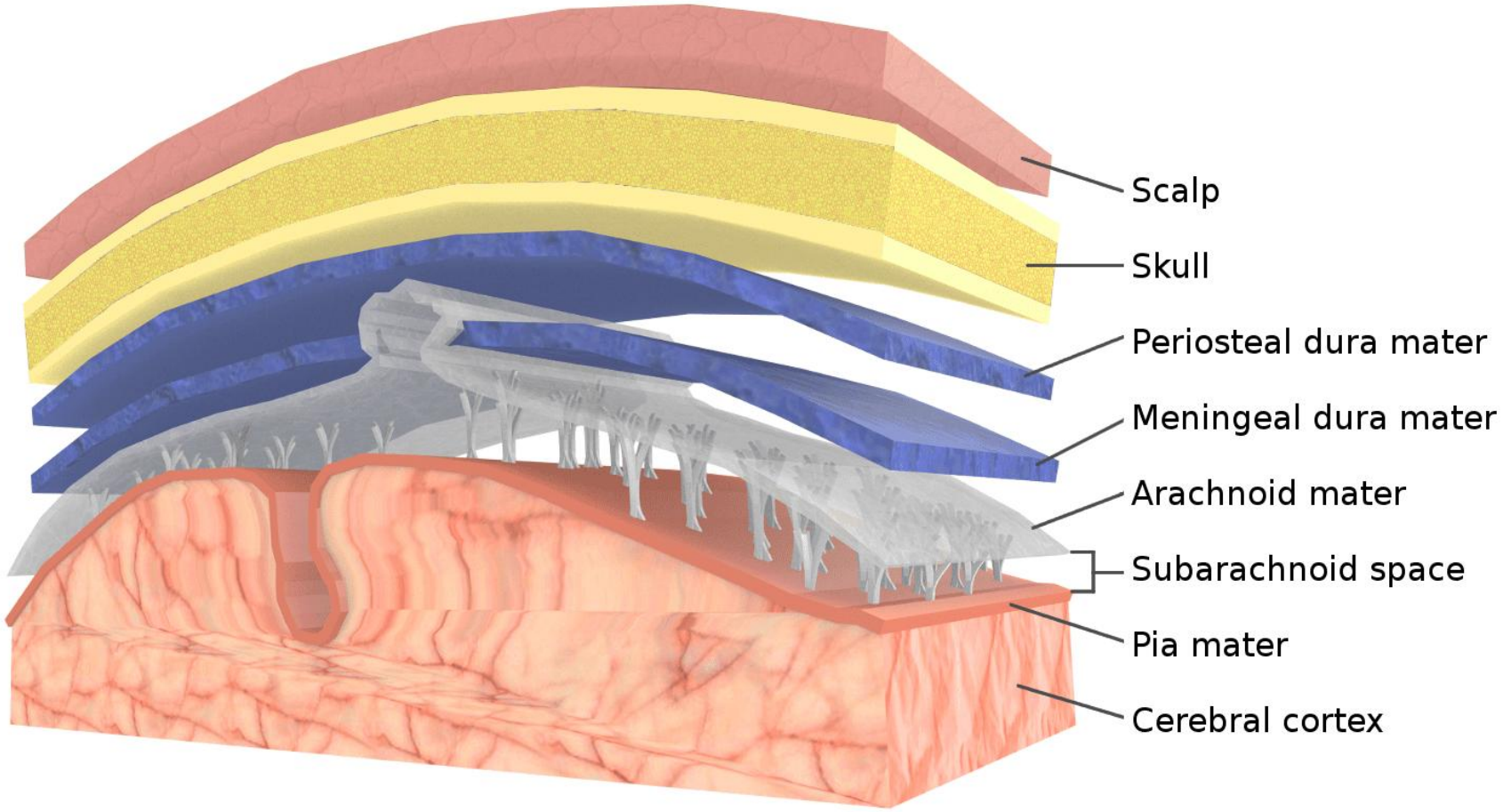
