palsy

EXPLANATION:
Bell's palsy is the most likely diagnosis here although it is very important in clinical practice to exclude the remaining disorders. Bell's palsy may present with pain around the ear during the early days.

Ramsay-Hunt syndrome may present similarly to this but usually with an association with an ear rash. Antivirals would be appropriate with such a presentation.

Parotid tumours can also compress the facial nerve causing facial palsy however this stem did not include any mass or swelling around the jaw.

Multiple sclerosis is an upper motor neuron disease which would mean that she would be able to raise her eyebrow.

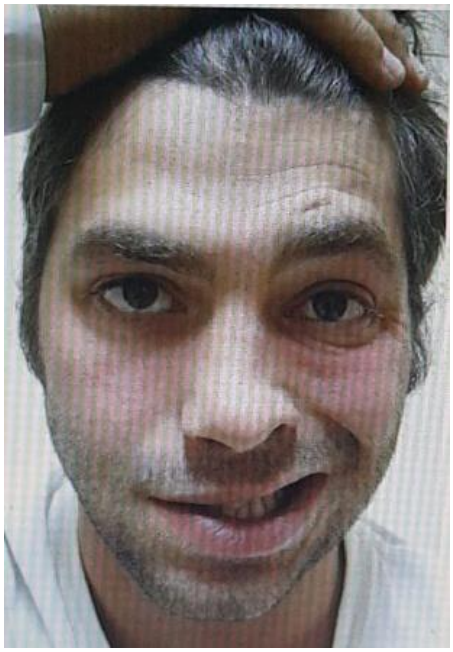
BELL'S PALSY
Bell's palsy can be described as lower motor neuron facial nerve palsy in the absence of other neurology.

Presentation:
- Unilateral facial weakness (seen as facial droop)
- Sagging of corner of mouth, drooling
- Difficulty in eye closure
- Numbness on affected side may occur
- Associated with pregnancy and diabetes

Be sure to exclude other causes of facial weakness before giving the diagnosis of Bell's palsy.

Diagnosis:
- Clinical diagnosis
- Borrelia antibodies and varicella zoster antibodies to rule out Lyme disease, Ramsay-Hunt syndrome (case dependent)
- MRI brain to rule out stroke or tumours (case dependent)

Treatment:
- Within 72 hours onset, give prednisolone (also in pregnancy)
- Acyclovir if suspecting Ramsay-Hunt syndrome
- Eye protection with eye patch



Quiz: Whichside of the face is affected by Bell's palsy?
Answer: The patient's right face (i.e. right facial nerve) is affected. He is trying to smileand only his left facial muscles are working.

Q-19

A 51 year old man presents with worsening difficulty in swallowing and progressive weakness in his limbs. He is known to have motor neuron disease which has been progressively worsening over the years and is now bedridden. Hiswife, who has accompanied him says that he is unable to perform everyday tasks with one hand and that he is unable to eat properly of which he sometimes chokes when eating. On examination, he is noted to have a significant slur and is seen drooling. What is the SINGLE best method to provide nutrition in this patient?

A. **Percutaneous endoscopic gastrostomy**
B. **Nasogastric tube**
C. **Orogastric tube**
D. **Oesophageal stent**
E. **Total parenteral nutrition**

ANSWER:
Percutaneous endoscopic gastrostomy

EXPLANATION:
When people with amyotrophic lateral sclerosis can no longer get enough nourishment from eating, it is advisable to insert a feeding tube into the stomach. This method is called percutaneous endoscopic gastrostomy.

Since this patient is having difficulty in eating and since this is a chronic degenerative condition in which long term feeding is required, this is the single best method to provide adequate nutrition to him.

The use of a feeding tube also reduces the risk of choking and aspiration pneumonia. The tube is not painful and does not prevent people from eating food orally if they wish. Dietitians advise to prepare neumerous small meals throughout the day that provide enough calories, fiber and fluid for patients with ALS

Q-20

A 33 year old woman previously in good health presents with sudden onset of severe occipital headache and vomiting a few hours ago. Her only physical sign on examination is a stiff neck. What is the SINGLE most likely diagnosis?

A. **Subarachnoid haemorrhage**
B. **Sudural haematoma**
C. **Cerebellar haemorrhage**
D. **Migraine**
E. **Cerebral embolism**

ANSWER:
Subarachnoid haemorrhage

EXPLANATION:
Sudden onset severe occipital headache and vomiting with stiffness makes the likely diagnosis to be subarachnoid haemorrhage. The neck stiffness is due to meningeal irritation. Usually patients would be complaining of photophobia as well. Patients often describe the headaches as “the worst headache of my life”.

Q-21

A 65 year old woman with difficulty in swallowing presents with an aspiration pneumonia. She has a bovine cough. Her tongue looks wasted and sits in the mouth with fasciculations. It is very difficult for her to articulate certain words. Sometimes as she swallows food, it comes back through her nose. What is the SINGLE most likely cause of her dysphagia?

A. **Bulbar palsy**
B. **Oesophageal carcinoma**
C. **Pharyngeal pouch**
D. **Pseudobulbar palsy**
E. **Systemic sclerosis**

ANSWER:
Bulbar palsy

EXPLANATION:
Given her symptoms of dysphagia, tongue fasciculations, nasal regurgitations, and dysarthria, the likely diagnosis is bulbar palsy.

The phrase "A bovine cough" is used to describe the non- explosive cough of someone unable to close their glottis. It is seen vagus nerve lesions, and may be associated with dysphonia.

Bulbar Palsy
Bulbar relates to the medulla. Bulbar palsy is the result of diseases affecting the lower cranial nerves (VII-XII). A speech deficit occurs due to paralysis or weakness of the muscles of articulation which are supplied by these cranial nerves.

Bulbar palsy is sometimes also classified as non-progressive or progressive:
- Non-progressive bulbar palsy is an uncommon condition of uncertain aetiology and there are few reports of it in the literature.
- Progressive bulbar palsy can occur in children or adults and form a spectrum of severity. Progressive bulbar palsy is more common in elderly women. Starts of with dysarthria and/or dysphagia. Note: dysphagia without dysarthria is very unusual. The limb involvement comes later, perhaps in a couple of year. The median survival is 2–3 years.

Presentation
- Tongue - weak and wasted and sits in the mouth with fasciculations.
- Drooling - as saliva collects in the mouth and the patient is unable to swallow (dysphagia).
- Dysphonia - a rasping tone due to vocal cord paralysis; a nasal tone if bilateral palatal paralysis.
- Articulation - difficulty pronouncing “r”; unable to pronounce consonants as dysarthria progresses.

Q-22

A 22 year old female was hit on her side of her head with a cricket ball during a match. She initially lost consciousness but spontaneously recovered but is now experiencing increasing headache with one episode of vomiting. Her roommate has noticed that there is a slowing of responses. What is the SINGLE most likely diagnosis?

A. Subarachnoid haemorrhage
B. Subdural haemorrhage
C. Epidural haemorrhage
D. Simple seizure
E. None of the above

ANSWER:
Epidural haemorrhage

EXPLANATION:
PLAB 1 case stem for epidural haemorrhage usually have a young athletic patient that had a head injury during a sports match. They will experience a “lucid interval” before having a decrease in mental function. The stem may or may not give you a CT brain result: “bi-convex” extra-axial mass.

Epidural haemorrhage
Presentation:
- Head injury mostly to the side of the head, arterial bleed
- Loss of consciousness immediate, then recovers spontaneously followed by lucid interval
- Then patient will have a decline in mental function

Diagnosis:
- CT brain – bi-convex extra-axial mass

Treatment:
- Referral immediately to neurosurgery
- Burr hole over pterion then craniotomy and evacuation of haematoma

Q-23

A 49 year old man first presented with increasing difficulty in swallowing. Several months later he developed weakness in his right foot. Now he can no longer feed himself, he chokes on food and has become confined to a wheelchair. What is SINGLE most likely diagnosis?

A. **Cerebral tumor**
B. **Myasthenia gravis**
C. **Lambert-Eaton syndrome**
D. **Motor neuron diseaase**
E. **Cerebrovasculaer disease**

ANSWER:
Motor neuron disease

EXPLANATION:
Motor neuron disease (MND). This picture is of amyotrophic lateral sclerosis with bulbar onset.

In MND, motor nerves become damaged and eventually stop working. Therefore, the muscles that the damaged nerves supply gradually lose their strength. There are various subtypes of MND. In each type, symptoms tend to start in different ways. However, as the disease progresses, the symptoms of each type of MND tend to overlap. This means that symptoms in the later stages of each type of MND become similar. The main types of MND are:

Amyotrophic lateral sclerosis (ALS). This is the classical MND and the most common type. About 8 in 10 people with MND have this type. Symptoms tend to start in the hands and feet. The muscles tend to become stiff as well as weak at first.

Progressive bulbar palsy (PBP). About 2 in 10 people with MND have this type. The muscles first affected are those used for talking, chewing and swallowing (the bulbar muscles).

Progressive muscular atrophy (PMA). This is an uncommon form of MND. The small muscles of the hands and feet are usually first affected but the muscles are not stiff.

Primary lateral sclerosis (PLS). This is a rare type of MND. It mainly causes weakness in the leg muscles. Some people with this type may also develop clumsiness in the hands or develop speech problems.

The subtypes for PLAB are not so important as they are unlikely to be asked. The only subtype that has potential in being asked is Amyotrophic lateral sclerosis (ALS)

Amyotrophic lateral sclerosis
Presentation:
• Progressive weakness of bulbar, limb, thoracic and abdominal muscles
• Oculomotor, sphincter, cognitive functions are usually spared
• Late stages - swallowing difficulty and hoarseness

Diagnosis:
• Clinical diagnosis via diagnostic criteria by EFNS guidelines

Treatment:
• Multidisciplinary care
• Neuroprotective medication: riluzole
• Medications to treat respiratory symptoms, drooling, insomnia, fatigue, and psychological symptoms
• Genetic testing and counseling for family

COMPARING GUILLAIN-BARRE SYNDROME, MYASTHENIA GRAVIS AND MOTOR NEURON DISEASE
It is important to differentiate Guillain-Barre syndrome, Myasthenia Gravis and Motor Neuron disease. Remember these basic points:

	Guillain-Barre Syndrome	Myasthenia Gravis	Motor Neuron Disease
Weakness	Yes	Yes	Yes
Reflexes	Absent or diminished	Present	May be increased
Fatigue	No	Yes	No
Pain	Often	No	No
Fasciculations	No	No	Yes

Q-24

A 63 year old man presents after having a seizure. He is alert and oriented. On examination, inattention on the left side is noticed with hyperreflexia of the arm. What is the SINGLE most likely diagnosis?

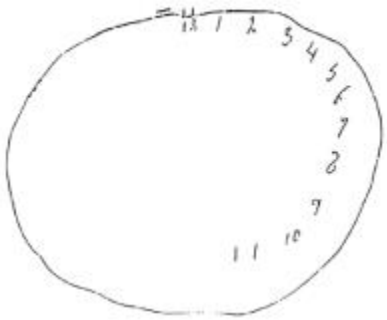
A. **Cerebral tumour**
B. **Pituitary adenoma**
C. **Cerebellar abscess**
D. **Huntington's disease**
E. **Parkinsonism**

ANSWER:
Cerebral tumour

EXPLANATION:
Inattention or neglect is a feature of parietal lobe lesion. Seizure may occur in space occupying lesions.

The most likely explanation for this answer is that the cerebral tumour has caused the right parietal lobe of the brain to be affected which can lead to neglect for the left side of the visual field, causing a patient with neglect to behave as if the left side of sensory space is nonexistent (although they can still turn left).

In an extreme case, a patient with neglect might fail to eat the food on the left half of their plate, even though they complain of being hungry. If someone with neglect is asked to draw a clock, their drawing might show only the numbers 12 to 6, or all 12 numbers might be on one half of the clock face with the other half distorted or blank. Neglect patients may also ignore the contralesional side of their body; for instance, they might only shave, or apply makeup to, the nonneglected side. These patients may frequently collide with objects or structures such as door frames on the side being neglected.



This is how someone with hemineglect might draw a clock

Q-25

A 62 year old man presents with his daughter to the clinic with complaints of visual hallucinations and features of cognitive impairment including memory loss. His symptoms of attention and levels of consciousness seem to fluctuate. He has a tremor and a festinating gait. What is the SINGLE most likely diagnosis?

A. Frontotemporal dementia
B. Lewy body dementia
C. Delirium tremens
D. Alzheimer's disease
E. Huntington's disease

ANSWER:
Lewy body dementia

EXPLANATION:
The most important features of Lewy body dementia that differentiate it from the other forms of dementia is the:
• Visual hallucinations
• Fluctuating course with lucid intervals
• Signs of mild Parkinsonism

Two of which are found in this stem: signs of parkinsonism and visual hallucinations.

Typical presentation of lewy body dementia

- Dementia is usually the presenting feature, with memory loss, decline in problem solving ability and spatial awareness difficulties.
- Characteristically there are fluctuating levels of awareness and attention.
- Signs of mild Parkinsonism (tremor, rigidity, poverty of facial expression, festinating gait). Falls frequently occur.

- Visual hallucinations (animals or humans) and illusions. → *This is particularly important to differentiate lewy body from other types of dementia in the PLAB exam*
- Sleep disorders including rapid eye movement sleep disorder, restless legs syndrome

Q-26

A 75 year old lady on warfarin for atrial fibrillation is brought into clinic by her daughter. Her daughter is concerned as her mother is progressively getting more confused over the last couple of weeks. On physical examination, the lady was noticed to have bruises on her arms. She has an INR of 7. What is the SINGLE most likely diagnosis?

A. Alzheimers
B. Delirium
C. Chronic subdural haemorrhage
D. Vascular dementia
E. Pick\s dementia

ANSWER:
Chronic subdural haemorrhage

EXPLANATION:
She is an elderly lady on anticoagulation. A trivial fall may have gone unnoticed. Warfarin and a high INR are risk factors for a subdural haemorrhage. Progressive confusion over days to weeks support this diagnosis.

Chronic subdural haematoma occurs in the very old or in severe alcoholics. A shrunken brain is rattled around the head by minor trauma, tearing venous sinuses. Over several days or weeks, mental function deteriorates as haematoma forms. CT scan is diagnostic, and surgical evacuation provides dramatic cure.

Remember in PLAB, Chronic subdural haematoma usually presents as an elderly, on anticoag or an alcoholic who may have history of fall. Slow onset of symptoms compared to epidural haematoma.

Q-27

A 56 year old male has increased thirst and increased micturition. He drinks around 6 litres of fluids a day. He is a known liver cancer patient and is suspected to have brain metastasis. He is awaiting an MRI of his head. Where is the SINGLE most likely location for the tumour?

A. Diencephalon
B. Midbrain
C. Medulla
D. Pons
E. Cerebrum

ANSWER:
Diencephalon

EXPLANATION:
This is most likely a diagnosis of Diabetes Insipidus. The diencephalon consists of the thalamus, the hypothalamus, the epithalamus and the subthalamus. The hypothalamus is a crucial part of the endocrine system of the body and so therefore the most likely location for an intracranial tumour causing diabetes insipidus would be the diencephalon.

In contrast, the most likely location for a brain tumour causing SIADH (Syndrome of Inappropriate Antidiuretic Hormone) would be the cerebrum or cerebellum.

Both DI and SIADH are common in cancer patients or those with brain tumours so it is important to know the most likely tumour locations causing these diseases.

DIABETES INSIPIDUS TYPE AND FEATURES
There are two main features of Diabetes insipidus

Cranial DI
- Decreased secretion of ADH reduces the ability to concentrate urine and so causes polyuria and polydipsia.

Nephrogenic DI
- Decreased ability to concentrate urine because of resistance to ADH in the kidney

Major diagnostic features include, but are not exclusive to:
- Marked polyuria – sometimes in excess of 3 litres a day
- Polydipsia and chronic thirst
- Nocturia

Q-28

A 33 year old patient presents with gradual onset of headache, neck stiffness, photophobia and fluctuating loss of consciousness. Cerebral spinal fluid shows lymphocytosis and decreased glucose but no organism on Gram stain. A CT head was read as normal. What is the SINGLE most likely causative organism?

A. Neisseria meningitides
B. Mycobacterium tuberculosis
C. Cytomegalovirus
D. Listeria monocytogenes
E. Streptococcus pneumoniae

ANSWER:
Mycobacterium tuberculosis

EXPLANATION:
Tuberculous meningitis would show lymphocytosis and decreased glucose.

Characteristic cerebrospinal fluid (CSF) findings in meningitis:

	Bacterial meningitis	**Viral meningitis**	**Tuberculous meningitis**
Glucose	Low	Normal	Low
Protein	High	Normal to high	High
White cells	Mainly neutrophils	Increased lymphocytes	Neutrophils in early disease, lymphocytes later

Q-29

A 67 year old main with a known case of diabetes mellitus type II and prostate carcinoma presents to clinic with back pain, groin numbness, and inability to initiate vomiting. Which of the following is the SINGLE most likely mechanism to explain for these symptoms?

A. **Cauda equina syndrome**
B. **Urinary outlet obstruction secondary to prostate carcinoma**
C. **Hydronephrosis secondary to urolithiasis**
D. **Neurogenic bladder from longstating diabetes mellitus type II**
E. **None of the above**

ANSWER:
Cauda equina syndrome

EXPLANATION:
PLAB 1 questions are usually very straight-forward. They would usually only ask diagnosis, investigation, and management. However occasionally, there would be a few odd questions where they would ask for the mechanism behind certain pathology. In this case stem, the patient has a history of prostate carcinoma; therefore, the symptoms presented here would most likely indicate metastasis/tumour that is compressing on the cauda equina. Option B would produce a degree of voiding dysfunction but not in the initiation of voiding and there would not be sensory changes. Option D although possible will not produce severe back pain or perineal numbness.

Cauda Equina syndrome
Presentation:
- Severe back pain
- Groin numbness / “saddle distribution sensory loss”
- Difficulty to initiate voiding
- Urinary or faecal incontinence
- Distal motor weakness

Diagnosis:
- MRI spine

Treatment:
- This is a neurosurgical emergency and needs neurosurgery referral

Q-30

A 42 year old woman has been treated with breast-conserving therapy plus systemic chemotherapy for breast cancer 6 months ago. She presents to Accidents & Emergency with a gradually worsening headache over the past week associated with nausea and vomiting and was admitted under the medical team. She has a normal neurological exam with a Glasgow Coma scale of 15. Her pulse rate is 88 beats/minute and her blood pressure is 140/80 mmHg. A non-contrast CT of the head shows a large intra-axial space occupying lesion with surrounding oedema and mass effect. What is the SINGLE most appropriate next step in management?

A. **High dose dexamethasone**
B. **Mannitol**
C. **Levetiracetam**
D. **Radiotherapy**
E. **Urgent decompressive craniotomy and tumour resection**

ANSWER:
High dose dexamethasone

EXPLANATION:
The imaging features are consistent with cerebral metastases which likely originated from the breast by haematogenous spread.

The key treatment components of patients with cerebral metastasis revolves around the control of peritumoral oedema and control of high intracranial pressure of which corticosteroids does the trick. Majority of peritumoral oedema and cerebral tumours responds well with corticosteroids (usually dexamethasone). Corticosteroid treatment reduces intracranial pressure and improves neurological symptoms within hours. Headaches tend to resolve and if neurological deficits were present, they would also improve with the maximum benefit seen in around 24 to 72 hours.

In regards to image modality, a magnetic resonance imaging (MRI) with contrast would be more appropriate than a computed tomography (CT) to look for cerebral tumours as it is more sensitive however in emergency settings like the above. CT scans are usually performed to look for any intracranial bleeding.

Mannitol which is an osmotic diuretic is used in emergency scenarios where rapid decrease of intracranial pressure is required. These would include situations where the GCS is less than 8, a history of head trauma, or fixed unilateral or bilateral pupils.

Antiseizure drugs like levetiracetam are not generally recommended in patients who have never had a seizure although they do have a place in prophylactic management for patients undergoing craniotomy for tumour resection.

A neurosurgical evaluation for surgical intervention would be eventually required however as the patient is clinically stable, this would not be the best next step.

Q-31

The daughter of a 69 year old male found her father alone in his apartment with confusion, bruising on his left arm and an unsteady gait. CT brain reveals a midline shift away from the side of a clot. What is the SINGLE most likely diagnosis?

A. **Subarachnoid haemorrhage**
B. **Intracebral bleed**
C. **Subdural haemorrhage**
D. **Epidural haemorrhage**
E. **Complex partial seizure**

ANSWER:
Subdural haemorrhage

EXPLANATION:
In most subdural haemorrhage case stems for PLAB 1, most will present as elderly and male (chronic subdural haemorrhage). Pay attention to history details such as history of falls or other trauma.

Subdural haemorrhage
Presentation:
- Fluctuating levels of consciousness
- Physical or intellectual slowing
- Sleepiness, headache, personality changes
- Unsteadiness
- Seizures

Diagnosis:
- CT brain / MRI brain – clot +/- midline shift; "crescent shaped" haematoma

Treatment:
- First line: Irrigation / evacuation via burr twist drill and burr hole craniostomy

Q-32

A 66 year old man, known case of uncontrolled hypertension, presents to the clinic with his wife complaining of deterioration of his memory and confusion. He has a past history of transient ischaemic attack where he temporarily suffered from left arm paralysis. Throughout the year, his wife has noticed a decline in his memory, along with clumsy gait which has made him prone to falls, as well as proressive incontinence. He is a heavy smoker. On examination, his BMI is 31 kg/m^2 and has an irritable mood. He scores 19 out of 30 on his mini-mental status examination. An MRI of the brain was requested and showed multiple subcortical lacunar old infarcts. What is the SINGLE most likely diagnosis?

A. **Vascular dementia**
B. **Lewy body dementia**
C. **Fronto-temporal (Pick's) dementia**
D. **Alzheimer's disease**
E. **Normal pressure hydrocephalus**

ANSWER:
Vascular dementia

EXPLANATION:
The exam clues for vascular dementia: > 50 years with a history of smoking, hypertension, and past stroke or transient ischaemic attack. *Cardiovascular risk factors would ALWAYS be present in the stem.*

Often there would be a "step-wise" deterioration of symptoms. Some case stem s would have the patient undergo a stroke-like event, deteriorate, then recover partially. There would be some overlap with Alzheimer's in terms of symptoms but look out for the history of ischaemia.

Q-33

A 54 year old man had a recent stroke. He now presents with ataxia, intentional tremors and dysarthria. Which part of the brain is most likely affected by the stroke?

A. **Inner ear**
B. **Brain stem**
C. **Diencephalon**
D. **Cerebrum**
E. **Cerebellum**

ANSWER:
Cerebellum

EXPLANATION:
The ataxia, intentional tremors and dysarthria point towards a cerebellar disorder.

