

Dural Nerve Supply

Branches of the trigeminal, vagus, and first three cervical nerves and branches from the sympathetic system pass to the dura.

Numerous sensory endings are in the dura.

The dura is sensitive to stretching, which produces the sensation of headache.

Stimulation of the sensory endings of the trigeminal nerve above the level of the tentorium cerebelli produces referred pain to an area of skin on the same side of the head.

Stimulation of the dural endings below the level of the tentorium produces referred pain to the back of the neck and back of the scalp along the distribution of the greater occipital nerve



Dural Arterial Supply

Numerous arteries supply the dura mater
For example, the internal carotid, Maxillary
vertebral arteries.

However

Clinically the most important is

THE MIDDLE MENINGEAL ARTERY

The main source of extradural heamorrhage

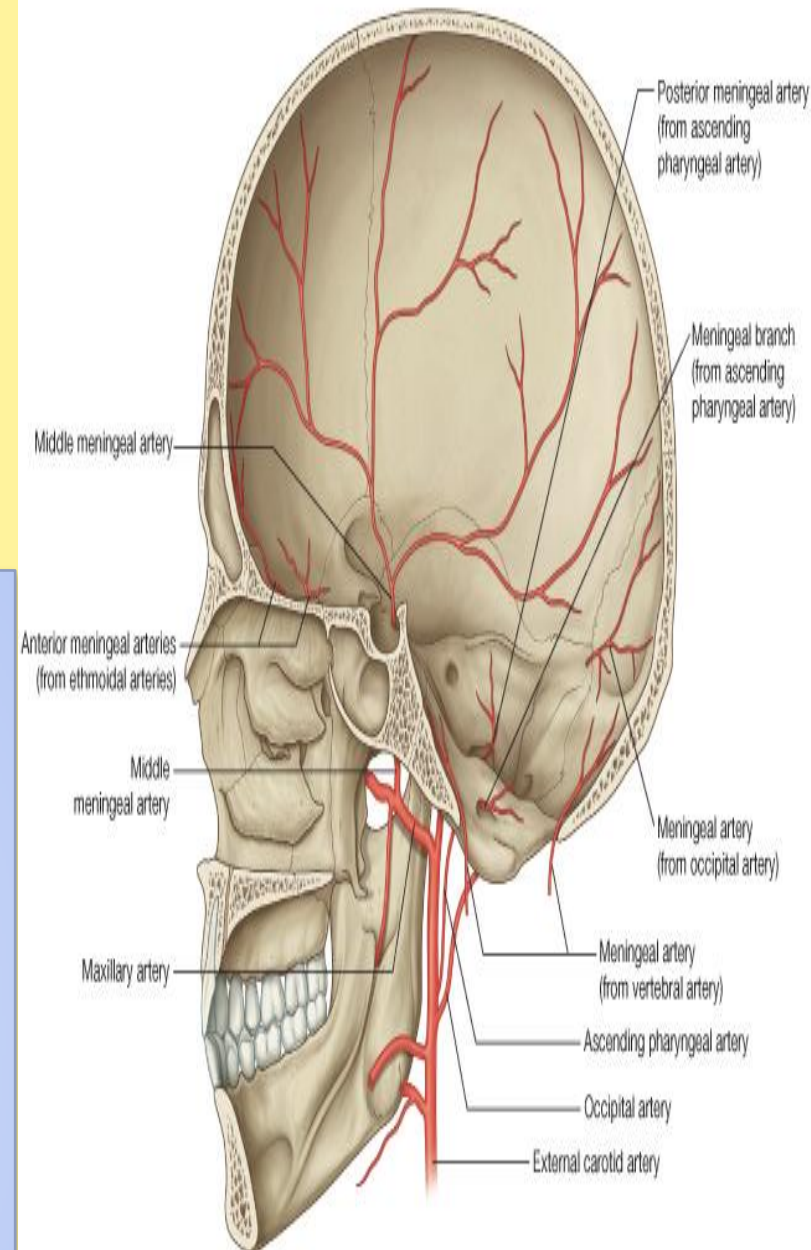
arises from the maxillary artery in
the infratemporal fossa

it passes through the foramen spinosum to lie between
the meningeal and endosteal layers of dura

Branches

The anterior (frontal) branch deeply
grooves or tunnels the anteroinferior angle of the
parietal bone, and its course corresponds roughly to the
line of the underlying precentral gyrus of the brain.