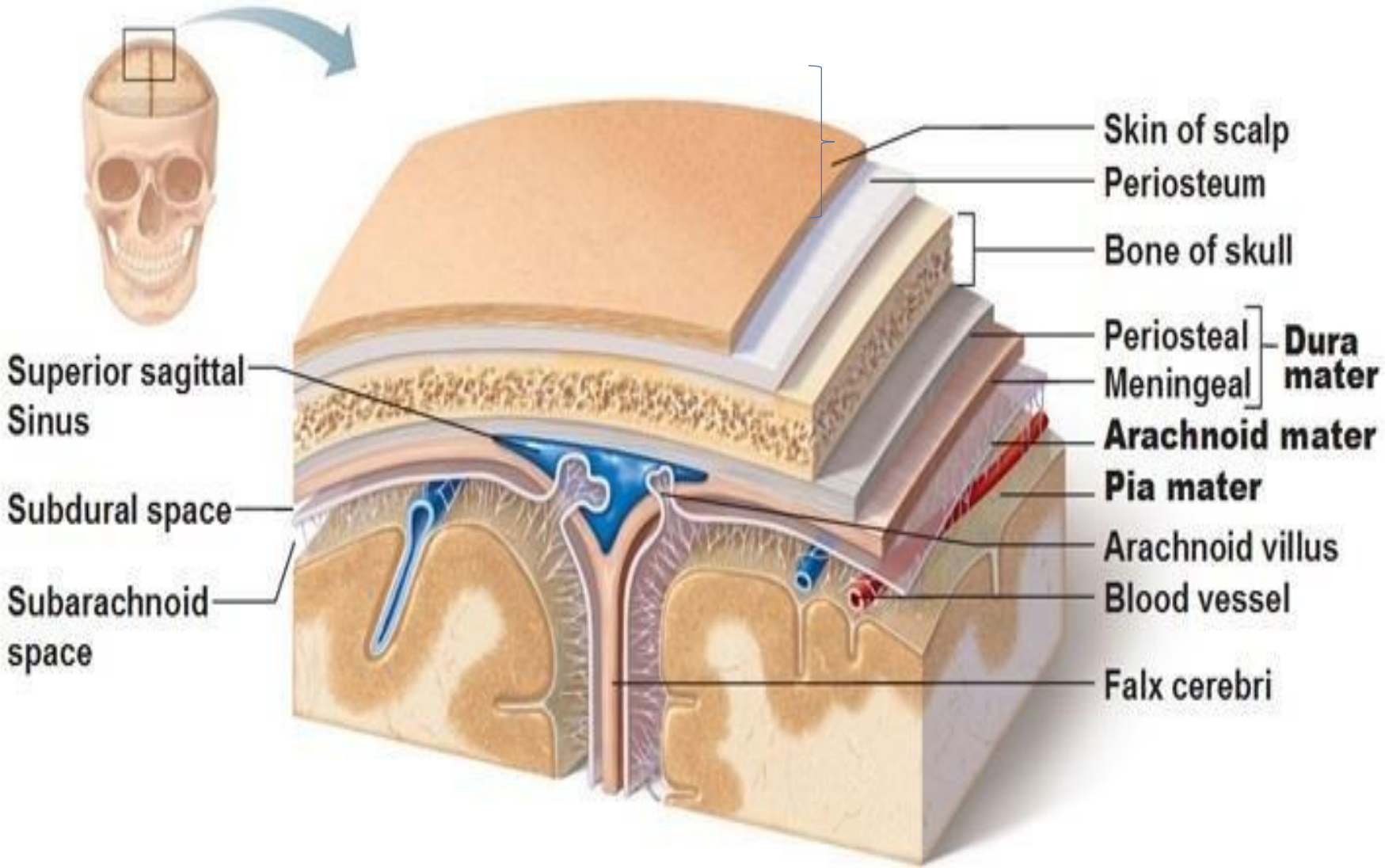
cranial cavity