Cerebellar Disorders
Aetiology includes stroke or transient ischaemic attack (TIA)

Presentation
As the cerebellum is associated with motor control, lesions produce a range of movement disorders (ataxias). Lesions of the midline vermis of the cerebellum cause truncal ataxia, while lesions of the cerebellar hemispheres cause limb ataxia of the ipsilateral side.

Q-34

A 55 year old male has a history of slurred speecch and left arm weakness that lasted for 5 minutes and resolved completely. An ECG performed in the Emergency Department showed a heart rate of 80 beats/minute in sinus rhythm. He takes regular antihypertensive medications. He does not have any other medical conditions. He was discharged from the hospital and asked to be seen in a TIA clinic for follow up. What is the SINGLE most appropriate long term medication(s) to be prescribed.

A. **Clopidogrel only**
B. **Aspirin 75 mg**
C. **Warfarin**
D. **Clopidogrel and statins**
E. **Add statin only**

ANSWER:
Clopidogrel and statins

EXPLANATION:
Post management of Transient ischaemic attack (TIA)
Clopidogrel (75 mg daily) is the preferred long-term antiplatelet (off-label use in TIA).

Current guidelines recommend treatment with high intensity **statin** following a TIA for all patients unless contraindicated.

Q-35

A 70 year old man with a known case of ischaemic heart disease presents to emergency with paralysis of his left arm, sensory loss on the left side of his face, right sided gaze preference and homonymous hemianopsia. Which of the following is the SINGLE most likely artery to be affected?

A. **Right middle cerebral artery**
B. **Right posterior cerebral artery**
C. **Left posterior cerebral artery**
D. **Right anterior cerebral artery**
E. **Basilar artery**

ANSWER:
Right middle cerebral artery

EXPLANATION:
For PLAB 1, stroke questions come in various forms ranging from the anatomical locations of the lesion, investigations and management. Pay special attention to the anatomy of the lesions especially the vascular distribution and the functions of the different parts of the brain.
i.e. anterior cerebral artery – frontal and medial cerebrum
middle cerebral artery – lateral part of the hemisphere
posterior cerebral artery – occipital lobe
basilar artery – cerebellum, brainstem, occipital lobe

Presentation:
- Middle cerebral artery occlusion features:
- Aphasia in the dominant hemisphere
- Neglect in the non-dominant hemisphere
- Contralateral paralysis (face & arm)
- Contralateral sensory loss (face & arm)
- Gaze preference toward side of lesion
- Homonymous hemianopsia

Stroke general features:
- Usually sudden onset with possible further progression that takes place over hours
- May have underlying ischaemic heart disease, carotid bruits, atrial fibrillation

Diagnosis:
- CT brain with no contrast to rule out whether stroke is ischaemic or haemorrhagic (initial investigation)
- Diffusion-weighted MRI brain provides more sensitivity in acute setting

Treatment:
- ABC protocol
- Blood glucose – keep between 4-11mmol/L & IV fluid hydration
- If ischaemic stroke – give Aspirin 300mg PO
- If < 3 hours and ischaemic stroke, thrombolysis (alteplase) (NICE Guidelines say give within 4.5 hours)

Q-36

A 64 year old man presents to the Accidents & Emergency department with a history of left sided hemiparesis and slurred speech that started earlier today. His symptoms resolved and he was completely asymptomatic 6 hours after the episode. A CT scan of his head revealed no acute haemorrhage. What is the SINGLE most appropriate prophylactic regimen?

A. **Aspirin 300 mg for 2 weeks followed by aspirin 75 mg**
B. **Aspirin 300 mg for 2 weeks followed by aspirin 75 mg and dipyridamole 200 mg**
C. **Aspirin 300 mg for 2 weeks followed by clopidogrel 75 mg**
D. **Dipyridamole 200 mg**
E. **Aspirin 300 mg for 2 weeks**

ANSWER:
Aspirin 300 mg for 2 weeks followed by clopidogrel 75 mg

EXPLANATION:
Post management of Transient Ischaemic Attack (TIA)
Aspirin is given for 2 weeks followed by clopidogrel (75 mg daily) as clopidogrel is the preferred long-term antiplatelet for secondary prevention.

If clopidogrel is contraindicated or not tolerated, give a combination of modified-release dipyridamole (200 mg twice daily) and low dose aspirin.

A statin should also be offered as soon as possible ater a TIA

Q-37

A 24 year old woman complains of progressive left leg stiffness and clumsiness over the past few weeks. There has also been a history of intermittent blurry vision that spontaneously resolves each time. On examination, there is increased tone, left leg power of 3/5, and upward plantars. A pale disc was seen on ophthalmoscopy. All other neurological examinations were normal. What is the SINGLE most appropriate initial management?

A. **Non-steroidal anti-inflammatory drug**
B. **Methotrexate**
C. **Interferon-beta**
D. **Methylprednisolone**
E. **Bed rest**

ANSWER:
Methylprednisolone

EXPLANATION:
This patient is presenting with upper motor neuron signs and optic neuritis. The diagnosis is relapsing-remitting multiple sclerosis. The patient is eligible for interferon-beta management; however, the question asks for the most appropriate initial management, which in this case would be methylprednisolone. Note that steroids can be given orally or via IV here; there is no difference in terms of efficacy but if the patient was to be admitted then IV is usually the choice. Be wary of NSAIDs: if the patient was

to be presenting with pain, you must confirm where this pain is coming from. If it is neuropathic pain then you would not give NSAIDs.

Multiple Sclerosis
Presentation:
Variety of symptoms involving motor and sensory mainly of the brainstem and cerebellum. It may be easier to divide them into groups to remember.

- *1. Transverse myelitis:*
    - o Weakness, sensory symptoms
    - o Urinary urgency and retention
    - o Flexor spasms
    - o Spastic quadriparesis or paraparesis
- *2. Brainstem:*
    - o Ataxia
    - o Diplopia
    - o Dysarthria
    - o Facial numbness
    - o Ophthalmoplegia
    - o Gaze palsy
- *3. Cerebellum*
    - Ataxia
    - Dysarthria
    - Nystagmus

• PLAB 1 stem usually have some clue to optic neuritis. Optic neuritis is an acute, sometimes painful, reduction or loss of vision in one eye and is a relatively common presenting symptom of MS. Colour vision may be impaired
• Also depression is common

Pattern is usually: symptoms evolve over days, plateau, then resolves over days/weeks

Diagnosis:
• Mostly a clinical diagnosis
• MRI (definitive diagnostic test): demyelination and/or lesions disseminated in time and place
• Oligoclonal bands in CSF

Treatment:
• Acute: IV or oral methylprednisolone
• Interferon-beta or glatiramer acetate (first line)

Q-38

A 72 year old man with a history of hypertension and an ex-smoker presents to the clinic with his wife due to change in behaviour. For the past year and a half, he has slowly become socially withdrawn with a decreased interest in his usual hobbies. There are times where he forgets to groom himself and there was an incident once where his wife found him urinating on the sofa. Over the past few months there has been a gradual struggle with finding the right word choice while talking. What is the SINGLE most likely diagnosis?

A. **Depression**
B. **Frontotemporal dementia**
C. **Alzheimer's disease**
D. **Vascular dementia**
E. **Lewy body disease**

ANSWER:
Frontotemporal dementia

EXPLANATION:
The keys in this case stem: patient has been struggling with word choice (temporal lobe) and disinhibition / urinating on the sofa (frontal lobe). Alzheimer's disease would usually present with memory loss first before changes in personality. Vascular dementia would have a "step-wise progression" and they would have had some sort of previous cardiac/vascular event in the stem. Lewy body disease would require a clue into having some parkinsonian symptoms.

Frontotemporal dementia
Presentation:
- Typical PLAB 1 presentation: elderly (>65 years)
- The history will be from a friend, carer, or family member
- Personality changes, change in habits of daily activities
- Memory is usually intact
- Disinhibition (may be sexual)
- On examination, may have difficulty initiating gait (frontal lobe)

Diagnosis:
- MRI brain – depending different subtypes will have atrophy of frontal and paralimbic areas, anterior or inferior lobes

Treatment:
- No pharmaceutical therapy available
- If sexual disinhibition, can give cimetidine or spironolactone

Q-39

A 50 year old man complains of being pursued by the police for a crime he denies committing however on further investigation, this was found to be untrue. He has poor concentration and impaired short-term memory. He admits to drinking large amounts of alcohol for the last 20 years. He is able to carry on a coherent conversation, but moments later he is unable to recall that the conversation took place. What is the SINGLE most likely diagnosis?

A. **Cotard syndrome**
B. **Alcohol withdrawal**
C. **Wernicke's encephalopathy**
D. **Schizophrenia**
E. **Korsakoff psychosis**

ANSWER:
Korsakoff psychosis

EXPLANATION:

Korsakoff syndrome

This is termed Wernicke-Korsakoff syndrome and is characterised by the addition of antero- and retrograde amnesia and confabulation in addition to the classic triad of confusion, ataxia and ophthalmoplegia found in Wernicke's encephalopathy.

Those with Korsakoff syndrome may "confabulate," or make up, information they can not remember. They are not "lying" but may actually believe their invented explanations.

They create events to fill the gaps in day-to-day memory. For example, a person who has been in hospital for several weeks may talk convincingly about having just visited their aunt earlier that day. This is more common in the early stages of the condition..

Individuals may seem able to carry on a coherent conversation, but moments later be unable to recall that the conversation took place or to whom they spoke. They can often answer questions promptly with inaccurate and sometimes bizarre answers.

Q-40

A 79 year old stumbled at home and sustained a minor head injury 2 weeks ago. He did not become unconscious and was well after the fall. His son has brought him to clinic because he has become increasingly confused, drowsy and unsteady over the past few days. He has a GCS of 13. His past medical history includes atrial fibrillation which he takes warfarin for. What is the SINGLE most likely diagnosis?

A. **Alzheimer's**
B. **Delirium**
C. **Chronic subdural haemorrhage**
D. **Vascular dementia**
E. **Pick's dementia**

ANSWER:

Chronic subdural haemorrhage

EXPLANATION:

An elderly man with a history of fall and on anticoagulation with progressive confusion over the last couple of days points towards the diagnosis of chronic subdural haemorrhage.

Chronic subdural haematoma occurs in the very old or in severe alcoholics. A shrunken brain is rattled around the head by minor trauma, tearing venous sinuses. Over several days or weeks, mental function deteriorates as haematoma forms. CT scan is diagnostic, and surgical evacuation provides dramatic cure.

Remember in PLAB, Chronic subdural haematoma usually presents as an elderly, on anticoag or an alcoholic who may have history of fall. Slow onset of symptoms compared to epidural haematoma.

Q-41

A 53 year old man presents to clinic with complaints of urinary incontinence and erectile dysfunction. He is seen to have ataxia, rigidity and a pill rolling tremor of the hands. On examination, postural hypotension is also noted. What is the SINGLE most likely diagnosis?

A. **Parkinson's diseae**
B. **Cruetzfeldt-Jakob disease**
C. **Huntington's disease**
D. **Lewy body dementia**
E. **Shy-Drager syndrome**

ANSWER:
Shy-Drager syndrome

EXPLANATION:
Shy-drager syndrome
A rare neurodegenerative disorder, caused by cell loss in certain areas of the brain and the spinal cord, leading to a variety of symptoms characterised by Parkinsonian features, cerebellar ataxia and autonomic dysfunction (particularly urogenital)

Mean age at onset is between 50 and 70 years

Presentation:
• Urinary dysfunction → most common presentation
• Erectile dysfunction
• Postural hypotension
• Cerebellar ataxia
• Parkinsonian symptoms with poor response to levodopa

In the exam, if you get a stem with characteristics of parkinsonism (rigidity, pill rolling tremor of the hands) plus autonomic dysfunction (urinary incontinence, erectile dysfunction) consider Shy-drager syndrome as the answer.

Q-42

An 8 year old girl is brought to the clinic due to abnormal behaviour noticed by her teacher. She would stare blankly towards the wall, sometimes with an upturning of the eyes for around 15 seconds, then blinks. This would occur several times during the day. The teacher notes that while she would resume her activity after these events she would be tired and unable to concentrate. What is the SINGLE most likely diagnosis?

A. **Simple partial seizure**
B. **Complex partial seizure**
C. **Absence seizure**
D. **Generalized seizure**
E. **Febrile seizure**

ANSWER:
Absence seizure

EXPLANATION:
In PLAB 1 stems, absence seizures would usually be a child (<10 years) with either the parent or teacher noticing that the patient is "daydreaming" often and when they resume their studies they are not able to perform well.

Absence seizure
Presentation:
- Child usually <10 years old
- Loss of awareness (“daydreaming”), stare blankly into space, will not respond to their surroundings
- May be accompanied by upturning of eyes, other repetitive movements
- Will return to normal activities after seizure but may not perform well and feel tired
- No photosensitivity
- Maybe triggered by hyperventilation

Diagnosis:
- EEG
- Check FBC, glucose levels, ECG, MRI for other underlying causes

Treatment:
- If recurring, sodium valproate or ethosuximide

Q-43

A 34 year old housemaid presents with severe headaches in the back of her head for several days and pain on flexing her neck. The pain is worsened by movements. On examination, there is limited range of movement of the neck. What is the SINGLE most likely diagnosis?

A. **Subdural haemorrhage**
B. **Cervical spondylosis**
C. **Subarachnoid haemorrhage**
D. **Meningitis**
E. **Cluster headache**

ANSWER:
Cervical spondylosis

EXPLANATION:
Cervical spondylosis is chronic cervical disc degeneration with herniation of disc material, calcification and osteophytic outgrowths.

Headache in the back of head and pain on flexing neck is an early feature of cervical spondylosis which gradually progress to later symptoms like radiculopathies due to root compression in arms and hands.

Q-44

A 33 year old man presents with speech difficulties. He ahs an irregular breakdown of articulation. On examination, nystagmus is seen. Which anatomical site is most likely to be affected?

A. **Midbrain**
B. **Pons**
C. **Cerebellum**
D. **Cerebrum**
E. **Vestibulocochlear nerve**

ANSWER:
Cerebellum

EXPLANATION:
It is quite unclear what sort of speech difficulties this patient has. But with a combination with nystagmus, one can assume that this patient is having cerebellar dysarthria (also known as ataxic dysarthria). Cerebellar dysarthria is an acquired neurological and sensorimotor speech deficit caused by damage to the superior cerebellum and the superior cerebellar peduncle. If, for example, there is damage to the left cerebellar hemisphere in a right handed person, ataxic dysarthria could develop. Of all the individual dysarthria types, it most clearly reflects a breakdown in timing and coordination.

Q-45

A 32 year old female presents with a history of recurring headaches. They are usually unilateral, last for 24-48 hours, have a pulsatile quality, and are associated with nausea and photophobia. The patient describes the headaches as intense, usually requiring her to limit her activities. She has tried several over-the-conter medications with no relief. Which of the following is the SINGLE most appropriate choice for first-line management of her condition?

A. **Paracetamol oral**
B. **Prednisone oral**
C. **Sumatriptan oral**
D. **Sumatriptan nasal**
E. **Oxycodone oral**

ANSWER:
Sumatriptan oral

EXPLANATION:
This is a classic presentation of acute migraine. First line therapy are triptans according to NICE guidelines. Note that if the patient was 12-17 years, then it is recommended that they start with a nasal triptan before oral. Be aware that opioids are never given during an acute onset of migraine.

Migraine
Presentation:
• History of unilateral, throbbing headache
• Associated with nausea/vomiting; photophobia
• Associated with aura/triggers
• May be described as: “need to limit activities” or “prefer to stay in a dark room”

Diagnosis:
• Clinical diagnosis
• May require CT / MRI head to rule out other pathology

Treatment:
• Sumatriptan - first line
• Monotherapy: triptan, NSAID, aspirin, paracetamol
• Combination therapy: triptan + NSAID; triptan + paracetamol

• Transcutaneous stimulation of the vagus nerve
• Avoid triggers

Q-46

A 68 year old lady complains of falls to the ground without any warning. She maintains consciousness throughout and remembers the event. There is no confusion after the fall. What is the SINGLE most likely diagnosis?

A. **Stokes Adams attack**
B. **Hypoglycaemia**
C. **Vasovagal syncope**
D. **Drop attacks**
E. **Epilepsy**

ANSWER:
Drop attacks

EXPLANATION:
Drop attacks are sudden spontaneous falls while standing or walking, with complete recovery in seconds or minutes. There is usually no loss of consciousness, and the event is remembered.

The remaining options given usually have a prodrome or identifiable symptoms prior to the episodes like dizziness or pallor. Drop attacks do not have these.

Drop attacks
Drop attacks refers to unexplained falls with no prodrome, no loss of consciousness, and rapid recovery. The proportion of falls due to 'drop attack' increases with age.

Causes
• Vertebrobasilar insufficiency
• Weak legs (eg cauda equina syndrome)

Note that the usual cause is sudden weakness of the legs that causes the patient, usually an older woman, to fall to the ground. There is no warning, no loss of consciousness and no confusion afterwards. The condition is usually benign, resolving spontaneously after a number of attacks.

Q-47

A 50 year old man presents to the clinic with his wife. She states that her husband has had a noticeable change in personality. He is impulsive and occasionally demonstrates inappropriate behaviour. On examination, he has difficulty naming objects, but his memory, ability to calculate, and his visuospatial skills are intact. What is the SINGLE most likely diagnosis?

A. **Alzheimer's disease**
B. **Frontotemporal dementia (Pick's disease)**
C. **Parkinson's disease**
D. **Wilson's disease**
E. **Lewy body dementia**

ANSWER:
Frontotemporal dementia (Pick's disease)

EXPLANATION:
The hallmark of Pick's disease is behavioural changes, inappropriate behaviour, and disinhibition. In early stages of Pick's disease memory, visuospatial skills, and calculation are relatively intact and this differs from Alzheimer's where usually memory would be affected first.

Frontotemporal dementia (Pick's disease)
Presentation:
• Behavioural changes, disinhibition, inappropriate behaviour
• Lip smacking
• Early stages - memory, ability to calculate, and visuospatial skills are intact
• Later stages - memory and cognitive function disrupted
• Age group - younger than Alzheimers - 30-65 years

Diagnosis:
• Clinical diagnosis
• Lund–Manchester criteria, NINDS criteria
• MRI brain to rule out other pathology

Treatment:
• Structured daily routine to control behaviour; predominantly supportive care
• Trial of trazodone or selective serotonin reuptake inhibitors

Q-48

A 58 year old woman presents with acute onset of back pain following a rough and long journey in a car. On examination, there is tenderness at the mid-thoracic vertebra. The pain goes away when she bends forward. What is the SINGLE most likely diagnosis?

A. **Osteoporotic fracture of vertebra**
B. **Myofascial pain syndrome**
C. **Whiplash injury**
D. **Multiple myeloma**
E. **Bone metastasis**

ANSWER:
Myofascial pain syndrome

EXPLANATION:
Myofascial pain syndrome is a chronic pain disorder characterised by regional muscle pain associated with restricted painful regions or trigger points. The pain is often aching and deep in nature.

Myofascial pain syndrome typically occurs after a muscle has been contracted repetitively. In this case, the long car ride journey has caused muscles to contract repetitively.

In the options given, only myofascial pain/muscle sprain relieves on change of position. The trapezius, levator scapula, infraspinatus, and scales are commonly affected areas but in this question with the mid-thoracic vertebra, it is likely the trapezius that is affected the most.

The remaining options are wrong

Osteoporotic fracture of the vertebrae would cause severe pain which will not improve on bending or on any movement. There also would be neurological features in the stem which is absent here.

Whiplash injury occurs with a fast motion composed of a combined flexion and extension of the cervical spine. This occurs commonly in a road traffic accident which we do not see in this stem.

Q-49

A 26 year old woman who is a known epileptic wants to start a family. She takes sodium valproate for her epilepsy which has been well controlled and has been seizure free for the past year. She and her husband have been using condoms as contraception till present. She attends clinic seeking advice regarding her antiepileptic medication as she would like to get pregnant. What is the SINGLE most appropriate advice to give?

A. **Add ferrous sulphate**
B. **Change sodium valproate to carbamazepine**
C. **Advise to stop antiepileptic medication and start folic acid**
D. **Reduce the dose of sodium valproate**
E. **No change in medication**

ANSWER:
Change sodium valproate to carbamazepine

EXPLANATION:
Change to carbamazepine is the best option given the options provided. If there was an option that said, change to carbamazepine and add folic acid 5mg, that would be an even better answer.

One would not stop antiepileptic medication especially if the patient has only be seizure free for one year. The patient needs to be seizure free for more than 2 years before it would be considered reasonable to stop antiepileptic medication prior to pregnancy.

Epilepsy and pregnancy
Pre-pregnancy
If a woman is taking antiepileptic drugs and planning a pregnancy, the general advice to give to her is about the increased risks of fetal malformations, neurodevelopmental delay, and possible increased seizure frequency in pregnancy.

Since there is no agreement as to which antiepileptic drug is most or least teratogenic, the antiepileptic drug that stops seizures in a given patient is the one that should be used. However, there is one exception to the rule, SODIUM VALPROATE! The risk of teratogenicity with Valproate is greater than risk of teratogenicity with other antiepileptic

drugs. Hence, sodium valproate should always be changed to another antiepileptic drug prior to pregnancy. Currently, carbamazepine and lamotrigine has good safety profiles but again there is no consensus as to which should be used.

The Medicines and Healthcare products Regulatory Agency (MHRA) issued a special reminder on the risk of neurodevelopmental delay in children following maternal use of sodium valproate, and advises that this drug should not be used in women of childbearing potential unless there is no effective alternative.

High dose (5mg) folic acid is recommended for at least 1 month preconceptually and throughout the first trimester.

In established pregnancy
In established pregnancy, changes to alternate antiepileptic drug therapy should NOT be undertaken solely to reduce teratogenic risk for 2 reasons :
1. Changing AEDs may precipitate seizures
2. Overlapping AEDs during the change exposes the fetus to effects of an additional antiepileptic drugs

Once an unplanned pregnancy is discovered it is usually too late for changes to be made to the epilepsy treatment regimen. The risk of harm to the mother and fetus from convulsive seizures outweighs the risk of continued therapy

Q-50

A 44 year old lady with established multiple sclerosis attends A&E with the complaint of weakness and a reduction in sensation on the left side of her face. She also complains of hearing loss in her left ear, as well as unsteadiness when she tries to walk. She is noted to have difficulty in coordinating her hand movements. What is the SINGLE most likely neuroanatomical structure affected?

A. Cerebellum
B. Cerebral cortex
C. Brainstem
D. Spinal cord
E. Optic nerve

ANSWER:
Brainstem

EXPLANATION:
The lesions of multiple sclerosis most commonly affect the white matter in the optic nerve, brainstem, basal ganglia, and spinal cord, or white matter tracts close to the lateral ventricles.

The brainstem provides the main motor and sensory innervation to the face and neck via the cranial nerves. It includes the midbrain, the medulla oblongata and the pons. Since this patient is experiencing deficits in her trigeminal nerve (CN V) and her vestibulocochlear nerve (CN VIII), this answer makes the most sense.

