The function of the CSF

• The CSF acts like a “sink”, effectively flushing waste products as new fluid is secreted reabsorbed

• A constant CSF electrolyte composition helps maintain a stable medium for excitable cells (neurons)
Aqueductal stenosis

The normal aqueduct measures about 1 mm in diameter, and is about 11 mm in length.
Aqueductal stenosis

- Is the most common cause of congenital hydrocephalus (43%)
  - Aqueduct develops about the 6th week of gestation
  - M:F = 2:1
  - Other congenital anomalies (16%): thumb deformities
  - Prognosis: 11-30% mortality
Etiology of aqueductal stenosis

- Extrinsic Pathology of the Aqueduct:
  - Infectious. Abscesses.
  - Neoplastic. Pineal tumors, brainstem gliomas, medulloblastoma, ependymoma.
  - Vascular. AVM, aneurysm, Galen aneurysm.
  - Developmental. Arachnoid cysts.
Treatment of hydrocephalus

• The two most commonly used shunt systems are the ventriculoatrial (VA) and ventriculoperitoneal (VP) shunts. The VP shunt is most commonly used as it is simpler to place, extra tubing may be placed in the peritoneum and the consequences of infection are less.
Shunt malfunction

• If left untreated, shunt malfunction or infection is associated with high morbidity and mortality rates. Most patients with these complications have subtle presentations and nonspecific signs, despite elevated ICP or CNS infection. The workup includes a focused review of records, information from the patient’s family or caretaker, and elements of a unique examination to supplement routine work-up of the patient with a ventricular shunt. A shunt series and head CT scan are part of the initial evaluation. Empiric antibiotic therapy is initiated to cover Gram-positive organisms, predominantly *S. epidermidis*, as well as the less common Gram-negative and anaerobic organisms responsible for shunt infections.