THE DURAL INFOLDINGS

- The meningeal layer folds up to form dural infoldings that divide the cranial cavity into different compartments:

Meninges




Skin of scalp
Periosteum
Bone of skull
Periosteal
Meningeal
Dura mater
Arachnoid mater
Pia mater
Arachnoid villus
Blood vessel
Falx cerebri
Superior sagittal Sinus
Subdural space
Subarachnoid space

The Cranial Meninges

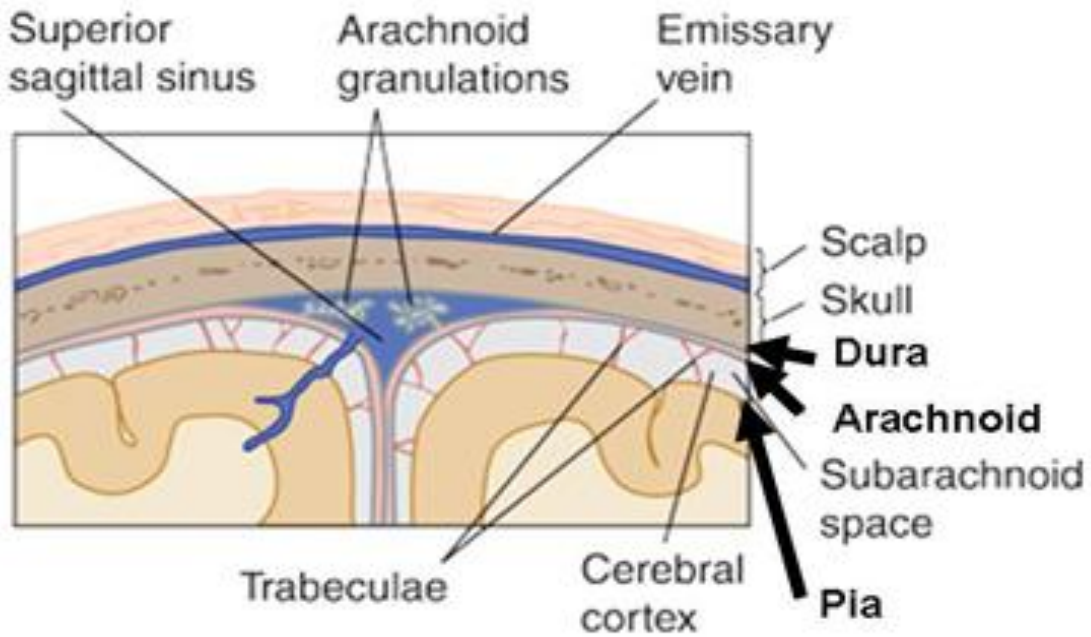


Figure 11-5. Schematic illustration of a coronal section of the brain. Enlargement of the top. In: Waxman SG. *Clinical Neuroanatomy*, 26th ed. http://www.accessphysiotherapy.com. Accessed October 20, 2009.

The Cranial Meninges (*Cont.*)

- The meningis form three spaces
  - Epidural space
  - Subarachnoid space
  - Subdural space