None of the other choices would cause the patient to present with her particular set of signs and symptoms.

Cerebral cortex is not the correct answer as this usually results in unilateral symptoms in the limbs that are predominantly weakness and loss of sensation. Incoordination is not usually even possible to check in these cases as there is such a degree of loss of function.

Spinal cord is not the correct answer as usually when the spinal cord is affected, there are symptoms present from the level of the cord affected and below. One would expect paraplegia and possibly even loss of ability to ventilate if the lesion is high enough.

Optic nerve is not the correct answer as none of the symptoms mentioned include any visual disturbances or loss. However, in Multiple Sclerosis, some of the very common and characteristic features involve the optic tracts.

Q-51

A 73 year old male presents with a history of falls over the past 12 months. His relatives have also noticed a rather strange behaviour lately and more recently he has had episodes of enuresis. Examination reveals that he is disoriented to time and place with a broad-based, clumsy gait. What is the SINGLE most likely diagnosis?

A. **Parksinson's disease**
B. **Pituitary adenoma**
C. **Cardiovascular disease**
D. **Syringomyelia**
E. **Normal pressure hydrocephalus**

ANSWER:
Normal pressure hydrocephalus

EXPLANATION:
The history of falls and broad based clumsy gait (balance and gait disturbance), strange behavior and disorientation to time and place (due to dementia), episodes of enuresis (urinary incontinence) points towards normal pressure hydrocephalus.

Remember the classic triad

Normal pressure hydrocephalus
Normal pressure hydrocephalus will present with prominent gait abnormalities early in the course of the disease that usually precede the onset of cognitive impairment. There will also be associated urinary incontinence.

Normal pressure hydrocephalus is a reversible cause of dementia seen in elderly patients. It is thought to be secondary to reduced CSF absorption at the arachnoid villi.

Has a classical triad of:
• Urinary incontinence
• Dementia
• Gait abnormality (may be similar to Parkinson's disease)

"the wet, wobbly and wacky grandpa"

This classical symptoms are known as Hakim's triad. The incontinence does not follow the pattern of spinal cord lesions (painless retention and overflow); rather, it is the apparently normal passage of urine in response to a full bladder, but without the patient being aware or particularly concerned by it. It is best thought of as part of the cognitive decline rather than a separate entity. In elderly patients it may be confused with urgency or gait problems preventing them getting to the toilet in time.

Q-52

A 49 year old chronic alcoholic with establlished liver damage is brought to the hospital after an episode of heavy drinking. He is not able to walk straight and is complaining of double vision. He is shouting obscenities and expletives. What is the SINGLE most likely diagnosis?

A. **Korsakoff psychosis**
B. **Delirium tremens**
C. **Wernicke's encephalopathy**
D. **Tourette's syndrome**
E. **Alcohol dependence**

ANSWER:
Wernicke's encephalopathy

EXPLANATION:
Wernicke's encephalopathy is a neuropsychiatric disorder caused by thiamine deficiency which is most commonly seen in alcoholics. A classic triad of confusion, ophthalmoplegia and ataxia may occur.

Treatment is with urgent replacement of thiamine (vitamin B1) If not treated Korsakoff's syndrome may develop as well. This is termed Wernicke-Korsakoff syndrome and is characterised by the addition of antero- and retrograde amnesia and confabulation in addition to the above classic triad.

Q-53

A 2 year old child is brought to the Paediatric Accidents & Emergency by his parents as they are worried about the possibility of their son having a seizure. Earlier today he fell from his bicycle but made no sound then becomes pale. This was accompanied by a stiffening, clonic jerks of the limbs and loss of consciousness. He regains full consciousness a few seconds later. What is the SINGLE most likely diagnosis?

A. **Reflex anoxic seizures**
B. **Epilepsy**
C. **Myoclonic seizure**
D. **Postural orthostatic tachycardia syndrome**
E. **Pure autonomic failure**

ANSWER:
Reflex anoxic seizures

EXPLANATION:
When a toddler cries after a minor injury, stops breathing and loses consciousness for a few seconds followed by rapid recovery, you should be thinking of two conditions:

1. Blue breath holding spells
2. Reflex anoxic seizures also known as reflex asystolic syncope or white breath holding attacks

Since blue breath holding spells was not part of the options, we will only discuss reflex anoxic seizures here.

Reflex anoxic seizures are paroxysmal, spontaneously-reversing brief episodes of asystole triggered by pain, fear or anxiety. They are non-epileptic events caused by a reflex asystole due to increased vagal responsiveness. They begin when a toddler typically aged from 6 months to 2 years has a sudden surprising pain or an unexpected fright, stops breathing then goes pale, rigid and may have upward eye deviation with clonic movements. These episodes last less than a minute and it is followed by rapid recovery. Management is just reassurance and advise parents to place child in recovery position during episodes.

Remember: Reflex anoxic seizures do not cause tongue biting – An important point when differentiating from epilepsy.

Q-54

A 44 year old woman presents with a severe throbbing unilateral right sided headache and photophobia 20 minutes after an episode of tingling and numbness of her left hand. What is the SINGLE most likely diagnosis?

A. Transient Ischaemic Attack
B. Migraine
C. Meningitis
D. Stroke
E. Subarachnoid haemorrhage

ANSWER:
Migraine

EXPLANATION:
This is a typical case stem for migraine in PLAB 1. The patient will present with or without aura (sensory or motor) followed by the headache itself. THIS IS EXTREMELY IMPORTANT. The key to differentiating between a migraine or a headache of a more serious origin (e.g. subarachnoid hemorrhage) is the onset of a unilateral, throbbing headache AFTER an aura.

Types of aura include, but are not limited to:
Visual disturbances can include:
• blind spots in the field of eyesight
• coloured spots
• sparkles or stars
• flashing lights before the eyes
• tunnel vision
• zig zag lines
• temporary blindness.
Other aura symptoms can include:
• numbness or tingling

• pins and needles in the arms and legs
• weakness on one side of the body
• dizziness
• a feeling of spinning (vertigo).

More information about migraine:

Migraine

Presentation:

Young to middle aged female or male (for PLAB 1)
Throbbing headache, localized to one side preceded by aura
+/ Nausea and vomiting
+/ Photophobia

Diagnosis:

Clinical diagnosis
MRI – can check for physiological changes in the brain during a migraine, but not necessary (doesn't change management)

Acute Treatment:

• Combination therapy with an oral triptan and an NSAID, or an oral triptan and paracetamol.
• If monotherapy is preferred, offer an oral triptan, or NSAID, or aspirin, or paracetamol.

Prevention:

• Topiramate or propranolol as first line for prevention
• Preventive treatment should be offered in addition to acute treatment.
• If both topiramate and propranolol are ineffective or are unsuitable, offer gabapentin or acupuncture

Q-55

A 72 year old woman is seen to collapse by her son. He calls the paramedics when she is unable to stand and seems weak down her right side. On arrival to the A&E her GCS is 13/15 with a right hemiparesis. She is increasingly agitated and within an hour her GCS is 8/15. Which is the SINGLE most appropriate next course of action?

A. Urgent anaesthetic review
B. Start thrombolysis treatment
C. Give aspirin
D. Give lorazepam
E. Urgent CT head

ANSWER:

Urgent anesthetic review

EXPLANATION:

Anaesthetic review would be the next most appropriate step of action. The history and examination are convincing for a stroke but the patient has rapidly dropped her consciousness levels, and before any investigations and treatment can happen this needs to be addressed. An anaesthetist would rather know at this stage rather than

when a peri-arrest call is put out as her GCS reaches 4 or 5. The airway can be stabilized so that a CT scan can be performed safely.

The other options are less likely to be the appropriate next course of action.

Thrombolysis or aspirin → are the treatment options for ischaemic strokes but cannot be started until a CT scan excludes a haemorrhage.

Lorazepam → Agitation is common in intracranial events, especially haemorrhages, but should not be treated with sedation as this can mask real fluctuations in consciousness levels.

Urgent CT head → This will certainly be needed as the history and examination are convincing for a stroke. CT helps rule out primary haemorrhage. But only after the airway has been stabilized by the anaesthetist.

Q-56

A 32 year old female who is 18 weeks pregnant presents to the Emergency Department. She has a history of epilepsy and is on medication for it however she was non-compliant and did not take her medication for the past 5 days. She had a tonic-clonic seizure earlier in the morning lasting for 5 minutes and was brought in by ambulance. She has IV access. While waiting for a doctor, she starts to have another generalized tonic-clonic seizure. What is the SINGLE most appropriate management?

A. **IV Lorazepam**
B. **IV Phenobarbital**
C. **IV phenytoin**
D. **Refer to ICU**
E. **Rectal Diazepam**

ANSWER:
IV Lorazepam

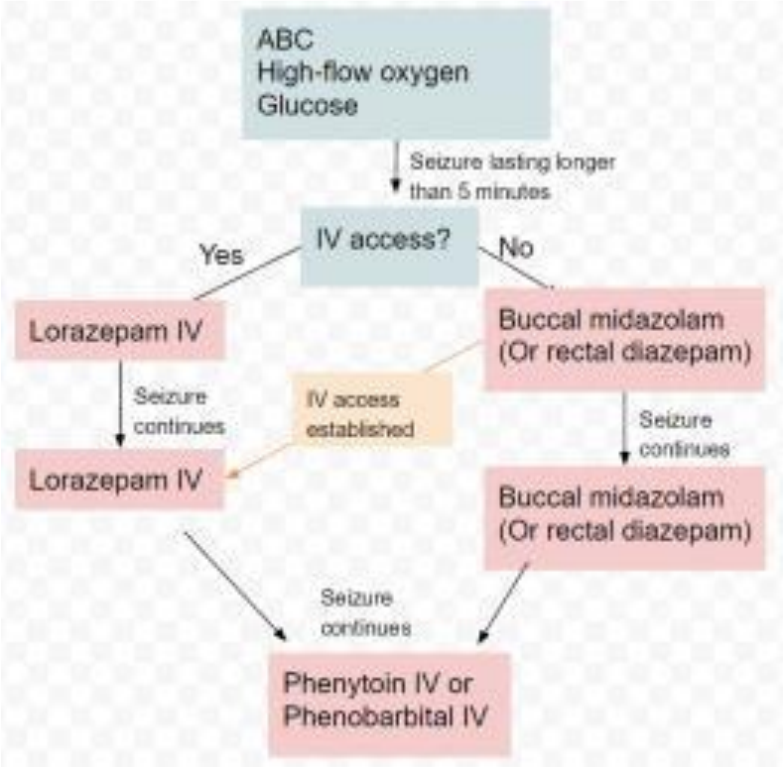
EXPLANATION:
Seizures lasting longer than 5 minutes should be treated urgently with intravenous lorazepam (repeated once after 10 minutes if seizures recur or fail to respond). Intravenous diazepam is effective but it carries a high risk of thrombophlebitis (reduced by using an emulsion formulation). Absorption of diazepam from suppositories is far too slow for treatment of status epilepticus.

The fact that she is pregnant does not change the management of a convulsive status epilepticus.

The management for ongoing generalised tonic–clonic seizures (convulsive status epilepticus) in hospital is different from the community. Below we will only discuss management in hospital.

STATUS EPILEPTICUS HOSPITAL MANAGEMENT:
• ABC protocol
• Give high-concentration oxygen

• Check blood glucose levels
• Secure intravenous access in a large vein
• Administer intravenous lorazepam as first-line treatment in hospital for ongoing generalised tonic–clonic seizures (convulsive status epilepticus)
• Administer intravenous diazepam if intravenous lorazepam is unavailable, or buccal midazolam if unable to secure immediate intravenous access. Administer a maximum of two doses of the first-line treatment (including pre-hospital treatment)
• If seizures continue, administer intravenous phenobarbital or phenytoin as second-line treatment in hospital
• If seizure still continues despite above (>30 minutes), referral to ICU



Here are some of the common first line doses of medications in hospitals for adults: Note: These doses are probably not needed for the exam but useful to memorize in the event you have a patient having status epilepticus in front of your where you do not have the time to pull out your BNF to find out the doses.

- *If no intravenous access:*
  - *Diazepam 10-20 gm given rectally repeated once15 minutes later if status epilepticus continues or*
  - *Midazolam 10 mg buccally repeated after 10 minutes if status epilepticus continues*
- *If IV access established*
  - *Lorazepam 4 mg bolus repeated after 10 to 20 minutes*

Q-57

A 39 year old chronic alcoholic stopped drinking alcohol for the last 2 days. He presents to A&Ewith symptoms of feeling anxious, having tremors and is seen sweating profusely. His heart rate is 103 beats/minnute. What is the SINGLE most appropriate treatment?

A. **Naloxone**
B. **Benzodiazepines**
C. **Acamprosate**
D. **Disulfiram**
E. **Haloperidol**

ANSWER:
Benzodiazepines

EXPLANATION:
The patient presents with symptoms of an acute alcohol withdrawal. This patient would require benzodiazepines as part of his management (usually chlordizepoxide) and would need to be referred to the medical team from A&E.

IV Pabrinex (Thiamine) would also be given in the hospital. This is to help prevent Wernicke's encephalopathy

ALCOHOL WITHDRAWAL SYMPTOMS:

- Symptoms typically present about eight hours after a significant fall in blood alcohol levels.
- Symptoms peak on day 2 and, by day 4 or 5, the symptoms have usually improved significantly.
- Minor withdrawal symptoms (can appear 6-12 hours after alcohol has stopped)
- Alcoholic hallucinosis (can appear 12-24 hours after alcohol has stopped).
  - This includes visual, auditory or tactile hallucinations.
- Withdrawal seizures (can appear 24-48 hours after alcohol has stopped).
- If withdrawal symptoms continue to increase in severity it could advance to delirium tremens which is characterised by hallucinations that are indistinguishable from reality and associated with severe confusion, disorientation and tremors

ACUTE ALCOHOL WITHDRAWAL MANAGEMENT

Patients often present with anxiety, tremor, hyperactivity, sweating, nausea and retching, tachycardia, hypertension and mild pyrexia. Symptoms peak at at 12-30 hours and subside by 48 hours

Medications used in alcoholics

- **Benzodiazepines** for acute withdrawal (NHS commonly uses Chlordiazepoxide)
  - Chlordiazepoxide is used as sedation
  - If patient has withdrawal seizures, lorazepam issued as it is a quick-acting benzodiazepine
- **IV Pabrinex** (Thiamine) (vitamin B1) is used to prevent Wernicke's encephalopathy which is a neuropsychiatric disorder caused by thiamine deficiency which is most commonly seen in alcoholics
- **Disulfiram:** promotes abstinence - alcohol intake causes severe reaction due to inhibition of acetaldehyde dehydrogenase. Patients should be aware that even small amounts of alcohol (e.g. In perfumes, foods, mouthwashes) can produce severe symptoms. *Example of when to use disulfiram in PLAB: 40 year old man wants medication to serve as a deterrent when he takes alcohol*
- **Acamprosate:** reduces craving, improves abstinence in placebo controlled trials. *Example of when to use disulfiram in PLAB: 40 year old man wants some medication to help him reduce cravings*

Q-58

A 71 year old lady has a history of a fall 3 days ago with an injury to the head. She is increasingly drowsy and has recently become confused and disoriented. What is the SINGLE most likely vessel to be involved?

- **A. Diploic vein**
- **B. Cerebral vein**
- **C. Basal vein**
- **D. Middle meningeal vein**
- **E. Middle meningeal artery**

ANSWER:
Cerebral vein

EXPLANATION:
The clinical symptoms match those of a chronic subdural haematoma. This would be caused by a rupture of a bridging vein. Among the options given, cerebral vein would be the most likely.

Chronic subdural haematoma occurs in the very old or in severe alcoholics. A shrunken brain is rattled around the head by minor trauma, tearing venous sinuses. Over several days or weeks, mental function deteriorates as haematoma forms. CT scan is diagnostic, and surgical evacuation provides dramatic cure.

Remember in PLAB, Chronic subdural haematoma usually presents as an elderly, on anticoag or an alcoholic who may have history of fall. Slow onset of symptoms compared to epidural haematoma.

Q-59

A 40 year old man who has recently lost his job was found to be stumbling and wandering around the local partk, muttering to himself with plans to kill himself. The police have brought him to the hospital in an unkempt and disheveled state and he displays a general level of bad hygiene. He is pale and smells of stale sweat. The police officer who brought him to the hospital says that he had administered an alcohol breath test for the patient which showed zero percent of alcohol. In addition, the patient appears to be confused and is unable to answer most of your questions. What is the SINGLE best initial management for this patient?

- **A. Acamprosate**
- **B. Antipsychotics**
- **C. High potency vitamins**
- **D. Disulfiram**
- **E. Benzodiazepines**

ANSWER:
Benzodiazepines

EXPLANATION:
This is a classic case of alcohol withdrawal, which develops about 12 to 24 hours after the drinking abruptly stops. The symptoms can last for days afterwards. The fact that

the stem gives ou that this patient has lost his job, is unkept and smells of stale sweat sounds mucch like there is a background of alcoholism in this picture.

Benzodiazepines would be the most appropriate initial management as it helps with the alcohol detoxification. The next best option after benzodiazepines, would be high potency vitamins to prevent him from getting Wernicke's encephalopathy as he is likely malnourished and deficient in vitamins due to alcoholism. Both of these medications are usually prescribed together in the A&E.

Q-60

A 35 year old lady is seen by a Neurologist for funny turns. These episodes were witnessed by her husband who describes15 minute episode of inability to talk without losing consciousness. This has been ongoing every 2-3 days since the sudden unexpected death of her mother 2 months ago. What is the SINGLE most useful investigation to help aid in diagnosis?

A. **Magnetic Resonance Imaging of the Head**
B. **Video electroencephalogram**
C. **Serum electrolytes**
D. **Tilt table testing**
E. **Echocardiogram**

ANSWER:
Video electroencephalogram

EXPLANATION:
The correct answer is B. Video electroencephalogram. This investigation will help rule out any form of epilepsy. The diagnosis is most likely some form of conversion disorder or non-epileptic attack disorder (NEAD) which is benign and not life threatening. However, if there is an underlying diagnosis of epilepsy then the implications are quite serious.

Option A. Magnetic Resonance Imaging of the Head is incorrect. Although this is a useful investigation in this type of case, it is not the most useful to help aid diagnosis. There are no features in the story that suggest a vascular pathology or space occupying lesion. These are the main types of disorders one would expect to see on any kind of head scan.

Option C. Serum electrolytes is incorrect. Again this is a useful investigation but not the most useful in this case. There are no features of electrolyte disturbance mentioned in the case, such as blood test results or other physical signs of electrolyte imbalance.

Option D. Tilt table testing is incorrect. This is a type of test used to investigate episodes of loss of consciousness. In this case,it is clearly stated that the lady is not losing consciousness.

Option E. Electroencephalogram is incorrect. Thismay be a useful investigation in thissetting, however againit is not the most useful and there is no indication of heart disease or symptoms of palpitations or chest pain.

A key learning point from this question is to make sure you know why you do tests and choose them carefully. The National Health Service is very under resourced and requires good choices on our part as doctors to help save those resources. Remember to always be able to justify why you are doing a test and request them appropriately.

EPILEPSY VS NON-EPILEPTIC ATTACK DISORDER (NEAD)

Symptom	Epilepsy	NEAD
History	Genetic factor	History of childhood physical or sexual abuse
Triggers	Many including sleep deprivation, alcohol, flashing lights, sudden noises	Stress, panic
Occur in company	No association	Common
Onset	Sudden	Gradual
Duration	0.5 to 2 minutes	Often longer than 2 minutes (sometimes hours)
Pelvic thrusting	Rare	Occasional
Eyes/mouth	Typically open If eyes are closed, they have no resistance to opening it	Often closed If eyes are closed, there is resistance to trying to open it.
Side-to-side head movement	Rare	Common
Asynchronous movements	Rare	Common
Tongue biting	Common	Rare
Incontinence	Common	Rare
Self-injury during attack	Common	Rare
Crying during the attack	Rare	Common
Breathing	Apnoeic	Continuous
Post-ictal confusion	Common	Rare
Post-ictal EEG	Slow	Normal
Medications	Responsive to medications	Not responsive to multiple drug trials

Interestingly, patients with NEAD usually retain their consciousness. This means that if you elevated their arm above their face and drop it, the patient wouldavoid hitting his face. If you did something very discomforting like inserting a vibrating tuning forck into the patient's nostrils, the patient would immediately wake up. We do not suggest you do it though.

Q-61

A 42 year old female had a sudden onset of severe headache and vomiting. She took paracetamol and an hour later she collapsed. Her medical history is significant for Ehlers-Danlos syndrome. What is the SINGLE most likely diagnosis?

A. Subarachnoid haemorrhage
B. Viral encephalitis
C. Meningitis
D. Anaphylaxis
E. Epidural haematoma

ANSWER:
Subarachnoid haemorrhage

EXPLANATION:
Sudden onset of severe headache, vomiting then collapsing are more suggestive of subarachnoid haemorrhage. This is also supported by the medical history of Ehlers-Danlos syndrome.

Occasionally the stem would include signs of meningeal irritation. This includes neck stiffness and photophobia. Patients often describe the headaches as "the worst headache of my life"

Q-62

A 67 year old woman with a history of atrial fibrillation presents to emergency with slurred speech, asymmetric facial weakness, left sided hemiparesis and ataxia. On arrival to the A&E, her GCS is 14/15. She is increasingly agitated. Which is the SINGLE most appropriate next course of action?

A. **Anticoagulation**
B. **Start thrombolysis treatment**
C. **Give aspirin**
D. **Give lorazepam**
E. **Urgent CT head**

ANSWER:
Urgent CT head

EXPLANATION:
The history and examination are convincing for a stroke. Before any treatment can happen we need to exclude a haemorrhagic stroke with the help of imaging. This was done in this question which showed an ischaemic stroke. The next step is to start thrombolytics.

The other options are less likely to be the appropriate next course of action.

Anticoagulation → with regards to atrial fibrillation, RCP states that "anticoagulants should not be started until brain imaging has excluded haemorrhage, and usually not until 14 days have passed from the onset of an ischaemic stroke"

Thrombolysis or aspirin → are the treatment options for ischaemic strokes but cannot be started until a CT scan excludes a haemorrhage.

Lorazepam → Agitation is common in intracranial events, especially haemorrhages, but should not be treated with sedation as this can mask real fluctuations in consciousness levels.

Basically all treatments that can cause bleeding should be held off until haemorrhagic stroke is ruled out by imaging.

Q-63

A 35 year old woman complains of dizziness. She awoke in the morning with a mild headache and dizziness started when she sat up in the bed. She felt that the room was spinning for a few minutes. If she is at rest the spinning stops but is aggravated by movement. There are no other neurological symptoms. What is the SINGLE most likely diagnosis?