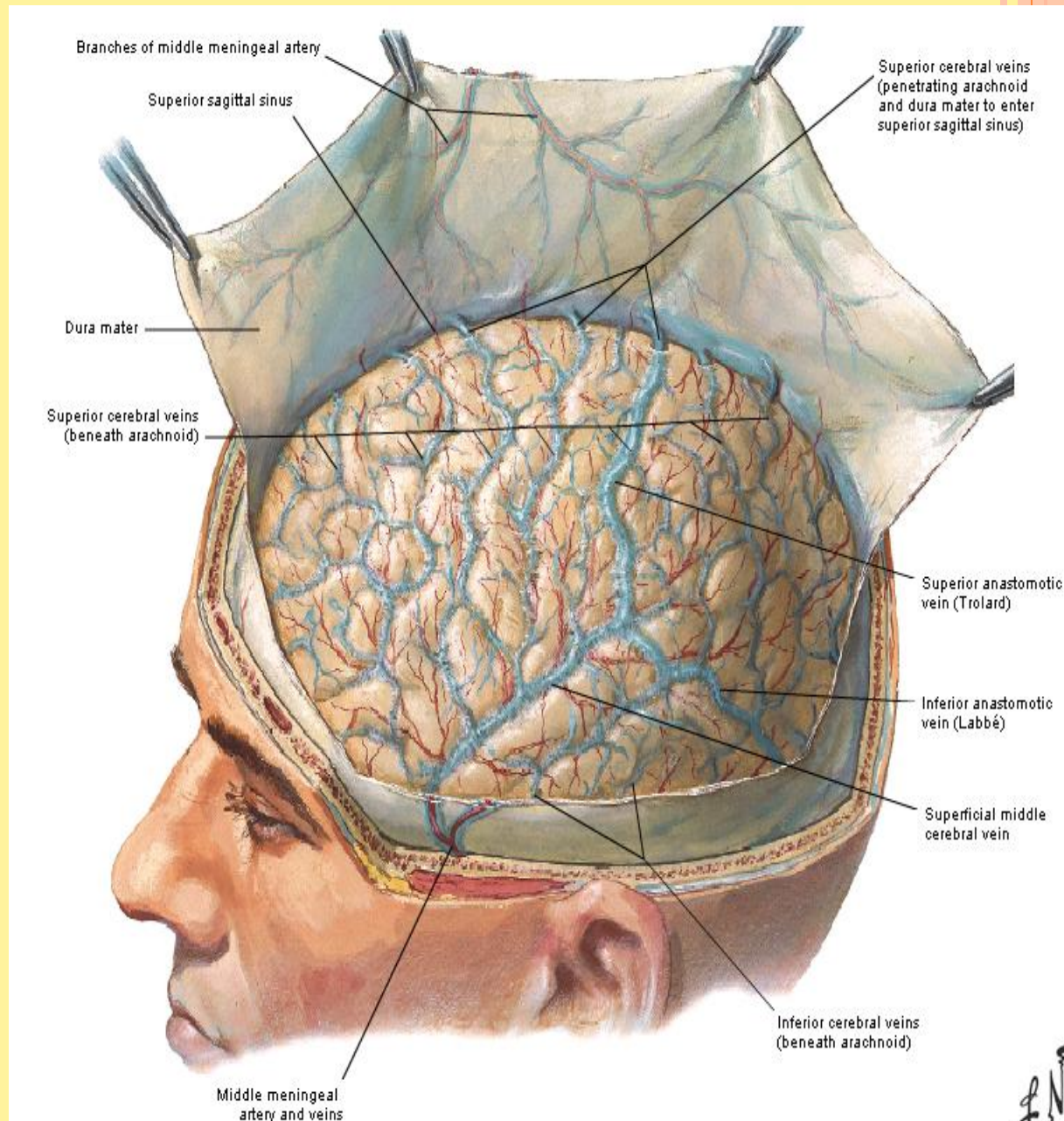
The posterior (parietal) branch curves
backward and supplies the posterior part of the dura
mater



2-Arachnoid Mater of the Brain

➤ The arachnoid mater is a delicate membrane covering the brain and lying between
THE PIA MATER INTERNALLY
THE DURA MATER EXTERNALLY

It is separated from the dura by
a potential space
THE SUBDURAL SPACE
and from the pia by
THE SUBARACHNOID SPACE
which is filled with
cerebrospinal fluid



