

Cerebrospinal fluid is a specialised extracellular fluid

located in the ventricles, spinal central cord canal and the subarachnoid space.

Its normal volume is 150ml (2ml/kg)

It is isotonic with respect to plasma

Has increased CO₂, increased sodium and chloride, reduced K, Ca and Mg and almost no proteins

It provides mechanical support (brain's relative weight changes from 1400g to 50g), a mechanical buffer in the setting of raised ICP, an isotonic bath, and has important roles in acid-base regulation

Formation

Occurs in choroid plexus (70%)
endothelial cells lining ventricles and capillaries (30%)

Process of ultra filtration (through the BBB)
secretion (via active transport)

Dependent on cerebral perfusion pressure

Formation is relatively constant within normal physiological parameters

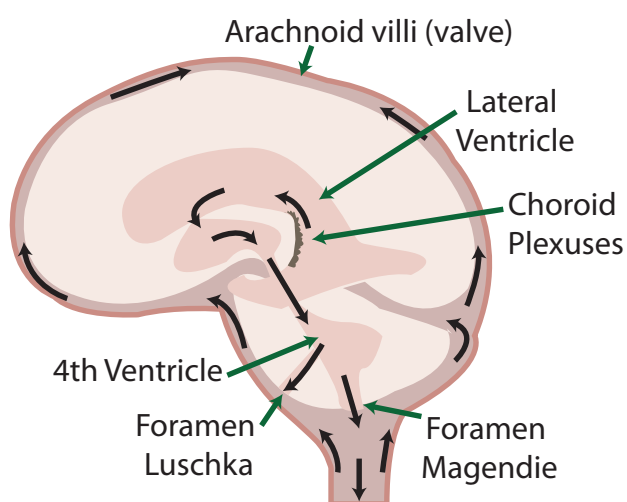
Daily production is approximately 500ml, representing a turnover of 3-4 times

Flow

Is determined by the pressure in the lateral ventricles (normally 10-15mmHg)

Cilia direct flow towards the fourth ventricle

Flow terminates at the arachnoid villi which act as pressure valves



Absorption

Occurs in the arachnoid villi and granulations

These act as valves and prevent backflow

These valves widen with raised ICP and this is the main regulatory mechanism for volume control