

Bullet Point Nursing

Medical - Surgical / Adult Health Nursing – Neurology system

Disclaimer: These notes are designed to provide the key points of each topic. These notes should be used with the associated lectures that expand upon each of the points. Every effort is made to ensure this content is up to date and accurate at the time of writing. No liability is assumed for the content or its relation to current standards and practices.

Anatomy and physiology neurology review:

- Primary function of the nervous system: Coordinate body functions, cognition, and response to internal/external stimuli.
- Divisions:
 - Central Nervous System (CNS): Brain and spinal cord.
 - Peripheral Nervous System (PNS): Cranial nerves, spinal nerves, autonomic system.
- Autonomic Nervous System (ANS):
 - Sympathetic = “fight or flight.”
 - Parasympathetic = “rest and digest.”
- Meninges: Protect brain and spinal cord.
 - Dura mater (outer), arachnoid mater (middle), pia mater (inner).
 - CSF flows in subarachnoid space; cushions and maintains chemical stability.
- Cerebrum: Higher functions.
 - Frontal = motor, speech (Broca’s), executive function.
 - Parietal = sensory.
 - Temporal = hearing, memory, language (Wernicke’s).
 - Occipital = vision.
- Cerebellum: Coordination and balance.
- Brainstem: Midbrain, pons, medulla; regulates vital functions.
- Spinal Cord: Reflexes, motor/sensory pathways.

Neurology assessments:

- Level of Consciousness (LOC):
 - Alert, lethargic, obtunded, stuporous, comatose.
 - Glasgow Coma Scale (GCS): Eye, verbal, motor responses (3–15 score).
 - Considered a key indicator of overall neuro status.
- Pupils: PERRLA (pupils equal, round, reactive to light and accommodation).
- Motor: Strength (0–5 scale), symmetry, pronator drift.
- Sensory: Light touch, pain, temperature, vibration, proprioception.
- Reflexes: Deep tendon reflexes (0–4+ scale), Babinski.
- Speech/Language: Slurred speech, aphasia, dysarthria.
- Cognition: Orientation, memory, judgment, safety awareness.
- Cranial Nerves (CN I–XII): Assessed as part of a comprehensive neuro exam.
- Vital Signs: Abnormal patterns may indicate increased intracranial pressure (ICP).
 - Cushing’s Triad: Hypertension (widening pulse pressure), bradycardia, irregular respirations.

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Neurology Diagnostics:

- CT scan: Rapid assessment of hemorrhage, stroke, trauma.
- MRI: More detailed soft tissue view; useful for tumors, MS, ischemic stroke.
- Cerebral Angiography (CTA): Imaging of cerebral blood vessels.
- EEG (Electroencephalogram): Electrical brain activity; used for seizures, encephalopathy.
- ICP Monitoring: Intracranial catheter to measure pressure; normal ICP = 5–15 mmHg.

Neurology Notes:

- Head of Bed (HOB): Elevated ~30° for increased ICP, stroke, TBI.
- Seizure Precautions: Suction available, padded rails, do not restrain during seizure.
- Neuro Checks: Serial monitoring of pupils, LOC, motor, sensory, and vitals.
- Increased intracranial pressure: Secondary complication.
- Autonomic Dysreflexia: Hypertensive crisis seen in spinal cord injuries at T6 or above, triggered by noxious stimuli.
- Guillain-Barré Syndrome (GBS): Acute, immune-mediated demyelination of peripheral nerves, often following a viral infection.
 - Known for ascending weakness and potential respiratory compromise.

Pathophysiology and Nursing Practice:

- **Acute Stroke / Cerebrovascular Accident (CVA)**
 - Patho: Disruption of blood flow to an area of the brain
 - Ischemic – blood clot
 - Hemorrhagic – ruptured blood vessel (SAH, ICH)
 - Presentation: Sudden onset of one-sided (contralateral) weakness, speech difficulties, AMS.
 - Diagnosed based on presentation (NIHSS) and head CT
 - Management:
 - Ischemic: Thrombolytics (Within 3-4.5 hours) and/or thrombectomy
 - Hemorrhagic: Possible surgery
 - Anticoagulants for ischemic or anticoagulant reversal is needed for bleed
 - Include medication education if needed
 - Notes: Assess FAST, NIHSS, glucose, identify right versus left stroke
 - Perform frequent neuro reassessments (include vitals)
 - Avoid rapid decrease in blood pressure
 - NPO until passes a swallow study
 - **Transient Ischemic Attack (TIA):** Often called a “mini-stroke.” Symptoms mimic a stroke but fully resolve within 24 hours without permanent damage. A TIA is a critical warning sign and a major risk factor for a future stroke.
- **Seizures / Epilepsy**
 - Patho: Sudden abnormal uncontrolled electrical activity in the brain. Can be generalized, partial (focal), or absence.

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- Presentation: May present with or without an aura. Sudden onset of seizure activity. Generally, it has a postictal phase (often presents in this phase).
- Diagnosed by EEG, possibly MRI
- Management: Seizure precautions
 - Active seizure: Benzodiazepines
 - Epilepsy: Phenytoin, carbamazepine, valproic acid, levetiracetam, lamotrigine.
- Notes:
 - Status epileptics may require intubation and paralytics
 - Investigate causes of seizures such as electrolyte imbalances, toxins, medication or substance withdrawal, infection, trauma, stroke, tumor, fever, triggers (flashing lights)
 - Patients may lose driving privileges, caution about water activities
 - Medication is generally taken for years or decades
- **Traumatic Brain Injury**
 - Patho: Traumatic injury to the brain from direct impact, acceleration–deceleration, or penetrating injury.
 - Primary injury: Occurs at impact (contusion, laceration, bleeding).
 - Secondary injury: Results from increased intracranial pressure (ICP), cerebral edema, ischemia, inflammation, or other secondary causes.
 - Presentation: Altered level of consciousness (LOC), headache, vomiting, amnesia, confusion, pupillary changes, abnormal posturing, and other neuro issues.
 - Concussion – Reversible
 - Contusion – Brain bruise
 - DAI – Widespread shearing
 - Epidural – Arterial bleeding
 - Subdural – Venous bleeding
 - Intraparenchymal / SAH / ICH
 - Diagnosed by CT scan of the head and can be followed up with MRI.
 - Management: Hypertonic saline or Mannitol, Surgery
 - Notes:
 - Always assess GCS (8 or less is severe TBI)
 - Maintain HOB elevated 30-45 degrees
 - Seizure precautions
 - Monitor for DI/SIADH
 - Cushing's triad, racoon eyes, Battle's sign, CSF leak sign
- **Meningitis**
 - Patho: Inflammation of meninges, can be bacterial or viral.
 - Presentation: Fever, nuchal rigidity, headache, photophobia, vomiting, AMS, rash
 - Positive Kernig's sign: Pain on leg extension
 - Positive Brudzinski's sign: Neck flexion leads to knee/hip flexion
 - Diagnosed by lumbar puncture (↑WBC, ↓glucose, ↑protein), blood cultures, CT/MRI
 - Management: Antibiotics (IV) and supportive measures
 - Notes:

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- Initiate droplet isolation
- Educate on prevention through vaccination
- Treat all exposed prophylactically

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References:

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