in certain situations the arachnoid and pia are widely separated to form

THE SUBARACHNOID CISTERNAE

In certain areas the arachnoid projects into the venous sinuses to form

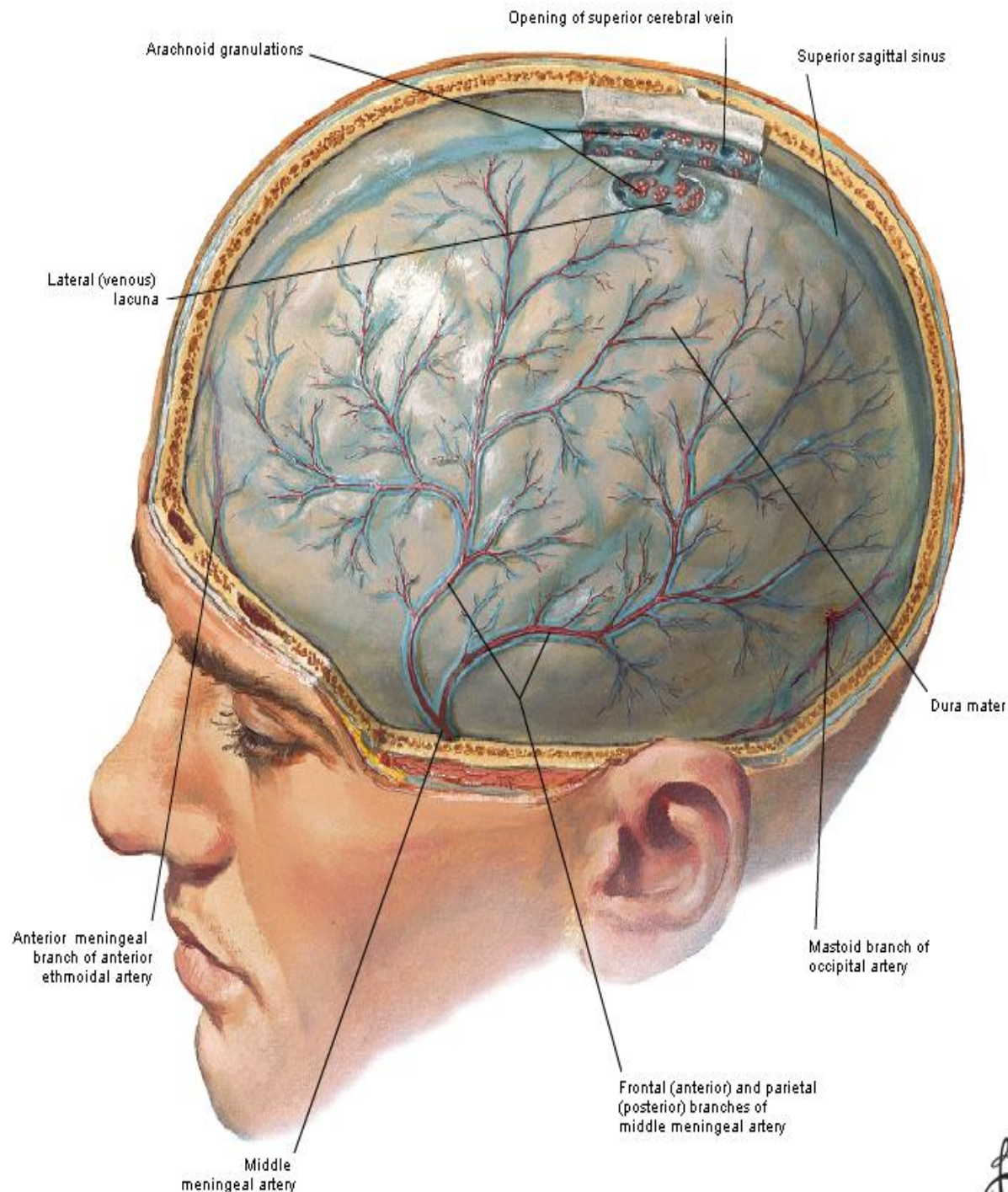
ARACHNOID VILLI

The arachnoid villi are most numerous along *the superior sagittal sinus*.

Aggregations of arachnoid villi are referred to *as arachnoid granulations*

Arachnoid villi serve as sites where the cerebrospinal fluid diffuses into the bloodstream.

All the cerebral arteries, the ☐ cranial nerves and veins lie in the space

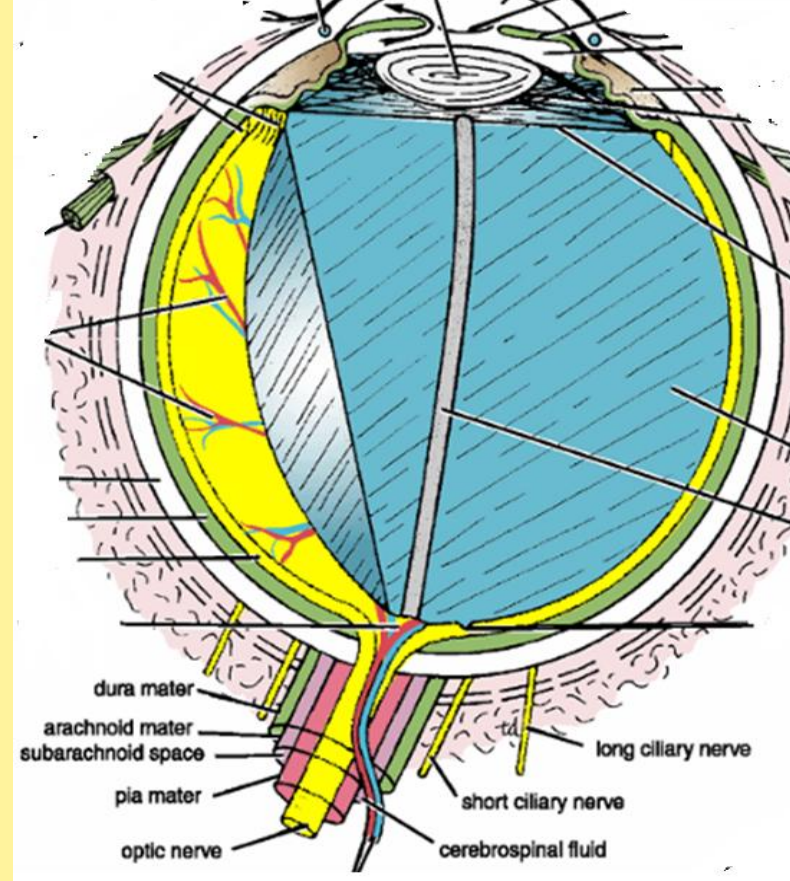


The arachnoid fuses with
the epineurium of the nerves at their point of
exit from the skull
For example

THE OPTIC NERVE

the arachnoid forms a sheath for
the nerve that extends into the
orbital cavity through the optic
canal and fuses with the sclera of
the eyeball

Thus, the subarachnoid space
extends around the optic nerve as
far as the eyeball



Papilledema

**Because the optic nerve sheath is
continuous with the subarachnoid
space of the brain, increased pressure
is transmitted through to the optic
nerve.**

