Nervous System

History

- For any neurological symptom ask about onset , duration , pattern , exacerbating , relieving factors and associated symptoms.
- In cases of amnesia or loss of consciousness we need additional witness history.

➢ Symptoms:

Headache :is the most neurological symptom (Use SOCRATES to analyze it)

✓ *Primary* (idiopathic) causes*:*

1- Migraine

- Recurrent attacks of moderate to severe headaches
- *Onset* : 30 -120 min
- *Duration* : Usually last < 24 h , weeks / months symptom-free
- *Pain location* : mostly unilateral [but may be anywhere including face / neck]
- Associated symptoms : Aura(usually visual)/or without Aura ,nausea/vomiting , photophobia and phonophobia
- During the attack the patient prefers to be in a dark room .
- Stabbing headache is common

2- Cluster headaches

- *Onset : rapid onset , often* waking patient from sleep
- *Duration :30 – 120 min , 1-4 attacks per day , lasts* weeks to months , with months to years of remission
- *Pain location :* Orbital/retro-orbital; always same side during cluster, may switch sides between clusters
- Associated symptoms: Autonomic features, including conjunctival injection, tearing, nasal stuffiness, ptosis, miosis, agitation
- During the attack the patient keep pacing around the room in an agitated state, or even head banging

3-Stabbing headache

- *Onset* : Abrupt , rarely from sleep
- *Duration* : very brief, seconds or less
- *Pain location* : Anywhere over head
- Common in patients with migraine

4-tension headache

- Feeling of a tight band around the head

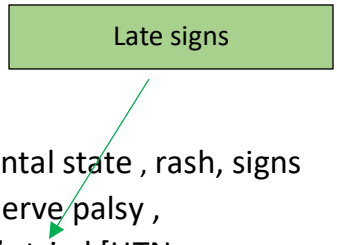
5- cough, exertional or sex headache

6. primary thunderclap headache

✓ Secondary (or symptomatic) headaches: Less common

1- Meningitis

- *Onset* : 1-2 days , can be abrupt
- *Duration* : days to weeks
- *Pain location* : Global , including neck stiffness
- Associated symptoms: neck stiffness, fever, altered mental state , rash, signs of raised intracranial pressure (vomiting , sixth cranial nerve palsy , papilledema , decrease level of consciousness , cushing's triad [HTN , bradychardia , irregular respiration])and false localizing signs, meningism



2- Subarachnoid hemorrhage

- *Onset* : Abrupt , immediately maximal , rare from sleep
- *Duration* : may be fatal at onset , days to weeks
- *Pain location* : Anywhere , poor localizing value
- Associated symptoms: 20% isolated headache only ; nausea/ vomiting, reduced consciousness, false localising signs, III nerve palsy
- Life – threatening
- Causes: trauma ,ruptured brain aneurysm

