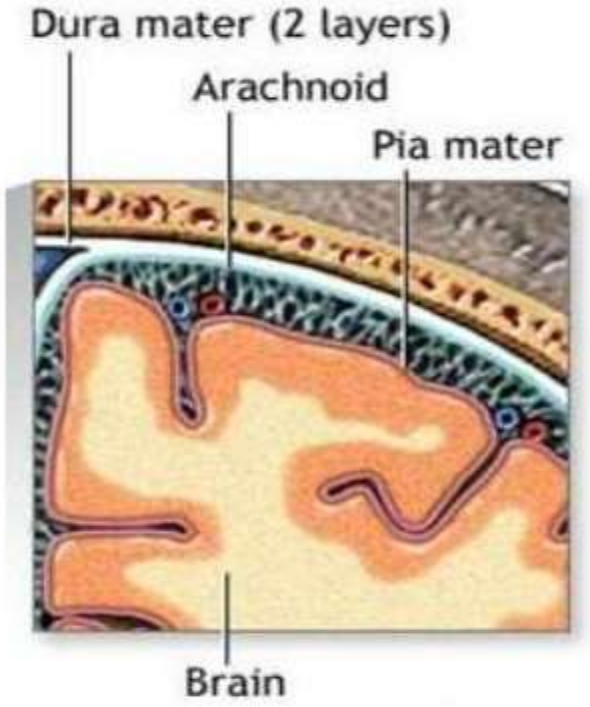
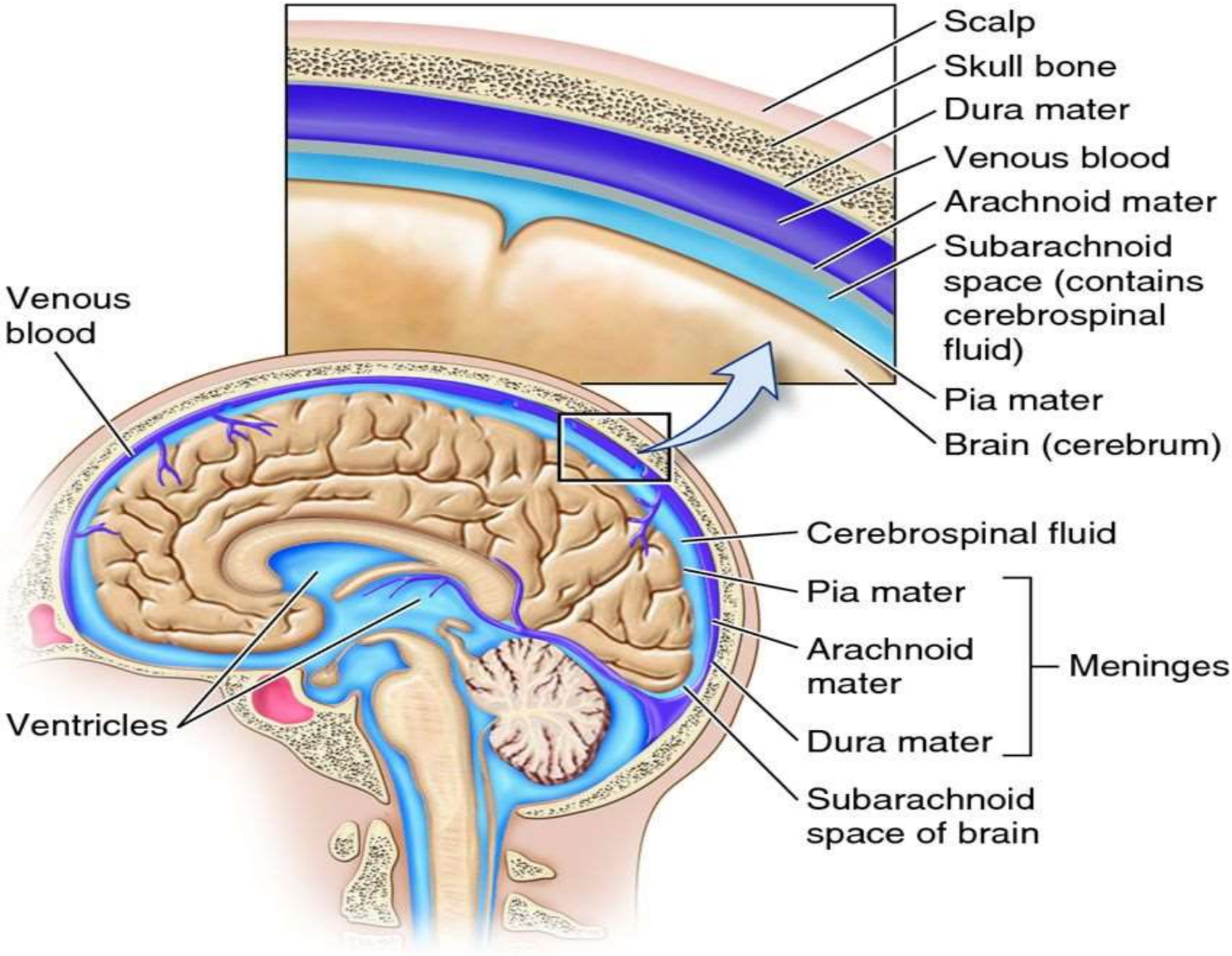
Cerebrospinal fluid C.S.F.