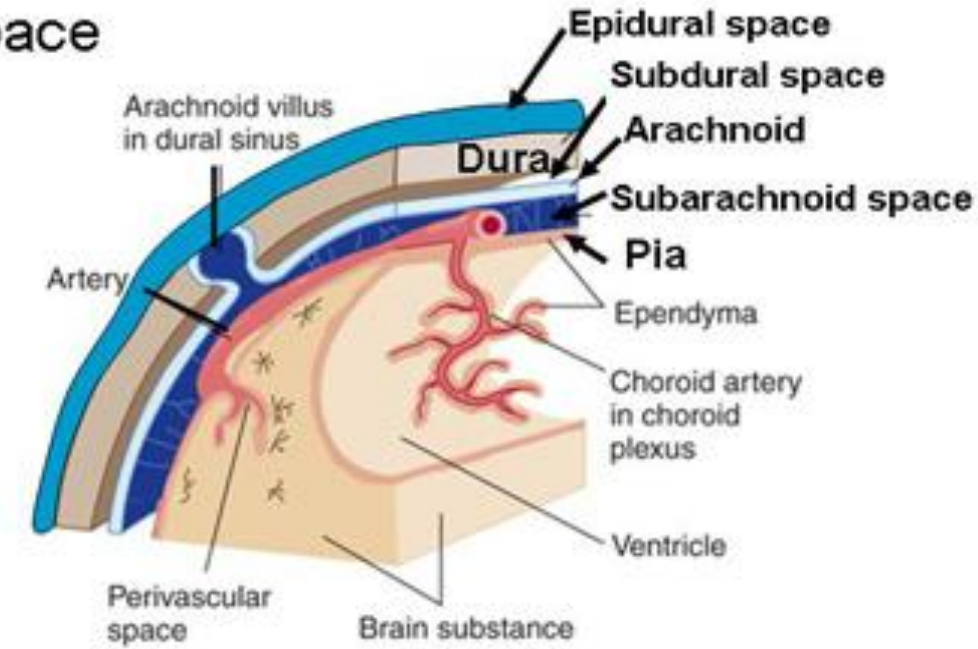


Figure 11-15. Schematic illustration of a coronal section of the brain. Enlargement of the top. In: Waxman SG. *Clinical Neuroanatomy*, 26th ed. http://www.accessphysiotherapy.com. Accessed October 20, 2009.

• Meninges

- The brain and spinal cord are enclosed in three protective **membranes called *meninges*.**

- **From without inwards these are:**
- **(a) dura mater, (b) arachnoid mater, and (c) pia mater.**

- **The dura mater is mesodermal in origin while arachnoid and pia mater are ectodermal in origin (derived from neural crests).**

- **The dura mater is the thick outermost covering of the brain and spinal cord. The part enclosing the brain is called *cranial/cerebral dura*, and the part around the spinal cord, *the spinal dura*.**

- **It is very tough opaque inelastic membrane of fibrous tissue (Gk. *dura* = tough, *mater* = mother). It is also called *pachymeninx* (pachy = thick).**

- **The arachnoid mater (Gk. *arachnoid* = cobweb like, *mater* = mother) is a delicate avascular membrane deep to dura mater. Many thread-like trabeculae extend from it to the pia mater.**
- **The pia mater (Gk. *pia* = tender, *mater* = mother) is a thin transparent vascular membrane closely adherent to the surface of the brain and spinal cord.**

- **The arachnoid mater and pia mater together are termed *leptomeninges* (Gk. *lepto* = thin).**

- **The intracranial arrangement of these membranes differs from that in the vertebral canal and are therefore described separately.**

- **The spinal meninges are described later**

intracranial Meninges

Dura mater

-

- The dura mater in the cranium (cranial dura) consists of two layers:
- an outer *endosteal layer* and an inner *meningeal layer*.
-

- These two layers are firmly adherent to each other everywhere except,
- (a) where they split to enclose the venous sinuses, and (b) where the inner layer is folded to form the dural septa.

- The **endosteal layer** is attached to the inner surfaces of the cranial bones and is continuous through the sutural ligaments, and around the margins of the foramina with the periosteum on the external surface of the cranium.