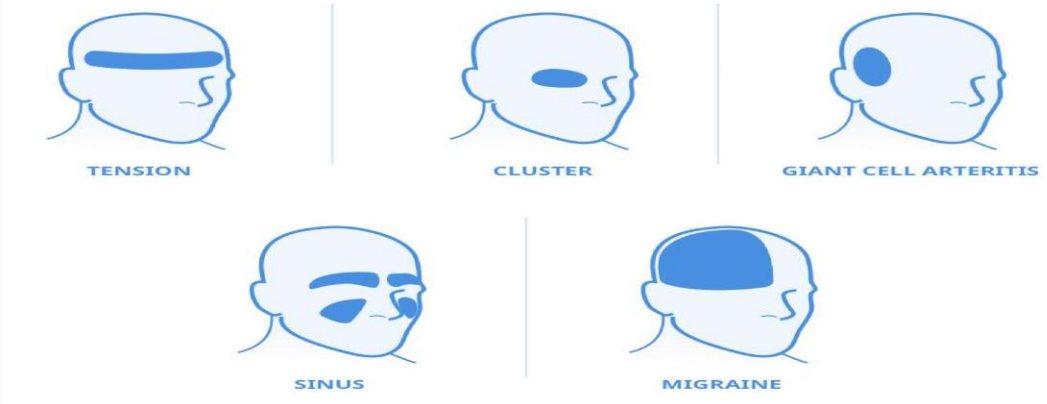
3- Temporal arteritis

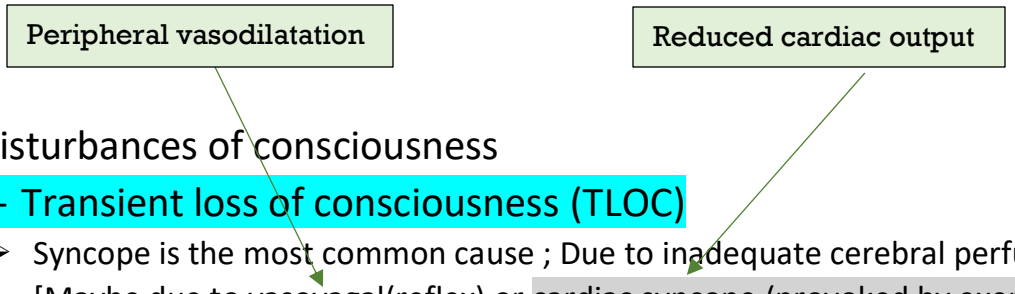
- Onset : gradual , temple pain and scalp tenderness
- Duration : Continuous
- Pain location : Temple and Scalp
- Associated symptoms: jaw pain on chewing, visual symptoms , and tender temporal arteries, elevated ESR and CRP
- Usually in those > 55 years , un well , Life – threatening

❖ Cerebral vein thrombosis : isolated headache + truly abrupt onset

- Onset and course of headaches :

Acute single episode:	
Subarachnoid haemorrhage	Vasodilator drugs
Acute meningitis	Angle-closure glaucoma
Acute recurrent:	
Migraine	Angle-closure glaucoma
Sinusitis	Cluster headache
Neuralgias (e.g., trigeminal and post-herpetic)	
Subacute single episode:	
Infections (e.g., tuberculous meningitis, cerebral abscess)	
Raised intracranial pressure (e.g., tumour, hydrocephalus)	
Benign intracranial	
hypertension Temporal arteritis	
Chronic:	
Chronic daily headache syndrome	
Depression	
Cervical spondylosis	
Drugs (e.g., nitrates, overuse of analgesics)	





Disturbances of consciousness

1- Transient loss of consciousness (TLOC)

- Syncope is the most common cause ; Due to inadequate cerebral perfusion [Maybe due to vasovagal(reflex) or cardiac syncope (provoked by exertion (severe aortic stenosis , HOCM), or sudden (arrhythmia)]
- Postural(orthostatic) hypotension ; (TLOC on standing) could be due to : 1- drugs (levodopa or anti hypertensive drugs) or 2- autonomic diseases such as DM. 3- in people more than 65 years. 4- hypovolemia
- Exercise related syncope (or syncope with no warning or triggers) : suggest cardiac causes ; recovery is usually rapid.

2- Vasovagal syncope

- Lasts < 60 sec , may be associated with myoclonic jerks
- Usually occurs whiles standing.
- stimulation of parasympathetic system due to pain , emotional upset or illness or in people forced to stand in warm environment. Leads to vasodilation and bradycardia.
- Often preceded by light-headedness, vision darkening, tinnitus, and nausea
- It causes pale or grey skin
- If kept flat, recovery is rapid

Epileptic Seizures : paroxysmal electrical discharges from either the whole brain (generalized) or part of the brain (Focal)

1- Generalized tonic–clonic seizure

- *Prodromal phase* : Change of mood or 'odd' feeling (aura)
- *Tonic phase*: Loss of consciousness Cyanosis
  Spasm of all muscles Fall
- *Clonic phase*: rhythmical jerking crescendoing (Jerking of limbs and trunk), tongue biting and Incontinence of urine . Subsiding over 30-120 sec
- *Post-ictal phase*: period of unresponsiveness often with heavy breathing, the patient appears to be deeply sleep and finally confusion as the patient awakes. (Flaccidity ,Confusion ,Headache and Amnesia)

2- Focal (partial)seizure

- Simple (consciousness is preserved) or complex (impaired consciousness)
- Characterized by whichever part of the brain is involved
- frontal lobe seizures: focal motor seizure
- temporal lobe seizures characterized by autonomic and/or psychic symptoms, often associated with automatisms such as lip smacking or swallowing.
- *Features of complex partial seizures*: Dream-like states / Disturbances of memory (déjà-vu, jamais vu) / Hallucinations of smell, taste or auditory / Emotional disturbance / Abnormal behavior

❖ Functional dissociative attacks(non- epileptic or psychogenic attacks or pseudo seizures)

- *Difficult to distinguish from epileptic seizures, clues to differentiate psychogenic seizures:*
  1. occurring multiple times in a day
  2. may last considerably longer
  3. symptoms waxing and waning
  4. asynchronous movements
  5. pelvic thrusts , side-to-side rather than flexion/extension movements
  6. absence of postictal confusion.