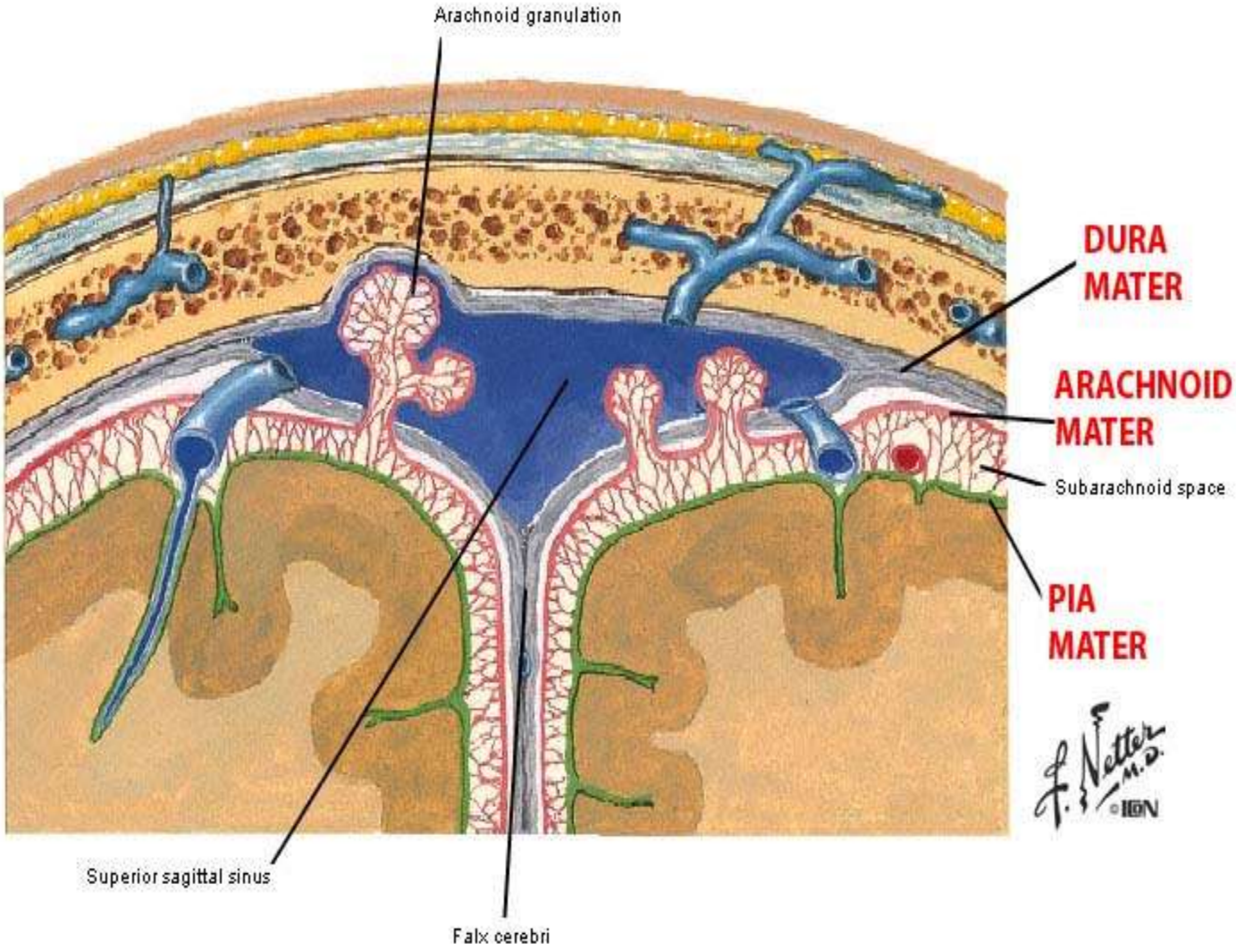
The Meninges

- The Meninges are the membrane covering the brain and spinal cord.
- The Meninges consist of three membranes:

1. The dura mater,
2. The arachnoid mater,
3. The pia mater.




Scalp
Skull bone
Dura mater
Venous blood
Arachnoid mater
Subarachnoid space (contains cerebrospinal fluid)
Pia mater
Brain (cerebrum)
Venous blood
Cerebrospinal fluid
Pia mater
Arachnoid mater
Dura mater
Meninges
Subarachnoid space of brain
Ventricles


Arachnoid granulation
DURA MATER
ARACHNOID MATER
Subarachnoid space
PIA MATER
Superior sagittal sinus
Falx cerebri
F. Netter M.D.
©IGN

Origin of C.S.F.

Originated in choroid plexus of third ventricle in the brain .