**the anterior end of the optic nerve
stops abruptly at the eye.**



The cerebrospinal fluid
is produced by
THE CHOROID PLEXUSES

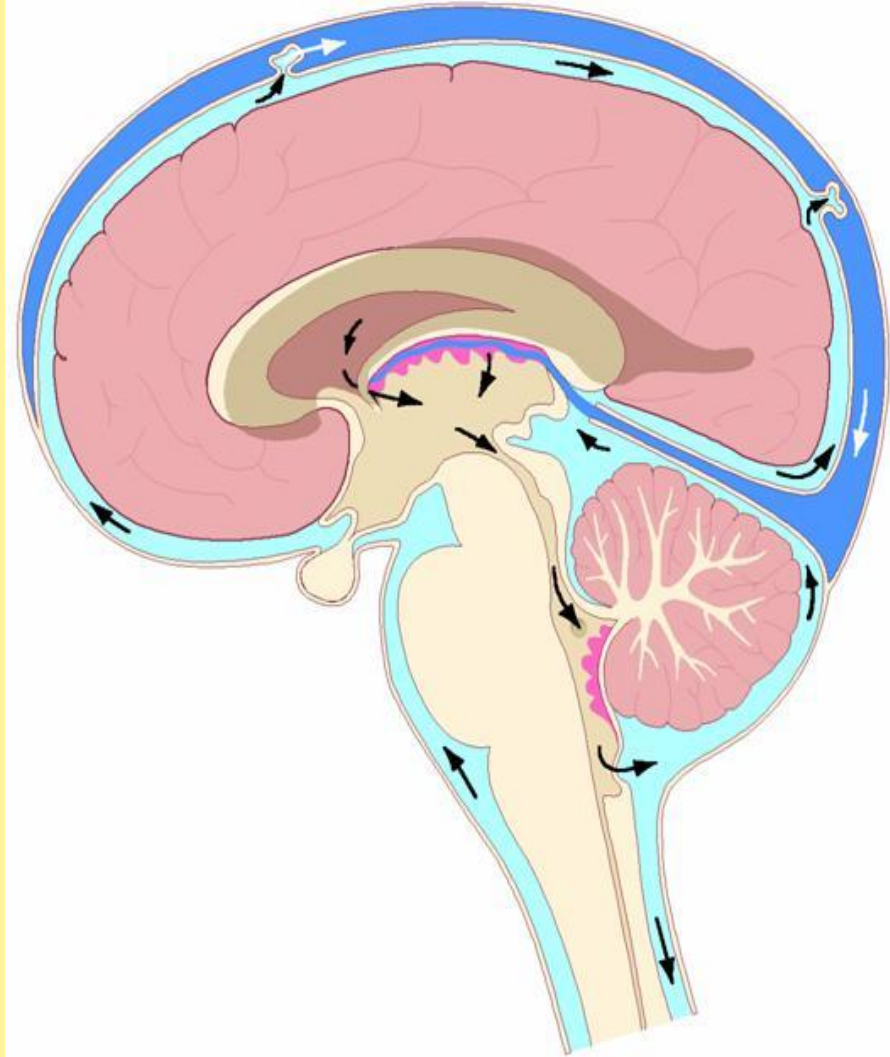
Within
THE LATERAL
THIRD and
FOURTH VENTRICLES OF THE
BRAIN.

It escapes from the ventricular system of the
brain through
the three foramina in the roof of the fourth
ventricle
and so
enters the subarachnoid space.

It now circulates both upward over the surfaces
of the cerebral hemispheres and downward
around the spinal cord
The spinal subarachnoid space extends down
as far as the second sacral vertebra

Eventually, the fluid enters the

bloodstream by passing into the arachnoid villi and diffusing through their walls.



THE CRANIAL NERVES IN THE CRANIAL CAVITY

THE 12 PAIRS OF CRANIAL NERVES ARE NAMED AS FOLLOWS:

I. OLFACTORY (SENSORY)

II. OPTIC (SENSORY)

III. OCULOMOTOR (MOTOR)

IV. TROCHLEAR (MOTOR)

V. TRIGEMINAL (MIXED)

VI. ABDUCENT (MOTOR)

VII. FACIAL (MIXED)

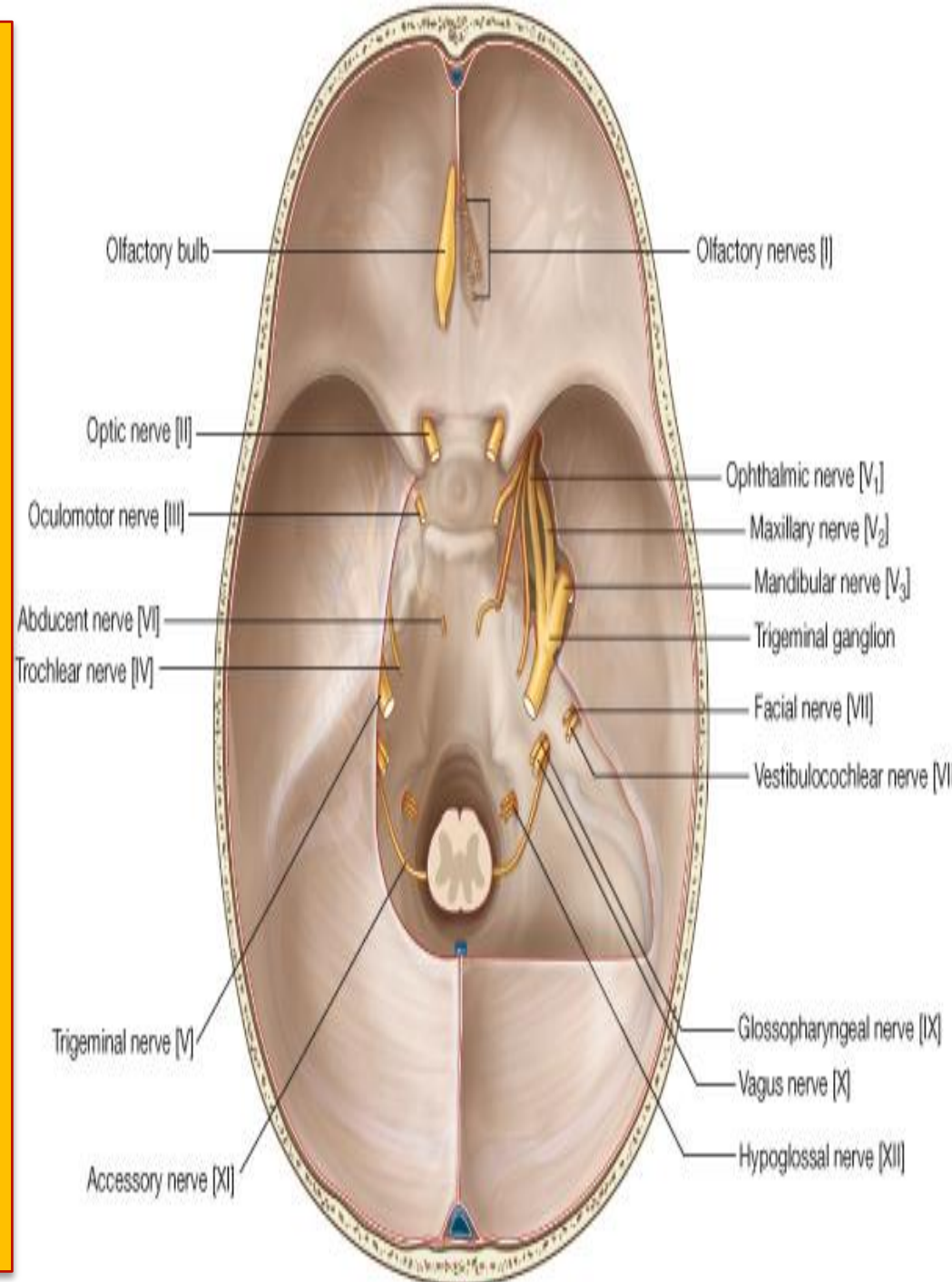
VIII. VESTIBULOCOCHLEAR (SENSORY)

