

N201 – Special Populations  
Newborn Neurological

- I. Anencephaly- Neural tube defect
  - Brain does not fully develop, absence of the cerebral hemispheres
  - Could have a brainstem, but they don't have forebrain or a cerebrum
  - Incompatible with life- born with exposed neural tissue
  - Could be r/t a folic acid deficiency vs genetic / environmental factors
  
- II. Encephalocele- Neural tube defect
  - Portion of brain and meninges protrudes through opening in skull, covered with skin
  - Severity can vary depending on size and location and what is involved
  - Treatment needed to remove fluid filled sac, replace contents of brain/meninges and repair opening in the skull
  
- III. Chiari Malformation
  - Structure defects in base of the skull. Brain tissue (cerebellum) squeezed downward
  - Part of skull is abnormally small or misshapen, pressing on brain forcing it downward
  - S/S- may have none, may have neck pain, balance issues, weakness and lower limb spasticity, dizziness, tinnitus, vomiting, headaches
  - Treatment- surgery to remove small section of the bone, relieving pressure. Posterior fossa decompression
  
- IV. Hydrocephalus
  - CSF collects in an abnormal pattern in the brain. Imbalance of the production and absorption of CSF in the ventricular system of the brain.
  - Can cause ventricles to enlarge in the brain and increases pressure on brain
  - Two Types
    - Communicating hydrocephalus- nonobstructive, impaired absorption of the CSF within the subarachnoid space, or malfunction of the structures that drain CSF
    - Non-communicating hydrocephalus- obstructive, the flow of CSF through the ventricular system is blocked
  - Causes: Congenital or Acquired Hydrocephalus
    - Tumors, developmental malformations, infection, trauma
  - Clinical Manifestations
    - may be present prenatally or in the first few weeks/months of life
    - most obvious sign: head size increase
    - bulging fontanel
    - eyes rotate downward
    - Pupils- sluggish/unequal response to light
    - Signs of increasing ICP-
  - Diagnosis
    - head circumference abnormalities or rapid increase in size
    - CT/MRI
    - transillumination
  - Therapeutic management
    - must be recognized early for treatment

- o Surgical - bypass the point of obstruction by shunting fluid to another point of absorption
    1. Shunt drains CSF from the ventricles to extracranial compartment (usually peritoneum)
    2. VP= ventriculoperitoneal shunt
      - A small hole is drilled in the skull. A thin tube called a catheter is passed into a ventricle of the brain
      - Another catheter is placed under the skin behind the ear. It is sent down the neck and chest, and usually into the belly or chest area. The doctor may make a small cut in the neck to help position it.
      - A valve (fluid pump) is placed underneath the skin behind the ear. The valve is connected to both catheters. When extra pressure builds up around the brain, the valve opens, and excess fluid drains through the catheter into the belly or chest area. This helps lower intracranial pressure.
    3. Endoscopic Third Ventriculostomy- Small opening made in floor of 3<sup>rd</sup> ventricle that allows CSF to flow more freely
      - o problems with shunts= infection, outgrowing the shunt, blockages, malfunctions
  - Nursing Considerations for Pre/Post Shunt surgery
    - o Pre-op-
    - o Post op-
    - o Family Considerations/Teaching-
- V. Spina Bifida/ Myelodysplasia
- Spina Bifida- midline defects involving failure of the spine to close. Categorized by two types:
    - o spina bifida occulta
    - o spina bifida cystica
  - Spina Bifida Occulta
    - o Occurs when the posterior laminae of vertebrae fail to fuse (most often L5 S1) Defect is not visible externally.
    - o S&S: may not be able to detect problem. Could have skin manifestations thought such as dimpling, tuft of hair, lipoma, possible neuromuscular issues- weakness/bowel bladder issues
    - o Treatment: depends on case severity and if nerves involved.
  - Spina Bifida Cystica
    - o Visible defect of the spinal canal/cord with an external sac protrusion
    - o 2 major forms:
      1. meningocele –contains meninges and spinal fluid but no neural elements. Usually has no neurological deficits.
      2. myelomeningocele or meningomyelocele - contains meninges, spinal fluid and nerves. Spinal cord, meninges and nerves protrude through the vertebrae. The spinal cord often ends at the site of the defect
        - motor and sensory function is absent beyond that point
        - lower motor neuron damage flaccidity
        - lack of bowel control

- could have associated deformities of joints
- Therapeutic Management
  - Initial Care- Protecting the sac from trauma, avoid rectal temperatures
  - Prevention of infection for the sac
  - Positioning off of the affected area- prone at all times
  - Early surgical closure for most favorable outcome
- Multidisciplinary Care
- Orthopedic Considerations- achieve best possible ambulatory function, early PT
- GU function
  - neurogenic bladder will require a clean cath intermittently, skin care, UTI education
- Bowel Control
  - fecal incontinence will require diet modification, regular toileting, good skin care
- Nursing Considerations
  - Delivery of affected infant
  - Dressings to external cyst: NS moist non-adherent dressing needed
  - Positioning- prone
  - Post-operative care- observe for s/s infection, urine and stool output, wound care per MD orders, movement of extremities, vital signs
- Family considerations
  - Teaching- avoid latex could be hypersensitive, ROM activities at home
  - Spina Bifida Association of America resource
  - Folic acid for future pregnancies