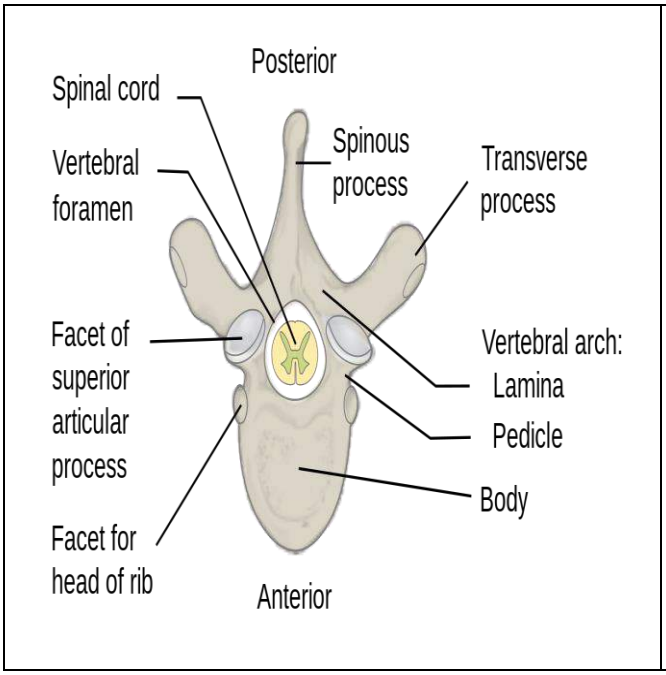
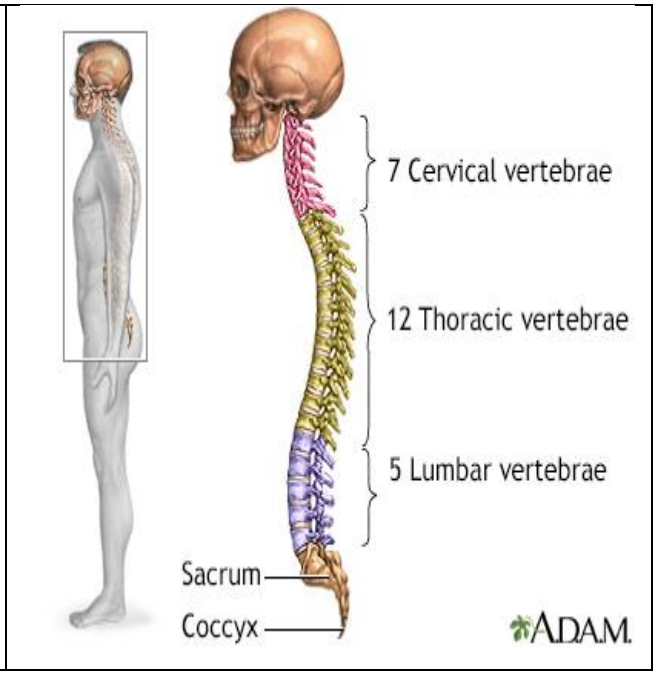
Nursing care of Neurological dysfunction

1. Spina Bifida

Spina bifida is part of a group of birth defects called neural tube defects.

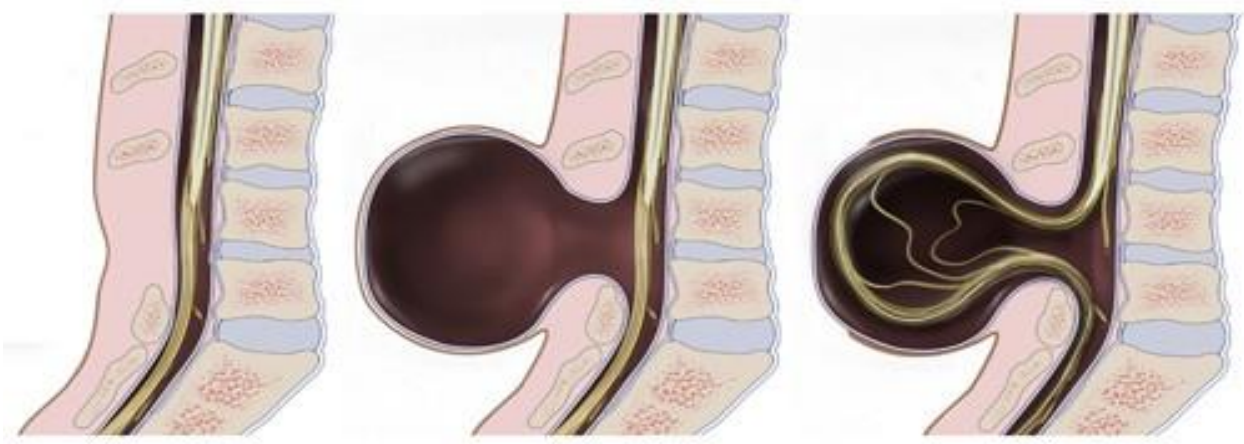
Caused by a defect in the neural arch generally in the lumbosacral region, spina bifida is a failure of the posterior laminae of the vertebrae to close; this leaves an opening through which the spinal meninges and spinal cord may protrude.