IX. GLOSSOPHARYNGEAL (MIXED)

X. VAGUS (MIXED)

XI. ACCESSORY (MOTOR)

XII. HYPOGLOSSAL (MOTOR)



Origin of the 12 cranial nerves

CEREBRUM

1 & 2

BRAINSTEM

MIDBRAIN

3 & 4

PONS

5, 6, 7, & 8

MEDULLA

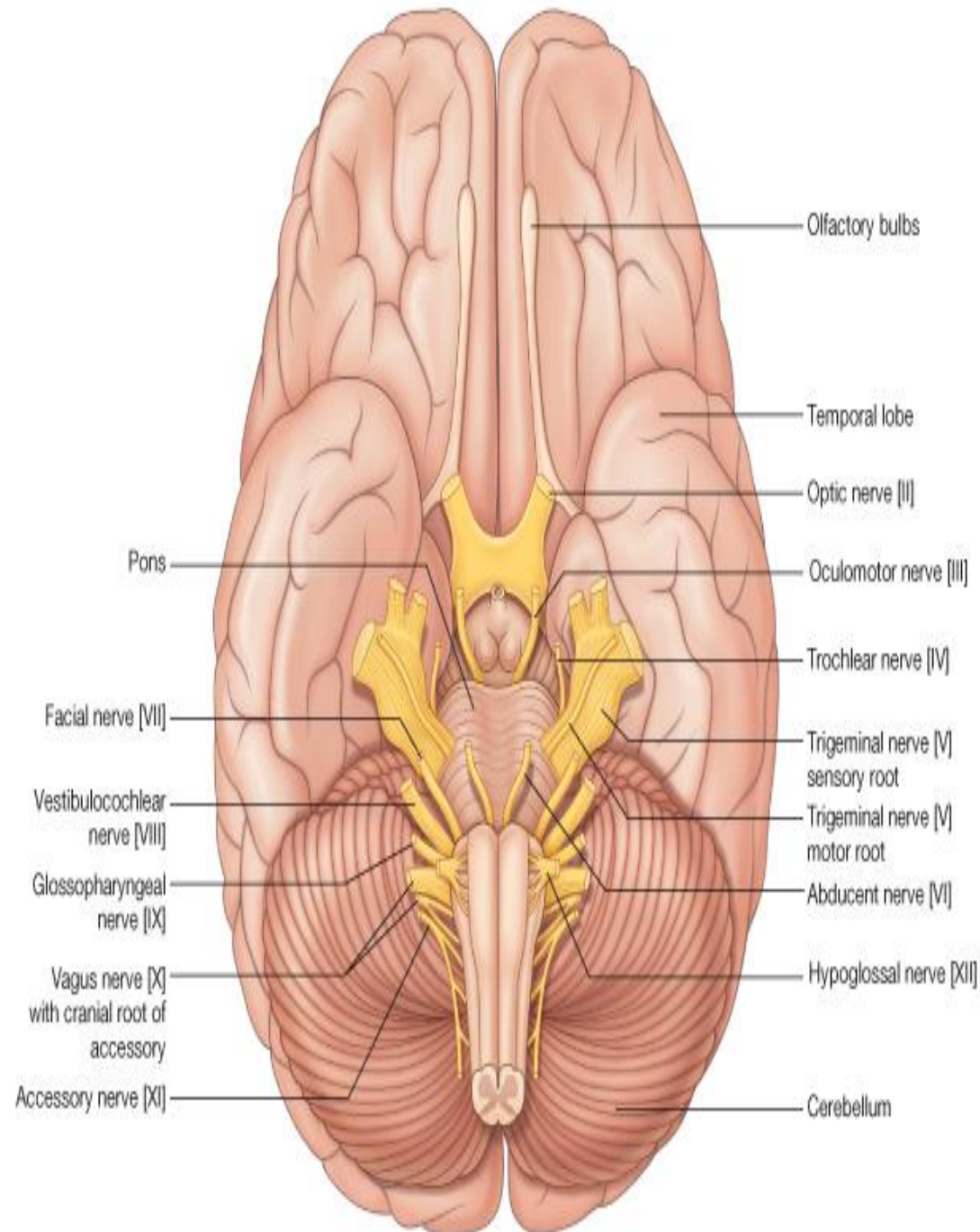
9, 10, 11 & 12

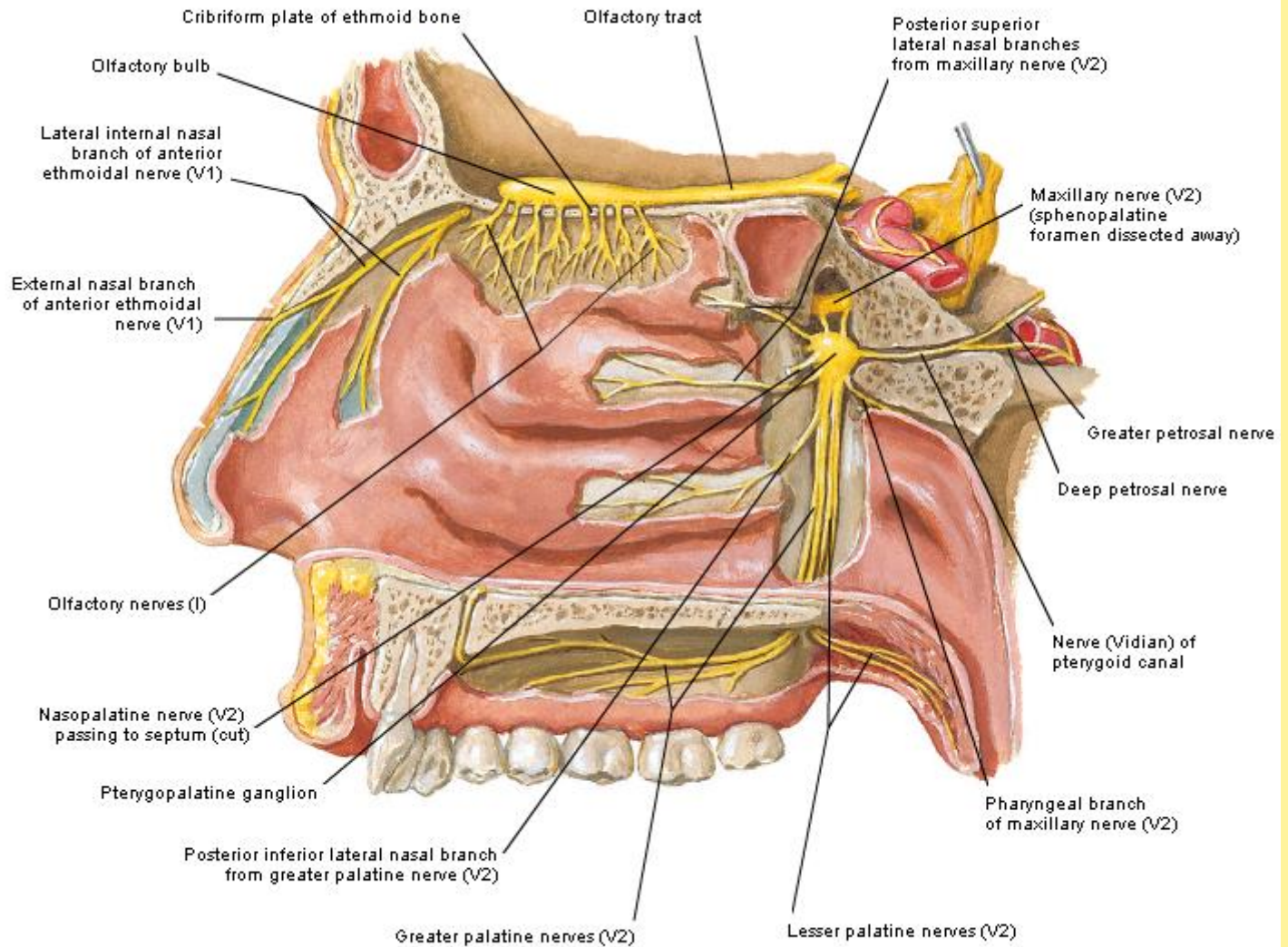
Accessory nerve (11th) has dual origin

– Cranial & spinal root

Only one nerve arise from dorsal aspect

– Trochlear nerve (4th)





