
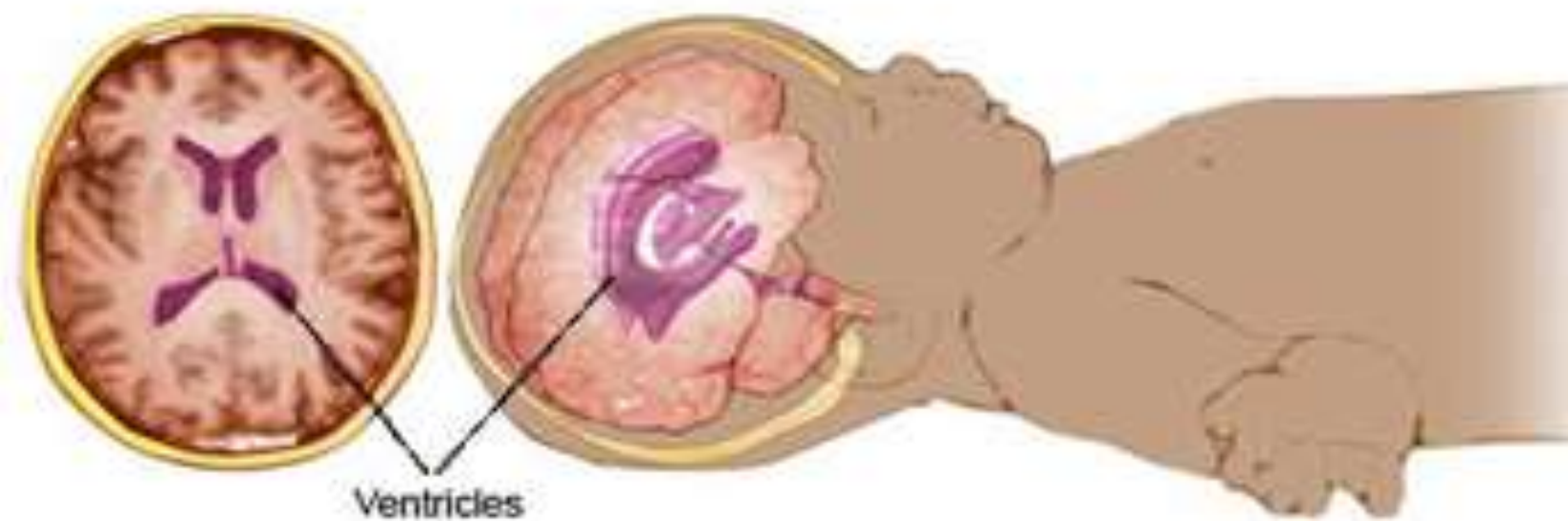


HYDROCEPHALUS

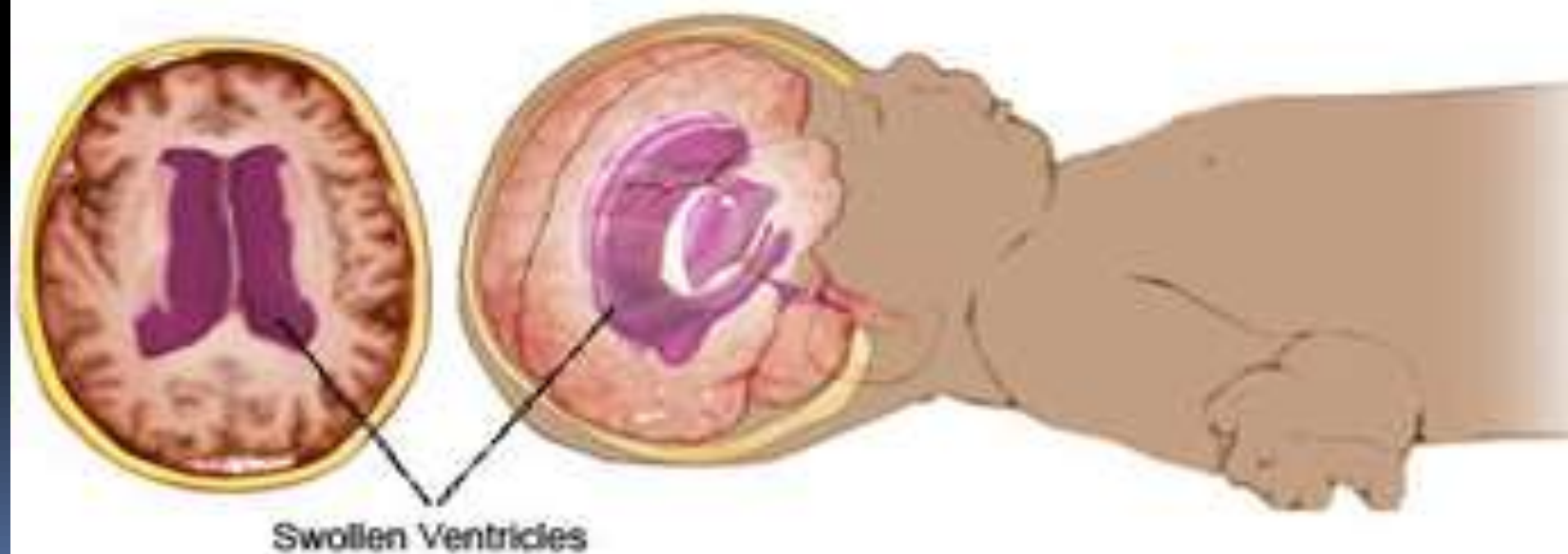


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- Hydrocephalus is the abnormal accumulation of CSF in the intracranial spaces
 - It occurs due to imbalance between production r absorption of CSF or due to obstruction of the CSF pathways.

Normal Brain and Ventricles



Hydrocephalus Brain



Etiology

Congenital causes:

- Intrauterine infections
- Congenital brain tumor obstructing CSF flow
- Intra cranial hemorrhage
- Congenital malformations

Acquired causes:

- Inflammation: meningitis, encephalitis
- Trauma: birth injury, head injury
- Space occupying lesions
- Degenerative atrophy of brain
- Arterio venous malformations

