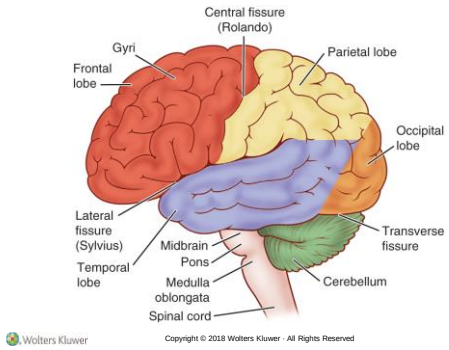
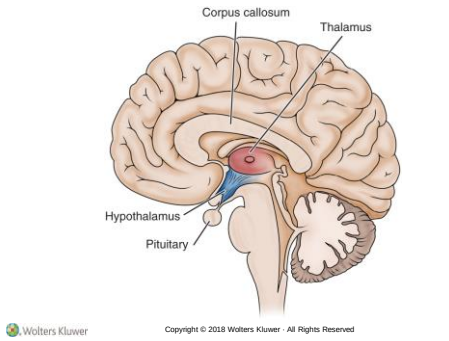
NEUROLOGICAL DYSFUNCTION

Dr. Rexi Thomas
Spring 2023

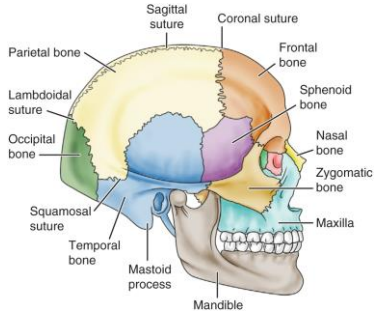
Brain



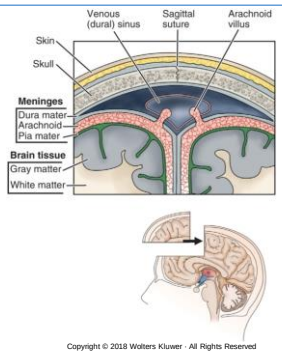
Medial View of the Brain



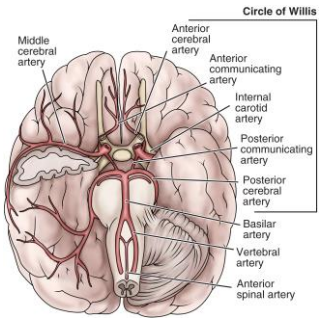
Bones and Sutures of the Skull



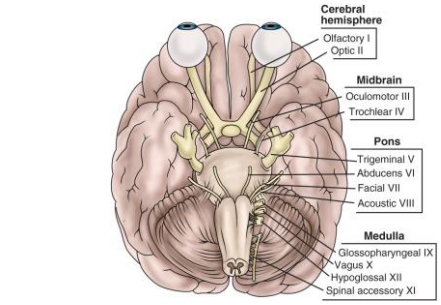
Meninges and Related Structures



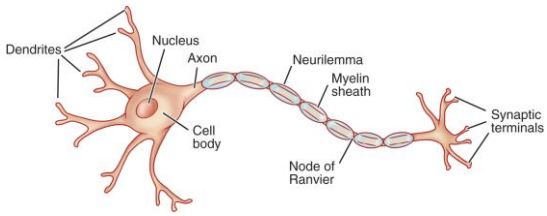
Arterial Blood Supply of the Brain



Cranial Nerves



Neuron



Altered Level of Consciousness

- LOC
  - Confusion
  - Lethargy
  - Stupor
  - Coma
  - Akinetic mutism
  - Persistent vegetative state
  - Locked-in syndrome

Assessment

- Verbal response and orientation
- Alertness
- Motor responses
- Respiratory status
- Eye signs
- Reflexes
- Postures

- Glasgow Coma Scale (GCS)

Glasgow Coma Scale (GCS)

	1	2	3	4	5	6
Eye Response	Does not open	Opens in response to painful stimuli	Open in response to voice	Opens spontaneously		
Verbal Response	No sound	Incompre-hensible sounds	Utters Inappropriate words	Confused	Oriented, converse normally	
Motor Response	No movement	Extension to painful stimuli-decerebrate	Abnormal flexion to painful stimuli-decorticate	Flexion/ withdrawal to painful stimuli	Localizes painful stimuli	Obeys commands

Nursing Process- Nursing Dx

- Ineffective airway clearance
- Risk of injury
- Deficient fluid volume
- Impaired oral mucosa
- Risk for impaired skin integrity and impaired tissue integrity (cornea)
- Ineffective thermoregulation
- Impaired urinary elimination and bowel incontinence
- Disturbed sensory perception
- Interrupted family processes

Complications

- Respiratory distress or failure
- Pneumonia
- Aspiration
- Pressure ulcer
- Deep vein thrombosis (DVT)
- Contractures