A. **Brainstem stroke**
B. **Benign paroxysmal positional vertigo**
C. **Meniere's disease**
D. **Vestibular neuronitis**
E. **Acoustic neuroma**

ANSWER:
Benign paroxysmal positional vertigo

EXPLANATION:
All of the above options are popular topics in PLAB 1. Meniere's disease would usually involve tinnitus, deafness, and increased ear pressure in the case stem. Vestibular neuronitis, while similar to Meniere's does not have hearing loss. Acoustic neuroma as it grows into the cerebellopontine angle would involve cranial nerves V, VII, VIII; therefore, you would have a variation of symptoms involving these three nerves. Between options A and B, the symptoms in the case stem would not spontaneously resolve for option A.

Q-64

A 62 year old male is brought to the emergency department by his daughter as he is confused, and has an unsteady, uncoordinated walking. He is a known alcoholic and has been admitted recently with delirium tremens. On questioning, he denies any problem with his memory. He knows his name and address and convincingly states that he was at a betting shop in the morning. His daughter interjects saying that, that is untrue as he was at home. What is the SINGLE most likely diagnosis

A. **Ganser syndrome**
B. **Cotard syndrome**
C. **Wernicke's encephalopathy**
D. **Korsakoff psychosis**
E. **Alcohol withdrawal**

ANSWER:
Korsakoff psychosis

EXPLANATION:
Please see Q-39

Q-65

A 78 year old woman admitted for a urinary tract infection for the last 10 days has become increasingly confused. Her son has noted her level of consciousness has been fluctuating and is disoriented to time and place. She is more withdrawn but intermittently becomes very noisy and agitated. What is the SINGLE most likely diagnosis?

A. **Dementia**
B. **Delirium**
C. **Schizophrenia**
D. **Depression**
E. **Cerebral mass**

ANSWER:
Delirium

EXPLANATION:
For the exam, it is important to know the difference between dementia and delirium. The onset for delirium is more acute with fluctuating levels of consciousness. There will be disorientation, mood changes, paranoia, and some memory impairment. Urinary tract infections are a common cause of delirium in the elderly.

Delirium	**Dementia**
Acute onset *(hours to days)*	Gradual onset *(over months)*
Fluctuating course *(symptoms fluctuate during the day)*	Progressive course
Altered consciousness	Consciousness usually clear
Hallucinations more common	Hallucinations less common
Recent memory problems	Recent then remote memory problems
Reversible	Irreversible

Delirium
Presentation:
• Acute onset
• Fluctuating levels of consciousness
• Often in elderly
• Disorientation, mood changes, paranoia
• Memory impairment
• Abnormalities of perception e.g. hallucinations or illusions
• Withdrawn or heightened arousal

Common precipitating factors
• Metabolic derangement
• Hypoxia
• Infection
• Dehydration
• Constipation
• Medications e.g. benzodiazepines

Treatment:
• Treat underlying cause
• Consider anti-psychotics

Q-66

A 78 year old male presents with a history of urinary incontinence and change in behaviour. On examination, he has a waddling gait. What is the SINGLE most likely diagnosis?

A. **Subdural haemorrhage**
B. **Brain tumour**
C. **Parkinson's disease**
D. **Psychotic depression**
E. **Normal pressure hydrocephalus**

ANSWER:
Normal pressure hydrocephalus

EXPLANATION:
Please see Q-13

Q-67

A 79 year old man was seen in the memory clinic as an outpatient. On his mental state examination, he was noted to be disengaged, expressing boredome as well as making inappropriate comments to the doctor of a sexual nature. What is the SINGLE most likely diagnosis?

A. **Alzheimer's disease**
B. **Huntington's disease**
C. **Lewy body dementia**
D. **Frontotemporal dementia**
E. **Cerebrovascular accident**

ANSWER:
Frontotemporal dementia

EXPLANATION:
The patient in this scenario is exhibiting signs of disinhibtion. This feature is most characteristically seen in those with frontotemporal dementia. They may also have features of insisting on ingesting sweet things as well as angry and violent outbursts.

Answer A. Alzheimer's disease is not correct as in Alzheimer's disease, patients classically show signs of reduced function such as reduced ability to speak with eventual aphasia. To help remember, think of the three A's: apraxia (inability to carry out purposeful movements), aphasia (loss of ability to speak) and agnosia (loss of ability to recognise what objects are and do as well as people).

Answer B. Huntington's disease is not correct as this is primarily a neurological disorder that is characterised by movements disorder (chorea specifically) as well as gradual decline in mental function over time with a typically younger onset of symptoms.

Answer C. Lewy Body dementia is not correct as the characteristic features here include increased risk of falls as well as visual hallucinations.

Answer E. Cerebrovascular accident is not the correct answer as this is more typically characterised by motor/sensory loss of function. Although cerebrovascular disease can lead to vascular dementia, this is not the single best answer for this question.

Q-68

A 44 year old woman has a two week history of electric shock-like stabbing facial pain starting from her left jaw and radiates towards her forehead. The pain is unilateral and it is descrbed as very severe and coming in spasms. The pain is trigerred by chewing but occurs at other times as well. Her corneal reflexes are found to be normal. What is the SINGLE most likely diagnosis?

A. **Trigeminal neuralgia**
B. **Temporomandibular joint disorder**
C. **Atypical facial pain**
D. **Giant cell arteritis (GCA)**
E. **Herpes zoster ophthalmicus**

ANSWER:
Trigeminal neuralgia

EXPLANATION:
Electric shock-like, sharp, shooting, stabbing are features usually used to describe trigeminal neuralgia. The onset of pain is episodic and sudden, lasting a few seconds to minutes and stopping suddenly, with many attacks a day.

Patients with classical trigeminal neuralgia have a normal neurologic examination. Facial sensation, masseter bulk and strength, and corneal reflexes should be intact. A loss of corneal reflex excludes the diagnosis of idiopathic trigeminal neuralgia and prompt physicians to consider other causes of patient's symptoms, unless a previous trigeminal nerve section procedure has been performed. Thankfully the corneal reflex in this stem is intact which makes the the choice of answer more clear.

Trigeminal neuralgia
Presentation
• Unilateral, shooting or stabbing electric shock-like facial pain
• Pain exacerbated with movement or touch especially in the jaw (CN V, 2nd and 3rd branch distribution)
• Abrupt in onset and termination

Diagnosis
• Clinical diagnosis
• MRI is routinely done to rule out other pathology (i.e. schwannoma, meningioma)

Treatment:
• Medication then surgery
• Carbamazepine >lamotrigine / phenytoin / gabapentin
• Surgical: microvascular decompression

Q-69

An 80 year old man has had an ischaemic stroke and was brought to the A&E department 6 hours after the onset of symptoms by his concerned daughter who found him lying on the floor at home. A CT brain has already been done and has confirmed the diagnosis. The patient has no drug allergies and no other comorbidities. What is the SINGLE most appropriate medication to be given to this patient upon discharge?

A. **Clopidogrel 75 mg daily**
B. **Statin**
C. **Combination of modified-release dipyridamole (200 mg) and low dose aspirin (75 mg) daily**
D. **Warfarin**
E. **Aspirin 300 mg daily for 3 months**

ANSWER:
Clopidogrel 75 mg daily

EXPLANATION:
Post management of Transient ischaemic attack (TIA), Stroke, and Myocardial infarction (MI)

TIA	Stroke	Heart Failure	MI
Clopidogrel (75 mg daily) is the preferred long-term antiplatelet. If clopidogrel is contraindicated or not tolerated, give a combination of modified release dipyridamole (200 mg twice daily and low dose aspirin. Ensure a **statin** has been offered as soon as possible after a TIA	**Aspirin 300 mg daily for 2 weeks** is given immediately after an ischaemic stroke is confirmed by brain imaging **Clopidogrel 75 mg daily** is then given long-term. If clopidogrel is contraindicated or not tolerated, give a combination of modified-release dipyridamole (200 mg twice daily) and low dose aspirin. Ensure a **statin** has been offered	Decrease mortality: 1. ACE inhibitor (Enalapril, Lisinopril, Ramipril) 2. Beta blocker (Bisoprolol, Carvedilol, Nebivolol) (initiate one at a time) Manage symptoms: **Furosemide** Add on if symptoms not controlled **Spironolactone or Digoxin**	All patients with MI on discharge • **Dual antiplatelet therapy: Aspirin + Clopidogrel** Note: Aspirin is continued life long Clopidogrel for 12 months • **Beta Blockers** Offer BB to people who present acutely with MI as soon as they are haemodynamically stable Continue a beta-blocker for at least 12 months after an MI in people without heart failure. Continue a beta-blocker indefinitely in people with HF • **ACEi** Offer ACEi to people who present acutely with MI as soon as they are haemodynamically stable If intolerant to ACEi – use ARB • **STATINS**

Q-70

An 8 year old boy developed a seizure first affecting his right arm. The seizure lasted for several minutes. He was unconscious throughout the seizure and has no recollection of the events that occurred leading to his seizure. A computed tomography scan of his head was organized after the seizure and has been reported as having a lesion on the left cerebral hemisphere. What is the SINGLE most likely reason for his seizure?

A. **Epilepsy**
B. **Space occupying lesion**
C. **Dementia**
D. **Huntington's chorea**
E. **Intracranial hypertension**

ANSWER:
Space occupying lesion

EXPLANATION:
This boy has just had a complex partial seizure. The term "partial" (or focal) seizure means that the electrical activity was limited to a part of one cerebral hemisphere. The term "complex" seizure means there was loss of awareness. The seizure is likely caused by a the lesion seen on the CT scan that is occupying space.

Less likely answers
Epilepsy - is incorrect as the termed epilepsy would require at least two unprovoked seizures occurring more than 24 hours apart for the definition to fall into place.

Dementia - is incorrect as dementia is a brain disorder causing memory loss and decline in cognition. It occurs in the elderly and does not cause seizures.

Huntington's chorea - is also incorrect. Firstly, symptoms of Huntington's disease become noticeable between ages of 35 and 44 years old. This boy is too young to develop symptoms of Huntington's disease. Secondly, Huntington's chorea is characterised by jerky, random and uncontrolled movements. During these movements, there is no loss of consciousness.

Raised intracranial pressure (intracranial hypertension) - is also not entirely wrong however it should be picked only if there was no option for space occupying lesion. Raised intracranial pressure does occur when there is a space occupying lesion. The symptoms of raised intracranial pressure include headaches, double vision, drowsy, irritable and the occasional seizures however because the term intracranial hypertension is such a broad term which also incorporates other aetiologies such as brain trauma, meningitis, aneurysm rupture and others, it would be better to pick a more specific term like space occupying lesion as the cause of the seizure in this question.

Q-71

A 5 year old girl is brought to the hospital by her mother with complaints of sudden right facial weakness, numbness and pain around her ear. She reports no other symptoms. On examination, her right eyebrow is unable to raise and the right hand corner of her mouth is drooping. What is the SINGLE most likely diagnosis?

A. **Subarachnoid haemorrhage**
B. **Bell's palsy**
C. **Stroke**
D. **Transient ischaemic attack**
E. **Subdural haemorrhage**

ANSWER:
Bell's palsy

EXPLANATION:
These are classic features of Bell's palsy. Bell's palsy can strike anyone at any age although less common below 15. Facial weakness presentations at a young age like thisstem usually warrant an urgent referral to paediatrics as Bell's palsy is less likely to be a cause and should be investigated for other potential reasons. This question however clearly points towards the diagnosisof Bell's palsy.

Q-72

A 33 year old man was working late in his office when he had a sudden onset of an excruciating headache localized to his right side and associated with right eye pain. He has had similar episodes 2 months ago. On examination, his right eye is swollen and red with lacrimation. What is the SINGLE most likely diagnosis?

A. Migraine with aura
B. Temporal arteritis
C. Conjunctivitis
D. Cluster headache
E. Tension headache

ANSWER:
Cluster headache

EXPLANATION:
For the exam, it is important to know how to differentiate the different types of headaches (e.g. intracerebral haemorrhage, migraine, cluster headache, tension headache)
Features of a cluster headache in the exam usually include a male undergoing some sort of activity with a rapid onset of a severe headache with eye involvement. The eye pain is usually periorbital. As the name implies, the frequency of these headaches occurs in "clusters". Look at the time frame in the stem: there is usually a clue to having frequent past episodes with/without a period of remission.

CLUSTER HEADACHE
Presentation:
- Excruciating headache: *(pain is often worse compared to tension-type headaches or even migraines)*
- Unilateral orbital, supraorbital, temporal
- Intermittent for days to years
- Pain description can vary (can be sharp, burning, or throbbing)
- Triggers include stress, alcohol, exercise
- Accompanied by redness, lacrimation, lid swelling, nasal stuffiness
- Intense pain around one eye (recurrent attacks 'always' affect same side) *(pain is so severe that patients are often restless or agitated)*

Management:
- Acute: sumatriptan subcutaneous + 100% oxygen
- Prophylaxis: verapamil

Q-73

A 64 year old housewife, who is a known case of uncontrolled hypertension, presents to Accident & Emergency with the complaints of dysphagia, right sided hemiparesis and ataxia. She also reports a loss of sensation on the right side of her face and a loss of sensation on her left leg. Which of the following is the SINGLE most likely area in the brain to be affected?

A. **Frontal lobe**
B. **Parietal lobe**
C. **Temporal lobe**
D. **Lateral medulla**
E. **Occipital lobe**

ANSWER:
Lateral medulla

EXPLANATION:
For PLAB 1, stroke questions come in various forms ranging from the anatomical locations of the lesion, investigations and management. Pay special attention to the anatomy of the lesions especially the vascular distribution and the functions of the different parts of the brain. In this case stem, the vascular system affected is the vertebrobasilar circulation. Therefore, symptoms will arise from one or all of the following areas: cerebellum, brainstem, and occipital lobes. From the options above, D and E are possibilities; however the question asks the single most likely answer, so it will be D. Option E will usually have some clue to a visual disturbance in the case stem, which this question does not.

Presentation:
This is an infarction of the brainstem and is part of the lateral medullary syndrome.

It will have some or all of the following depending on the severity of the vascular occlusion
- Vertigo, vomiting, dysphagia
- Nystagmus
- Ipsilateral ataxia, soft palate paralysis
- Ipsilateral sensory loss in the face, contralateral sensory loss in the trunk and limbs

Stroke general features:
- Usually sudden onset with possible further progression that takes place over hours
- May have underlying ischaemic heart disease, carotid bruits, atrial fibrillation

Diagnosis:
- CT brain with no contrast to rule out whether stroke is ischaemic or haemorrhagic (initial investigation)
- Diffusion-weighted MRI brain provides more sensitivity in acute setting

Treatment:
- ABC protocol
- Blood glucose – keep between 4-11mmol/L & IV fluid hydration
- If ischaemic stroke – give Aspirin 300mg PO
- If < 3 hours and ischaemic stroke, thrombolysis (alteplase) (NICE Guidelines say give within 4.5 hours)

Q-74

A 65 year old man has been recently diagnosed with atrial fibrillation. He has suffered from a transient ischaemic attack 3 years ago. His medical history is significant for diabetes mellitus type 2. What is the SINGLE best scoring method to assess for anticoagulation?

A. ABCD2
B. CHA2DS2-VASc
C. Well's score
D. CURB-65
E. NYHA score

ANSWER:
CHA2DS2-VASc

EXPLANATION:
Knowing the contents of the ABCD2 and the CHA2DS2-VASc scoring system is not necessary for the PLAB 1 exam but knowing when to apply each scoring system is vital.

ABCD2 score
The ABCD2 score is to assess risk of future stroke in the next 7 days in patients who have already suffered from a transient ischaemic attack (TIA). After a TIA, early recurrent stroke is common. Around 10-15% have a second TIA/CVA in the first week often within the first 48 hours. Assessment of this risk using the ABCD2 score is important for physicians to take action as indicated.

An example of use of a ABCD2 score is a patient presenting to A&E or a GP surgery with symptoms of a TIA. The ABCD2 score helps the physician decide on how to manage the patient. If the patient scored high on the ABCD2 score, the physician would refer the patient for specialist assessment within 48 hours of the onset of symptoms, give a statin and give an antiplatelet drug if the patient is not already taking any anticoagulation medication. This management would reduce the risk of developing stroke occurring in the next 7 days.

CHA2DS2-VASc score
The CHA2DS2-VASc score is to assess the risk of future stroke in patients who have atrial fibrillation. This score is then used to determine whether or not treatment is required with anticoagulation therapy.

Remember:
ABCD2 = Risk of future stroke following TIA in view of how soon to refer to a specialist
CHA2DS2-VASc = Risk of future stroke in patients with atrial fibrillation in view of necessity of anticoagulation therapy

Q-75

A 50 year old lady presents with a sudden onset of severe occipital headache associated with neck pain and vomiting. CT brain was inconclusive and a lumbar puncture was performed which revealed xanthochromia. What is the SINGLE best likely diagnosis?

A. **Bacterial meningitis**
B. **Viral meningitis**
C. **Migraine**
D. **Subarachnoid haemorrhage**
E. **Subdural haemorrhage**

ANSWER:
Subarachnoid haemorrhage

EXPLANATION:
Case stems for subarachnoid haemorrhage usually have middle-aged patients with sudden onset headaches that are severe in nature, which may be described as “the worst headache of their lives” or “thunderclap headache”. This is also important to note since there aree middle cerebral artery [MCA] occlusions (due to ischaemia) and MCA berry aneurysmks (causing subarachnoid haemorrhage). Ischaemic occlusions would usually have more stroke symptoms provided in the stem such as motor and sensory loss, rarely presenting with headache. Know how to differentiate each haemorrhage via their signs/symptoms., CT and lab results.

Q-76

A 52 year old woman diagnosed with breast cancer presents with urinary frequency and extreme thirst. She finds herself passing large amounts of urine even at night. Which part of the brain is the metastasis likely to have spread to?

A. **Brain stem**
B. **Pons**
C. **Medulla**
D. **Diencephalon**
E. **Cerebral cortex**

ANSWER:
Diencephalon

EXPLANATION:
The topic to be discussed here is Diabetes Insipidus which accounts for her urinary frequency. In this question, cranial diabetes insipidus is described. It is due to deficiency of circulating arginine vasopressin (antidiuretic hormone). The pathophysiology behind this is pituitary infiltration by metastases originating from breast. A little anatomy knowledge is needed in this question. Among all of the answers, diencephalon would fit as it gives rise to the posterior forebrain structures including the thalamus, hypothalamus, posterior portion of the pituitary gland, and pineal gland.

Q-77

A 45 year old man has back pain radiating down to his legs. He has motor weakness with knee extension and foot dorsiflexion. On examination, perineal sensory loss is noted. What is the SINGLE most appropriate action?

A. **Analgesia, rest and review in 6 weeks**
B. **Administer benzodiazepine**
C. **Encourage to keep active and referral to physiotherapy**
D. **Advise on correct sitting position and posture**
E. **Immediate referral to orthopaedic surgeon**

ANSWER:
Immediate referral to orthopaedic surgeon

EXPLANATION:
This is a classic example of cauda equina syndrome. It is a serious neurologic condition in which damage to the cauda equina causes loss of function of the nerve roots of the spinal canal below the termination (conus medullaris) of the spinal cord. Any lesion which compresses or disturbs the function of the cauda equina may disable the nerves although the most common is a central disc prolapse.

Spinal cord compression or cauda equina syndrome are neurological emergencies that require immediate referral and intervention.

The management of true cauda equina syndrome frequently involves surgical decompression.

Pain due to a herniated lumbosacral disc may settle within six weeks. If it does not, or there are red flag signs such as the possibility of cauda equina syndrome like in this case, referral to an orthopaedic surgeon or a neurosurgeon should be considered.

Red flags that suggest cauda equina syndrome include:
- Severe or progressive bilateral neurological deficit of the legs, such as major motor weakness with knee extension, ankle eversion, or foot dorsiflexion
- Recent-onset urinary retention and/or urinary incontinence (caused by loss of sensation when passing urine).
- Recent-onset faecal incontinence (due to loss of sensation of rectal fullness)
- Perianal or perineal sensory loss (saddle anaesthesia or paraesthesia)

Q-78

A 55 year old was admitted to the hospital for investigations of haemoptysis. Two days after admission he develops alternating state of consciousness, sweating, and tremors. His temperature is 37.3 C. He gives a history of drinking alcohol every day for the past year. What is the SINGLE most appropriate management?

A. Acamprosate
B. Chlordiazepoxide
C. Antibiotics
D. High potency vitamin B complex
E. Disulfiram

ANSWER:
Chlordiazepoxide

EXPLANATION:
These are features of acute alcohol withdrawal. Chlordiazepoxide would help reduce his symptoms.

Q-79

A 28 year old attends the GP surgery wanting advice on combined oral contraceptive pills. She has been taking combined hormonal contraception for the past year but has recently developed symptoms of migraines. She read online that combined hormonal contraception should not be used in migraine with aura sufferers. Which of the following is a characteristic of a migraine with aura?

A. **Motor symptoms begin after the start of the headache**
B. **Visual symptoms begin during the episode of the headache**
C. **Symptoms of aura last several hours**
D. **Headache either begins before the end of the aura or within an hour of the end**
E. **Visual symptoms are always bilateral**

ANSWER:
Headache either begins before the end of the aura or within an hour of the end

EXPLANATION:
The reason combined hormonal contraception is not used in patients with migraine with aura is that they have a 2-4 time added risk of cerebrovascular accident.

It is quite important to remember the differences between migraines with and without auras. Auras can be described as warning signs before the headache begins.

Aura characteristics:
- Occurs before the onset of headache
- Lasts 5 to 60 minutes
- Visual symptoms (homonymous hemianopia, fortified spectra, scotoma), unilateral paraesthesia or weakness, dysphasia
- Headache either begins before the end of the aura or wtihin an hour of the end

MIGRAINE WITH AURA, CONTRACEPTION AND UKMEC
When discussing contraception, it is always important to understand the basics of the UK Medical Eligibility Criteria for Contraceptive Use (UKMED). The UKMEC offers guidance to prescribers in regards to prescribing suitable contraception taking into account the risks and benefits of individual contraception. A UKMEC category of 1 means that this contraception is safe and can beused without restrictions whereas a UKMEC category of 4 represents an absolute contraindication due to unacceptable risk.

Migraine with aura is an absolute contraindication to usingthe combined oral contraceptive pill due to an increased risk of cerebrovascular accidents (UKMEC 4)

The levonorgestrel-releasing intrauterine device (Mirena ® IUD) is classed as UKMEC 2 in patients who suffer from migraine with aura.

At present, there is no evidence that the use of progestogen-only contraception is associated with an increased risk of ischaemic stroke however progestogen-only pill (POP), progestogen-only injectables such as depot medroxyprogesterone acetate (DMPA) and progestogen-only implant (IMP) are still classed as UKMEC 2 in patients who suffer from migraine with aura. This means that their advantages of use generally

outweigh the theoretical or proven risks.

The only completely safe mode of contraception (excluding barrier methods) is the copper intrauterine device which is classed as UKMEC 1.

Q-80

A 43 year old chronic alcoholic stopped drinking alcohol for the last 3 days. He is anxious, has tremors and is now having hallucinations. His heart rate is 106 beats/minute. What is the SINGLE most appropriate treatment?