Item	Epileptic seizures	PNES
Eyes	Opened	Closed
Head	Fixed/unilateral	Side-to-side movements
Limbs	In phase/same direction	Out of phase
Body (axis)	Straight	Opisthotonus
Body (movement)	No rotation	Intense rotation in bed
Evolution of seizure	Continuous	Fluctuating

PNES, psychogenic non-epileptic seizures; ES, epileptic seizures.

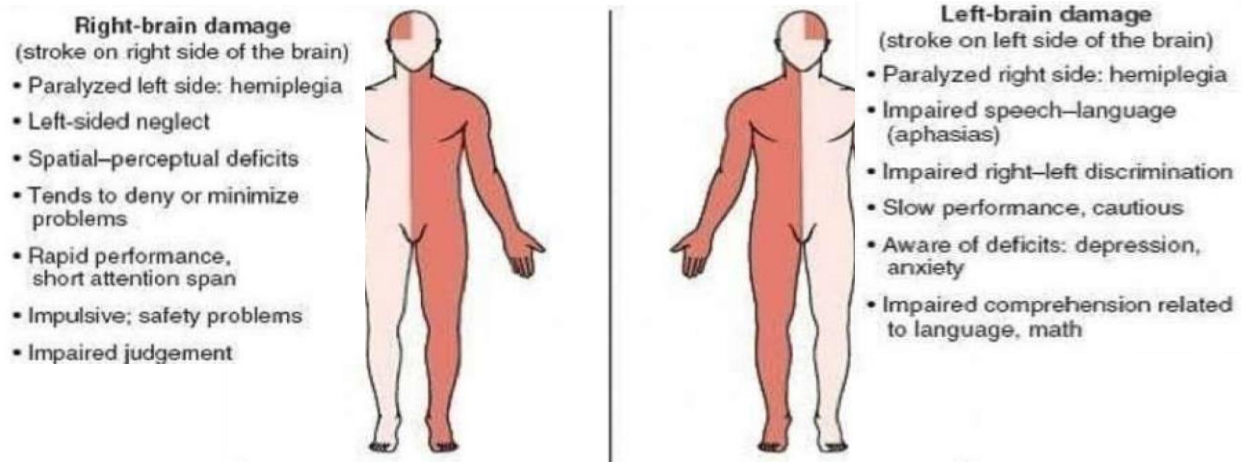
❖ The history from the patient and witnesses can help distinguish epilepsy from syncope:

7.2 Features that help discriminate vasovagal syncope from epileptic seizure

Feature	Vasovagal syncope	Seizure
Triggers	Typically pain, illness, emotion	Often none (sleep deprivation, alcohol, drugs)
Prodrome	Feeling faint/ lightheaded, nausea, tinnitus, vision dimming	Focal onset (not always present)
Duration of unconsciousness	<60 s	1–2 mins
Convulsion	May occur but usually brief myoclonic jerks	Usual, tonic–clonic 1–2 mins
Colour	Pale/grey	Flushed/cyanosed, may be pale
Injuries	Uncommon, sometimes biting of tip of tongue	Lateral tongue biting, headache, generalised myalgia, back pain (sometimes vertebral compression fractures), shoulder fracture/ dislocation (rare)
Recovery	Rapid, no confusion	Gradual, over 30 mins; patient is often confused, sometimes agitated/ aggressive, amnesic

Stroke

- a focal neurological deficit of rapid onset that is due to a vascular cause , maybe ischemic (80 %) or hemorrhagic (20 %)
- A transient ischaemic attack (TIA) is the same but symptoms resolve within 24 hours.
- TIAs are an important risk factor for impending stroke and demand urgent assessment and treatment.
- Factors in the history or examination that increase the likelihood of haemorrhage include: use of anticoagulation, headache, vomiting, seizures and early reduced consciousness. more frequent in Asian populations.
- Isolated vertigo, amnesia or TLOC are rarely, if ever, due to stroke.
- Spinal strokes are very rare; patients typically present with abrupt bilateral paralysis , depending on the level of spinal cord affected.
- The anterior spinal artery syndrome is most common and causes loss of motor function and pain/temperature sensation, with relative sparing of joint position and vibration sensation below the level of the lesion (sparing dorsal column).