Clinical features:

a. Not visible externally.
b. Occurs most commonly in the lumbosacral area (L5 and S1).
c. Indicate that the disorder may occur in as many as 10% to 30% of the general population.
d. Skin depression or dimple.
a. Dark tufts of hair
b. Soft, subcutaneous lipomas.
e. These signs may be absent, appear singly, or be present in combination.
f. Progressive disturbance of gait with foot weakness.
g. Bowel and bladder sphincter disturbances.



Spina bifida occulta Meningocele Myelomeningocele

Causes:

1. **Low folic acid intake**.

Research indicates Folate can reduce the incidence of neural tube defects by about 70% and can also decrease the severity of these defects when they occur.

2. **Genetics**.

If a woman gives birth to a baby with spina bifida, she has a higher-than-normal risk of having another baby with spina bifida too (about 5% risk)

Certain medications.

Some medications, such as some for treating epilepsy or bipolar disorder have been associated with a higher risk of giving birth to babies with congenital defects, such as spina bifida.

3. **Diabetes.**

Women with diabetes are more likely to have a baby with spina bifida, compared to other females.

4. **Obesity.**

Obese women, those whose BMI (body mass index) is 30 or more have a higher risk of having a baby with spina bifida. The higher the woman's BMI is over 30, the higher the risk.

Surgical management

Surgery is required to close the open defect but may not be performed immediately, depending on the surgeon's decision.

Prenatal surgery.

In this procedure — which takes place before the 26th week of pregnancy — surgeons expose a pregnant mother's uterus surgically, open the uterus and repair the baby's spinal cord.

Nursing Interventions

Prevent infection.

Monitor the newborn's vital signs, neurologic signs, and behavior frequently; administer prophylactic antibiotic as ordered; carry out routine aseptic technique; cover the sac with a sterile dressing moistened in a warm sterile solution and change it every 2 hours; the dressings may be covered with a plastic protective covering.

Promote skin integrity.

Placing a protective barrier between the anus and the sac may prevent contamination with fecal material, and diapering is not advisable with a low defect.

Proper positioning of the newborn.

Maintain the newborn in a prone position so that no pressure is placed on the sac; after surgery, continue this positioning until the surgical site is well healed.

Promote family coping.

Be especially sensitive to their needs and emotions; encourage family members to express their feelings and emotions as openly as possible; provide privacy as needed for the family to mourn together over their loss; encourage the family members to cuddle and touch the newborn using proper precautions for the safety of the defect.

Provide family teaching.

Give family members information about the defect and encourage them to discuss their concerns and ask questions; provide information about the newborn's present state, the proposed surgery, and follow-up care; information shall be provided in small segments to facilitate comprehension; after the surgery, teach the family to hold the newborn's head, neck, and chest slightly raised in one hand during feeding; also teach them that stroking the newborn's cheeks helps stimulate sucking.

1. Hydrocephalus

Hydrocephalus can be defined broadly as a disturbance of cerebrospinal fluid (CSF) formation. flow, or absorption, leading to an increase in volume occupied by this fluid in the central nervous system.

This condition could also be termed a hydrodynamic CSF disorder

There are two types of hydrocephalus:

1-**Noncommunicating.**
In the noncommunicating type of congenital hydrocephalus, an obstruction occurs in the free circulation of CSF.
2-**Communicating**.
In the communicating type of hydrocephalus, no obstruction of the free flow of the CSF exists between the ventricles and the spinal theca; rather, the condition is caused by defective absorption of CSF, thus causing increased pressure on the brain or spinal cord.

Causes

a. **Causes usually are genetic factors and how the fetus develops.**
b. **Obstruction.** The most common problem is a partial obstruction of the normal flow of CSF, either from one ventricle to another or from the ventricles to other spaces around the brain.
c. **Poor absorption.** Less common is a problem with the mechanisms that enable the blood vessels to absorb CSF; this is often related to inflammation of brain tissues from disease or injury.
d. **Overproduction.** Rarely, the mechanisms for producing CSF create more than normal and more quickly than it can be absorbed

Clinical features

Clinical features of hydrocephalus are influenced by the patient's age, the cause of the hydrocephalus, the location of the obstruction, its duration, and its rapidity of onset.

Infant to 2 years:
(Poor feeding, Large head, bulging of the anterior fontanels, Setting sun sign, High-pitched cry, & Irritability).

Older Children:

1. Changes in head size less common.
2. Signs of increased ICP (projectile vomiting, ataxia, headache).
3. Alteration in consciousness.

Medications

Diuretics: Acetazolamide (ACZ) and furosemide (FUR).

Anticonvulsants &Antibiotics.