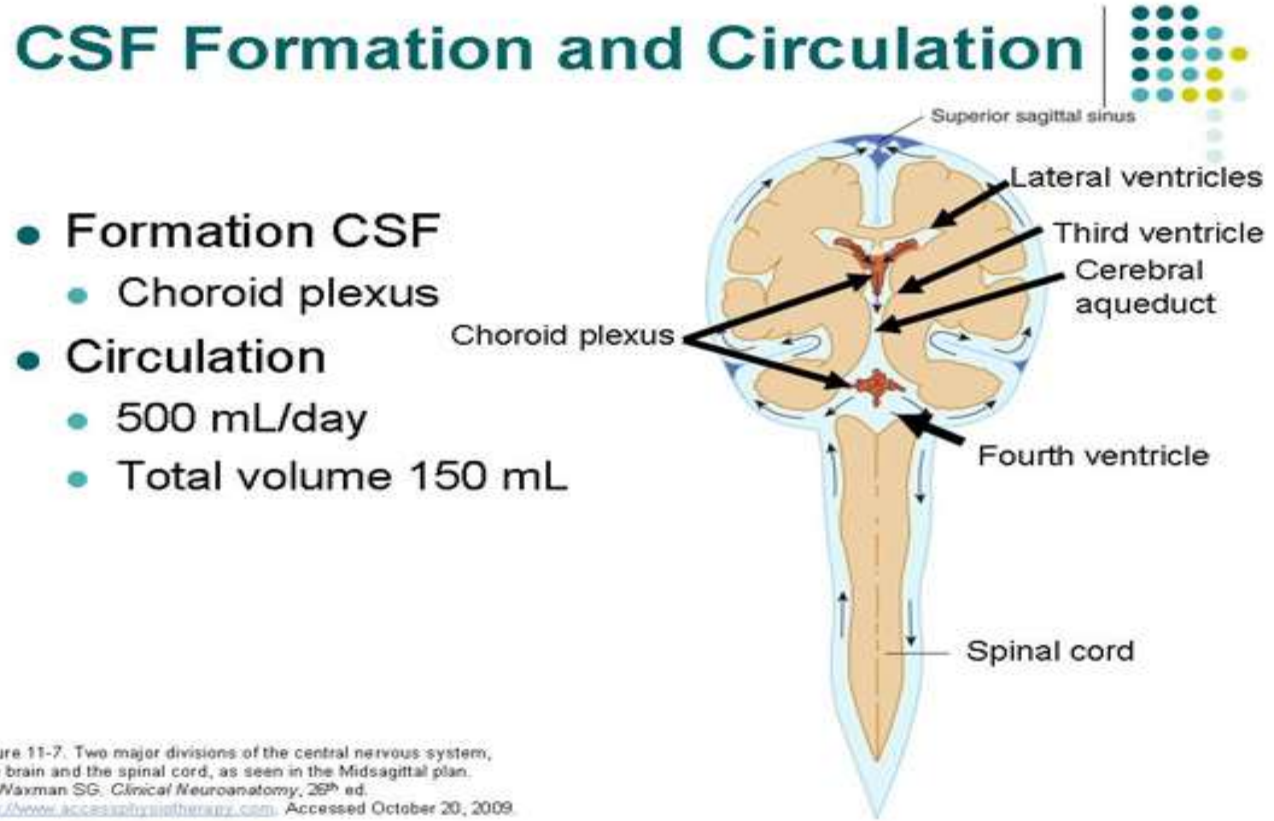