Middle cerebral artery (MCA) occlusion	Anterior cerebral artery (ACA) occlusion	Posterior cerebral artery (PCA) occlusion
•Contralateral lower face weakness • Contralateral hemiplegia • Contralateral hemianesthesia • Ataxia • Speech impairments (usually the left brain) • Perceptual deficits (usually the right brain) • Visual deficits	• Weakness of foot and leg • Sensory loss of foot and leg • Ataxia • Incontinence	• Midbrain syndrome (Weber's Syndrome) occlusion of the paramedian branches of the posterior cerebral artery ; Ipsilateral Third nerve palsy , Contralateral hemiplegia • Visual field deficits (macular sparing) • Visual hallucinations • Memory problems

7.3 Clinical classification of stroke

Total anterior circulation syndrome (TACS)

- Hemiparesis, hemianopia and higher cortical deficit (e.g. dysphasia or visuospatial loss)

Partial anterior circulation syndrome (PACS)

- Two of the three components of a TACS
- OR isolated higher cortical deficit
- OR motor/sensory deficit more restricted than LACS (see below)

Posterior circulation syndrome (POCS)

- Ipsilateral cranial nerve palsy with contralateral motor and/or sensory deficit
- OR bilateral motor and/or sensory deficit
- OR disorder of conjugate eye movement
- OR cerebellar dysfunction without ipsilateral long-tract deficits
- OR isolated homonymous visual field defect

Lacunar syndrome (LACS)

- Pure motor > 2 out of 3 of face, arm, leg
- OR pure sensory > 2 out of 3 of face, arm, leg
- OR pure sensorimotor > 2 out of 3 of face, arm, leg
- OR ataxic hemiparesis

Dizziness

- Recurrent dizzy spells affect approximately 30% of those over 65 years.
- *Causes* : 1- Postural hypotension 2- Cerebrovascular disease 3- Cardiac arrhythmia 4- Hyperventilation induced by anxiety and panic.

Vertigo

- the illusion of movement
- specifically indicates a problem in the vestibular apparatus (peripheral) (most common) or the brain (central)
- *Peripheral causes of vertigo* :
  - Benign paroxysmal positional vertigo (BPPV) -treatable-: recurrent episodes of vertigo lasting a few seconds , attacks increased when sleeping on the affected side or with movement.
  - Meniere disease: vertigo lasting minutes or hours, associated with hearing loss, tinnitus, nausea and vomiting.
- *Central causes of vertigo* :
  - Migraine , brainstem ischemia or infarction ,multiple sclerosis
- TIAs do not cause isolated vertigo.

Functional/psychogenic/hysterical/ somatisation/conversion disorder

- Neurological symptoms not due to a neurological disease
- Presentations include blindness, tremor, weakness and collapsing attacks, and patients will often describe numerous other symptoms, with fatigue, lethargy, pain, anxiety and other mood disorders commonly associated.
- *Clues include* : 1- symptoms not compatible with disease (such as retained awareness of convulsing during non -epileptic attacks, or being able to walk normally backwards but not forwards)

2-considerable variability in symptoms (such as intermittent recovery of a hemiparesis) .

3- multiple symptoms with numerous visits to other specialties and multiple unremarkable investigations, leading to numerous different diagnoses.

- Most functional neurological disorders follow recognizable patterns, so be cautious when the pattern is atypical.

✓ *Past medical history:*

- History of previous visual loss (optic neuritis) in someone presenting with numbness suggests multiple sclerosis.
- Birth history and development may be significant, as in epilepsy.
- If considering a vascular cause of neurological symptoms, ask about important risk factors, such as other vascular disease, hypertension, family history and smoking

✓ *Drug history:*

- Prescriptions, OTC, Recreational, Neurotoxic
- phenytoin toxicity causes ataxia
- excessive intake of simple analgesia causing medication overuse headache
- cocaine provoke convulsions.

✓ *Family history:*

- Single-gene defects: such as myotonic dystrophy or Huntington's disease.
- Polygenic influences: as in multiple sclerosis or migraine
- Parkinson's or motor neuron disease, may be either due to single-gene disorders or sporadic
- Mitochondrial DNA abnormalities : diabetes, short stature , deafness , migraine or epilepsy.
- Charcot – Marie – Tooth disease :may be AD , AR or X- Linked

✓ *Social history:*

- alcohol affects CNS (ataxia, seizures, dementia) and PNS (neuropathy)
- Vitamin deficiency may occur in alcoholism or dietary exclusion
- Vegetarians may be susceptible to vitamin B12 deficiency (subacute combined degeneration of the spinal cord)
- nitrous oxide inhalation causes subacute combined degeneration of the cord due to dysfunction of the vitamin B12 pathway
- smoking contributes to vascular and malignant disease.
- A travel history may give clues to the underlying diagnosis such as: - Lyme disease (facial palsy) , Malaria (coma)

- Always consider sexually transmitted or bloodborne infection, such as human immunodeficiency virus (HIV) or syphilis, as both can cause a wide range of neurological symptoms and are treatable

✓ ***Occupational history :***

- Lead exposure : motor neuropathy.
- Manganese causes Parkinsonism.