Surgical intervention

is the only effective means of relieving brain pressure and preventing additional damage to the brain tissue Surgery. Surgical treatment is the preferred therapeutic option in patients with hydrocephalus.

Ventriculoperitoneal (VP) shunt. A ventriculoperitoneal (VP) shunt is a medical device that relieves pressure on the brain caused by fluid accumulation.

Ventriculoatrial (VA) shunt. Ventriculoatrial shunt placement enables cerebrospinal fluid (CSF) to flow from the cerebral ventricular system to the atrium of the heart.

Nursing interventions

Preventing injury.

At least every 2 to 4 hours, monitor the newborn's level of consciousness; check the pupils for equality and reaction and keep suction and oxygen equipment at the bedside.

Promoting skin integrity.

After a shunting procedure, keep the newborn's head turned away from the operative site until the physician allows a change in position; reposition the newborn at least every 2 hours, as permitted; inspect the dressings over the shunt site immediately after the surgery, every hour for the first 3 to 4 hours, and then at least every 4 hours

Nursing interventions for the newborn with hydrocephalus include:

Preventing infection.

Promoting growth and development.

Reducing family anxiety.

Providing family teaching.

3. Meningitis

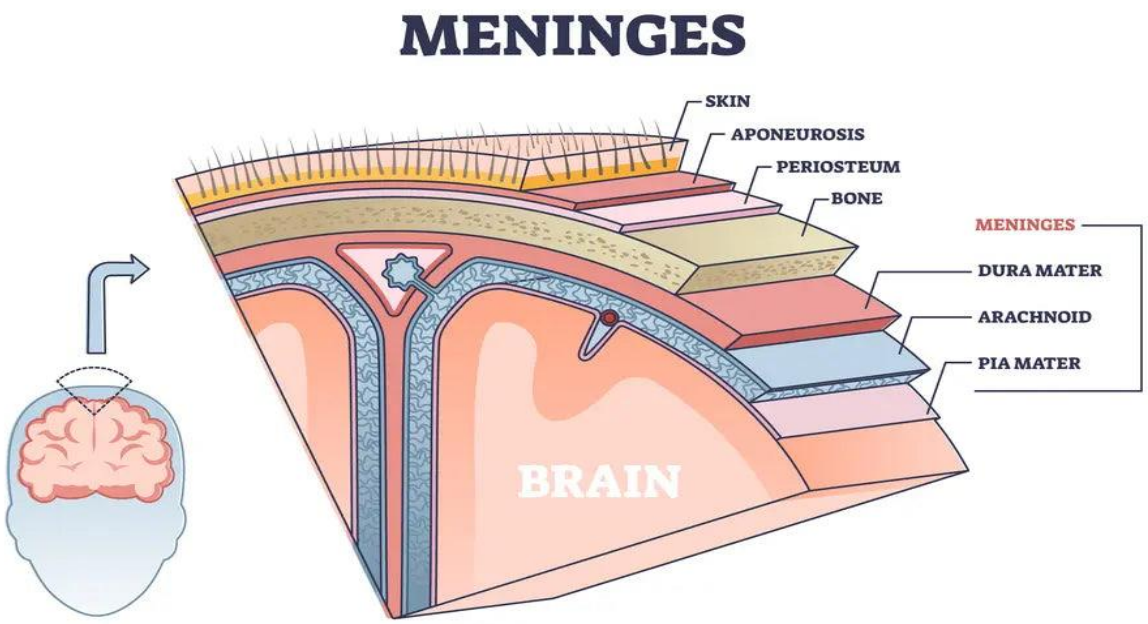
Meningitis is a clinical syndrome characterized by inflammation of the meninges, the three layers of membranes that enclose the brain and spinal cord.

These layers consist of the following:

-Dura – A tough outer membrane.

-Arachnoid – A lacy, weblike middle membrane.

- pia mater (Subarachnoid space) – A delicate, fibrous inner layer that contains many of the blood vessels that feed the brain and spinal cord.



Causes:

1. **Bacteria.** S pneumoniae, a gram-positive coccus, is the most common bacterial;
2. **Viruses.**

Enteroviruses account for of the majority of cases of aseptic meningitis in children; the **nonpolio enteroviruses** (NPEVs) account for approximately 90% of cases of viral meningitis in which a specific pathogen can be identified; **the mumps** virus is the most common cause of aseptic meningitis in unimmunized populations, occurring in 30% of all patients with mumps.

3. **Fungi.** &**Parasite**

Clinical features:

- **Fever, High-pitched cry, Lethargy & Neck stiffness.**
- **Seizures.** As bacterial meningitis progresses, patients of any age may have seizures
- **Neurologic symptoms.** Patients present with neurologic symptoms developing over 1-7 days.
- **Photalgia (photophobia).** Discomfort when the patient looks into bright lights

Nursing intervention:

1. **Assess neurologic status and vital signs constantly.**
2. **Assess blood pressure.**
3. **Rapid IV fluid replacement**
4. **Reduce high fever**
5. **Protect the patient from injury**