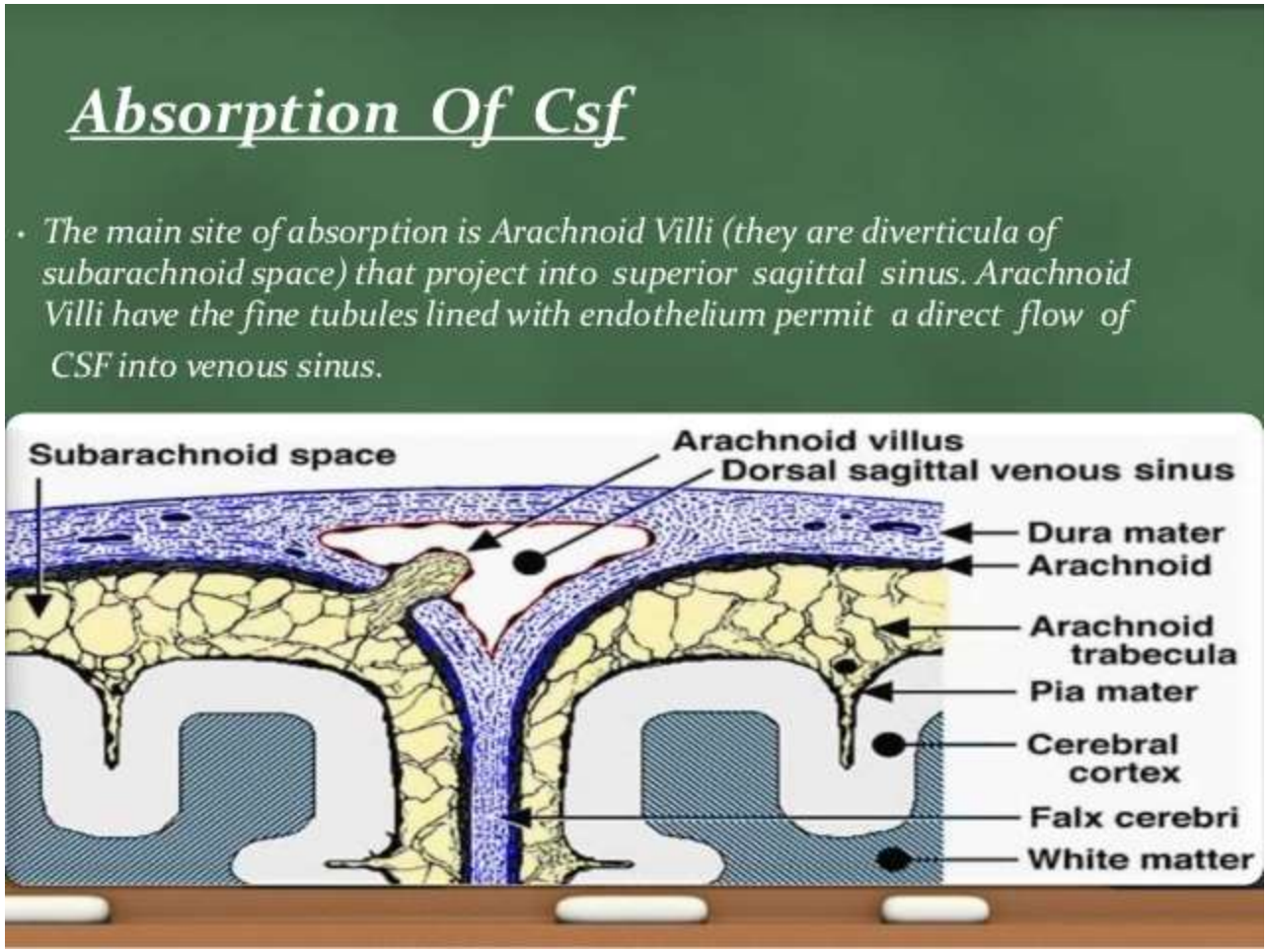


