

Neural Manipulation 1 Preparation

1. Review [this video](#)
2. Read: *Trauma: An Osteopathic Approach*
3. Review these slides

Important terms and structures important to study prior to NM1 attendance.

- Relationship of Spinal Nerves to Dura
 - Brachial Plexus ~ Lumbar Plexus ~ Sacral Plexus
- Layers of the intracranial membrane system
- Cranial Suture Anatomy – coronal, sagittal, lamdoid
- Craniospinal Junction Anatomy
- Pelvic Ligaments – sacrotuberous, sacrospinous
- Tentorium Cerebelli – anatomy of intracranial attachments
- Brachial Plexus
- Femoral Nerve
- Sciatic Nerve



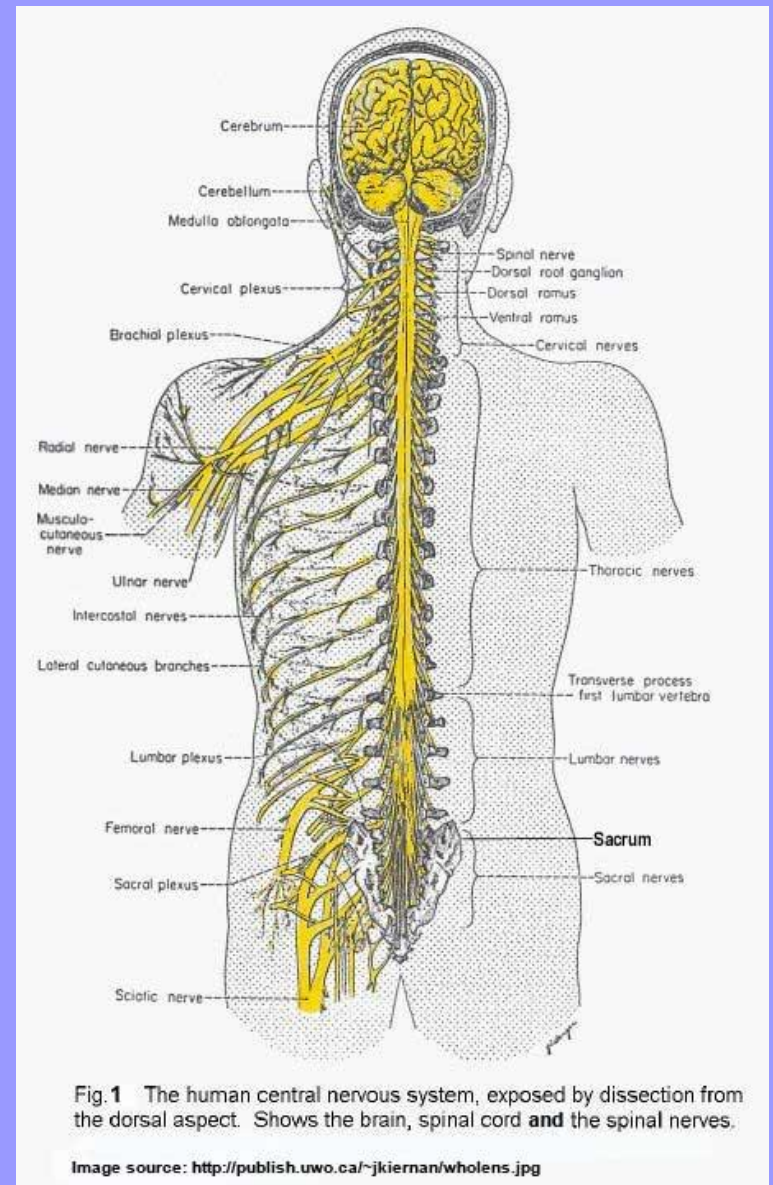
NM1 Preparation Quiz

Answers at the end

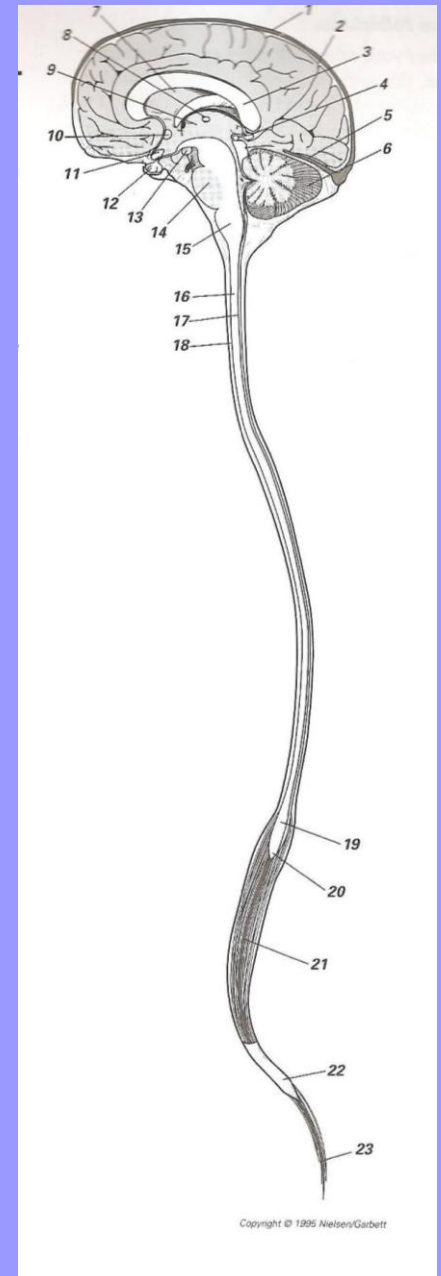
1. The coronal suture is between what 2 bones?
2. The occipito-mastoid suture/jugular foramen is between what 2 bones?
3. The falx cerebri is mostly under what suture?
4. The attachments of the tentorium cerebelli are:
 - a. frontal bone, petrouss part of temporal bone, occiput
 - b. occiput, parietal, temporal, bones, anterior and posterior clinoid processes of sphenoid bone
 - c. occiput, parietal and temporal bones, maxilla

Neural Manipulation

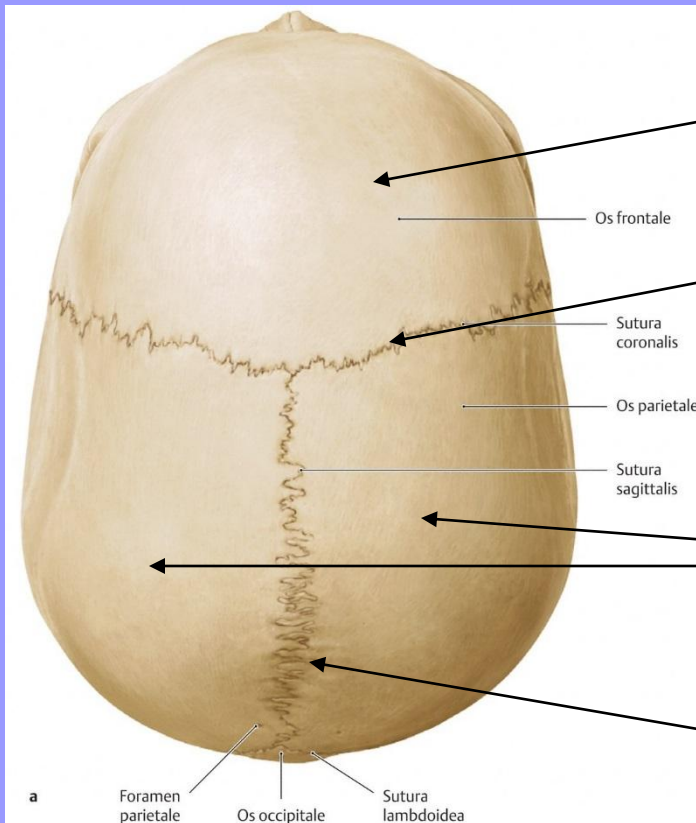
- Neural Manipulation (NM) is a gentle hands-on therapy which helps to free up the nerves and the connective tissue around the nerves (dura mater), the bones around the brain (cranium) so that the nervous system functions better.
(Barral & Croibier 2007)



“Neural” refers to the nervous system of the body, which includes the brain, spinal cord, nerves of upper and lower extremities, trunk and head.



