

Cerebrospinal Fluid (CSF)

Cerebrospinal fluid (CSF) is a clear, colorless fluid that surrounds the brain and spinal cord. It plays critical roles in mechanical protection, metabolic support, and intracranial pressure regulation.

□ Composition

Component	Normal Value
Volume (adult)	140 – 270 mL
Opening pressure	10 – 20 cmH ₂ O
pH	~7.33
Glucose	45 – 80 mg/dL
Protein	15 – 45 mg/dL
WBC	0 – 5 cells/μL (lymphocytes)

□ Functions

- Mechanical cushion: protects brain and spinal cord from trauma.
- Buoyancy: reduces the effective weight of the brain.
- Metabolic exchange: removes waste and delivers nutrients.
- Intracranial pressure (ICP) buffer.
- Immune surveillance.

□ Circulation Pathway

1. Produced in the **choroid plexus** of the lateral, third, and fourth ventricles.
2. Flows:
 1. Lateral ventricles → Foramina of Monro →
 2. Third ventricle → Aqueduct of Sylvius →
 3. Fourth ventricle → Foramina of Luschka and Magendie →
 4. Subarachnoid space → Arachnoid villi → Superior sagittal sinus.

□ Clinical Relevance

Lumbar Puncture (LP)

- Diagnostic tool for infection, bleeding, or demyelinating disease.
- Normal pressure: 10–20 cmH₂O in lateral decubitus position.
- Contraindicated in patients with raised ICP and midline shift.

Hydrocephalus

- Excess accumulation of CSF.
- Classified as:
 1. Communicating
 2. Non-communicating (obstructive)
 3. Normal pressure hydrocephalus

CSF Shunting

- Types: Ventriculoperitoneal (VP), ventriculoatrial, lumboperitoneal
- Indications: hydrocephalus, CSF pseudocysts, Dandy-Walker malformation

CSF Leak

- Can be spontaneous or traumatic/post-surgical.
- Clinical signs: rhinorrhea, otorrhea, low-pressure headache.
- Diagnosed via beta-2 transferrin test and imaging (CT/MRI cisternography).

□ Related Topics

- [intracranial_pressure_monitoring](#)
- [hydrocephalus](#)
- [lumbar_puncture](#)
- [shunt_malfunction](#)

From:

<https://neurosurgerywiki.com/wiki/> - **Neurosurgery Wiki**

Permanent link:

https://neurosurgerywiki.com/wiki/doku.php?id=cerebrospinal_fluid

Last update: **2025/05/27 19:47**