Figure 11-7. Two major divisions of the central nervous system, the brain and the spinal cord, as seen in the Midsagittal plan. In: Waxman SG. *Clinical Neuroanatomy*, 26th ed. http://www.accessphysiotherapy.com. Accessed October 20, 2009.

Drainage of C.S.F:

It occur by the villi of subarchanoid spaces



COMPOSITION OF CSF

Proteins(Less than plasma)=20-40 mg/100 ml

Glucose(Less than plasma)=50-65 mg/100 ml

Cholesterol=	0.2 mg/100 ml
Na+(more)=	147 meq/Kg H2O
Cl+(more) =	
Ca+(less) =	2.3 meq/kg H2O
Urea(less) =	12.0 mg/100 ml
Creatinine =	1.5 mg/100 ml
Lactic acid =	18.0 mg/100 ml

Function of the CSF :

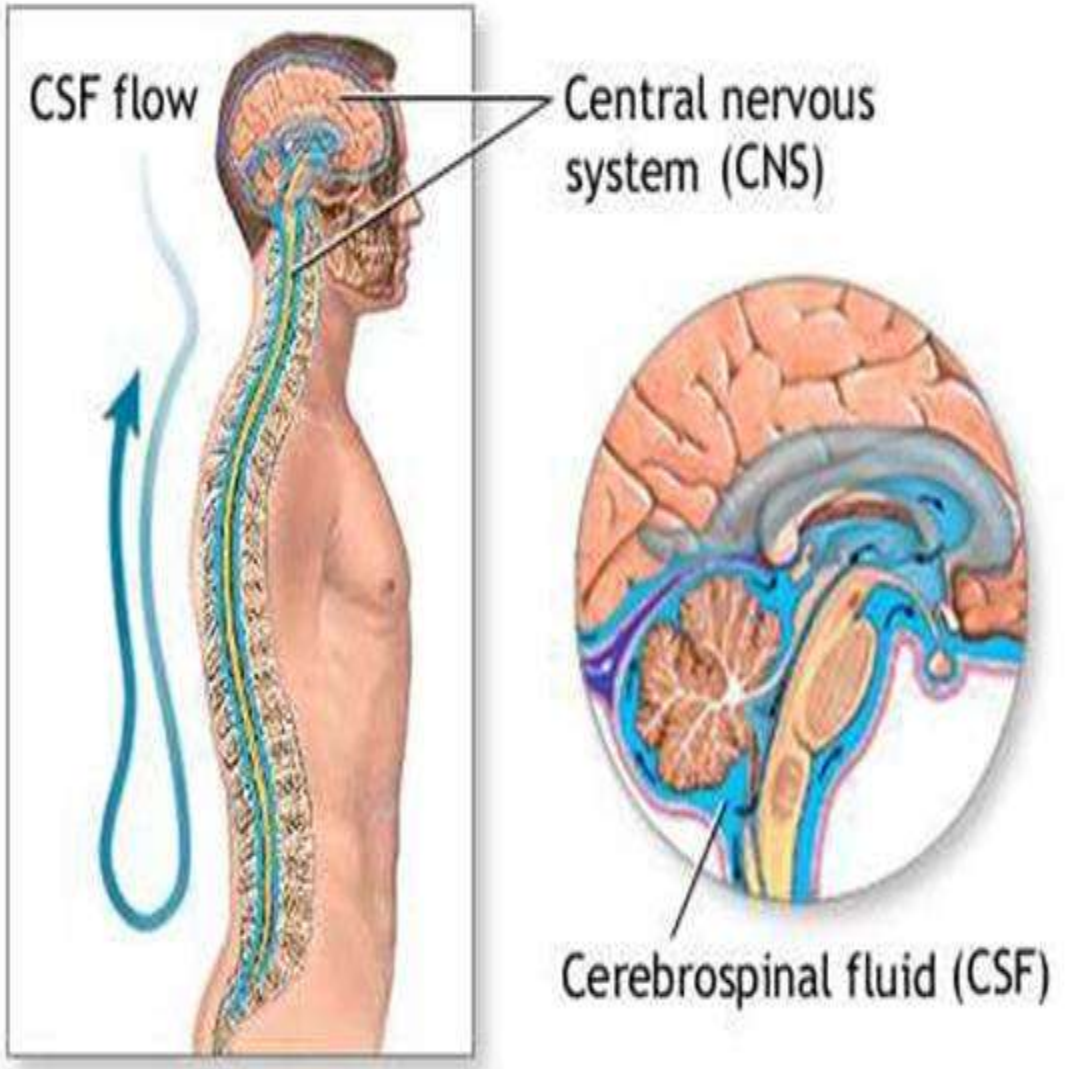
1. Cushions & protects the CNS from trauma
2. Provides mechanical buoyancy & support for the brain
3. Serves as a reservoir & assists in the regulation of the contents of the skull
4. Nourishes the CNS
5. Removes metabolites from the CNS
6. Serves as a pathway for pineal secretions to reach the pituitary gland

Pressure exerted by CSF

- Varies in different position:
  - Lateral recumbent position = 10-18 cm of H_2O
  - Lying position = 13 cm of H_2O
  - Sitting position = 30 cm of H_2O

Coughing and crying increases the pressure by decreasing the absorption.

Compression of internal jugular vein also raises the CSF pressure.


CSF flow
Central nervous system (CNS)
Cerebrospinal fluid (CSF)
A.D.A.M.

Other special fluid in the body are:

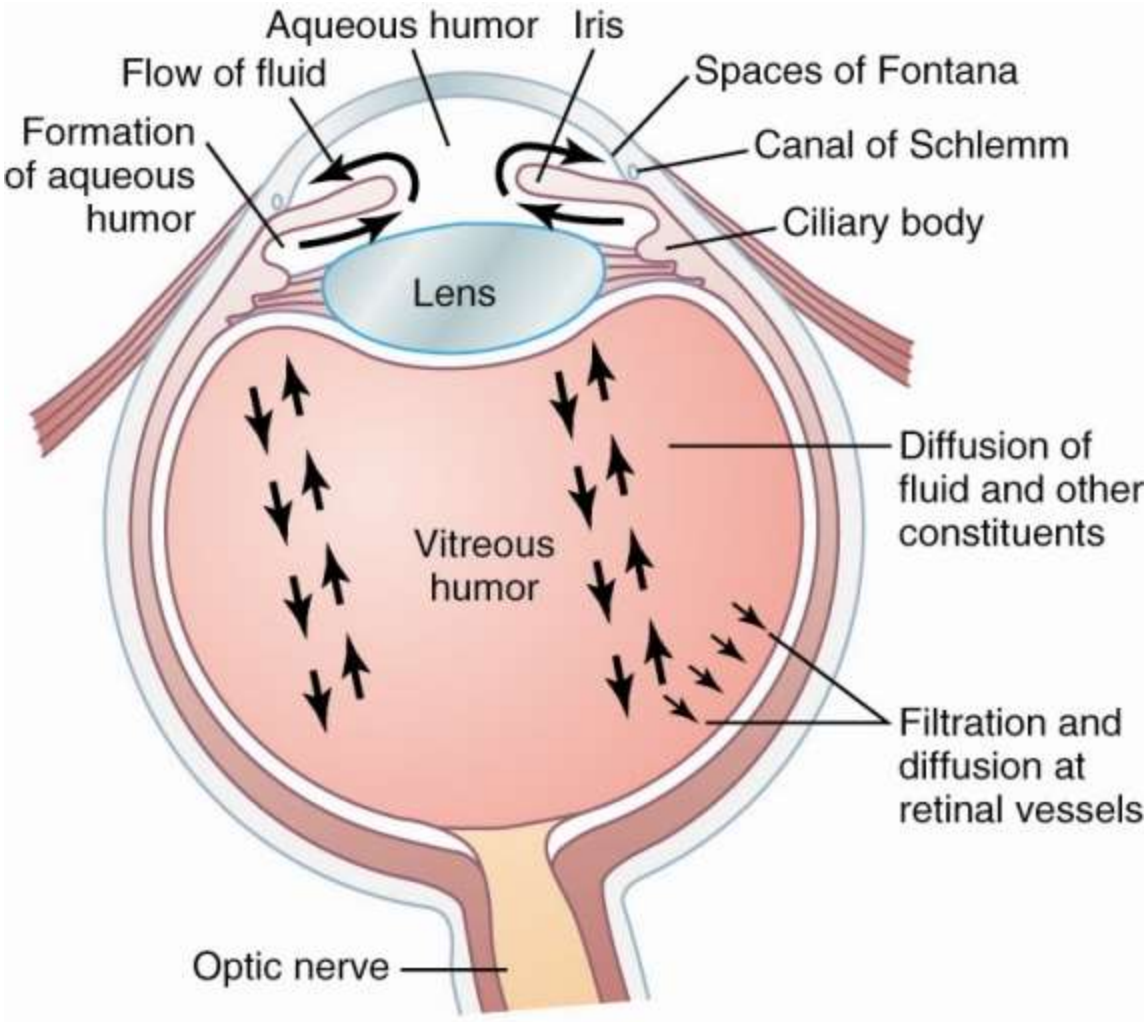
***synovial fluid:** synovial cavity contain large amount of proteoglycan, its Origen is not known but believed from surrounding connective tissue. The synovial fluid facility the sliding of two end bones over each other.**


Bone
Muscle
Synovium
Synovial
Fluid
Cartilage
Tendon

***Intraocular fluid:** **the eyes are filled with intraocular fluid which maintained sufficient pressure in eye ball to keep it distended.**