Cranial Anatomy



Frontal bone

Coronal suture

Parietal bones

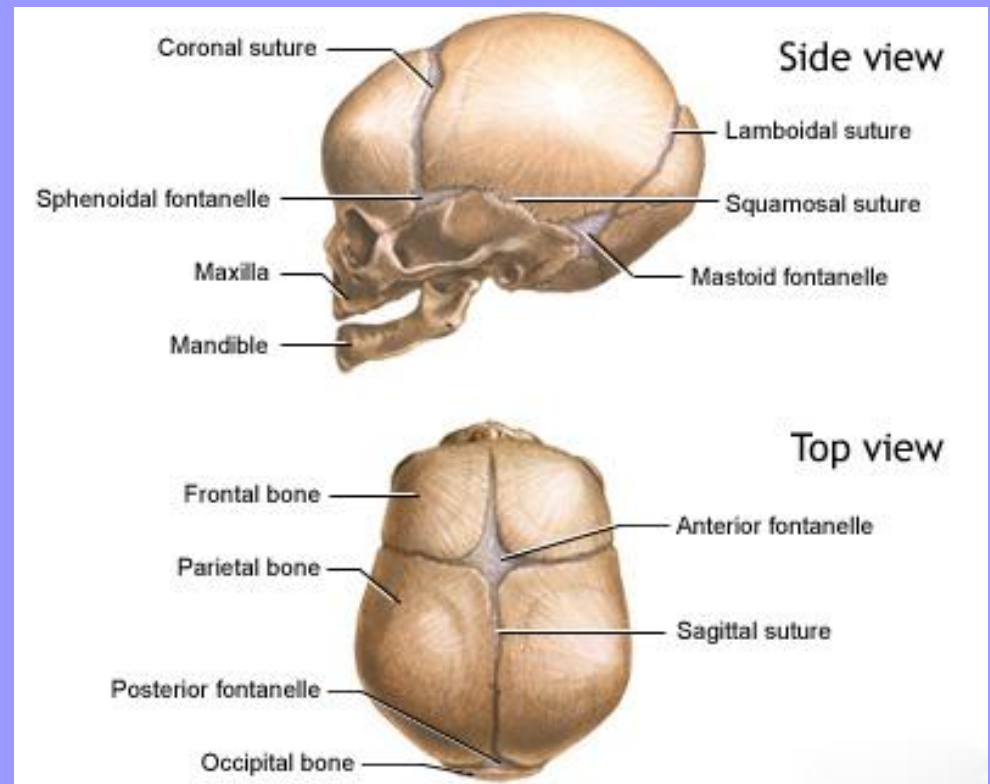
Sagittal suture

A Schädeldach von außen



Sutures

- The sutures provide for growth and elasticity of the newborn skull.
- They begin to close after 3-4 months, however the anterior fontanelle will not close until 20 months (average).
- They can be difficult to palpate after 6 months.

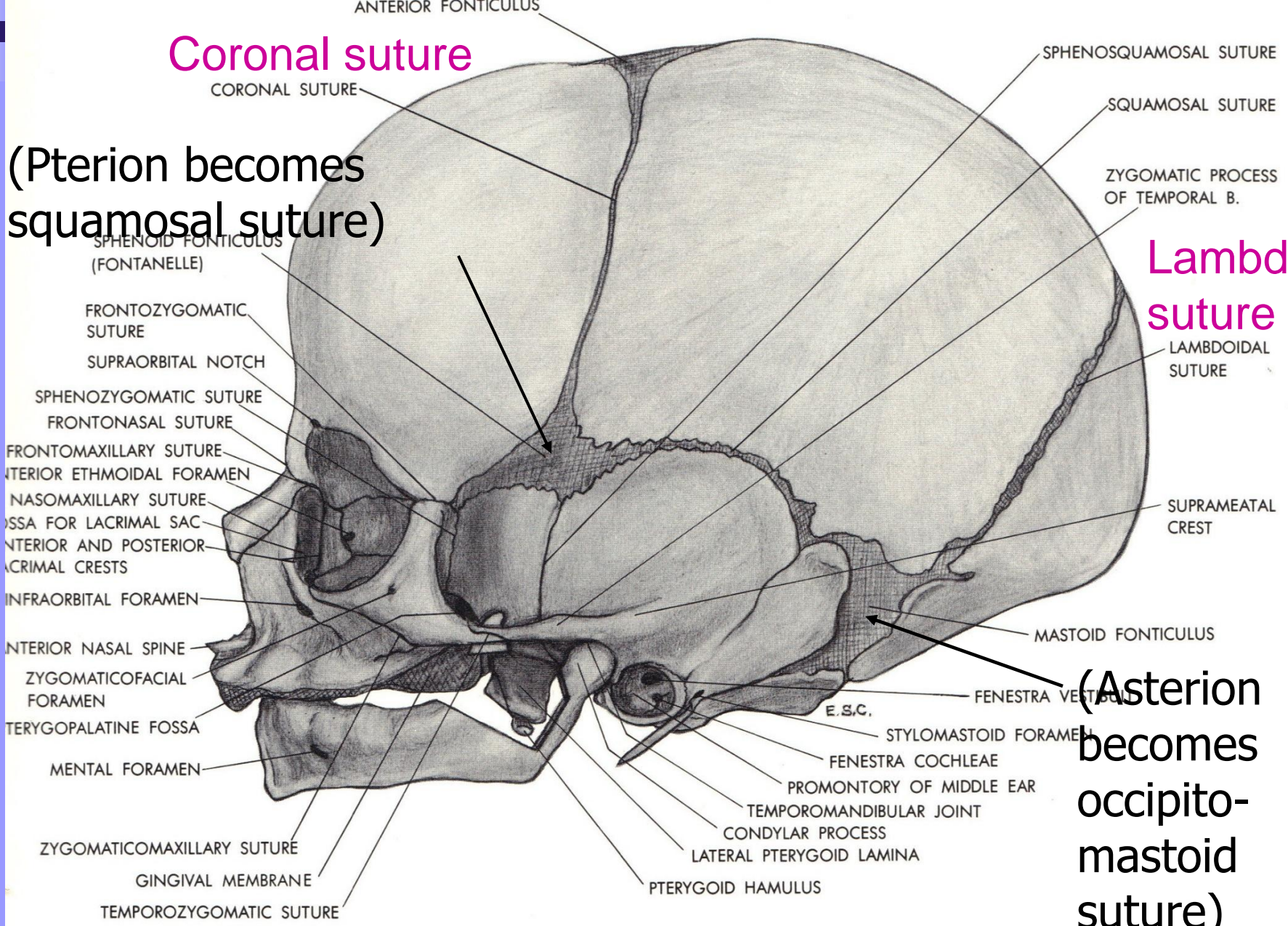


Coronal suture

(Pterion becomes squamosal suture)

Lambdoidal suture

(Asterion becomes occipito-mastoid suture)



CORONAL SUTURE

SPHENOSQUAMOSAL SUTURE

SQUAMOSAL SUTURE

ZYGOMATIC PROCESS OF TEMPORAL B.