Clinical Features of the Neonatal Skull

FONTANELLES

Palpation of the fontanelles enables the physician to determine

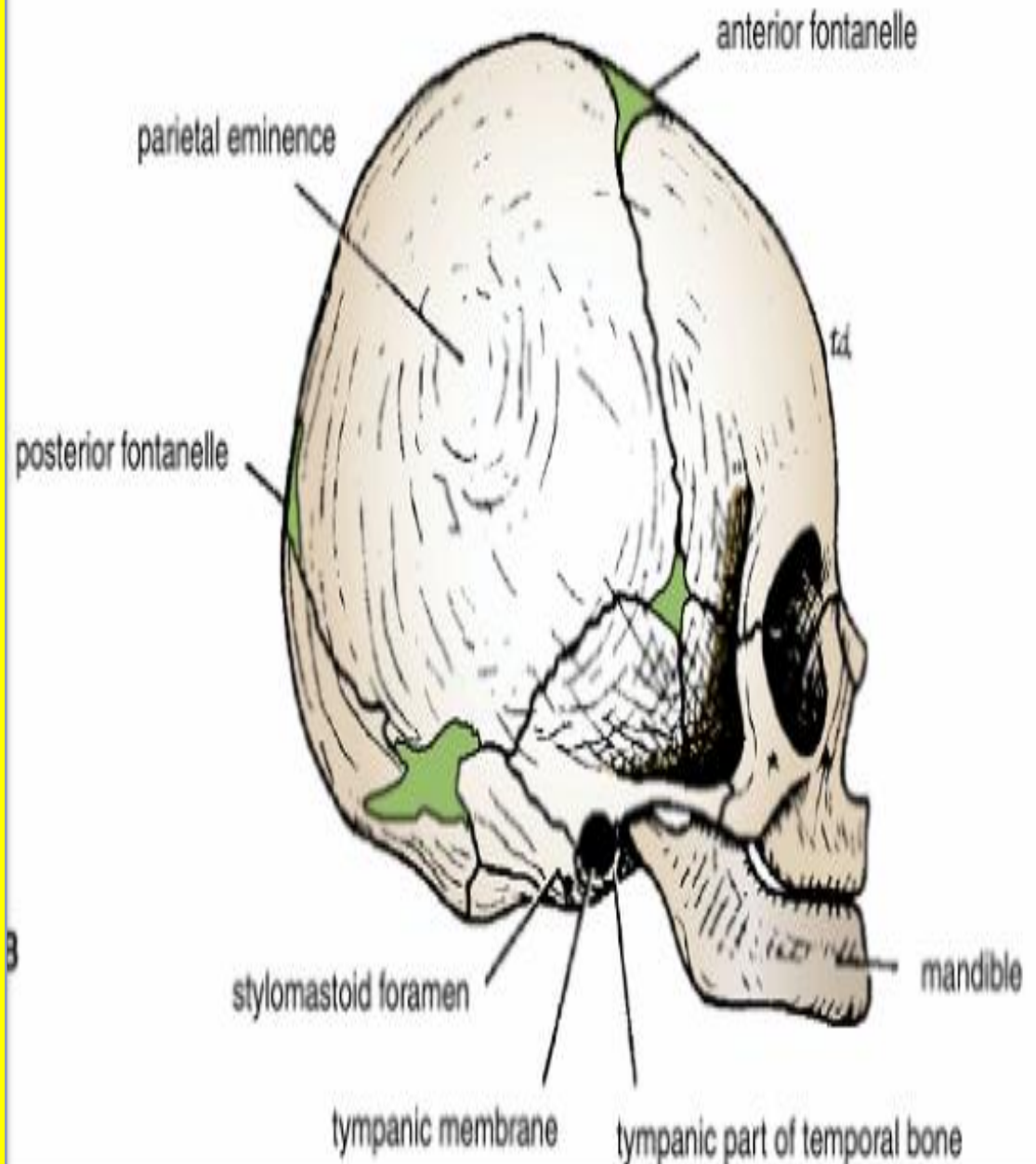
1-The progress of growth in the surrounding bones, 2-the degree of hydration of the baby

if the fontanelles are depressed below the surface **THE BABY IS DEHYDRATED**

a bulging fontanelle indicates **RAISED INTRACRANIAL PRESSURE**

Samples of cerebrospinal fluid can be obtained by passing a long needle obliquely through the anterior fontanelle into the subarachnoid space

CLOSES anterior after 18 months, because the frontal and parietal bones have enlarged to close the gap.



Intracranial Hemorrhage

Intracranial hemorrhage may result from
trauma or
cerebral vascular lesions.

Four varieties are considered here:

EXTRADURAL
SUBDURAL
SUBARACHNOID
CEREBRAL



CT-Brain

Extradural hemorrhage

results from injuries
to the meningeal arteries or veins.

The most common artery to be damaged
**is the anterior division of the middle
meningeal artery**

Bleeding occurs and strips up the meningeal
layer of dura from the internal surface of the
skull.

The intracranial pressure rises, and the
enlarging blood clot exerts local pressure on the
underlying motor area
in the precentral gyrus.