- **A. Olanzapine**
- **B. Diazepam**
- **C. Acamprosate**
- **D. Disulfiram**
- **E. Thiamine**

ANSWER:
Diazepam

EXPLANATION:
Benzodiazepines are the recommended drugs for alcohol detoxification. They have a slower onset of action and therefore are less likely to lead to abuse. A reducing dose of chlordiazepoxide is commonly used. Diazepam is an alternative.

In this particular case, he has hallucinations which are a sign that he is having not just an acute alcohol withdrawal but moving on to delirium tremens.

Patients with marked agitation or hallucinations and those at risk of delirium tremens (characterised by delirium, hallucinations, course tremor, and disorientation) may be prescribed antipsychotic drugs, such as haloperidol or olanzapine, as adjunctive therapy to benzodiazepines. But note that antipsychotics should not be used alone because they do not treat alcohol withdrawal and may lower the seizure threshold.

Q-81

A 75 year old woman has been admitted from a nursing home with sudden onset of right hemiplegia and homonymous hemianopia. She is dysphasic. She remains conscious throughout and on examination, brisk reflexes and several beats of clonus are noted. What is the SINGLE most likely artery to be occluded?

- **A. Right middle cerebral artery**
- **B. Left middle cerebral artery**
- **C. Right posterior cerebral artery**
- **D. Right basilar artery**
- **E. Left basilar artery**

ANSWER:
Left middle cerebral artery

EXPLANATION:
This patient has an upper motor neuron lesion as signified by a pathological extensor plantar response and hyperreflexia.

Every option that was given could cause the symptoms of stroke. But it is important to know which is the most common artery to be occluded in stroke. This would be the middle cerebral arteries. Given that the symptoms are on the right, the occluded artery would be on the left (Remember, stroke causes contralateral hemiplegia)

Cerebral hemisphere infarcts presentation

- Sudden onset or a stepwise progression of symptoms and signs over hours (sometimes even days) is typical
  - Cerebral hemisphere infarcts (50%) may cause:
  - Contralateral hemiplegia which is initially flaccid (floppy limb, falls like a dead weight when lifted) and then becomes spastic
  - Contralateral sensory loss
  - Homonymous hemianopia
  - Dysphasia

Note: Middle cerebral artery (MCA) is the most common cerebral occlusion site.

Q-82

A 54 year old patient is seen at the clinic for muscle weakness. His muscle weakness initially started at the level of his legs but now it is affecting his arms too. On examination, he has loss of tendon reflexes and decreased muscle strength. What is the SINGLE most likely mechanism of this weakness?

A. Amyloid deposition in neurons
B. Vasculitis
C. Reduction in the number of nicotinic acetylcholine at the postsynaptic muscle membrane
D. Autoimmune degeneration of myelin sheets of peripheral neurons
E. Compression of spinal nerve

ANSWER:
Autoimmune degeneration of myelin sheets of peripheral neurons

EXPLANATION:
You should suspect Guillain-Barre syndrome in ascending symptoms of paresthesia in line with the recent gastroenteritis. The pathophysiology is complicated but you would need to remember that it is an acute inflammatory demyelinating neuropathy.

GUILLAIN-BARRÉ SYNDROME

Guillain-Barre syndrome Is a disorder causing demyelination characterised by weakness, paresthesia and hyporeflexia. Around two-thirds precedes an infection, usually respiratory or gastrointestinal tract. This association with preceding infection suggests that antibodies to the infectious organism also attack antigens in peripheral nerve tissue.

In the stem, there would usually be a history of gastrointestinal or respiratory infection from anywhere between a few days to 3 weeks prior to the onset of weakness.

Presentation:

• Weakness
  o Presents with an ascending pattern of progressive symmetrical weakness, starting in the lower extremities
  o Reaches a level of maximum severity two weeks after initial onset of symptoms

o Facial weakness, dysphasia or dysarthria
o In severe cases, muscle weakness may lead to respiratory failure.
• Pain
o Neuropathic pain, particularly in the legs
• Reflexes
o Reduced or absent
• Sensory
o Paresthesia and sensory loss, starting in the lower extremities

Q-83

A 45 year old man with terminal cancer who has recently completed his course of chemotherapy develops tingling and numbness of the fingertips of both arms. He describes a constant mild burning discomfort in his hands and feet. Occasionally, he experiences a sharp, shooting, and electric-shock like pain in his feet. What is the SINGLE most likely cause of his symptoms?

A. Bone metastasis to cervical vertebrae
B. Chemotherapy induced peripheral neuropathy
C. Hyponatraemia
D. Hypocalcaemia
E. Hypomagnesaemia

ANSWER:
Chemotherapy induced peripheral neuropathy

EXPLANATION:
Chemotherapy drugs such as vincristine are known for the side effects of peripheral neuropathy due to neurotoxicity. Patients with this side effect would present with peripheral paraesthesia which is seen as numbness or tingling. Chemotherapy induced peripheral neuropathy is typically characterized by a glove-and-stocking distribution in the hands and feet with sensory loss or hypersensitivity, and in some cases motor and autonomic dysfunction.

Q-84

A 52 year old lady has weak limbs when examined. She was found to have burn marks on fingertips. Her hands looked wasted and with diminished reflexes. She also has weak spastic legs and dissociated sensory loss. What is the SINGLE most likely diagnosis?

A. Multiple sclerosis
B. Syringomyelia
C. Motor neuron disease
D. Guillain-Barre syndrome
E. Friedrich's ataxia

ANSWER:
Syringomyelia

EXPLANATION:
If you were to see burn marks on finger tips in any given question, think of a loss of sensation of temperature and pain in the hands. This is commonly seen in syringomyelia and syringobulbia.

The wasted and weak hands with diminished reflexes and weak spastic legs with dissociated sensory loss are features suggestive of syringomyelia.

Syringomyelia and Syringobulbia
Syringomyelia is a rare condition in which there is fluid-filled tubular cyst (syrinx) within the central, usually cervical, spinal cord. The syrinx can elongate, enlarge and expand into the grey and white matter and, as it does so, it compresses the nervous tissue of the corticospinal and spinothalamic tracts and the anterior horn cells. This leads to various neurological symptoms and signs, including pain, paralysis, stiffness and weakness in the back, shoulders and extremities. Syringomyelia may also cause loss of extreme temperature sensation, particularly in the hands, and a cape-like loss of pain and temperature sensation along the back and arms.

Syringobulbia occurs when the syrinx extends into the brainstem. This may affect one or more cranial nerves, resulting in facial palsies. Sensory and motor nerve pathways may be affected by interruption and/or compression of nerves.

Note: Progression of symptoms and deterioration occur over many years for syringomyelia and syringobulbia

Symptoms of both Syringomyelia and Syringobulbia
- Damage to the spinal cord often leads to progressive weakness in the arms and legs, stiffness in the back, shoulders, arms, or legs, and chronic, severe pain. These can be present at presentation.
- Other symptoms may include headaches, a loss of the ability to feel extremes of hot or cold (especially in the hands), and loss of bladder and other functions.
- Pain and temperature sensation are lost due to spinothalamic tract damage.
- Classically, the sensation loss is experienced in a shawl-like distribution over the arms, shoulders and upper body.
- Dysaesthesia (pain experienced when the skin is touched) is common.
- Light touch, vibration and position senses in the feet are affected as the syrinx enlarges into the dorsal columns.
- Muscle wasting and weakness begins in the hands and then affects the forearms and shoulders.
- Tendon reflexes are lost.

Q-85

A 26year old female presents with bladder incontinence, clumsiness when walking, shooting lower back pain, and blurry vision, and sensory loss. These symptoms have occurred all at once or in different combinations approximately every few months and each event lasts 3-4 days. There is swelling of the optic disc on fundoscopy, inability to walk heel to toe, and weakness at the hip girdles. What is the SINGLE most appropriate diagnostic test?

A. CT head and spinal cord
B. MRI brain and spinal cord
C. Serum vitamin B12 levels
D. EMG
E. None of the above

ANSWER:
MRI brain and spinal cord

EXPLANATION:
This is a diagnosis of multiple sclerosis. The definitive diagnostic test would be MRI brain and spinal cord. This patient is presenting with upper motor neuron signs and optic neuritis.

Multiple Sclerosis
Presentation:
Variety of symptoms involving motor and sensory mainly of the brainstem and cerebellum. It may be easier to divide them into groups to remember.

- *1. Transverse myelitis:*
  - Weakness, sensory symptoms
  - Urinary urgency and retention
  - Flexor spasms
  - Spastic quadriparesis or paraparesis
- *2. Brainstem:*
  - Ataxia
  - Diplopia
  - Dysarthria
  - Facial numbness
  - Ophthalmoplegia
  - Gaze palsy
- *3. Cerebellum*
  - Ataxia
  - Dysarthria
  - Nystagmus
- PLAB 1 stem usually have some clue to optic neuritis. Optic neuritis is an acute, sometimes painful, reduction or loss of vision in one eye and is a relatively common presenting symptom of MS. Colour vision may be impaired
- Also depression is common

Pattern is usually: symptoms evolve over days, plateau, then resolves over days/weeks

Diagnosis:
- Mostly a clinical diagnosis
- MRI (definitive diagnostic test): demyelination and/or lesions disseminated in time and place
- Oligoclonal bands in CSF

Treatment:
- Acute: IV or oral methylprednisolone
- Interferon-beta or glatiramer acetate (first line)

Q-86

A 30 year old primigravid woman of 32 weeks gestation presents to clinic with left facial droop of 2 days duration. On examination, there is no rash. The nasolabial fold is flattened, there is a drooping of the left corner of her mouth when asked to smile, and eye closure is weaker on the left side. She is unable to puff her cheeks or wrinkle her forehead. What is the SINGLE most likely cause to these clinical findings?

A. **Ramsay-Hunt syndrome**
B. **Parotid gland tumour**
C. **Bell's palsy**
D. **Internal capsule stroke**
E. **Lyme disease**

ANSWER:
Bell's palsy

EXPLANATION:
Cranial nerve palsies for CN III, VI and VII are very commonly asked.

In addition to the clinical findings on examination, another exam clue pointing to this diagnosis is the "pregnancy in the third trimester". Bell's palsy is three times more common in pregnancy. Another scenario that may be given would be a patient who is diabetic.

Look closely at the age: If the examiners would want you to pick stroke, they would have given a much older patient and they would provide some findings of upper/lower limb deficit. There is no travel history or going to the jungle; therefore, option E is unlikely. Option A would have a prior infection in the case stem and would most likely present with a rash.

Bell's palsy is a diagnosis of exclusion. So be sure to exclude all other possibilities in practice before you label someone with Bell's palsy.

One special take home point is that if the patient is able to close their eyes and raise their eyebrow on the affected side, then it is NOT Bell's palsy, but an upper motor neuron lesion. Bell's palsy is a lower motor neuron facial nerve palsy.

Q-87

A 38 year old heroin addict was involved in a car crash and, as a result, is now paraplegic. He was agitated and cried every day during the first two weeks after accident while he was in the hospital. Upon questioning, he was unable to remember the accident at all and refused to talk about it. What is the SINGLE most likely diagnosis?

A. **Posttraumatic stress disorder**
B. **Severe depression**
C. **Bipolar disorder**
D. **Organic brain injury**
E. **Borderline personality**

ANSWER:
Organic brain injury

EXPLANATION:
The likely diagnosis here is organic brain damage as he is unable to remember the accident. One can easily exclude post traumatic stress disorder with that history as patients with PTSD are quite the opposite and would remember the experience and have flashbacks and nightmares about it.

It is normal to have an amount of sadness after a major accident which involves brain injury. This differs from severe depression, as symptoms of severe depression interferes with normal function. If the severity of sadness persisted and there was a degree of functional impairment and disability associated with low mood, then we would be able to say that this is severe depression.

Symptoms of an organic brain injury may include confusion, impairment of memory, agitation which can be seen in this stem.

Q-88

A 22 year old female presents with progressive difficulty in walking due to lower back pain. There is tingling and numbness in her hands that has radiated towards her elbows. On examinatioin, cranial nerves are intact. There is no sensation of vibration or pin prick in her upper limbs to elbows and from lower limbs to hips. There are absent reflexes and mute plantars. Blood pressure is 124/85 mmHg and heart rate is 68 beats/minute. The patient had an episode of food poisoning two months ago. What is the SINGLE most likely diagnosis?

A. **Multiple sclerosis**
B. **Guillain-Barre syndrome**
C. **Myasthenia gravis**
D. **Diabetic neuropathy**
E. **Diabetic nephropathy**
F. **Infective neuropathy**

ANSWER:
Guillain-Barre syndrome

EXPLANATION:
Key features for case stem: young female with ascending polyneuropathy usually after a trigger (i.e. infection). There are absent reflexes therefore multiple sclerosis is ruled out since it involves upper motor neurons. Myasthenia gravis usually would have more emphasis of fatigue especially in the proximal muscles and cranial nerves would be affected. There is no clue in the stem that the patient is diabetic and even he is, the onset is acute while option D would require a more gradual progressive process. While the patient did have an infection, there was no history of travel and for option E to occur it would most likely be a diagnosis of Lyme disease.

Q-89

A 55 year olf chronic alcoholic who lives alone, brought in the emergency department having been found confused at home after a fall. He complains of a headache and gradually worsening confusion. What is the SINGLE most likely diagnosis?

ANSWER:
Subdural haematoma

EXPLANATION:
A chronic alcoholic with a history of fall with progressive confusion over the last couple of days points towards the diagnosis of chronic subdural haemorrhage.

Subdural haematoma may be acute or chronic. In the chronic subdural haematoma, symptoms may not be apparent for several days or weeks. Symptoms of subdural

haematomas are: fluctuating level of consciousness, ± insidious physical or intellectual slowing, sleepiness, headache, personality change and unsteadiness.

Chronic subdural haematoma occurs in the very old or in severe alcoholics. A shrunken brain is rattled around the head by minor trauma, tearing venous sinuses. Over several days or weeks, mental function deteriorates as haematoma forms. CT scan is diagnostic, and surgical evacuation provides dramatic cure.

Remember in PLAB, chronic subdural haematoma usually presents as an elderly, on anticoagulation or an alcoholic who may have history of fall. Slow onset of symptoms compared to epidural haematoma.

Q-90

An 18 year old female presents to the Emergency Department with a generalized tonic-clonic seizure. Her seizure had lasted 20 minutes according to eyewitness accounts. Her SpO2 is currently 97% and she has already been given 2 doses of rectal diazepam but the seizures have not stopped. What is the SINGLE most appropriate management?

A. **IV lorazepam**
B. **IV phenobarbital**
C. **IV phenytoin**
D. **Refer to ICU**
E. **Immediate intubation**

ANSWER:
IV phenytoin

EXPLANATION:
The diagnosis here is status epilepticus. The patient continues to have a seizure despite 2 doses of diazepam. Therefore, the next appropriate management would be phenytoin infusion. If the patient was not given two doses of rectal diazepam in the community, then we would administer IV lorazepam as first-line treatment in hospital. However, because two doses of diazepam was given (most likely in the community), we would move to second-line which would be IV phenytoin. Preference goes to IV phenytoin before using IV phenobarbital.

If this also fails then the next step would be referral to ICU and then consider intubation. For PLAB 1, know the initial management of all acute neurological emergencies.

Note that buccal midazolam is usually first-line treatment in children, young people and adults with prolonged or repeated seizures in the community. However, if buccal midazolam is unavailable, rectal diazepam is used. Hence, the probable reason why rectal diazepam was used in this stem.

Note that the management for ongoing generalised tonic–clonic seizures (convulsive status epilepticus) in hospital is different from the community. Below we will only discuss management in hospital.

Q-91

A 34 year old man is hit by a car. He loses consciousness but is found to be fine by the paramedics. When awaiting doctor's review in the Emergency Department he suddenly becomes unconscious. What is the SINGLE most likely diagnosis?

A. **Subarachnoid haemorrhage**
B. **Subdural haematoma**
C. **Intracerebral haemorrhage**
D. **Extradural (epidural) haematoma**
E. **Whiplash**

ANSWER:
Extradural (epidural) haematoma

EXPLANATION:
This patient has lucid intervals. It is important to note that acute subdural haematoma also has lucid intervals. And thus when a patient presents with lucid intervals it can be both an extradural haematoma or an acute subdural haematoma. In general, for extradural haematoma the trauma is usually trivial and patient goes back to doing what he was doing before before falling unconscious again. Whereas acute subdural haematoma is usually a sicker patient who barely awakes during the lucid intervals. But again in clinical practice we do not lie on clinical features to differentiate epidural haematoma from acute subdural haematoma because both of them will get a CT scan

Also note the difference between acute subdural haematoma and chronic subdural haematoma. In chronic subdural haematoma, it is usually an elderly, on anticoag or an alcoholic. Symptoms for chronic subdural haematoma are slow onset compared to epidural haematoma.

As this question did not specify whether subdural haematoma is acute or chronic in nature, it would be more correct to choose extradural (epidural) haematoma as the answer.

Extradural (epidural) haematoma
Often associated with skull fracture and middle meningeal artery injury. Involves arterial blood.

Features
- Features of raised intracranial pressure
- Patients may exhibit a lucid interval (note the lucid intervals as it is very commonly seen in PLAB)

Management
Surgical procedure: burr hole over pterion (to ensure that further haemorrhage escapes instead of expanding the clot further) followed by craniotomy and evacuation of the haematoma.

Q-92

A 31 year old man, known case of alcohol abuse, is brought into Emergency by his friend from a nightclub. The friend saw the patient suddenly collapse on the dance floor where his body went stiff then there was twitching of his legs followed by involuntary voiding. When he gained consciousness, he was drowsy and confused for several minutes before full recovery. What is the SINGLE most likely diagnosis?

A. **Complex partial seizure**
B. **Generalised myoclonic seizure**
C. **Generalised tonic seizure**
D. **Generalised tonic-clonic seizure**

ANSWER:
Generalised tonic-clonic seizure

EXPLANATION:
Know the difference between generalised and partial seizures in PLAB 1. Generalised seizures usually have patients with a loss of consciousness (i.e. "collapsed") while partial seizures may or may not have loss of consciousness depending if they are simple or complex. When both halves of the body (right and left) are involved, it is classified as generalised.

In this case, this patient's seizure activity is due to alcohol abuse and therefore should follow guidelines on management related to seizures secondary to alcoholism. Stiffness is the tonic phase followed by twitching which is the clonic phase.

Myoclonic seizures are irregular jerks of the trunk or limbs which occur while the patient is conscious and lasts for less than a second. *Most of us have this experience when we are falling asleep and suddenly jerk as if we fell down from a building. That is considered a normal phenomenon. Myoclonic seizures in an awake state are not normal and require specialist assessment.*

Q-93

A 33 year old woman has pain and a funny sensation in her legs especially at night when she sleeps. Her symptoms have been ongoing for the past 3 months. She describes the funny sensations as having insects crawling up her legs which wake her up at night. She finds relief almost immediately when she moves her legs. She has no previous psychiatry history of note. Her blood results show:

Haemoglobin 140 g/L
Ferritin 250 ng/ml

Which of the following medications is effective in treating this condition?

A. **Dopamine agonist**
B. **Nifedipine**
C. **Haloperidol**
D. **Vitamin B12**
E. **Iron supplementation**

ANSWER:
Dopamine agonist

EXPLANATION:
Restless legs (previously called Willis-Ekbom syndrome) is common and can be very disturbing.

The typical features include the urge to move (usually legs). It is often accomapnied by the abnormal sensation of aching or tingling and in some, pain is a feature. The symptoms tend to appear in the evening. They are also more commonly seen in pregnant women and often worsens as pregnancy progresses. The symptoms are relieved by moving.

Useful advice includes avoiding alcohol, smoking and caffeine. Exercise and good sleep hygiene have been shown to benefit symptoms.

It is common to measure serum ferritin levels in people suffering from restless legs syndrome as resless legs syndrome is associated with iron deficiency hence the reason the values were given in this stem. If ferritin is low, start iron supplementation, despite normal haemoglobin levels. Since in this question ferritin levels are within normal limits, she would not require iron supplementation.

Only around 20% of sufferers would actually need a drug treatment.

Common medication used for treatment of restless leg syndrome include:
- Dopamine agonist
- Gabapentin
- Pregabalin

Q-94

A 50 year old woman presents follwing a fall. She reports pain and weakness in her hands for several months, swallowing difficulties, and has bilateral wasting of the small muscles of her hands. Her back and shoulders feel stiff. The reflexes in her upper limbs are absent. Both legs show increased tone and hyperreflexia. Pain and temperature sensation are impaired in the upper limbs. She is also noted to have a facial palsy. What is the SINGLE most likely diagnosis?

A. Multiple sclerosis
B. Motor neuron disease
C. Syringobulbia
D. Syringomyelia
E. Myasthenia gravis

ANSWER:
Syringobulbia

EXPLANATION:
There are two close answers here: syringobulbia and syringomyelia

Syringomyelia does not have any cranial nerve involvement but syringobulbia does and thus causing the facial palsy in the above question.

Q-95

A 53 year old chronic alcoholic was brought to the emergency department with an alternating state of consciousness, nausea and vomiting. He has unsteady, uncoordinated walking and complains of double vision. On examination of his face, his eyelids seem to be drooping and nystagmus is seen. He denies having taken alcohol in the last 12 hours. What is the SINGLE most appropriate management?

- **A. Acamprosate**
- **B. Chlordiazepoxide**
- **C. Diazepam**
- **D. High potency vitamin B complex**
- **E. Disulfiram**

ANSWER:
High potency vitamin B complex

EXPLANATION:
This man is suffering from Wernicke's encephalopathy.

Eye-movement abnormalities seen in Wernicke's encephalopathy include gaze-evoked nystagmus, spontaneous upbeat nystagmus, and horizontal or vertical ophthalmoplegia.

Wernicke's encephalopathy is a neuropsychiatric disorder caused by thiamine deficiency which is most commonly seen in alcoholics. A classic triad of confusion, ophthalmoplegia and ataxia may occur.

Treatment is with urgent replacement of thiamine

If not treated Korsakoff's syndrome may develop as well. This is termed Wernicke-Korsakoff syndrome and is characterised by the addition of antero- and retrograde amnesia and confabulation in addition to the above classic triad.

Q-96

A 31 year old woman, no known cae of medical illnesses, presents to clinic with numbness and tingling of her hands and fingers followed by a severe throbbing headache localized to her left side. At home she tried to relieve her headache with cold packs, paracetamol, and ibuprofen but there was no relief. She has had similar episodes in the past. Currently, she is nauseated. On examination, she required the lights to be dimmed. What is the SINGLE most appropriate next step pharmacological management?