LAMBDOIDAL SUTURE

SUPRAMEATAL CREST

MASTOID FONTICULUS

FENESTRA VESTIBULI

E.S.C.

STYLOMASTOID FORAMEN

FENESTRA COCHLEAE

PROMONTORY OF MIDDLE EAR

TEMPOROMANDIBULAR JOINT

CONDYLAR PROCESS

LATERAL PTERYGOID LAMINA

PTERYGOID HAMULUS

SPHENOID FONTICULUS (FONTANELLE)

FRONTOZYGOMATIC SUTURE

SUPRAORBITAL NOTCH

SPHENOZYGOMATIC SUTURE

FRONTAL NASAL SUTURE

FRONTOMAXILLARY SUTURE

ANTERIOR ETHMOIDAL FORAMEN

NASOMAXILLARY SUTURE

OSSA FOR LACRIMAL SAC

ANTERIOR AND POSTERIOR LACRIMAL CRESTS

INFRAORBITAL FORAMEN

ANTERIOR NASAL SPINE

ZYGOMATICOFACIAL FORAMEN

PTERYGOPALATINE FOSSA

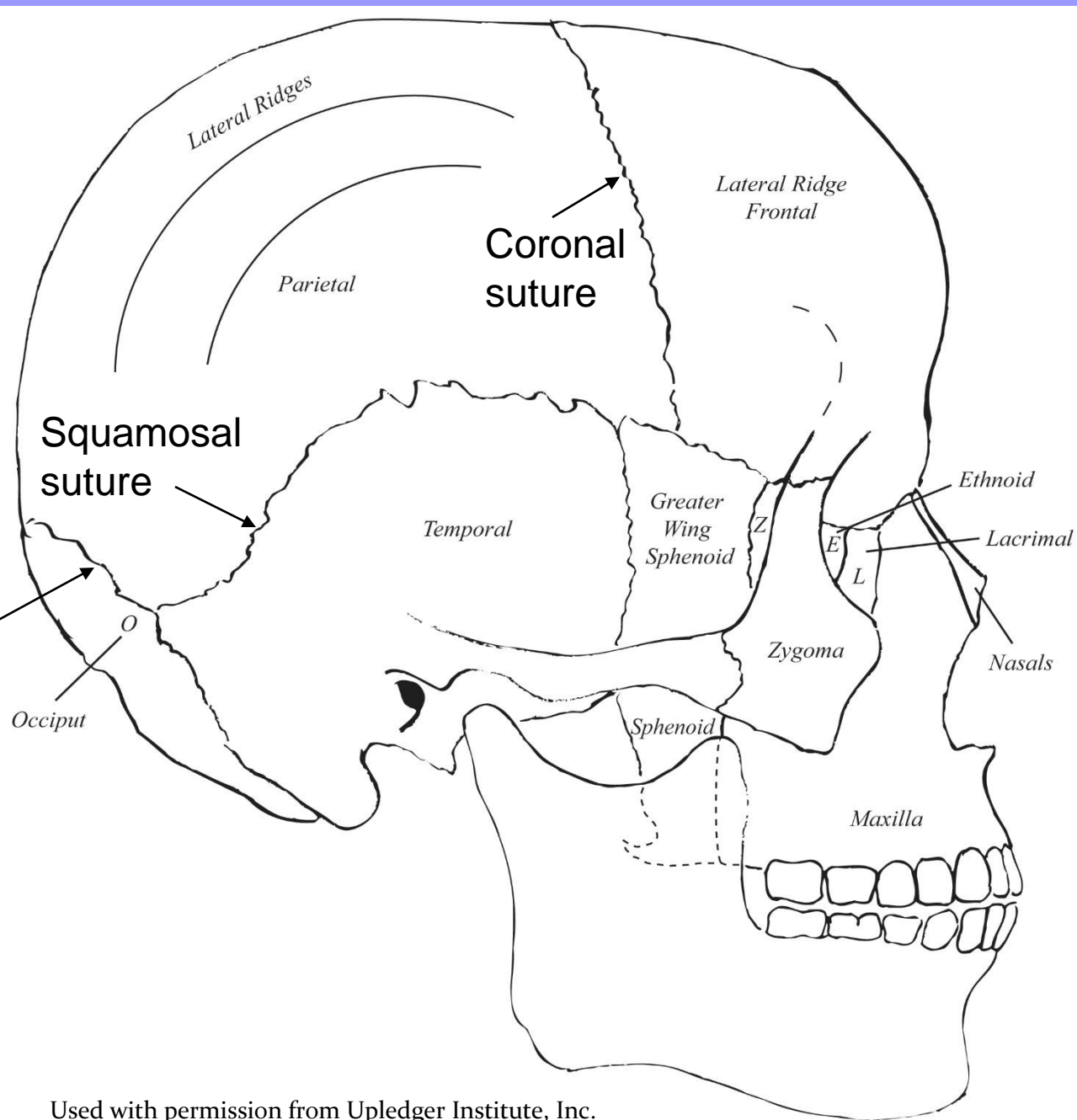