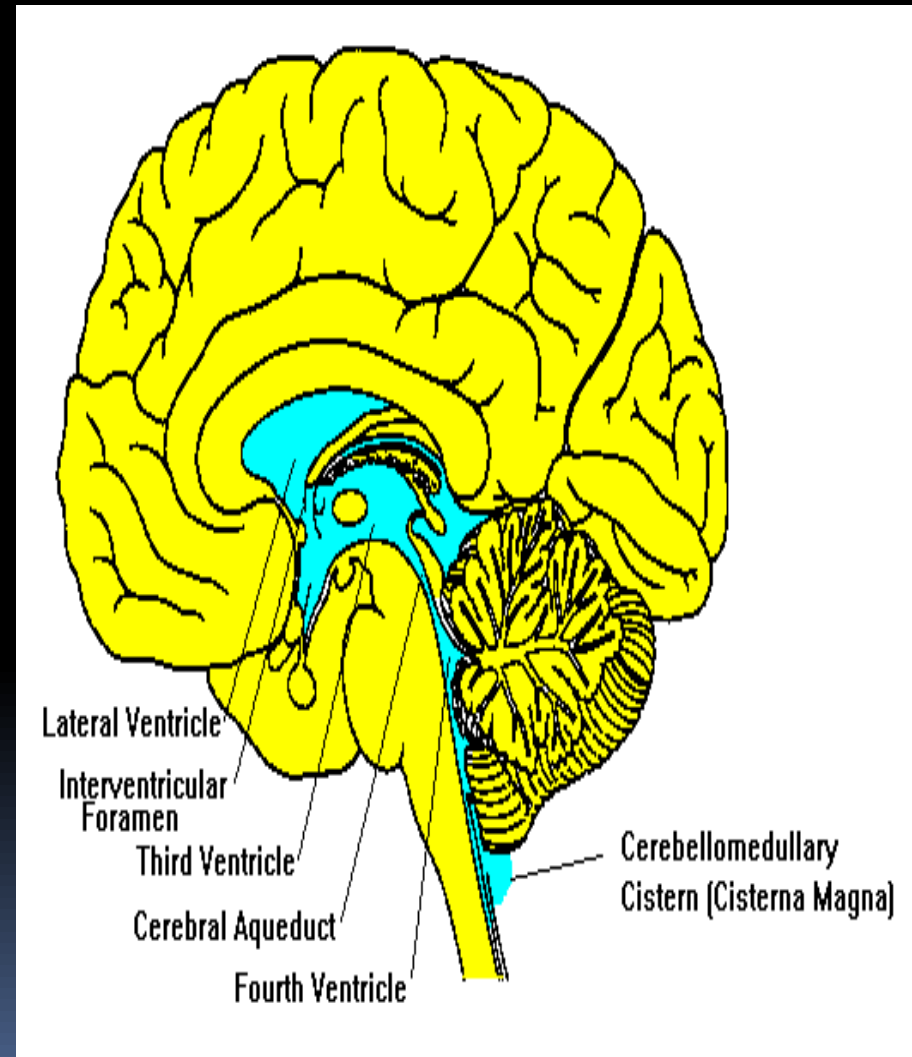


Types

- Two
 1. Communicating
 2. Non communicating
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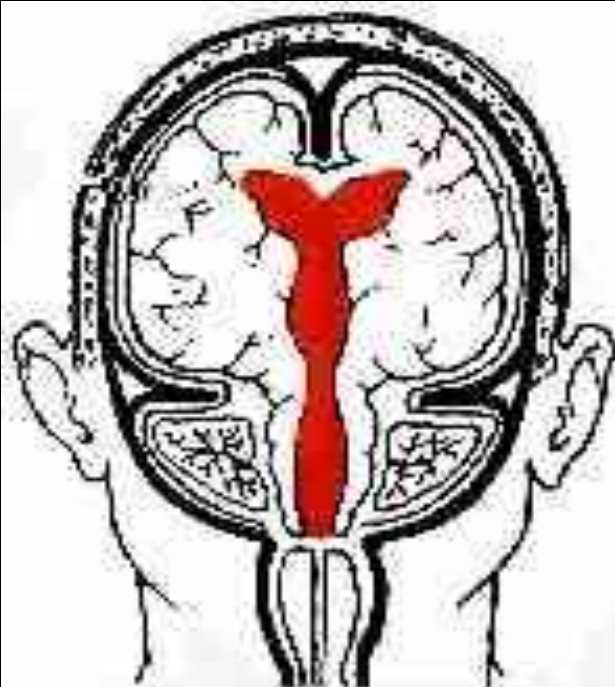
1. Communicating

- There is no blockage between ventricular system, the basal cisterns & the spinal subarachnoid space.
- There may be failure in the absorption of CSF or excessive production of CSF as in choroid plexus papilloma, pseudotumor cerebri etc.