- **A. Perfalgan IV**
- **B. Ketoprofen oral**
- **C. Sumatriptan oral**
- **D. Gabapentin oral**
- **E. Topiramate oral**

ANSWER:
Sumatriptan oral

EXPLANATION:
This is a typical case stem for migraine in PLAB 1. Patient will present with or without aura (sensory or motor) followed by the headache itself. To differentiate from more

serious headaches (i.e. intracranial haemorrhages) in PLAB 1, the clues usually would be “throbbing headache”, unilateral, and/or photophobia. Note that topiramate is teratogenic/cause embryopathy and a preventative measure for migraine. Also, pay attention to what PLAB 1 asks: If the woman is on COCP and has migraine with aura, advise cessation of COCP as it increases risk of ischemic stroke.

Q-97

A 7 year old child is brought to the hospital by his teacher. The child was playing with other children and suddenly fell down and hit the table and went unconscious for a few seconds before returning to his normal self. On probing further, the diagnosis of absence seizure was made. What is the SINGLE most likely reason that could have led to this diagnosis?

A. **The child had not eaten since morning**
B. **The child suddenly stared blankly into space and there was up-rolling of eyes**
C. **The child started moving his fingers uncontrollably before he fell**
D. **The child’s body becamerigid and then started to jerk**
E. **The child has a fever and feels unwell**

ANSWER:
The child suddenly stared blankly into space and there was up-rolling of eyes

EXPLANATION:
In PLAB 1 stems, absence seizures would usually be a child (<10 years) with either the parent or teacher noticing that the patient is “daydreaming” often and when they resume their studies they are not able to perform well. In this scenario however, the diagnosis was already given but they want you to know what is the history that could give you the diagnosis. Staring blankly into space and upturning of eyes for a few seconds and resuming activity almost immediately is indicative of absence seizures.

Q-98

A 31 year old man with no past medical history complains of severe headache since 2 hours ago during work. The headache is mainly localized to the left side and is associated with photophobia. A similar episode had occurred a few months ago which also involved his left side. It had lasted for several minutes for several times a day for a period of 2 weeks and resolved spontaneously. During this examination, he is unable to sit still with obvious agitation and anxiety. What is the SINGLE most likely diagnosis?

A. **Subarachnoid haemorrhage**
B. **Epidural haemorrhage**
C. **Tension headache**
D. **Cluster headache**
E. **Migraine**

ANSWER:
Cluster headache

EXPLANATION:
For PLAB 1, make sure you can differentiate the different types of headaches (tension, cluster, migraine). Cluster headache case stems usually have a young male with a

headache localized to one side along with some autonomic features. Also, there should be a past history of episodes over a couple of weeks. Another clue is people with cluster headaches usually move around while in migraines they have a tendency to be lying down in a dark room.

Q-99

A previously healthy 20 year old woman presents to the Emergency Department with the complaint of "falling out". She was with her friends at a restaurant when she felt faint and, according to friends, lost consciousnes for about a minute. There was no seizure activity noted, but the friends did notice her arms twitching irregularly. She is now acting normally. She denies chest pain or palpitation, and her electrocardiogram is normal. What is the SINGLE most likely diagnosis?

A. **Hypoglycaemia**
B. **Vertigo**
C. **Prolonged QT syndrome**
D. **Vasovagal syncope**
E. **Paroxysmal supraventricular tachycardia**

ANSWER:
Vasovagal syncope

EXPLANATION:
Have a basic idea of the major causes of syncope for PLAB 1. The most common amongst young women would be vasovagal syncope likely due to hypotension and stimulated by one of the following triggers: pain, fear, excitement, and standing for a prolonged period.

Vasovagal syncope
Presentation:
• Young adult more common in women
• Stimulated by either emotional stress or orthostatic stress
• Sweating, pallor, nausea

Diagnosis:
• Clinical history under recommended diagnostic criteria (ESC guidelines)
• ECG to rule out other pathology

Treatment:
• Reassurance and counseling of avoidance of triggers
• Educate how to recognize prodromal symptoms and perform manoeuvres to stop the syncope
• Tilt table training

Q-100

A young man who has just moved to new accommodation presents with severe lower back pain lasting for 2 weeks. It is worse at the end of the day. His gait is normal. There are no red flag symptoms or signs. He is otherwise well. What advice would you give him?

A. **Increase mobility and take analgesia**
B. **Bed rest**
C. **Manipulation**
D. **Acupuncture**
E. **Paracetamol alone**

ANSWER:
Increase mobility and take analgesia

EXPLANATION:
This man is suffering from mechanical lower back pain. He should continue to mobilise and take regular analgesia (not just when required). Of note, he may have been doing some heavy lifting while moving to his new accommodation which has exacerbated the condition.
He does not have any red flags.

Red flags for lower back pain are:
- Age over 50 years or under 18 years old
- Unexplained weight loss > 10 kg within 6 months
- Night pain or pain at rest
- Pain persists for more than 6 weeks
- Failure to improve with therapy
- History of cancer
- Urinary incontinence or retention
- Faecal incontinence
- Saddle anaesthesia
- Progressive neurological deficit
- Vertebral tenderness

Bed rest is not recommended. The current guidance is to continue mobilising and consider an exercise programme.

Spinal manipulation therapies can be offered as part of a treatment package including exercise.

NICE guidelines on lower back pain (2016) do not recommend acupuncture for lower back pain.

Paracetamol alone has not been shown to be effective for the treatment of lower back pain.

Q-101

A 40 year old woman with a history of epilepsy presents to the clinic with multiple fleshy nodules and several light brown, round macules with a smooth border on her back, arms and legs. There are also freckles under her arms. What is the SINGLE most likely diagnosis?

A. **Neurofibromatosis type I**
B. **Neurofibromatosis type II**
C. **Tuberous sclerosis**
D. **Hereditary haemorrhagic telangiectasia**
E. **Sturge-Weber syndrome**

ANSWER:
Neurofibromatosis type I

EXPLANATION:
While this is more of dermatology/connective tissue topic more than a neurology topic, neurofibromatosis type I (NF1) does have present with neurological deficits. Know how to differentiate between type I and type II as well as the basic management.

Neurofibromatosis type I
Presentation:
• Café au lait spots, axillary freckling and neurofibromas
• Lisch nodules (hamartomas on the iris)
• Optic gliomas
• Scoliosis, bone dysplasias
• Epilepsy / seizures
• Cognitive impairment

Diagnosis:
• The National Institutes of Health Consensus Development Conference diagnostic criteria

Treatment:
• Conservative
• Routine monitoring and counselling
• Neurofibromas - if irritation, removal by laser or surgical
• Malignant peripheral nerve sheath tumors - radiation and surgical excision

Q-102

A 49 year old patient has Parkinson's disease. What is the SINGLE most useful medication in the management of his tremor and dystonia?

A. Apomorphine
B. Cabergoline
C. Selegeline
D. Amantadine
E. Benzhexol

ANSWER:
Benzhexol

EXPLANATION:
Benzhexol (Trihexyphenidyl) is an anticholinergic agent and it is the drug of choice to treat parkinson's disease induced tremor. Anticholinergic agents have a limited role and should only be prescribed in young patients with severe tremor and dystonia. Orphenadrine is also another anticholinergic agent that is commonly used.

Q-103

A 66 year old female patient presents to Accident & Emergency with a 12 hour history of a severe headache with associated nausea and vomiting. She has no other complaints other than the headache which she describes as feeling like she was "kicked in the head". She claims that the headache is felt worse at the back of her head. Morphine and metoclopramide has been given for the pain and a CT scan of the head was done which was reported as no acute abnormalities seen.

What is the SINGLE most appropriate next action in this patient's management?

A. **Admit and observe for the next 48 hours**
B. **Magnetic resonance imaging (MRI) of head**
C. **Lumbar puncture**
D. **Repeat computed tomography scan**
E. **Discharge with analgesics**

ANSWER:
Lumbar puncture

EXPLANATION:
We should be suspecting subarachnoid haemorrhage in these cohort of patients who present this way.

It is important to note that a diagnosis of subarachnoid haemorrhage cannot be made on clinical grounds alone. The following are investigative steps to take if you suspect someone has had a subarachnoid haemorrhage.

1. CT scan: CT scanning without contrast is the first line in investigation
2. Lumbar puncture: If the CT scan is negative but the history is suggestive, a lumbar puncture should be undertaken
3. MRI: can be more sensitive than CT, but only after several days have passed

After a subarachnoid haemorrhage is confirmed, its origin needs to be determined. The choice between cerebral angiography and CT angiography to identify aneurysms.

Q-104

A 45 year old man has tremors in both his hands. The tremors are absent at rest but present when arms are held outstretched and persist on movement. Movements such as writing are affected by his tremor. The tremor is seen to be worse when he is tired or stressed. On examination, the tremor continues to be present even when patient is distracted. What is the SINGLE most likely diagnosis?

A. **Parkinsonian tremor**
B. **Essential tremor**
C. **Cerebellar disease**
D. **Psychogenic tremor**
E. **Stroke**

ANSWER:
Essential tremor

EXPLANATION:
Know the difference between psychogenic tremors and essential tremors. The given stem are of clinical features of an essential tremor. In psychogenic tremors, there is often an abrupt onset, spontaneous remission, and the characteristic of the tremor changes when the patient is distracted.

Parkinsonian tremors usually would have the classical sign of 'pill rolling' in combination with rigidity and bradykinesia which is absent in this stem.

Cerebellar disease could present with intention tremors which is not seen in this stem. Intentional tremors occur during voluntary active movements of an upper body. The tremor would worsen as goal-directed movement approaches its intended target. The stem would usually include overshooting or undershooting their target, a condition known as dysmetria. It is a form of ataxia. Example, a patient would find difficulty due to his tremor when asked to touch his nose and then the examiner's fingers.

Essential tremor symptoms
• Distal symmetrical postural tremor of the upper limbs
• Initially transient. May progress to become persistent.
• Amplitude of tremor may depend on physiological or emotional state
• May be seen to improve following alcohol ingestion
• Not seen at rest

Management
• Propranolol is first line

Q-105

A 45 year old man presents to the clinic for his routine diabetic check-up. Upon examination, the patient has a normal tone, 5/5 power, normal plantar reflexes and normal proprioception. There is a deficit in fine touch sensation on the medial side of the right lower leg. Which of the following is the SINGLE most likely dermatome to be affected?

A. L1
B. L2
C. L3
D. L4
E. L5

ANSWER:
L4

EXPLANATION:
These questions do sometimes appear on the exam and therefore would be useful to know. Usually, it would be the major dermatomes of the upper and lower limbs

In the exam, questions may appear with a diabetic neuropathy stem or a trauma with sensory loss. Alternatively, it may also appear as just a straightforward statement asking for the dermatome of a specific part of the body with no case stem.

Q-106

A 43 year old woman presented with blurred vision and intermittent clumsiness for 3 months. Reflexes are brisk in her arm and optic disc is pale. What is the SINGLE most appropriate test to confirm diagnosis?

A. CSF analysis
B. CT
C. MRI
D. EEG
E. EMG

ANSWER:
MRI

EXPLANATION:
She has features suggestive of multiple sclerosis. Investigation of choice is an MRI scan.

Multiple Sclerosis
Presentation:
Variety of symptoms involving motor and sensory mainly of the brainstem and cerebellum. It may be easier to divide them into groups to remember.
- *1. Transverse myelitis:*
    - o Weakness, sensory symptoms
    - o Urinary urgency and retention
    - o Flexor spasms
    - o Spastic quadriparesis or paraparesis
- *2. Brainstem:*
    - o Ataxia
    - o Diplopia
    - o Dysarthria
    - o Facial numbness
    - o Ophthalmoplegia
    - o Gaze palsy
- *3. Cerebellum*
    - - Ataxia
    - - Dysarthria
    - - Nystagmus

• PLAB 1 stem usually have some clue to optic neuritis. Optic neuritis is an acute, sometimes painful, reduction or loss of vision in one eye and is a relatively common presenting symptom of MS. Colour vision may be impaired
• Also depression is common

Pattern is usually: symptoms evolve over days, plateau, then resolves over days/weeks

Diagnosis:
• Mostly a clinical diagnosis
• MRI (definitive diagnostic test): demyelination and/or lesions disseminated in time and place
• Oligoclonal bands in CSF

Treatment:
• Acute: IV or oral methylprednisolone
• Interferon-beta or glatiramer acetate (first line)

Q-107

A 56 year old lady has developed severe right sided headache which worsens whenever she goes under the bright light. This has been occurring for the last 3 days. She feels nauseated, but has not vomited. She does not take any medication and has no relevant medical history. What is the SINGLE most likely diagnosis?

A. **Subarachnoid haemorrhage**
B. **Chronic subdural haemorrhage**
C. **Intracranial neoplasm**
D. **Cluster headache**
E. **Migraine**

ANSWER:
Migraine

EXPLANATION:
She is suffering from Migraines. The hints provided here are that it is a unilateral headache associated with photophobia and nausea.

The other options given here are much less likely
Subarachnoid haemorrhage → Usually presents with the worst headache ever. What we call a "thunderclap headache"

Chronic Subdural haematoma → PLAB questions usually gives a history of an elderly, on anticoagulation or an alcoholic.

Intracranial neoplasm → Possible but less likely compared to migraine. The history of headaches would usually be longer. It is a space-occupying lesion, so one can expect a raised intracranial pressure (ICP). Headache, which is typically worse in the mornings, nausea and vomiting, seizures, and papilloedema

Cluster headache → usually presents with intense pain around one eye accompanied by redness, lacrimation, lid swelling and also nasal stuffiness

Q-108

A 55 year old man presents to clinic for gradual weakness of his arms bilaterally over the past year. He is now unable to lift heavy loads above his head and has difficulty breathing while going up the stairs. In the past month, he has noticed hoarseness and difficulty in swallowing liquids. On examination, there was muscle atrophy and weakness in the trunk, neck and both proximal upper limbs for lower motor signs. Deep tendon reflexes in the upper and lower limbs were positive for upper motor signs with atrophy of the tongue. Hoffman's sign was positive and autoimmune panel is normal. What is the SINGLE most likely diagnosis?

A. **Myasthenia gravis**
B. **Guillain-Barre syndrome**
C. **Multiple sclerosis**
D. **Amyotrophic lateral sclerosis**
E. **Polymyositis**

ANSWER:
Amyotrophic lateral sclerosis

EXPLANATION:
Amyotrophic lateral sclerosis (ALS) is the most common form of motor neuron disease in addition to multiple sclerosis (MS). Know the distinction between both for PLAB 1 as

they will commonly appear as either a question or option. MS usually would present in episodes intermittently and affect different anatomic locations. Myasthenia gravis would present with weakness and fatigue along with a positive autoimmune panel. Guillain-Barre syndrome would usually give a clue to a prior infection. Polymyositis would affect lower limbs first with fatigue.

Amyotrophic lateral sclerosis
Presentation:
• Progressive weakness of bulbar, limb, thoracic and abdominal muscles
• Oculomotor, sphincter, cognitive functions are usually spared
• Late stages - swallowing difficulty and hoarseness

Diagnosis:
• Clinical diagnosis via diagnostic criteria by EFNS guidelines

Treatment:
• Multidisciplinary care
• Neuroprotective medication: riluzole
• Medications to treat respiratory symptoms, drooling, insomnia, fatigue, and psychological symptoms
• Genetic testing and counseling for family

Q-109

A 44 year old man with a history of chronic alcohol abuse attends A&E. He is unkempt, drowsy, walks with an ataxic gait and has poor memory. It is believed he has not eaten in forty eight hours. A decision to commence chlordiazepoxide and IV Pabrinex is made. Which vitamin, present in Pabrinex, can prevent the progression of his symptoms?

A. Vitamin B1
B. Vitamin B6
C. Vitamin B12
D. Vitamin C
E. Vitamin D

ANSWER:
Vitamin B1

EXPLANATION:
This man is suffering from Wernicke's encephalopathy. Vitamin B1, also called thiamine, is present in Pabrinex and it is needed to treat Wernicke's encephalopathy.

Wernicke's encephalopathy is a neuropsychiatric disorder caused by thiamine deficiency which is most commonly seen in alcoholics. A classic triad of confusion, ophthalmoplegia and ataxia may occur.

Treatment is with urgent replacement of thiamine

If not treated Korsakoff's syndrome may develop as well. This is termed Wernicke-Korsakoff syndrome and is characterised by the addition of antero- and retrograde amnesia and confabulation in addition to the above classic triad.

Q-110

A 26 year old woman is seen in neurology clinic with a history of 3 episodes of convulsions. Her husband has observed all three episodes. They last around 15 minutes and begin by her losing awareness and becoming unresponsive. This is followed by strange and repeated movements of her arms, legs and pelvis. During the episodes, her eyes are closed. There was no droolingof saliva, and no incontinence in any of the episodes. What is the SINGLE most appropriate investigation?

A. **Electroencephalogram (EEG)**
B. **Video electroencephalogram (EEG)**
C. **Serum electrolytes**
D. **Blood glucose test**
E. **Magnetic Resonance Imaging of the head**

ANSWER:
Video electroencephalogram (EEG)

EXPLANATION:
It is often difficult to tell the difference between an epileptic seizure and a non-epileptic attack disorder (NEAD) in clinical practice. Non-epileptic attacks may look like epileptic seizures but they are not caused by an electrical disturbance in the brain. From the history given, this sounds more like a non-epileptc attack disorder. The key phrases here that point towards the diagnosis of NEAD is the pelvic movements, episodes wehre eyes are closed, no droolingof saliva which means the mouth is closed during the attacks and lastly no incontinence.

Video electroencephalogram (EEG) is an investigation especially useful to diagnose NEAD or if the diagnosis was uncertain. This involves hooking up EEG equipment and also having a continuous video of the patient to capture the activity of the brain and physical movements and sounds during seizures.

Q-111

A 60 year old man presents to Emergency with dizziness. The onset was sudden and described as “the room spinning around”. He also is bumping into things on his right side. On examination, his blood pressure is 159/91 mmHg, heart rate is 72 bpm. He is positive for nystagmus and dysdiadochokinesia. CT brain confirms ischaemic stroke. Where is the SINGLE most likely location of his stroke?

A. **Temporal lobe**
B. **Left parietal lobe**
C. **Right parietal lobe**
D. **Anterior circulation**
E. **Posterior circulation**

ANSWER:
Posterior circulation

EXPLANATION:
Know that lesions to the posterior circulation would affect functions of the brainstem, cerebellum, and occipital lobe. This would be consistent with the vertigo, right hemianopia, nystagmus and ataxia seen in this patient.

Stroke in the posterior circulation
Presentation:
- Dizziness/vertigo, right hemianopia, nystagmus, ataxia, dysdiadochokinesia
- Usually sudden onset with possible further progression that takes place over hours
- May have underlying ischaemic heart disease, hypertension, carotid bruits, atrial fibrillation

Diagnosis:
- Non-contrast CT brain - initial investigation
- MRI brain - more sensitivity

Treatment:
- Ischaemic stroke - thrombolysis (alteplase) → aspirin
- Maintain oxygen saturation, glucose control, blood pressure control
- Maintain nutrition and hydration
- Early mobilization

Q-112

A 65 year old lady presents to the Accident and Emergency department with a 6 hour history of facial droop and weakness on her left side of her body. A CT scan was performed and ruled out a haemorrhagic stroke. She is allergic to Penicillin and takes Simvastatin and Amlodipine regularly. What is the SINGLE most appropriate medication to be prescribed long term for this patient?

A. Alteplase
B. Clopidogrel
C. Dipyridamole
D. Labetalol
E. Aspirin

ANSWER:
Clopidogrel

EXPLANATION:
The patient had an ischaemic stroke and the standard treatment would be Aspirin for 14 days, and then Clopidogrel long term. The question is asking for the long term treatment and therefore this would be Clopidogrel.

Alteplase - for patients who are appropriate for thrombolysis therapy who presents within 4.5 hours of onset of stroke symptoms, and intracranial haemorrhage has been excluded by imaging techniques

Dipyridamole - Modified-release dipyridamole alone is recommended as an option to prevent occlusive vascular events for people who have had an ischaemic stroke only if aspirin and clopidogrel are contraindicated or not tolerated.

Aspirin is started as a standard therapy for confirmed ischaemic stroke and is continued until 2 weeks, at which time definitive long-term antithrombotic treatment should be initiated. Aspirin is only recommended long term for patients intolerant to clopidogrel.

Q-113

A 72 year old man becomes confused over a period of 2 weeks. He used to be active and goes for long walks. Now he stares at the wall, barely talks to anyone, and sleeps majority of the day. His daughter recalls that he felldown the stairs about a week before the mental changes began. What is the SINGLE most likely diagnosis?

A. **Chronic Subdural haemorrhage**
B. **Epidural haematoma**
C. **Alzheimer's**
D. **Vascular dementia**
E. **Pick's dementia**

ANSWER:
Chronic subdural haemorrhage

EXPLANATION:
An elderly man with a history of fall and on anticoagulation with progressive confusion over the last couple of days points towards the diagnosis of chronic subdural haemorrhage.

Chronic subdural haematoma occurs in the very old or in severe alcoholics. A shrunken brain is rattled around the head by minor trauma, tearing venous sinuses. Over several days or weeks, mental function deteriorates as haematoma forms. CT scan is diagnostic, and surgical evacuation provides dramatic cure.

Remember in PLAB, Chronic subdural haematoma usually presents as an elderly, on anticoag or an alcoholic who may have history of fall. Slow onset of symptoms compared to epidural haematoma.

Q-114

An 82 year old lady had an ischaemic stroke that was confirmed with brain imaging. She has no drug allergies and no other combordities. She was put on aspirin 300 mg daily for two weeks. What is the SINGLE most appropriate medication to be given after the course of Aspirin is completed?

A. **Clopidogrel**
B. **Ticagrelor**
C. **Combination of modified-release dipyridamole and low dose aspirin**
D. **Abciximab**
E. **No additional medication needed long term**

ANSWER:
Clopidogrel

EXPLANATION:
Just a few years ago, the answer would be combination dipyridamole and low dose

asprin. However, NICE has recently published a technology appraisal in 2010 on the use of clopidogrel and dipyridamole.

Clopidogrel is now recommended by NICE ahead of combination use of aspirin plus modified release (MR) dipyridamole in people who have had an ischaemic stroke.

Q-115

A 69 year old woman is brought to A&E by ambulance with no significant past medical history of allergies. She presents with speech disturbance and asymmetric facial and arm weakness. The symptoms began 3 hours ago. Brain imaging shows an ischaemic stroke. What is the SINGLE most appropriate next course of action?

A. Anticoagulation
B. Administer alteplase
C. Administer streptokinase
D. Start statins
E. Review in 24 hours

ANSWER:
Administer alteplase

EXPLANATION:
The history and examination are convincing for a stroke. Before any treatment can happen we need to exclude a haemorrhagic stroke with the help of imaging. This was done in this question which showed an ischaemic stroke. The next step is to start thrombolytics.

The other options are less likely to be the appropriate next course of action.
Anticoagulation → anticoagulants should not be started until brain imaging has excluded haemorrhage, and usually not until 14 days have passed from the onset of an ischaemic stroke"

Streptokinase → NHS prefers alteplase over streptokinase.