ZYGOMATICOMAXILLARY SUTURE

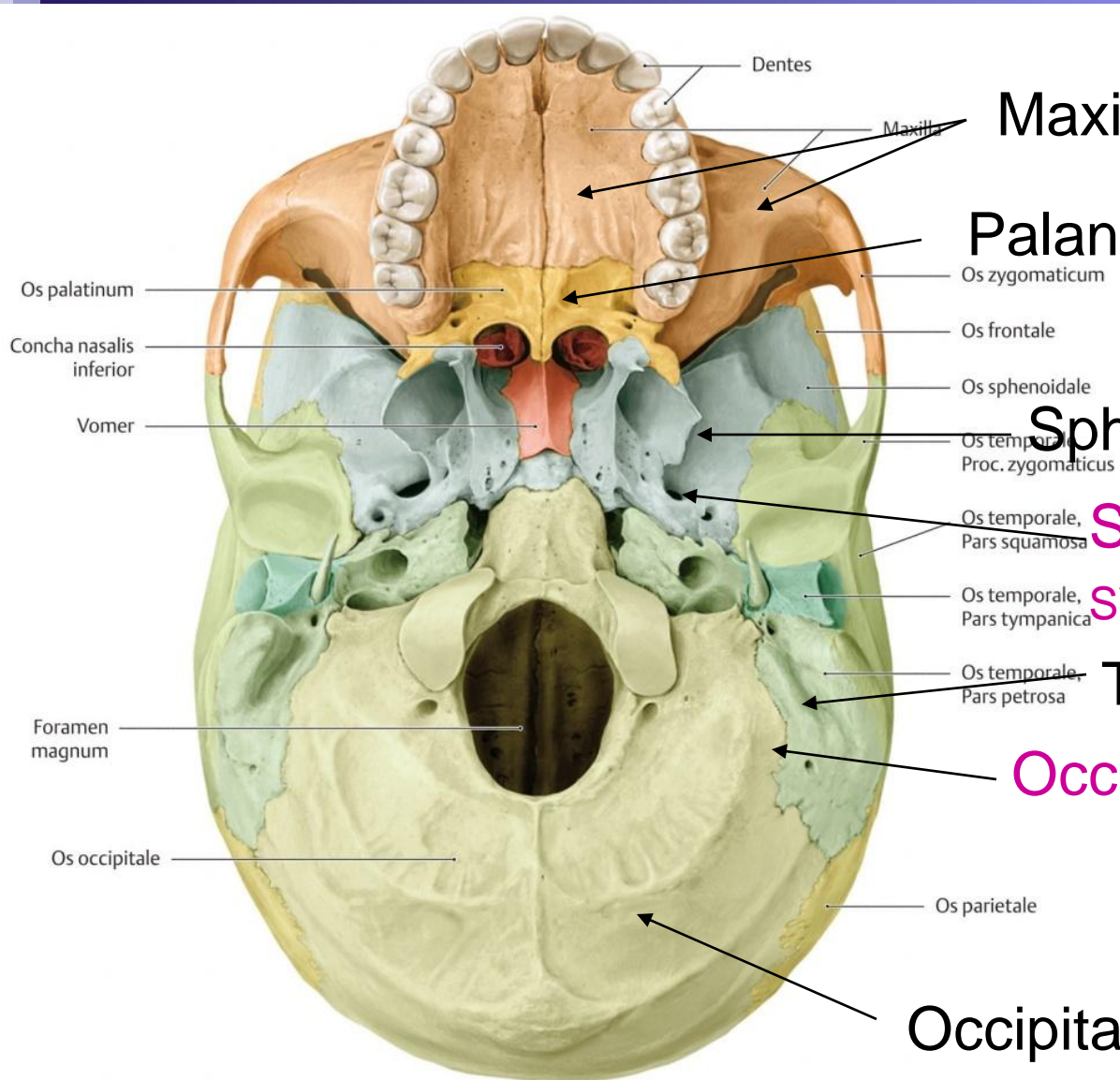
GINGIVAL MEMBRANE

TEMPOROZYGOMATIC SUTURE

Lateral View

Lambdoidal suture





Maxilla

Palantines

Sphenoid

Sphenobasilar junction/
synchondroses

Temporal bone

Occipitomastoid suture

Occipital bone

A Knochen an der Schädelbasis von außen

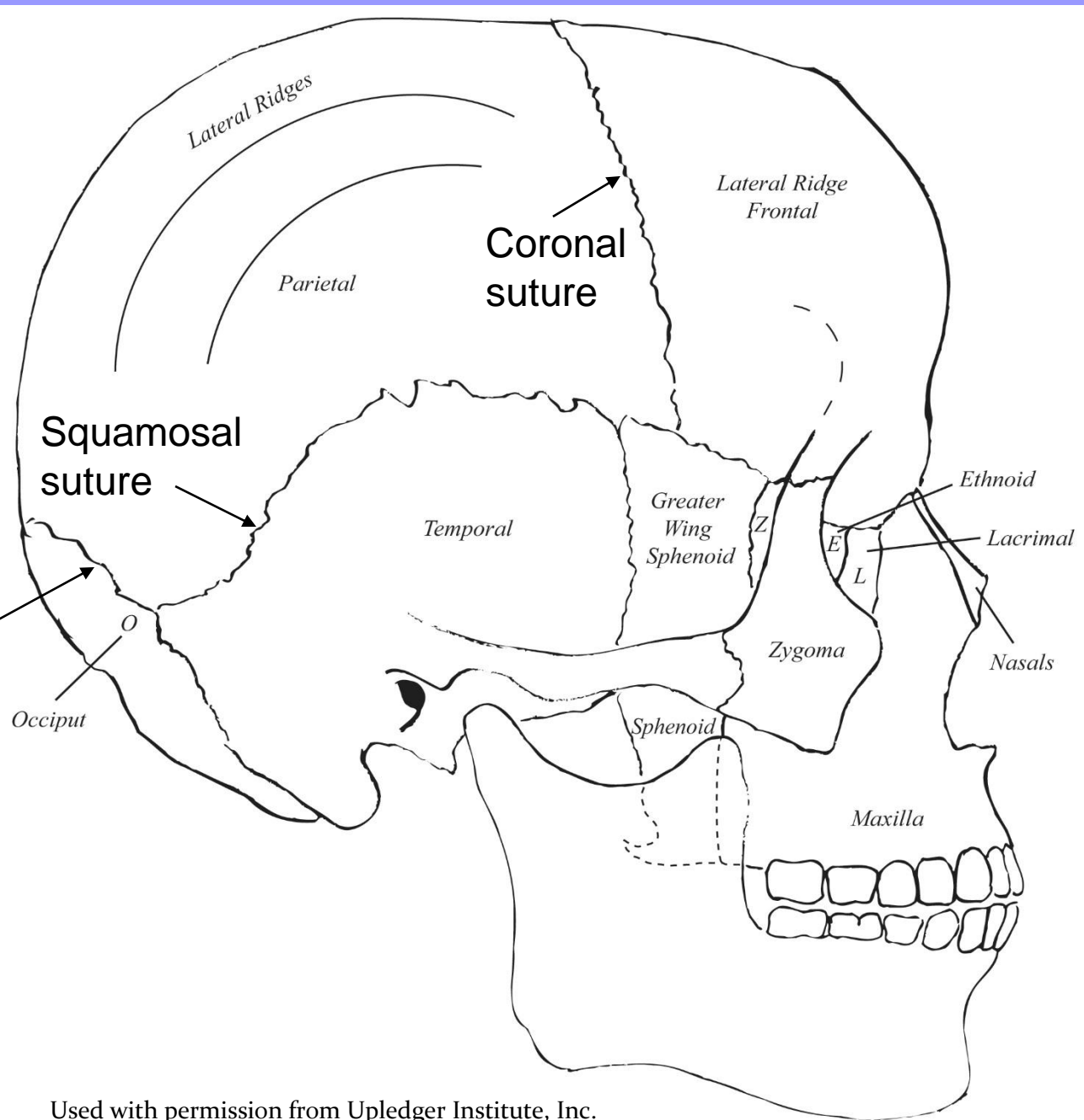
Ansicht von kaudal

Bones:

- Frontal
- Parietal
- Temporal
- Occipital
- Sphenoid
- Maxilla

Sutures:

- Coronal
- Lambdoidal
- Occipitomastoid



Occipitomastoid suture = jugular foramen
(exit of jugular vein, vagus,
glossopharyngeal & accessory nerves)