Clinical Correlation

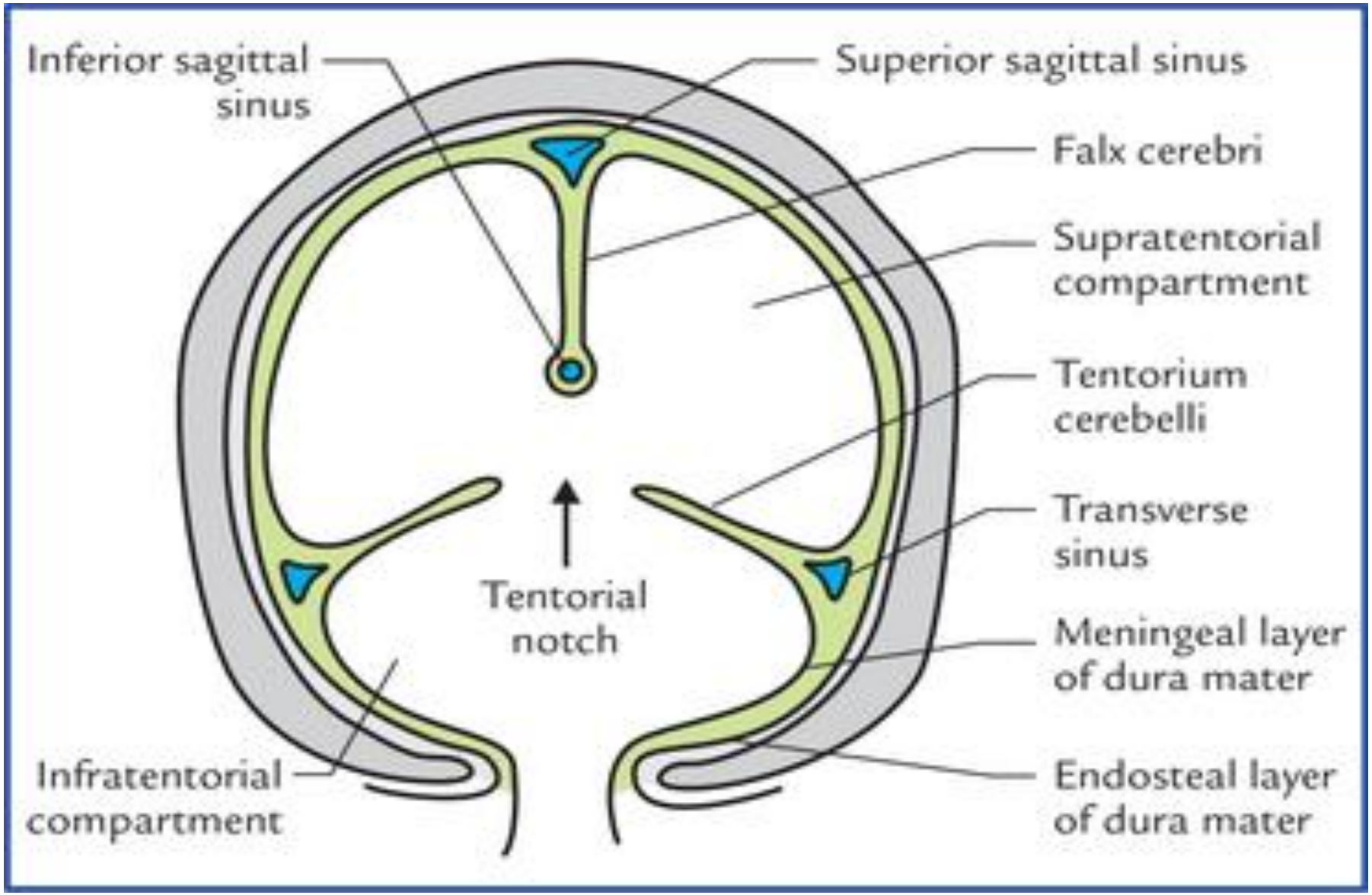
- The cranial dura is more firmly adherent to the base of skull than on the vault, hence, usually torn in fractures of the skull base. It also forms the part of the wall of the basal venous sinuses, hence **the fractures of skull base are often associated with bleeding from ear, nose, or into the pharynx**. Cerebral dura is usually stripped off from the cranial vault, when an extradural haematoma is formed between the bone and dura.
-

- **The meningeal layer is a strong fibrous membrane and becomes continuous with the spinal dura at the foramen magnum.**
- **It ensheathes the cranial nerves in their osseous foramina and fuses externally with epineurium; the sheaths of the optic nerves fuse with the ocular sclera.**

Dural septa or folds

- The meningeal layer gets reduplicated (infolded) along certain lines and forms septa or folds between the parts of the brain.

- Schematic coronal section of skull showing division of cranial cavity into three compartments by falx cerebri and tentorium cerebelli. Each half of the supratentorial compartment contains the cerebral hemisphere, whereas the infratentorial compartment contains the cerebellum and brainstem


Inferior sagittal sinus
Superior sagittal sinus
Falx cerebri
Supratentorial compartment
Tentorium cerebelli
Transverse sinus
Meningeal layer of dura mater
Endosteal layer of dura mater
Tentorial notch
Infratentorial compartment

The four important dural septa are:

- 1. Falx cerebri
- 2. Tentorium cerebelli
- 3. Falx cerebelli

4. Diaphragma sellae.

Functions of dural septa

- 1. Dural septa divide the cranial cavity into compartments to separate the different parts of the brain and thus restrict their movements within the cranial cavity

- 2. They enclose intracranial dural venous sinuses.

Falx Cerebri

- is a large sickle-shaped vertical fold of dura mater which dips into the longitudinal fissure, between the two cerebral hemispheres.
- Its narrow anterior end is attached to the crista galli and its broad posterior end to the upper surface of the tentorium cerebelli.
- Its convex upper border is attached to the vault of skull along the sagittal suture and its lower border is free and concave downwards.