Statins → Statins need to be offered but this is not the most appropriate next course of action. There is no urgency in giving statins.

Review in 24 hours → Thrombolysis should only be given if it is administered within 4.5 hours of onset of stroke symptoms and haemorrhagic stroke has been excluded by imaging. So review in 24 hours is clearly a wrong option.

Stroke management
Summary of management of acute stroke:
- blood glucose, hydration, oxygen saturation and temperature should be maintained within normal limits
- aspirin 300mg orally or rectally should be given as soon as possible if a haemorrhagic stroke has been excluded
- Thrombolysis should only be given if it is administered within 4.5 hours of onset of stroke symptoms and haemorrhagic stroke has been excluded by imaging (Alteplase is currently recommended by NICE)

Post management stroke

- Aspirin 300 mg daily for 2 weeks is given immediately after an ischaemic stroke is confirmed by brain imaging.
- Clopidogrel 75 mg daily is then given long-term
- If clopidogrel is contraindicated or not tolerated, give a combination of modified-release dipyridamole and low dose aspirin.
- Ensure a statin has been offered.

Q-116

A 74 year old woman was brought to clinic by her daughter for confusion and memory impairment. The patient would periodically start a task and forget to finish them and has difficulty naming objects. In the past few months, she has lost 5 kg and does not sleep well at night. On examination, the patient was agitated and had decreased skin turgor, and not oriented to time or place. She repeatedly asks the same questions during the interview. What is the SINGLE most likely diagnosis?

A. **Vascular dementia**
B. **Lewy body dementia**
C. **Fronto-temporal (Pick's) dementia**
D. **Alzheimer's disease**
E. **Normal pressure hydrocephalus**

ANSWER:
Alzheimer's disease

EXPLANATION:
For PLAB 1, know all the above options well as they appear in high frequency. PLAB 1 key clues to Alzheimer's disease: memory changes first before personality. As night progresses they are unable to sleep. They would also have difficulty in daily tasks and be confused. Vascular dementia would have a "stepwise progression" and they would have had some sort of previous cardiovascular event in the stem. Lewy body dementia would require a clue into having parkinsonian symptoms and hallucinations. Pick's dementia presents with disinhibition and personality changes before memory impairment. Normal pressure hydrocephalus presents with gait disturbance, urinary incontinence, and confusion.

Q-117

An 86 year old man was brought in by the police to the emergency department after being found wandering the streets in the middle of the night outside his home. He has been living alone since his wife died a year ago. The police had recorded accounts from neighbours that had reported him to have had increased forgetfulness and requiring help to get back home in the past eight to nine months. When neighbours have found him at times, they report that he has been talking to himself. What is the SINGLE most likely diagnosis?

A. **Grief reaction**
B. **Depression**
C. **Paraphrenia**
D. **Dementia**
E. **Hypothyroidism**

ANSWER:
Dementia

EXPLANATION:
The correct answer is Option D. Dementia. This gentleman likely had some cognitive impairment when his wife was alive. She likely helped him with his day to day activities. Therefore the problems likely did not surface. Now that he has no support, his impairments have likely worsened and he has not been able to manage alone. Orientation to time is usually lost first typically in dementia, followed by orientation to place and finally to person when it is most severe. There are various differences in presentation depending on the type of dementia. Another feature that is more suggestive of diagnosis of dementia is the patient's age. Rememebr that as age increases after the age of 65 years, the incidence of dementia increases exponentially. Furthermore, in certain types of dementia hallucinations can be present.

Option A. Grief reaction is incorrect as this is normally something that lasts for 6 months. In this case, the patient has had memory troubles for more than this time frame.

Option B. Depression is incorrect. There is no mention of low mood in this case or history of low energy or anhedonia. For a diagnosis of depression there must be at least two of these three core symptoms.

Option C. Paraphrenia is incorrect. This is an extremely rare type of schizophrenia that presents in old age. Given the rareness of this kind of condition, it is highly unlikely to be the answer given the more common conditions as options. Furthermore, one would expect a more acute presentation with likely more florid psychotic features.

Option E. Hypothyroidism is incorrect. Although this is an important physical diagnosis that is relevant before making a diagnosis of dementia, there are no features in the question that hint more towards a diagnosis of thyroid disorder. You should expect some lab test results or other physical features that may point towards a diagnosis of thyroid disease in the stem.

Q-118

A 45 yearold man presents to the emergency department with acute back pain radiating down to his legs, urinary retention and incontinence. On examination, perineal sensory loss is noted. What is the SINGLE most appropriate investigation?

- **A. MRI**
- **B. CT spine**
- **C. Plain x-rays**
- **D. Dual energy X-ray absorptiometry**
- **E. PET CT**

ANSWER:
MRI

EXPLANATION:
This is a classic example of cauda equina syndrome. It is a serious neurologic condition in which damage to the cauda equina causes loss of function of the nerve roots of the spinal canal below the termination (conus medullaris) of the spinal cord. Any lesion which compresses or disturbs the function of the cauda equina may disable the nerves although the most common is a central disc prolapse.

Investigation of choice is an MRI.

Q-119

A 52 year old man has incoherent speech. He is awaree of his speech difficulties but finds difficulty in using the right words when speaking. He has no other symptoms apart from his speech issue. He has good comprehension. Which anatomical site is most likely to be affected?

A. **Broca's area**
B. **Wernicke's area**
C. **Midbrain**
D. **Parietal lobe**
E. **Brainstem**

ANSWER:
Broca'sarea

EXPLANATION:
Broca's Aphasia
Broca's area is a region in the inferior frontal lobe of the dominant hemisphere responsible for speech production. Lesions in this area produce a non-fluent or expressive aphasia. Patients will typically exhibit slow and halting speech.

However, their comprehension is not affected. Unlike Wernicke's aphasia, patients with Broca's aphasia are aware of their language difficulties. For example, a person with Broca's aphasia may say in a slow manner something like, "Bathe. Dog" meaning to say, "I bathe the dog today". You can see that the content of the information is correct, but the grammar and fluidity of the sentence is incorrect. They know what to say, they just cannot get it out.

COMPARING TYPES OF APHASIA

	Broca's aphasia	**Wernicke's aphasia**
Fluency	Non-fluent	Fluent
Repetition	Affected	Affected
Comprehension	Not affected	Affected
Grammar	Incorrect grammar used	Not affected

Memory tool

B*roca*
B – B*roken words*

Wernicke
W – What? – W does not understand (comprehension affected)

Q-120

A 26 year old man complains of leg weakness. He first felt pins and needles on his feet which was followed by weakness of his legs for the past 2 days. He describes himself as a fit man who goes jogging every day however he now finds himself with great difficulty trying to stand due to his leg weakness. He gives a history of feeling unwell and having flu-like symptoms last week which has resolved after a few days. On examination, he has mild bilateral facial weakness, reflexes are diminished and has impaired sensation in hislegs. What is the SINGLE most likely diagnosis?

A. **Polymyositis**
B. **Multiple sclerosis**
C. **Guillain-Barre syndrome**
D. **Myasthenia Gravis**
E. **Motor neuron disease**

ANSWER:
Guillain-Barre syndrome

EXPLANATION:
Thesymptomshere are classic for Guillain-Barre syndrome. The weakness progresses quickly and always begins in the lower limbs. There is usually a history of a respiratory or a gastrointestinal infection preceding these symptoms.

Q-121

A 62 year old man has recently had a flu-like illness. He woke up with difficult and unclear articulation of speech. Movement of his eyelids and lips are weak on the right side. What is the SINGLE most likely anatomical defect?

A. **Facial nerve**
B. **Hypoglossal nerve**
C. **Oculomotor nerve**
D. **Trigeminal nerve**
E. **Glossopharyngeal nerve**

ANSWER:
Facial nerve

EXPLANATION:
Viral infection may cause facial nerve palsy

Facial Nerve Palsy

Presentation
Weakness of the muscles of facial expression and eye closure. The face sags and is drawn across to the opposite side on smiling. Voluntary eye closuremay not be possible and can produce damage to the conjunctiva and cornea. In severe cases, dysarthria and difficulty with eating may occur.

Q-122

A 73 year old woman presentsto clinic accompanied by her son with a 6 month history of anorexia and altered bowel habits. She has no significant past medical history and is on aspirin. On examination, the patient has an expressionless face, she takes many steps to turn, has resting tremor predominantly in her right hand, and cogwheel rigidity. Cognition is intact. What is the SINGLE most likely diagnosis?

A. **Malignancy**
B. **Normal pressure hydrocephalus**
C. **Parkinson's disease**
D. **Progressive supranuclear palsy**
E. **Huntington's disease**

ANSWER:
Parkinson's disease

EXPLANATION:
The clinical examination above is classic of Parkinson's Disease: bradykinesia, rigidity, resting tremor, and postural instability. While the beginning of the case stem may point to possible malignancy, the examination results point to OptionC.

Parkinson's disease
Presentation:
- >65 years (for PLAB 1)
- Classic presentation on examination: bradykinesia, rigidity, resting tremor, and postural instability
- +/- Extra-neurological features

Diagnosis:
- Clinical diagnosis

Treatment:
- Referral to neurologist before starting pharmacological management
- Levodopa (gold standard): start when >70yrs or severe disruption of quality of life (whichever one comes first)

Q-123

A 46 year old chronic alcoholic man is brought to the emergency department in a drowsy state. He is responding vaguely to questions. He denies any alcohol intake today. He walks with an ataxic gait. Examination reveals spontaneous upbeat nystagmus and hyperreflexia

Haemoglobin 128 g/L
Mean cell volume (MCV) 99 fL

What is the SINGLE most likely cause for his cognitive impairment?

A. **B1 deficiency**
B. **B6 deficiency**
C. **B12 deficiency**
D. **Folate deficiency**
E. **Liver disease**

ANSWER:
B1 deficiency

EXPLANATION:
Although, folate deficiency is more common in people who regularly misuse alcohol this is not the answer in this stem. A haemoglobin of 128 g/L is barely enough to cause any symptoms of anaemia.

This man is suffering from Wernicke's encephalopathy.

Eye-movement abnormalities seen in Wernicke's encephalpathy include gaze-evoked nystagmus, spontaneous upbeat nystagmus, and horizontal or vertical ophthalmoplegia.

Wernicke's encephalopathy is a neuropsychiatric disorder caused by thiamine deficiency which is most commonly seen in alcoholics. A classic triad of confusion, ophthalmoplegia and ataxia may occur.

Treatment is with urgent replacement of thiamine (vitamin B1)

If not treated Korsakoff's syndrome may develop as well. This is termed Wernicke-Korsakoff syndrome and is characterised by the addition of antero- and retrograde amnesia and confabulation in addition to the above classic triad.

Q-124

A 73 year old female patient presents with right sided hemiplegia and aphasia in the Emergency Department. Thee symptoms began in the morning and resolved spontaneously within 6 hours. An EEG conducted in the hospital revealed atrial fibrillation. What is the SINGLE best scoring method to assess her risk for future stroke in the next week?

A. **ABCD2**
B. **CHA2DS2-VASc**
C. **Well's score**
D. **CURB-65**
E. **NYHA score**

ANSWER:
ABCD2

EXPLANATION:
Knowing the contents of the ABCD2 and the CHA2DS2-VASc scoring system is not necessary for the PLAB 1 exam but knowing when to apply each scoring system is vital.

You may have difficulty in choosing either ABCD2 or CHA2DS2-VASc as the answer but remember that in this case stem, they are asking for a risk of stroke in the next few days. ABCD2 score would be more appropriate.

Q-125

A 19 year old female with previous history of repeated pain over the medial canthus and chronic use of nasal decongestants, presents with abrupt onset of a severe headache, fever with chills and rigor, diplopia on lateral gaze, moderate proptosis and chemosis. On examination optic disc is congested. Which of the following is the SINGLE most likely diagnosis?

A. **Cavernous sinus thrombosis**
B. **Orbital cellulitis**
C. **Acute ethmoidal sinusitis**
D. **Orbital apex syndrome**
E. **Migraine**

ANSWER:
Cavernous sinus thrombosis

EXPLANATION:
This case stem is rare to appear in PLAB 1, but know the presentation of how the question will appear to differentiate it from options B, C, and E which occur more frequently in the exam. Cavernous sinus thrombosis can appear as an option to those questions.

Cavernous sinus thrombosis
Presentation:
- Headache – can be severe intensity
- Chemosis, oedematous eyelids, proptosis, painful ophthalmoplegia
- Fever
- Usually preceded by sinusitis

Diagnosis:
- CT/MRI venography

Treatment:
- Referral to neurosurgery
- Antibiotics
- Anticoagulation – heparin
- +/- Corticosteroids and surgical drainage

Q-126

A 58 year old man presents with unsteadiness, difficulty walking and slurred speech. He has a history of hypertension and hypercholesterolaemia. He denies alcohol use. A stroke is suspected. What is the SINGLE most appropriate investigation?

A. **Computed tomography brain scan**
B. **Brain positron emission tomography scan**
C. **Magnetic resonance imaging brain**
D. **Carotid angiography**
E. **Monitor for 24 hours**

ANSWER:
Magnetic resonance imaging brain

EXPLANATION:
Ataxia and slurred speech are features of cerebellar lesion. Posterior fossa lesions are best imaged using magnetic resonance imaging.

A CT head would be the correct answer if asked about the best initial investigation to ensure there is no haemorrhage.

Brain PET has limited clinical use.

Q-127

A 45 year old man, with no known medical illnesses, presents to the clinic with left facial pain for the past month. It is a sharp shooting pain that radiates around his left cheek while chewing. It would last a few seconds repeatedly throughout the day. He has taken ibuprofen but with no relief. On examination: blood pressure is 120/70 mmHg, neurological exam is normal, palpation to the left jaw and cheek elicits pain although jaw muscles are of full strength. What is the SINGLE most appropriate management for this condition?

- **A. Amitriptyline**
- **B. Patient controlled analgesia**
- **C. Gabapentin**
- **D. Carbamazepine**
- **E. Microvascular decompression**

ANSWER:
Carbamazepine

EXPLANATION:
Please see Q-68

Q-128

A 26 year old woman complains of headache of 1 day duration that has been intensifying in severity over the last few hours. There is discomfort while turning her head and cannot tolerate bright lights. On examination, there is no papilloedema nor rashes. Kernig's sign is negative. Lumbar puncture results reveal: elevated protein, normal glucose, and lymphocytosis. She is generally unwell but haemodynamically stable. What is the single most likely diagnosis?

- **A. Viral meningitis**
- **B. Migraine**
- **C. Fungal meningitis**
- **D. Bacterial meningitis**
- **E. TB meningitis**

ANSWER:
Viral meningitis

EXPLANATION:
Know the types of meningitis for PLAB 1 since it overlaps in quite a few topics on the exam (i.e. neurology, emergency, and infectious diseases). Pay particular attention to the lumbar puncture results to differentiate each. Kernig's sign does not need to be present for it to be a diagnosis of meningitis. If you forget the lab results, look at the history: viral meningitis has less severe symptoms than bacterial meningitis which can progress rapidly and produce signs of septic shock. TB meningitis is more gradual with: fever, weight loss, headache with progression to focal deficit +/or altered consciousness.

Presentation
• Classic: headache, fever, photophobia, neck stiffness
• Cranial palsies: CN III, IV, VI, VII

Diagnosis
Lumbar puncture (viral meningitis CSF):
• Normal or high CSF pressure
• Increased lymphocytes
• Elevated protein
• Glucose normal

Treatment:
• Regardless of whether meningitis is bacterial, viral, or TB as a cause – give antibiotics before performing CT brain and/or lumbar puncture
• If no rash: IV cefotaxime or [IV ceftriaxone + IV vancomycin + IV ampicillin]
• If raised intracranial pressure: give mannitol

Q-129

A 62 year old woman comes with complaints of drooping of both upper eyelids and painless double vision that she first noticed when reading. The drooping of eyelids keeps alternating between her right and left eye and is worse towards the end of the day. Her speech is noted to be gradually getting slower and softer towards the end. Her pupils are normal on examination. The visual acuities are 6/6 in either eye. Which SINGLE investigation will help in confirming the diagnosis?

A. **Thyroid function test**
B. **Electrocardiography**
C. **Tensilon test**
D. **Serum skeletal muscle nicotinic acetylcholine receptor antibody**
E. **Computed tomography of the brain**

ANSWER:
Serum skeletal muscle nicotinic acetylcholine receptor antibody

EXPLANATION:
The woman has presented with features of myasthenia gravis. Almost all patients with myasthenia gravis will have ocular manifestations at some point during the course of their disease. The most important feature is that muscles fatigue more readily after exercise. Antibodies to acetylcholine receptors are seen in 85-90% of cases hence the answer is serum skeletal muscle nicotininc acetylcholine receptor antibody.

Tensilon test is not routinely done any longer.

MYASTHENIA GRAVIS
Presentation:
• Female (20-30 years) ; males (50-60 years)
• Painless muscle weakness that increases with exercise *(This feature of fatigue often gives the diagnosis in the exam) - It is even seen in the voice. For example, getting the patient to count up to 50. As the patient nears 50 their voice becomes less audible as they are fatiguing.*
• Ocular muscles involved - drooping eyelids
• Dysphagia, dysarthria, dysphonia
• Normal reflexes
• Associated with hyperthyroidism

A useful mnemonic to remember for clinical features of myasthenia gravis is "D".

- ***D**iplopia*
- ***D**rooping eyelids*
- ***D**ysphagia*
- ***D**ysarthria*
- ***D**ysphonia*

Q-130

A 48 year old male patient presents with symptoms of generalised muscle weakness, nausea, vomiting, polyuria and polydipsia. He was diagnosed with liver carcinoma three months ago. An MRI was done not too long ago and it was discovered that he now has brain metastasis. On examination, he is lethargic and has diminished deep tendon reflexes. Baseline blood tests have been done and show:

Serum sodium: 147 mmol/L
Serum potassium: 4.2 mmol/L
Urea 4.4 mmol/L
Creatinine: 89 micromol/L
Chloride: 102 mmol/L

Where is the SINGLE most likely area of lesion?

A. **Cerebellum**
B. **Pons**
C. **Lateral ventricles**
D. **Diencephalon**
E. **Brainstem**

ANSWER:
Diencephalon

EXPLANATION:
The best answer in the choices that fits in with this patient's signs and symptoms is diencephalon.

The diencephalon consists of the thalamus, the hypothalamus including the posterior pituitary, the epithalamus and the subthalamus. A lesioin near or at the posterior pituitary would give riske to this patient's symptoms of diabetes insipidus.

The signs and symptoms of sodium imbalance are primarily neurological.

Q-131

A 61 year old female is brought to the hospital by her daughter following a drastic change in her behaviour. Her daughter says that her mother's behaviour began to change three days ago whereby she became restless and aggressive. The daughter describes going to visit her mother three days ago and getting complaints from the neighbours that they hear banging and shouting all night. The patient herself claims that there are people who enter her room at night and she makes those noises to scare them off. There is no evidence to back up the patient's claims. What is the SINGLE most likely diagnosis for her condition?

A. **Delirium**
B. **Dementia**
C. **Mania**
D. **Schizophrenia**
E. **Bipolar disorder**

ANSWER:
Delirium

EXPLANATION:
Delirium describes an acute confusional state and is very common in the elderly. It involves altered perception and thought, and is of acute onset.

The other answers are less likely.

Dementia is incorrect as a person with dementia would have a chronic set of symptoms and a slow decline in mental functioning over a long period of time.

Mania describes an elevated mood. This can present as an abnormally high level of arousal or energy. This patient does not present with any of those symptoms.

Schizophrenia is less likely as a majority of schizophrenics develop their symptoms around adolescence or early adulthood. This patient is 61 years old.

Bipolar disorder presents with alternating episodes of hypomania and depression.

Q-132

A 19 year old woman complains of episodic headaches preceded by fortification spectra. These episodes can sometimes last for 2-3 days. When these headaches occur, she prefers to be in a quiet, dark room. What is the SINGLE most appropriate management for the acute phase?

A. **Topiramate**
B. **Aspirin**
C. **Propanolol**
D. **Gabapentin**
E. **Domperidone**

ANSWER:
Aspirin

EXPLANATION:
The diagnosis here is migraines. This question is a helpful reminder that the mean age of onset of migraines is 19 years old. In PLAB, it is usually a young to middle-aged person who presents with migraines.

It is highly unlikely that they would ask you to choose between an oral triptan, NSAID, aspirin, or paracetamol for the acute treatment of migraines. Although oxford clinical handbook does state that NSAIDS (e.g. ketoprofen 100mg, dispersible aspirin 900mg/6h) are good as there is less chance of developing medication misuse headache , and they have similar efficacy to oral 5HT agonists (triptans and ergot alkaloids), the NICE guidelines do not state which one of them would be used before the other. PLAB would have to adhere very closely to NICE guidelines thus any answer with oral triptan, NSAIDS, or aspirin for the acute treatment of migraines would be a correct answer.

Q-133

A 70 year old woman was brought into the Emergency Department by her son for increasing confusion and slurred speech. On examination, she was oriented to time, place and person. Neurological examination was positive for bilateral past pointing and truncal ataxia but no nystagmus. Blood tests were within normal limits. Where is the SINGLE most likely location of her lesion?

A. **Bilateral basal ganglia**
B. **Left temporo-parietal lobe**
C. **Cerebellar vermis**
D. **Left cerebellar lobe**
E. **Left-sided frontal lobe**

ANSWER:
Cerebellar vermis

EXPLANATION:
For PLAB 1, stroke questions come in various forms ranging from the anatomical locations of the lesion, investigations and management. Pay special attention to the anatomy of the lesions especially the vascular distribution and the functions of the different parts of the brain. Key clues to cerebellum lesions: dysdiadochokinesia, ataxia, nystagmus, intention tremor, slurred speech, hypotonia, past pointing.

Stroke (cerebellar lesion)
Presentation:
• Dysdiadochokinesia, ataxia, nystagmus, intention tremor, slurred speech, hypotonia, past pointing
• Usually sudden onset with possible further progression that takes place over hours
• May have underlying ischaemic heart disease, carotid bruits, atrial fibrillation

Diagnosis:
• Non-contrast CT brain - initial investigation
• MRI brain - more sensitivity

Treatment:
• Ischaemic stroke - thrombolysis (alteplase) → aspirin
• Maintain oxygen saturation, glucose control, blood pressure control
• Maintain nutrition and hydration
• Early mobilization

Q-134

A 45 year old man has been admitted for an electrive surgery. 2 days later he develops agitation, sweating and complains of seeing snakes on the hospital wall. A history of chronic alcoholic abuse is revealed and chlordiazepoxide has been started. What is the SINGLE most appropriate next course of action?

A. Add Diazepam
B. Add Acamprosate
C. Add Disulfiram
D. Add Thiamine
E. Add Naloxone

ANSWER:
Add Thiamine

EXPLANATION:
In regards to his diagnosis of chronic alcoholic abuse, many physicians would add in thiamine (IV Pabrinex) to the mix to prevent Wernicke's encephalopathy even though he is not showing any signs of Wernicke's encephalopathy.