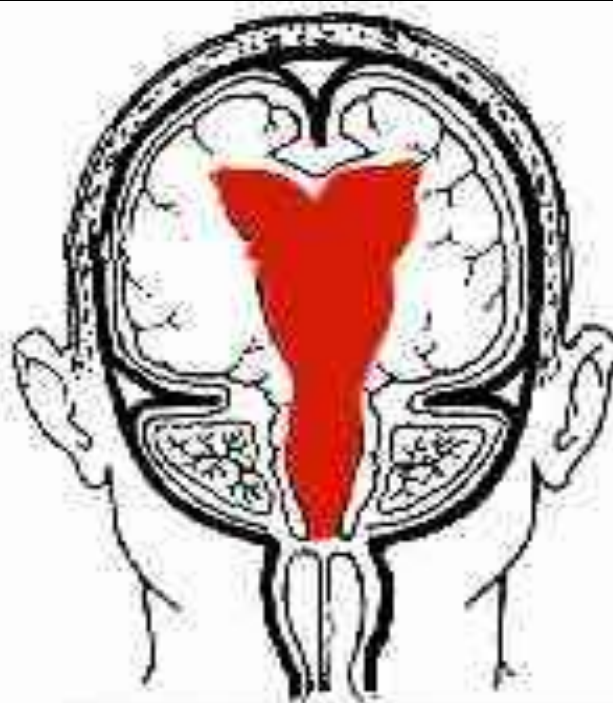


Non communicating

- There is obstruction at any level in the ventricular system, commonly at the level of aqueduct or at foramina.
- The obstruction may be partial, intermittent or complete.
- It develops mainly due to inflammation and developmental obstructive lesions.
- It occurs in majority of cases.



Normal ventricles




Enlarged ventricles

Modified from Iyooa Virtual Hospital

Pathophysiology

- 2 mechanisms by which CSF formed include:-
 - Secretion by the choroid plexuses
 - Lymphatic like drainage by the extracellular fluid of the brain.
- Hydrocephalus occurs as a symptom of an underlying brain disorder in either:-
 1. Impaired absorption of CSF within the subarachnoid space(communicating)
 2. Obstruction to the flow of the CSF within the ventricles (non communicating)

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- Any imbalance of secretion & absorption causes an increased accumulation of CSF in the ventricles, which become dilated & compress the brain substance against the surrounding rigid bony cranium.
 - When this occurs before fusion of the cranial sutures, it produces enlargement of the skull, as well as dilation of the ventricles.

C/M

INFANCY:

- Abnormally rapid head growth
- Bulging fontanel
- Dilated scalp veins
- Macewen sign
- Separated sutures
- Thinning of skull bones

LATER INFANCY:

- Frontal bossing
- Depressed eyes
- Setting sun sign
- Pupils sluggish
- Irritability
- Change in LOC
- Lethargy, poor sucking, feeding
- Cries when picked up

Bulging fontanelle






CHILDHOOD:

- Headache on awakening
- Palledema
- Strabismus
- Extraparamidal tract signs (ataxia)
- Irritability
- Lethargy, apathy
- Confusion, vomiting