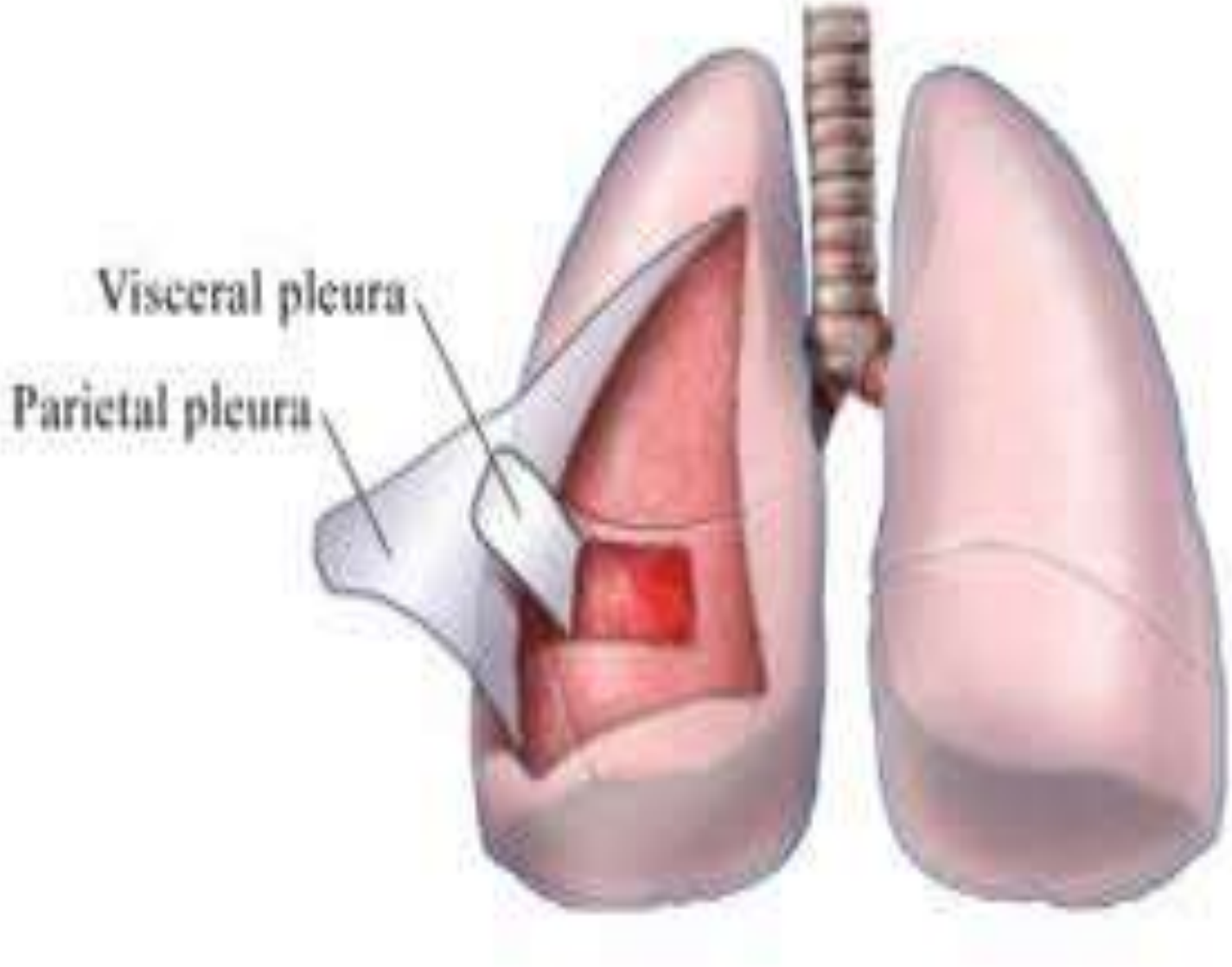
It divided into two portions:

Aqueous humor which lies in front of lens and its always fluid and in continuous formed and reabsorb.


Aqueous humor
Iris
Flow of fluid
Spaces of Fontana
Formation of aqueous humor
Canal of Schlemm
Ciliary body
Lens
Diffusion of fluid and other constituents
Vitreous humor
Filtration and diffusion at retinal vessels
Optic nerve

Vitreous humor: between lens and retina and it is gelatinous mass.
Increase ocular pressure lead to glaucoma.

***pleural fluid: between two layer of pleural membrane, facilitate the sliding of two layer over each other during inspiration and expiration.**


Visceral pleura
Parietal pleura