Nursing Care

- Airway
- Protect from injury
- Skin integrity
- Fluid balance
- Absence of corneal irritation
- Thermoregulation
- Bowel & bladder
- Sensory stimulation & communication
- Family/ Support systems
- Prevent complications

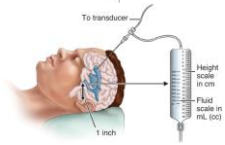
Increased Intracranial Pressure

- Monro-Kellie Hypothesis
- CCP (cerebral perfusion pressure)
- CCP = MAP (mean arterial pressure) – ICP
- Normal CCP 70-100
- A CCP of less than 50 results in permanent neurologic damage

Wolters Kluwer/ Lippincott Willi

Signs & Symptoms of ICP

- Early signs
- Late signs
- ICP monitoring
- Complications
  - Brainstem herniation
  - Cerebral edema
  - Diabetes Insipidous
  - SIADH
  - Infection



Nursing Process: The Care of the Patient With Increased Intracranial Pressure—Diagnoses

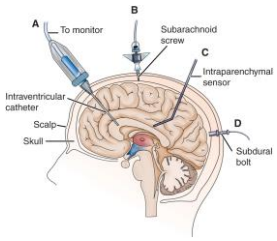
- Ineffective airway clearance
- Ineffective breathing pattern
- Ineffective cerebral perfusion
- Deficient fluid volume related to fluid restriction
- Risk for infection related to ICP monitoring

Nursing Process: The Care of the Patient With Increased Intracranial Pressure—Planning

- Major goals may include
  - Maintenance of patent airway
  - Normalization of respirations
  - Adequate cerebral tissue perfusion
  - Respirations
  - Fluid balance
  - Absence of infection
  - Absence of complications

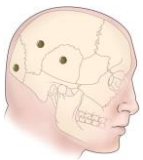
Management of ICP

- ICP monitoring
- Decrease cerebral edema
- Maintain cerebral perfusion
- CSF
- Fever
- Cerebral oxygenation
- Fluid balance
- Prevent Infection



Intracranial Surgery

- Craniotomy
- Craniectomy
- Cranioplasty
- Burr holes



Preoperative Care

- Diagnostic Tests
- Medications
  - Corticosteroids
  - Fluid restrictions
  - Hyperosmotic
  - Diuretics
  - Antibiotics
  - Diazepam
- Neuro assessment
- Support

Postoperative Care

- ↓ cerebral edema
- Pain management
- Prevent seizures
- ICP monitoring
- Neuro assessment
- Cerebral perfusion
- Prevent complications
- Other assessments/ interventions

Collaborative Problems and Potential Complications

- Increased ICP
- Bleeding and hypovolemic shock
- Fluid and electrolyte disturbances
- Infection
- CSF leak
- Seizures

Nursing Process: The Care of the Patient Undergoing Intracranial Surgery—Planning

- Major goals may include
  - Improved tissue perfusion
  - Adequate thermoregulation
  - Normal ventilation and gas exchange
  - Ability to cope with sensory deprivation
  - Adaptation to changes in body image
  - Absence of complications

Seizures

- Abnormal episodes of motor, sensory, autonomic, or psychic activity (or a combination of these) resulting from a sudden, abnormal, uncontrolled electrical discharge from cerebral neurons
- Classification of seizures
  - Focal: originates in one hemisphere
  - Generalized: occur and engage bilaterally
  - Unknown: epilepsy spasms
  - "Provoked" related to acute, reversible condition

Seizures

- Etiologies
  - Cerebrovascular disease
  - Hypoxemia
  - Fever (childhood)
  - Head injury
  - Hypertension
  - Central nervous system infections
  - Metabolic and toxic conditions
  - Brain tumor
  - Drug and alcohol withdrawal
  - Allergies

Seizure

- S/S
- Nursing care
- Diagnostics
  - CT/MRI
  - EEG
  - Labs
- Post seizure care

Epilepsy

- Prevention
- Medications
  - tegretol, klonopin, zarontin, felbatol, neurontin, lamictal, keppra, trileptal, luminal, dilantin, mysolins, gabitril, topamax, depakote, zonegran
- Surgery
- Status epilepticus

Headaches

- Primary
- Secondary
- Types
  - Migraine- prodrome, aura, headache, recovery
  - Tension
  - Cluster
  - Cranial arteritis
- Diagnostics
- Preventions
- Treatment/ Management

Diagnostic Tests

- Computed tomography (CT)
- Positron emission tomography (PET)
- Single photon emission computed tomography (SPECT)
- Magnetic resonance imaging (MRI)
- Cerebral angiography
- Myelography
- Noninvasive carotid flow studies
- Transcranial Doppler
- Electroencephalography (EEG)
- Electromyography (EMG)
- Nerve conduction studies, evoked potential studies
- Lumbar puncture, Queckenstedt test, and analysis of cerebrospinal fluid