Diagnosis

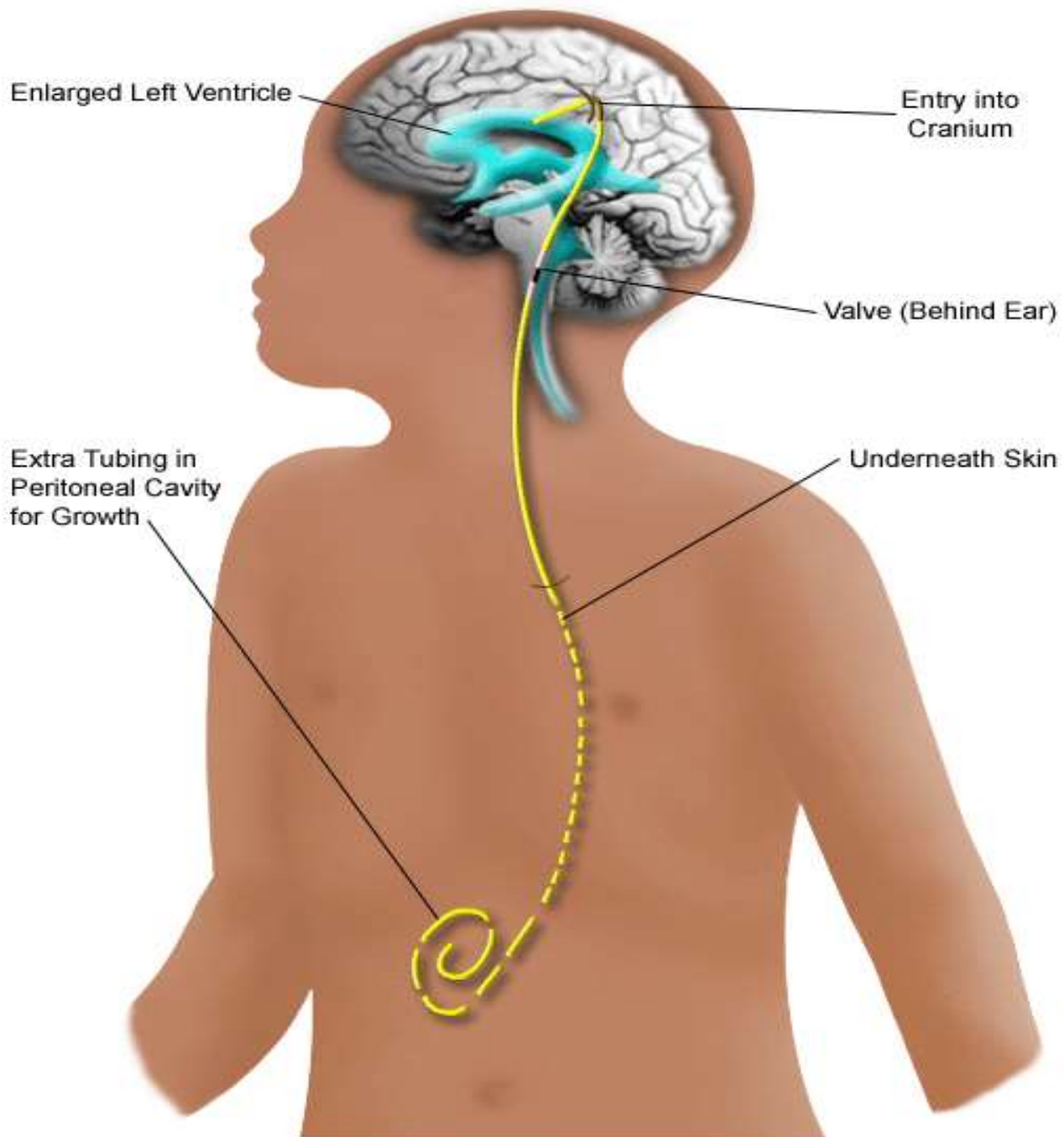
- Head enlargement : infancy
 - Head circumference
 - CT, MRI
 - Echoencephalography