Parenteral thiamine should be prescribed for treatment of suspected or confirmed Wernicke's encephalopathy, and for prophylaxis in alcohol-dependent patients attending hospital for acute treatment (including treatment unrelated to alcohol dependence).

Q-135

A 40 year old woman suddenly collapsed and died. At the post-mortem autopsy, it was found that there was a bleed from a berry aneurysm from the circle of Willis. Which is the most likely space that the bleeding occurred in?

A. Subarachnoid
B. Subdural
C. Extradural
D. Subparietal
E. Brain ventricles

ANSWER:
Subarachnoid

EXPLANATION:
Subarachnoid haemorrhage (SAH) is spontaneously in the context of a ruptured cerebral aneurysm but may be seen in association with other injuries when a patient has sustained a traumatic brain injury. Aneurysm formation is the most common aetiology.

There is also an association with polycystic kidney disease, Ehlers Danlos syndrome and other connective tissue disease.

Head trauma is rare as a cause of SAH

Q-136

A 42 year old man has increasing daytime sleepiness. He feels that his tiredness is affecting his work as he is unable to keep awake during meetings. He also complains of choking episodes during his sleep. On examination, his BMI is 36 kg/m^2, blood pressure is 150/70 mmHg, and respiratory exam was normal. What is the SINGLE most likely diagnosis?

A. **Idiopathic hypersomnia**
B. **Narcolepsy**
C. **Hyperventilation syndrome**
D. **Obstructive sleep apnoea syndrome**
E. **Rapid eye movement sleep behaviour disorder**

ANSWER:
Obstructive sleep apnoea syndrome

EXPLANATION:
Daytime sleepiness and obesity points the diagnosis of obstructive sleep apnoea syndrome. Choking episodes during sleep is also a suggestive feature of obstructive sleep apnoea syndrome.

Obstructive sleep apnoea syndrome
Presentation:
- Middle aged to elderly male
- Increased daytime sleepiness, fatigue, sleep disruption
- Snoring loudly at night
- Associated with hypertension, diabetes, obesity

Diagnosis:
- Pulse oximetry, overnight study of breathing pattern (initial investigation)
- Polysomnography (gold standard)

Treatment:
- Conservative: weight loss and reduce alcohol consumption
- Continuous positive airway pressure (CPAP)

Q-137

A 41 year old male with hypertension and recurrent kidney stones presents to the Emergency Department with a headache of intense severity. He is also noted to have neck stiffness and pain. Labs were done and revealed a serum sodium of 131 mmol/L. What is the SINGLE most likely mechanism behind his sodium results?

A. **Decreased intake of food**
B. **Polyuria**
C. **Syndrome of inappropriate anti-diuretic hormone**
D. **None of the above**
E. **All of the above**

ANSWER:
Syndrome of inappropriate anti-diuretic hormone

EXPLANATION:
This is a 2 step question. First figure out the diagnosis and through that find out the answer to the question. Some questions will require you to do this. In this case, the diagnosis is subarachnoid hemorrhage (SAH) and it is also implied in the case stem that the patient has possible polycystic kidney disease (hypertension and recurrent kidney stones). Know the presentation, associations, investigations, and complications of SAH since there is considerable overlap of this topic between neurology and emergency. One of the major complications of SAH is hyponatremia. Hyponatremia commonly occurs in patients with aneurysmal subarachnoid haemorrhage. The mechanism that has been proposed as a cause is syndrome of inappropriate anti-diuretic hormone.

Q-138

A 45 year old man has acute back pain radiating down to his legs and faecal incontinence. On examination, perineal sensory loss is noted. What is the SINGLE most likely diagnosis?

A. Multiple sclerosis
B. Lumbosacral disc herniation
C. Degenerative disc disease
D. Thoracic disc herniation
E. Cauda equina syndrome

ANSWER:
Cauda equina syndrome

EXPLANATION:
Cauda Equina Syndrome would fit the best. Although lumbosacral disc herniation and degenerative process of the spine are causes of cauda equina syndrome it would be more accurate to put Cauda Equina Syndrome as the answer due to the perineal sensory loss.

Cauda Equina Syndrome is a serious neurologic condition in which damage to the cauda equina causes loss of function of the nerve roots of the spinal canal below the termination (conus medullaris) of the spinal cord. Any lesion which compresses or disturbs the function of the cauda equina may disable the nerves although the most common is a central disc prolapse.

Spinal cord compression or cauda equina syndrome are neurological emergencies that require immediate referral and intervention.

The management of true cauda equina syndrome frequently involves surgical decompression.

If there are red flag signs such as the possibility of cauda equina syndrome like in this case, referral to an orthopaedic surgeon or a neurosurgeon should be considered.

Red flags that suggest cauda equina syndrome include:
• Severe or progressive bilateral neurological deficit of the legs, such as major motor

weakness with knee extension, ankle eversion, or foot dorsiflexion
- Recent-onset urinary retention and/or urinary incontinence (caused by loss of sensation when passing urine).
- Recent-onset faecal incontinence (due to loss of sensation of rectal fullness)
- Perianal or perineal sensory loss (saddle anaesthesia or paraesthesia)

Q-139

A 78 year old smoker collapses and is brought into accident and emergency. He is unable to lift his right hand or leg. He also complains of double vision. His left pupil is mydriatic and his left eyelid droops downwards. His left eye is deviated downwards and outwards. He is a known diabetic and has a history of hypertension. Where is the SINGLE most likely area of the lesion?

A. Cortex
B. Cerebellum
C. Medulla oblongata
D. Pons
E. Midbrain

ANSWER:
Midbrain

EXPLANATION:
This male has most likely suffered a midbrain infarct.

This specific presentation is called Weber's syndrome which is a result from a midbrain infarct. It is a form of stroke characterised by the presence of:
1. Contralateral hemiparesis and;
2. An ipsilateral oculomotor nerve palsy

The two structures in the midbrain that are damaged that primarily cause the symptoms in the above stem are:
- Corticospinal fibers which if damaged would cause contralateral hemiparesis (contralateral because it occurs before decussation in the medulla)
- Oculomotor nerve fibers which if damaged would cause a drooping eyelid and fixed pupil pointed down and out

Q-140

A 43 year old man presents with neck stiffness, headache and vomiting. The headache is severe, persistent and on the left side. He also has ear pain and discharge coming from his left ear. On examination, he has weakness of the right hand and leg. He has a temperature of 38.5 C. What is the SINGLE most likely diagnosis?

A. Viral meningitis
B. Bacterial meningitis
C. Mycotic aneurysm
D. Cerebral abscess
E. Cerebral tumour

ANSWER:
Cerebral abscess

EXPLANATION:
CEREBRAL ABSCESS
Cerebral abscess may show many of the same features of a brain tumors as they both are space-occupying lesions. The major difference is that cerebral abscess has features of a fever and an obvious source of infection nearby such as otitis media or mastoiditis.

Presentation
- Headache → is the most common symptom and it is often on the same side as the abscess
- Fever
- Changes in mental state (drowsiness, confusion)
- Focal neurological deficits
- Grand mal seizures
- Nausea and vomiting
- Neck stiffness
- Papilloedema → this is due to cerebral oedema

Investigations
- CT scanning is the investigation of choice. Cerebral abscesses appear as a radiolucent space-occupying lesion.

Note that in HIV-positive patients, majority of brain lesions will be either be due to toxoplasmosis or lymphoma.

Q-141

A 28 year old woman has a short history of double vision. She tires easily, especially as the day progresses. There is difficulty climbing stairs, reaching for items on shelves, and brushing her hair. As she speaks, her speech fades gradually. Over the last week, she has had difficulty chewing and swallowing. On examination, there were no significant findings. She has a family history of thyroid disease. What is the SINGLE most likely diagnosis?

A. Polymyositis
B. Multiple sclerosis
C. Guillain-Barre syndrome
D. Myasthenia Gravis
E. Motor neuron diseasde

ANSWER:
Myasthenia Gravis

EXPLANATION:
The symptoms here are classic for Myasthenia gravis. It is important to remember that there is a predisposition for autoimmune diseases to run in families hence the history of thyroid disease in the family in the stem.

Q-142

A 30 year old presents to the emergency department with confusion and ataxia. She had a surgical abortion 3 days ago at 13 weeks gestation. Her pregnancy was complicated with severe hyperemesis gravidarum. On examination, she has horizontal ophthalmoplegia. She is unsteady and has uncoordinated walking. She denies alcohol intake. What is the SINGLE most appropriate management?

A. **Magnesium sulphate**
B. **Haloperidol**
C. **Diazepam**
D. **Thiamine**
E. **Cyclizine**

ANSWER:
Thiamine

EXPLANATION:
She is suffering from Wernicke's encephalopathy.

One of the eye abnormalities seen in Wernicke's encephalopathy is horizontal or vertical ophthalmoplegia.

Wernicke's encephalopathy is a neuropsychiatric disorder caused by thiamine deficiency which is most commonly seen in alcoholics. A classic triad of confusion, ophthalmoplegia and ataxia may occur. It is also seen in pregnancy where there is severe persistent hyperemesis gravidarum. For this reason, it is important to replace thiamine in patients with hyperemesis gravidarum before they develop Wernicke's encephalopathy.

Treatment in this case is with urgent replacement of thiamine (vitamin B1).

Wernicke's Encephalopathy
Triad of: 1. Confusion 2. Ataxia 3. Ophthalmoplegia

Q-143

A 75 year old nursing home resident complains of worsening headache, and impaired vision for 4 days. Her daughter says she is getting more and more confused day by day. She has multiple bruises on her head. What is the SINGLE most likely cause of her confusion?

A. **Alcohol intoxication**
B. **Infection**
C. **Subdural haematoma**
D. **Hypoglycaemia**
E. **Hyponatraemia**

ANSWER:
Subdural haematoma

EXPLANATION:
Among the given answers, subdural haematoma fits the best. The multiple bruises on her head suggest head injury which can lead to subdural haematoma. Headache, confusion and impaired vision for 4 days could occur in chronic subdural haematoma

She is an elderly lady thus a trivial fall may have gone unnoticed.

Remember in PLAB, chronic subdural haematoma usually presents as an elderly, on anticoag or an alcoholic who may have history of fall. Slow onset of symptoms compared to epidural haematoma.

In this case, there is no history of anticoagulation or history of alcoholism. But the picture still fits chronic subdural haematoma.

Q-144

A 63 year old man, known case of hypertension and smoker, presents to clinic with a sudden onset of weakness in the right arm and changes in speech which had resolved within a 24 hour period. On examination, there were no residual neurological findings and cardiology examination was normal. What is the SINGLE most appropriate next step in management?

A. **MRI brain**
B. **CT brain**
C. **Echocardiogram**
D. **Electrocardiogram**
E. **Carotid doppler scanning**

ANSWER:
Carotid doppler scanning

EXPLANATION:
This is a classic presentation of transient ischaemic attack. Under the ABCD2 score, this patient has a score of 4. The most appropriate step according to guidelines is for carotid doppler scanning to check for carotid artery stenosis to assess the need for carotid endarterectomy. MRI would eventually be done but it would not be the “next step” as the patient no longer has residual neurological findings and his symptoms have completely resolved; therefore MRI at this moment would not be clinically beneficial.

Transient ischaemic attack
Presentation:
• Facial weakness, unilateral arm weakness, speech problems
• Association: smoking, hypertension, atrial fibrillation, ischaemic heart disease

Diagnosis:
• ABCD2 score
• Carotid doppler scan - definitive
• MRI brain

Treatment:
• On admission aspirin 300mg immediately unless contraindicated
• Referred to stroke unit to be assessed
• Carotid endarterectomy and stenting - need according to carotid doppler results
• Antihypertensives, antiplatelets, statins, lifestyle modification

Q-145

A 33 year old woman with multiple sclerosis complains of vertigo and double vision. She has also noticed recent drooping of her lips on the left side. She has loss of sensation over her face, reports intermittent shooting pains over the face and has increasing difficulty with hearing. She has a lack of voluntary coordination of muscle movements. The symptoms have been worsening over the past 3 days. What is the SINGLE most likely anatomical site affected?

A. **Cerebellum**
B. **Cerebrum**
C. **Spinal cord**
D. **Brain stem**
E. **Optic nerve**

ANSWER:
Brain stem

EXPLANATION:
Plaques can develop anywhere in the central nervous system in patientswith multiple sclerosis, but when they develop in the brain stem, a number of functions can be impaired and may result in an evolving vestibular syndrome. Vertigo is often seen with diplopia due to the demyelination of cranial nerves III, IV and VI as they leave the brainstem in patients suffering from multiple sclerosis. Cranial nerves V (trigeminal), VII (facial) and VIII (vestibulocochlear) are also seen affected here, seen as having symptoms of trigeminal neuralgia, facial numbness and diffculty hearing (usually a sensorineural hearing loss) which again points towards a brainstem involvement.

The choice of the cerebellum is incorrect. Lesions to the cerebellum often cause cerebellar ataxia, dysarthria, nystagmus, and dysdiadochokinesia.

The cerebrum houses many brain structures including the cerebral hemispheres. Invovlement of cerebral hemisphere usually involves poor memory and dementia. Without further information, it would be incorrect to choose this as an answer.

Demyelination in the spinal cord in patients with multiple sclerosis often presents with symmetrical tingling in both upper limbs especially if there is involvement high in the dorsal column. Sensory symptoms may begin distally in the lower limbs and progress proximally. Loss of proprioception is also seen.

Q-146

A 72 year old woman presents with the complaint of forgetfulness for three months. She used to live with her husband but since his passing four months ago, has been living alone. For the past three months, she has been increasingly forgetful and more socially withdrawn. She contacts her children less frequently than she used to and has been late in paying her bills. She blames her recent memory impairment on tiredness. Her medical history includes having depression more than 20 years ago. What is the SINGLE most likely diagnosis?

A. **Alzheimer's dementia**
B. **Frontal dementia**
C. **Normal grief response**
D. **Pseudodementia**
E. **Vascular dementia**

ANSWER:
Pseudodementia

EXPLANATION:
Pseudodementia is synonymously referred to as depressive dementia.

The history of disturbance in pseudodementia is often short and abrupt in onset, while dementia is more often gradual in onset.

Normal grief respoinse is a common mistake that many would pick. Although we are inclined to use time to distinguish pseudodementia and a normal grief response (whereby if less than 6 months history of symptoms, we would consider it to be a normal grief response), we ought to be looking at the actual symptoms instead of the time frame. Grief response is difficult to define according to time as everyone responds to grief differently.

Remember, typical normal grief reactions can last up to 12 months with the mean at 6 months.

In this question, there are evidences of a relatively abrupt onset, poor memory and a history of depression. These evidences should help you mark pseudodementia as the answer.

Suspect pseudodementia in older people with predominantly cognitive symptoms such as loss of memory, vagueness, prominent slowing of movement and reduced or slowed speech with a relatively acute onset in whom a major life event has occurred as they are more likely to be suffering from a major depressive episode as opposed to a true dementia.

COMPARING DEMENTIA, PSEUDODEMENTIA AND GRIEF RESPONSE

	Dementia	**Pseudodementia**	**Grief response**
Recognition	Decline in memory and cognitive function sufficient to disrupt daily life activities in an alert non-delirious person	Severe depression that presents with poor memory and concentration and impaired functional capacity *Seen in elderly patients whereby they exhibit symptoms consistent with dementia but the cause is actually depression*	Hard to define as everyone is different Follows a tragic even (loss of a loved one)
Features	Gradual onset Rarely reversible If asked questions, would give wrong answers *(This is because*	Onset relatively abrupt Poor memory Often with past history of depression	Goes through stages of grief Angry, guilt, disbelief, tearful, difficulty sleeping

	true dementia has poor attention and concentration)	Often short If asked questions, would reply as "I don't know, I can't be bothered, it's too difficult" *(This is because they are often upset but their attention and concentration are often intact)* Response to antidepressant medication	Symptoms reduce in intensity with acceptance of lsos and readjustment

In reality, in the geriatric age group, it is often difficult to distinguish depression and dementia as often they co-exist together. More than 20% of people with early dementia are also depressed.

Q-147

A 38 year old male presented to Accident and Emergency with the complaint of bilateral lower limb weakness. He said that he first noticed this two days ago when he fumbled while walking down the stairs. He has been noticing a gradual increase in muscle weakness of his legs and he is now unable to walk at all. The patient mentions an episode of diarrhoea that began one week ago and that lasted approximately two days. He works as a shop assistant and reports no problems at home or at work. The patient was subsequently admitted to the medical ward and physical examination of his limbs revealed a loss of deep tendon reflexes. His bilateral leg paralysis has now ascended to affect both of his upper limbs as well. What is the SINGLE most likely mechanism causing this patient's problems?

A. Injury of the corticospinal tract
B. Neuromuscular blockage
C. Demyelination of the peripheral nerve sheath
D. Infiltration of neurons by amyloid
E. Mononeuropathy

ANSWER:
Demyelination of the peripheral nerve sheath

EXPLANATION:
The patient has Guillain-Barre syndrome. Clues that allude to this diagnosis include his symptoms of ascending limb weakness accompanied by hyporeflexia as well as his history of a recent illness.

Guilllain-Barre syndrome is a disorder whereby antibodies created by the body to attack infectious organisms (usually of the gastrointestinal or respiratory tract) also attack antigens in the peripheral nerve tissue. The major complaint in most patients is weakness or neuropathic pain. Management includes a combination of plasma exchange, intravenous immunoglobulin and intubation and ventilation (if the paralysis reaches the respiratory muscles)

Injury of the corticospinal tract is a sensible answer since the corticospinal tract controls movements of the limbs and trunk however the ascending pattern of progressive

symmetrical weakness, starting in the lower extremities fits more in line with Guillain-Barre syndrome.

Neuromuscular blockade is used in conjunction with anaesthesia to produce paralysis for surgery. Neuromuscular blockage can be presynaptic (such as botulinum toxin and tetanus toxin) or postsynaptic (such as drugs that have clinical importance). This is the incorrect answer since this patient is experiencing a gradual ascending paralysis, not an immediate global paralysis.

Diseases caused by infiltration of amyloids into neurons include Alzheimer's disease, Parkinson's disese, Huntington's disease and many others. This is therefore the incorrect answer.

Q-148

A 44 year old man presents to Emergency after falling from a third floor building. His Glasgow Coma Scale is 4/15. He is intubated and ventilated on arrival. Neurological examination reveals unequal pupils. CT head and neck reveals midline shift and a left-sided convex enhancing area. What is the SINGLE most appropriate action?

A. **Intravenous mannitol to reduce intracranial pressure**
B. **Intravenous thiopentone to reduce intracranial pressure**
C. **Conservative management with 30 degree head-up**
D. **Urgent craniotomy**
E. **Endovasculare coiling under neuroradiological guidance**

ANSWER:
Urgent craniotomy

EXPLANATION:
This is a diagnosis of extradural haemorrhage. While this is a frequent neurology topic for PLAB 1, the presentation here has left out the usual clue: "lucid interval". However, the stem provides another clue to the diagnosis: the CT findings which are indicative of an extradural haemorrhage. Take note of the revised NICE guidelines regarding the management of traumatic brain injuries. In this case, this patient not only has raised intracranial pressure but he is also showing signs of neurological deficit (unequal pupils) in addition to the low Glasgow Score. Therefore, he is not suitable for conservative management and requires immediate craniotomy for evacuation of the haematoma.

Extradural haemorrhage
Presentation:
• Trauma to the head
• Followed by immediate loss of consciousness, +/- lucid interval with decline in mental function

Diagnosis:
• CT head and neck

Treatment:
• ABCDE protocol
• CT head and neck

• Immediate craniotomy
• If GCS > 8 + other CT criteria met, may attempt for conservative management → observation and serial CT brain

Q-149

A 51 year old male with a Pancoast tumour presents with unilateral partial ptosis, anhidrosis and miosis on the right side of his face. What is the SINGLE most likely underlying mechanism for the syndrome?

A. Sympathetic chain involvement
B. Ipsilateral sympathetic trunk irritation
C. Compression of the ipsilateral sympathetic chain
D. Hyperactivity of the sympathetic system
E. Involvement of the hypothalamospinal tract

ANSWER:
Compression of the ipsilateral sympathetic chain

EXPLANATION:
This man is suffering from Horner's syndrome secondary to the Pancoast tumour. Horner's syndrome describes an ipsilateral deficiency of sympathetic activity. There are many causes of a Horner's syndrome, but the one that is tested the most in exams is a Pancoast tumour.

Pancoast tumours are located at the apex of the lung and may compress the sympathetic ganglion resulting in symptoms of Horner's syndrome.

Although sympathetic chain involvement is technically correct, this answer is vague and could refer to bilateral sympathetic chain involvement. Compression of the ipsilateral sympathetic chain is a better answer as a descriptor of the underlying mechanism.

The cause of Horner's syndrome is an interruption of sympathetic pathways and not an irritation of the pathways.

Underactivity, and not overactivity, is the cause of Horner's syndrome.

Although involvement of the hypothalamospinal tract is a known cause of Horner's syndrome, it is not correct in this case because involvement of the hypothalamospinal tract occurs in spinal cord lesions. The reason for the symptoms of Horner's syndrome, in this case, has been given as a Pancoast tumour.

Q-150

A 79 year old man presents to the Emergency Department with an acute onset of double vision and vertigo. He has paraesthesia of his upper limbs. He is becoming increasingly drowsy with an unsteady gait. What is the SINGLE most likely diagnosis?

A. Brainstem stroke
B. Cerebellar infarction
C. Cerebellopontine angle infarction
D. Meniere's disease
E. Multiple sclerosis

ANSWER:
Brain stem stroke

EXPLANATION:
A significant differential when a patient presents to the Emergency Department with acute vertigo accompanied by neurological symptoms is brain stem and cerebellar strokes.

Brain stem strokes have complex symptoms and are difficult to diagnose. The hallmark of brain stem strokes are symptoms of vertigo, ataxia and diplopia. Other symptoms include slurred speech, numbness of the face, and decreased level of consciousness.

The distractor is cerebellar strokes. Cerebellar infarcts also present with acute vertigo. If the inferior cerebellum is affected, in addition to vertigo, patients could have nystagmus and postural instability however a pure cerebellar stroke would not usually have limb paraesthesia or diplopia.

Q-151

A 72 year old woman who is in long-term residential care has recently become deliriouis and distressed following a chest infection. She has already been prescribed antibiotics for the chest infection which she started taking a day ago. The staff are concerned that she is a risk to herself. They have attempted verbal and non-verbal de-escalation techniques however she continues to be agitated and restless. What is the SINGLE most appropriate short-term medication?

A. Olanzapine
B. Risperidone
C. Chlorpheniramine
D. Naloxone
E. Fluoxetine

ANSWER:
Olanzapine

EXPLANATION:
NICE (2010) has suggested short-term olanzapine or haloperidol (usually for a week or less) be used in patients with delirium who are in distress once non-pharmacological de-escalation techniques have failed.