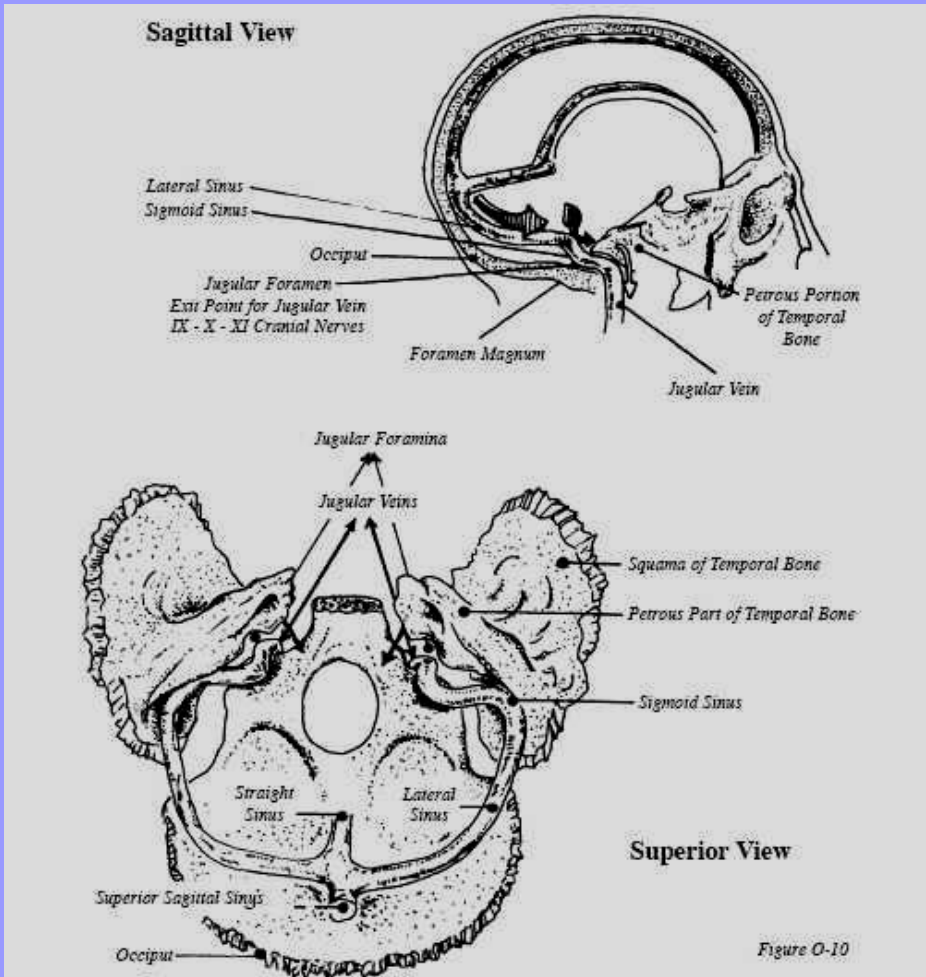
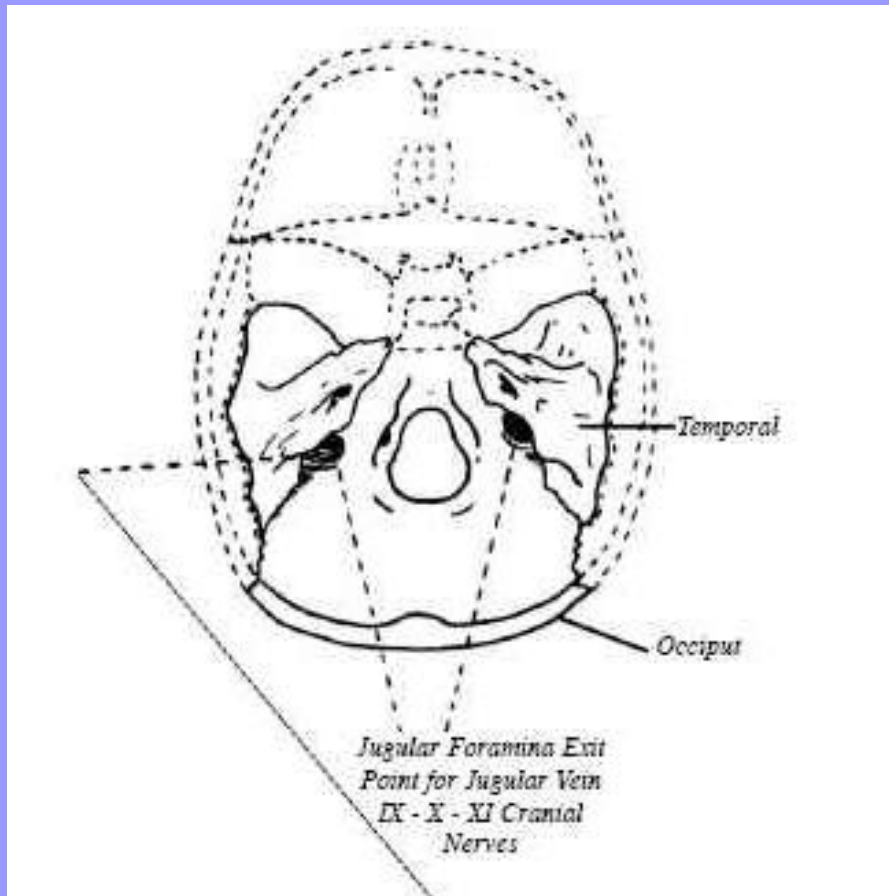
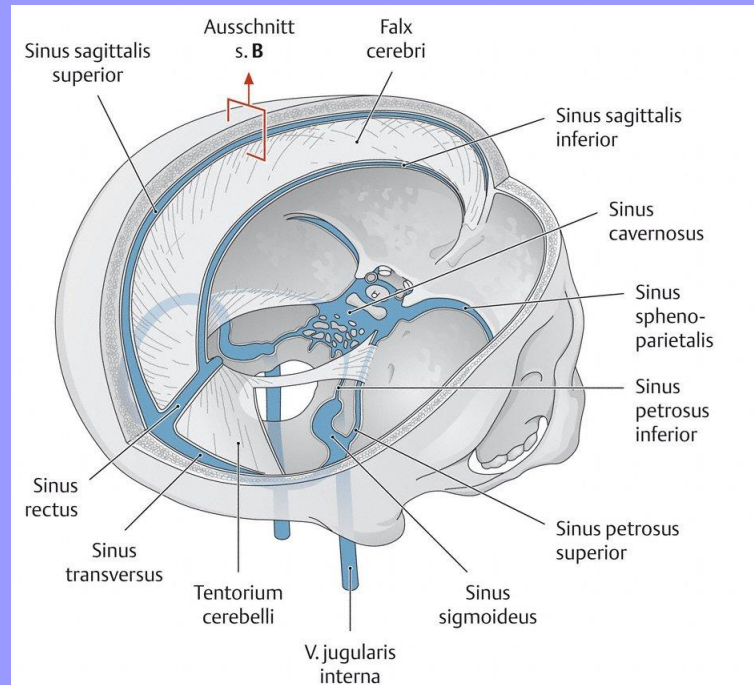