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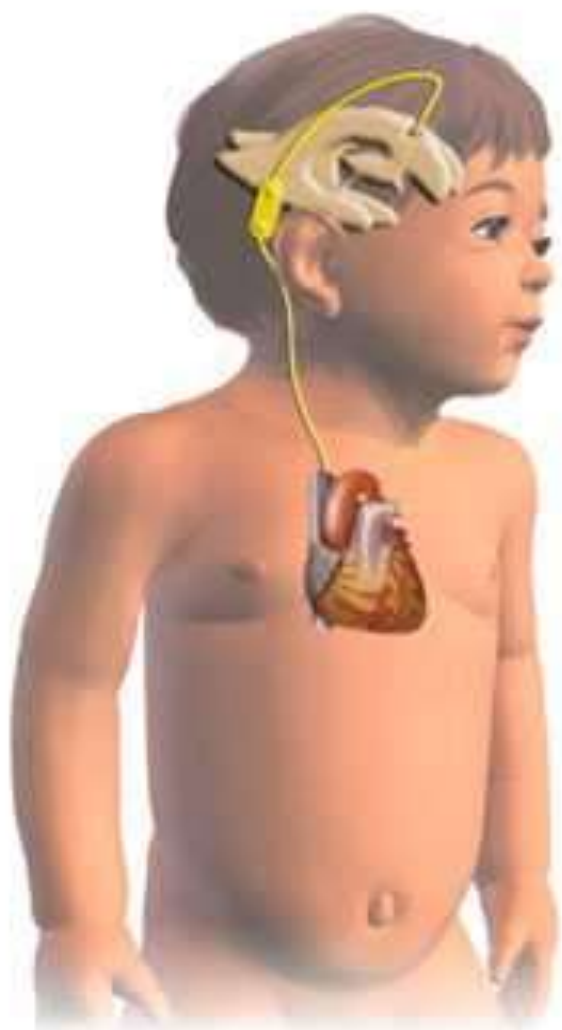
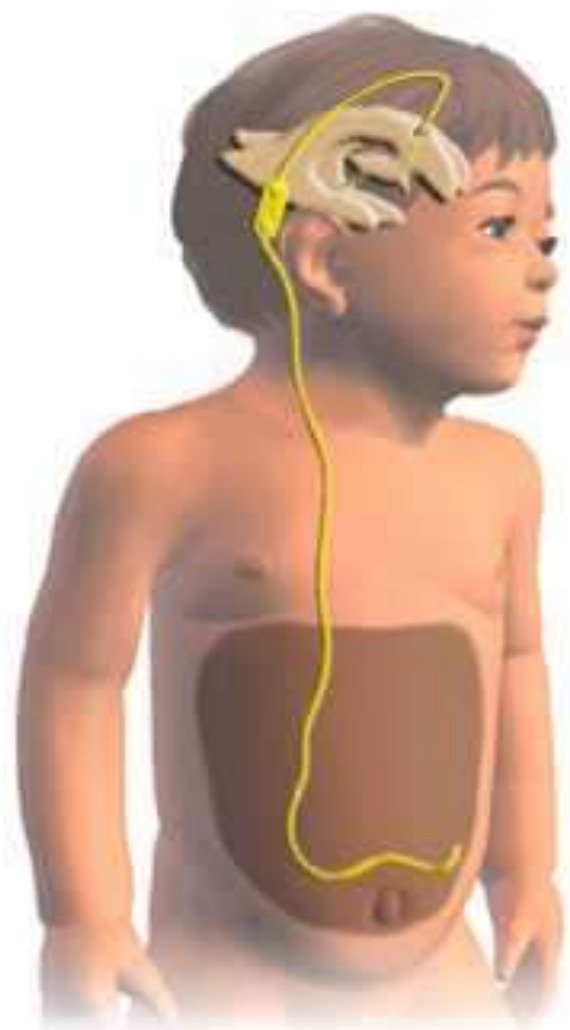
Management