Lucid interval

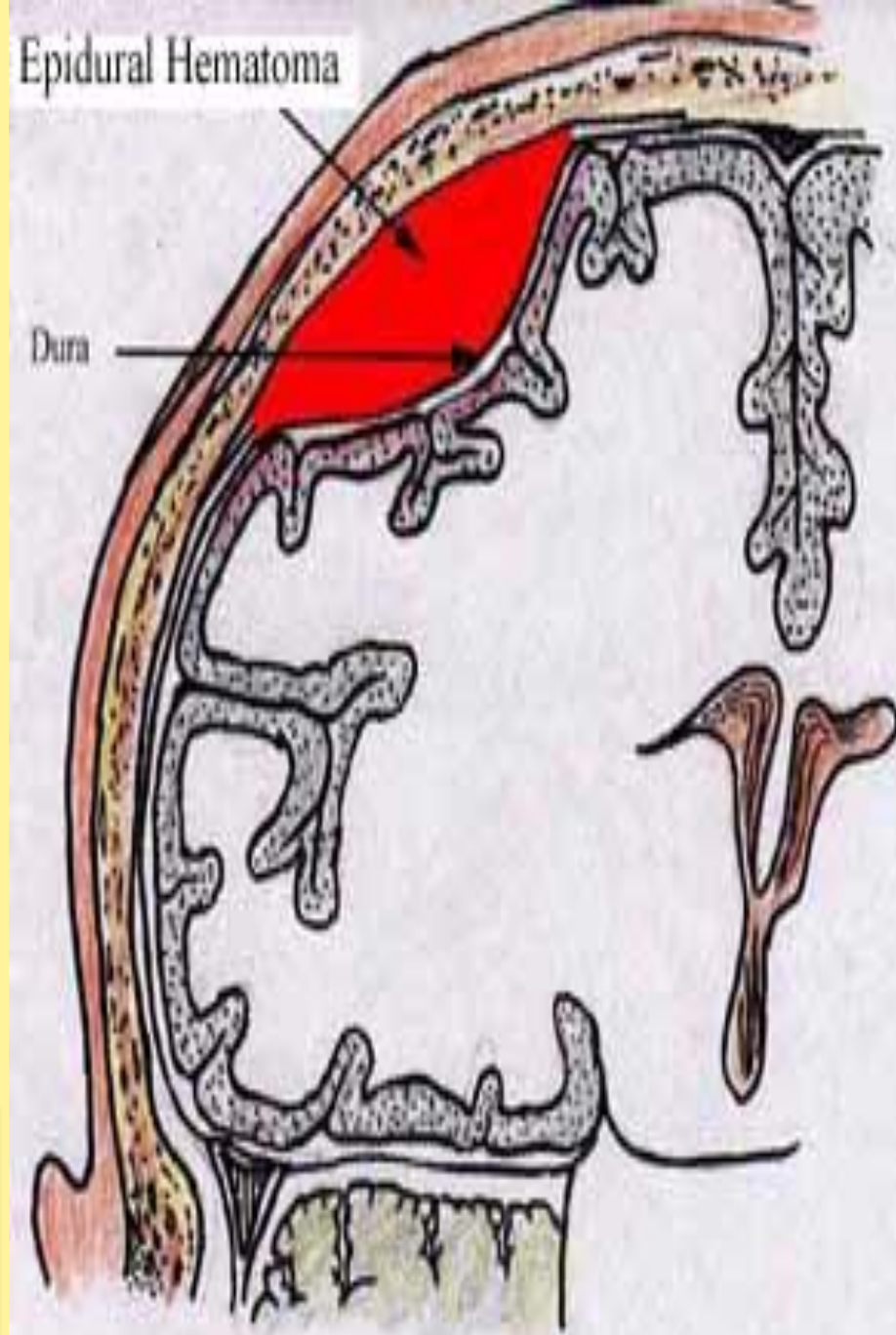
lucid interval is a temporary improvement in a patient's condition after a traumatic brain injury, after which the condition deteriorates

It occurs after the patient is knocked out by the initial concussive force of the trauma, then lapses into unconsciousness again after recovery when bleeding causes the hematoma to expand past the point at which the body can no longer compensate

A lucid interval is especially indicative of an epidural hematoma.

An estimated 20 to 50% of patients with epidural hematoma experience such a lucid interval.

It can last minutes or hours



To stop the hemorrhage, the torn artery or vein must be ligated or plugged. The burr hole through the skull wall should be placed about 1 to 1.5 in. (2.5 to 4 cm) above the midpoint of the zygomatic arch.

SUBDURAL HEMORRHAGE

results from tearing of
the superior cerebral veins
at their point of entrance into
the superior sagittal sinus.

SUBARACHNOID HEMORRHAGE

results from leakage or rupture
of
**a congenital aneurysm on
the circle of Willis**

The symptoms, which are
sudden in onset, include severe
headache, stiffness of the neck,
and loss of consciousness. The
diagnosis is established by
withdrawing heavily blood-
stained cerebrospinal fluid
through a lumbar puncture
(spinal tap).

Cerebral hemorrhage

is generally caused by rupture
of the thin-walled a branch of
the middle cerebral artery.

The hemorrhage involves the vital
corticobulbar and corticospinal fibers in the
internal capsule and produces hemiplegia on
the opposite side of the body. The patient
immediately loses consciousness, and the
paralysis is evident when consciousness is
regained