Figure O-10

Dural membranes: falx cerebri & cerebelli, tentorium cerebelli



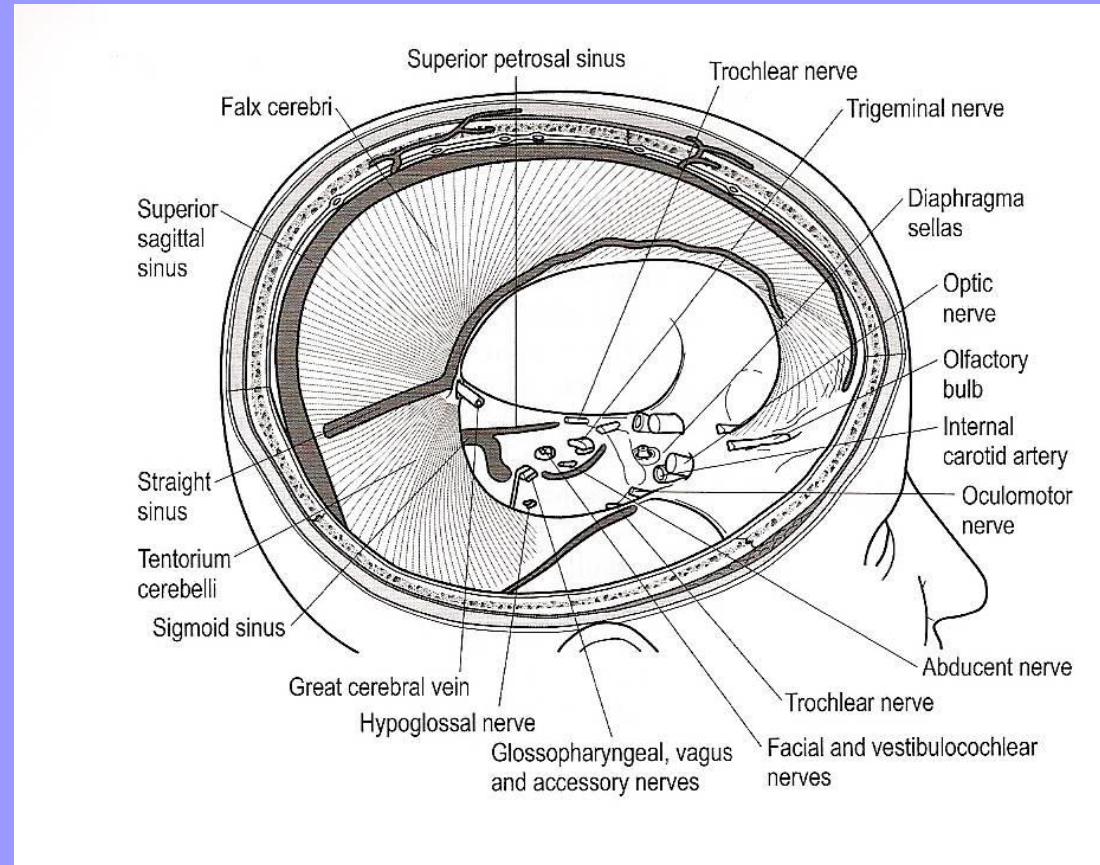
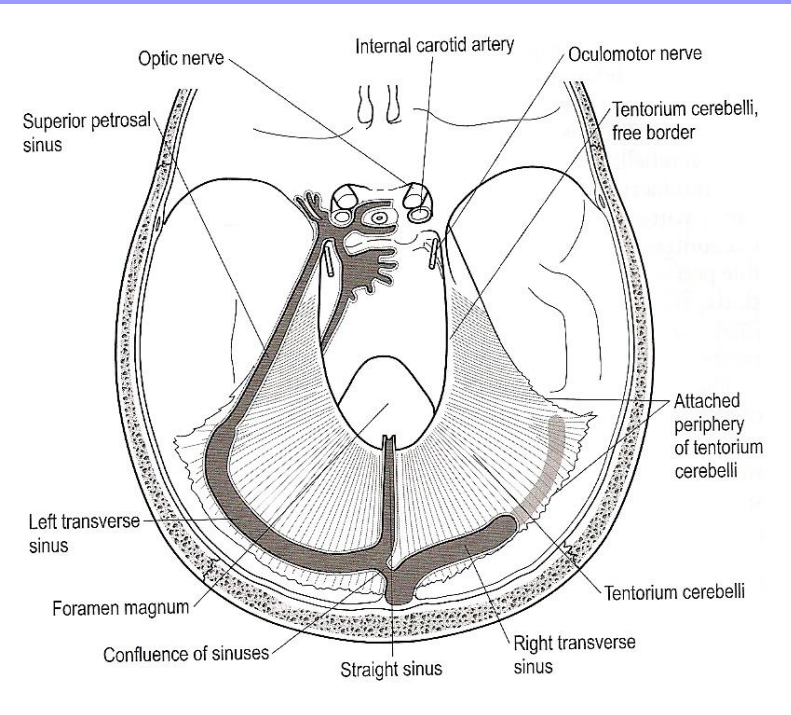
A Einbau der wichtigsten Sinus durae matris in den Schädel

Ansicht von rechts dorsal
(Gehirn entfernt und rechtes Tentorium cerebelli gefenstert)