- Removal of obstruction such as tumor
- Placement of a shunt
- Medical management to reduce ICP: carbonic anhydrase inhibitor, acetazolamide 50mg/kg/day to reduce CSF production.
- Surg: ventriculostomy
choroid plexectomy

- Intracranial or extracranial shunt is done to bypass the obstruction & to divert the CSF from the ventricular system to other compartment.
- Common extracranial shunt is ventriculoperitoneal shunt (V-P shunt)
- Other: ventriculoatrial shunt
ventriculopleural shunt
ventriculo gallbladder shunt


Ventriculoperitoneal Shunt Placement







Nursing management

- Measure head circumference
 - Check LOC, vitals, pupillary response, status of fontanel
 - Signs of increased ICP, incontinence of bladder & bowel.
- 



Nursing diagnoses


- Altered cerebral tissue perfusion rt to increased ICP
- Risk for impaired skin integrity rt to enlarged head.
- Anxiety rt to abnormal condition & surgery
- Risk for infection rt to introduction of infecting organism through the shunt
- Risk for fluid volume deficit rt to CSF drainage

Interventions

- Assess & manage increased ICP, assist in diagnostic procedures, take care of shunt.
- Provide adequate nutrition, exclusive breast feeding, older children – small feeds at frequent intervals
- Firm soft pillow under child's head, frequent change of position & keeping the area clean & dry. Good skin care & ROM exercise.
- Explanation, reassurance & encourage to express.



Cont;

- Aseptic techniques, eye care, mouth care, frequent hand washing.
 - Maintain fluid balance by IV therapy, I/O, NG feeding
 - Teach care of V-P shunt, inform parents about signs of increased ICP, which indicate shunt malfunctions.
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THANK YOU