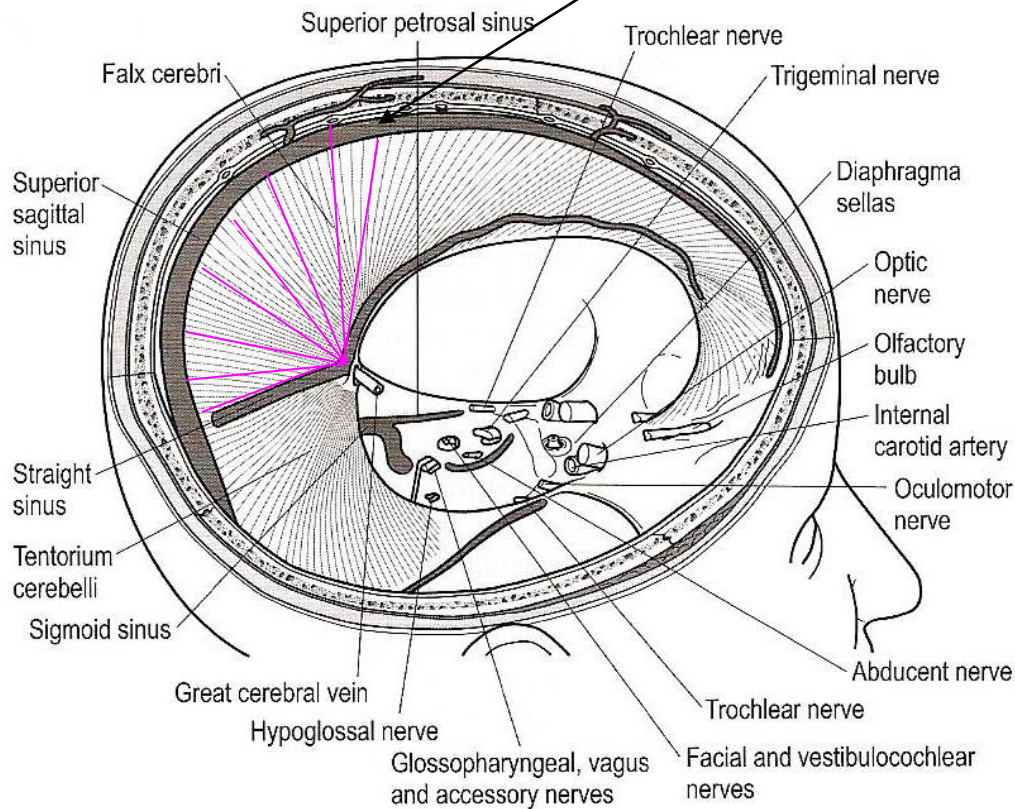


PROMETHEUS Lernatlas der Anatomie · Kopf und Neuroanatomie
M. Schünke, E. Schulte, U. Schumacher. Illustrator: M. Voll
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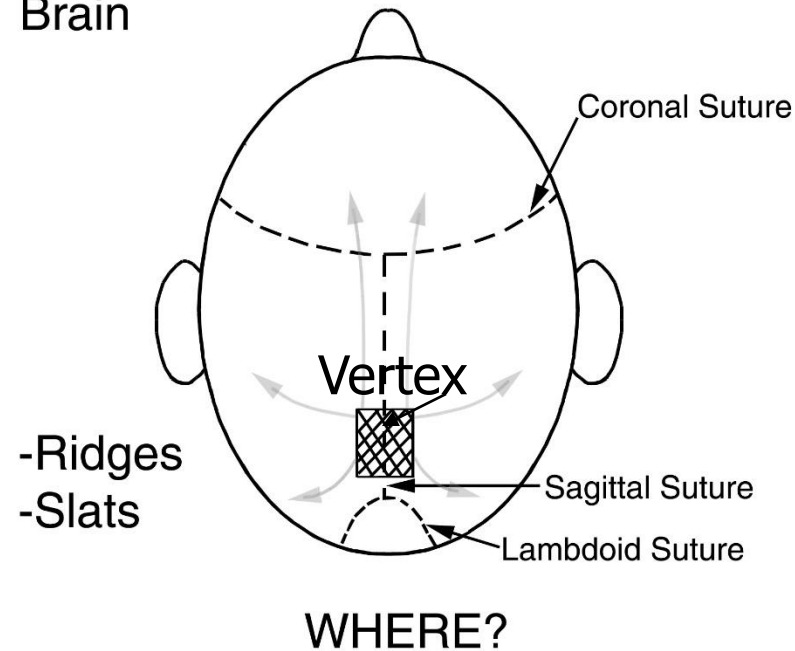
Tentorium: attaches to occiput, parietal, petrous temporal, ant & post clinoid processes of sphenoid



Vertex

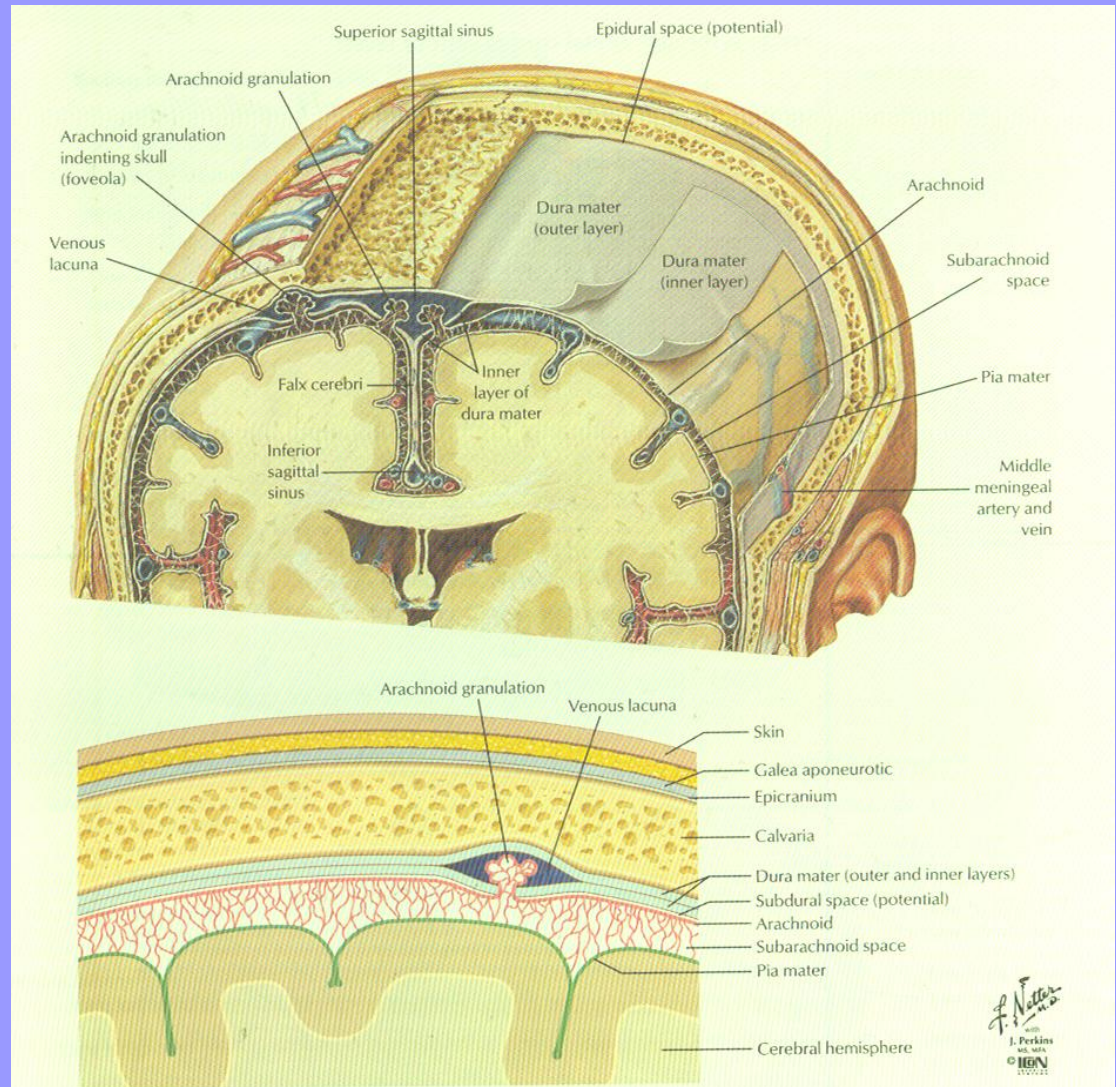


Bones/Sutures
 Membranes (Dura, Arachnoid, Pia)
 Brain



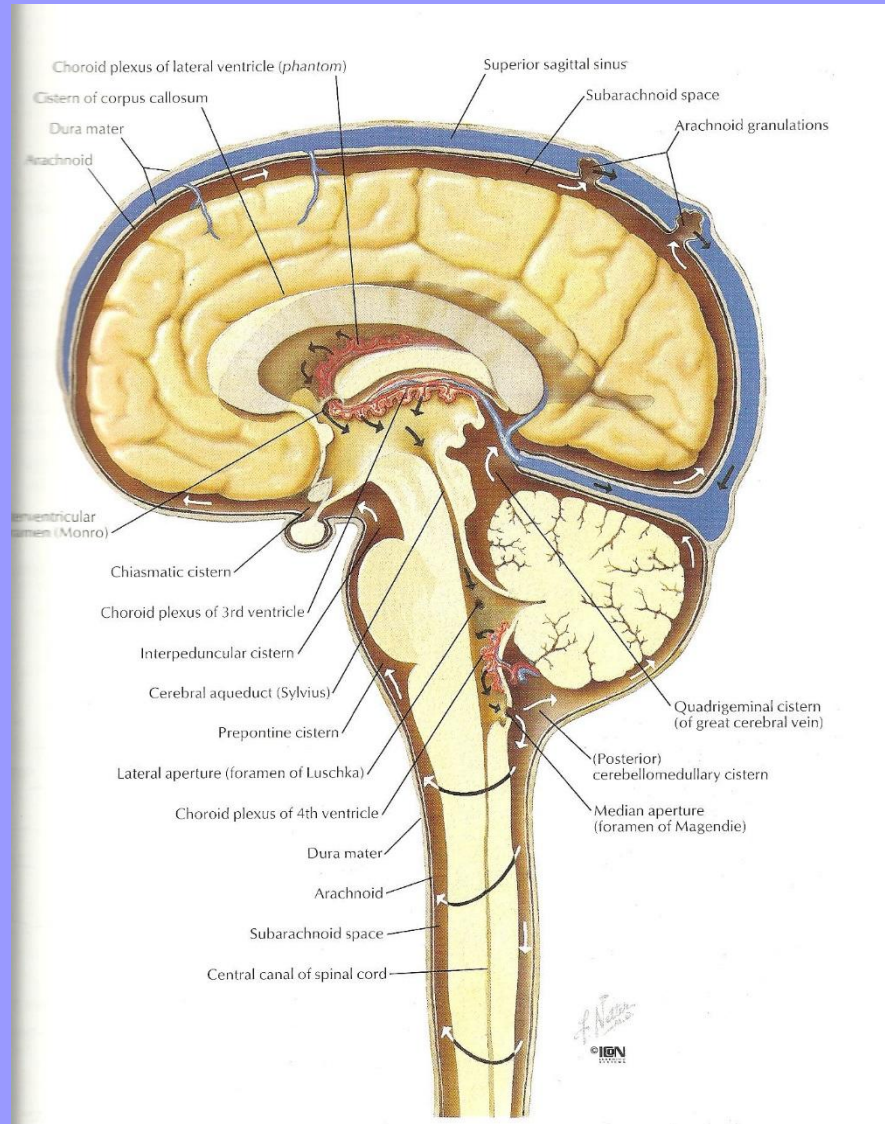
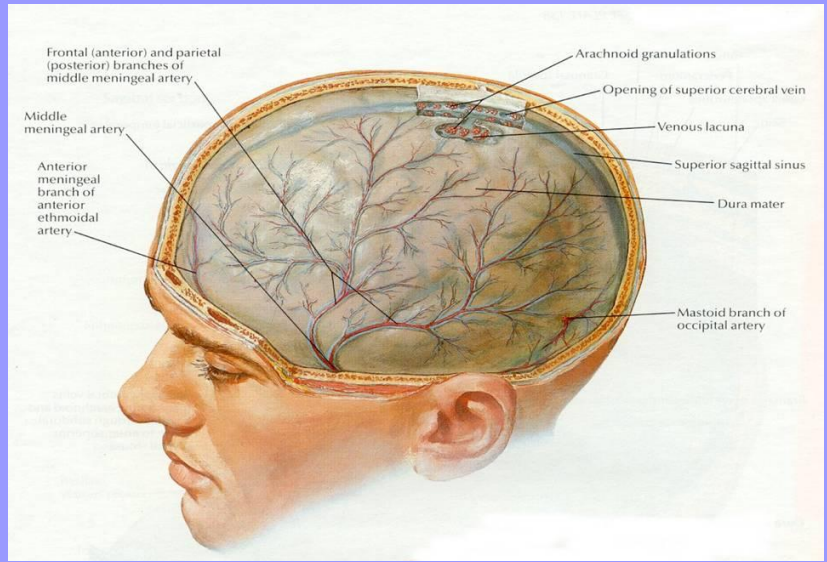
Layers of the Membrane System

- Skin
- Bone
- Dura
- Arachnoid
- Pia
- Brain



Expansion of the Nervous System

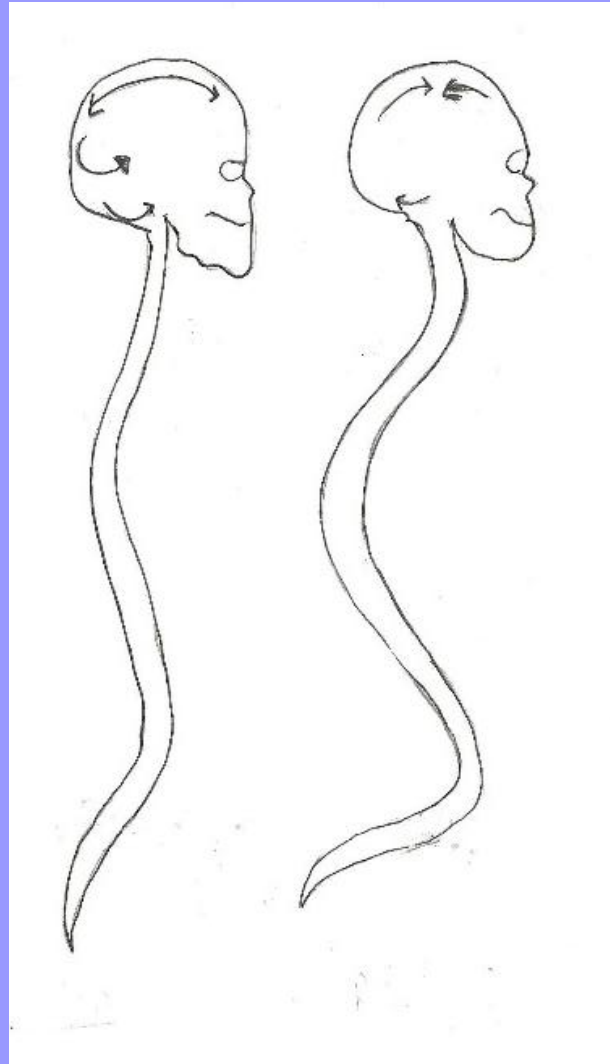
- Jean Pierre Barral prefers to talk about expansion of the nervous system vs retraction rather than flexion/ extension of the craniosacral system.
- Expansion includes not only the cerebrospinal fluid, but the expansion of the brain & meninges



Expansion

Retraction

Brain, dural membranes,
& cranium expand & widen



Brain, dural membranes
& cranium retract
towards center of head

Spinal cord & dural tube
Elongate. Feeling of
inflation in hand.

Spinal cord & dural tube
shorten. Feeling of
deflation in hand

NM1 Preparation Quiz

Answers

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Frontal/parietal

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Occiput/temporal

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Sagittal suture

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