Senate Counsel

Please note these are "graphic" but note I'm very proud & am strong and overcome the odds.

My son an active Marine & daughter a teacher are 400.

Graciously,

Bridget Dyer

The Brain

Figure 1: Gross Anatomy (Lateral View)

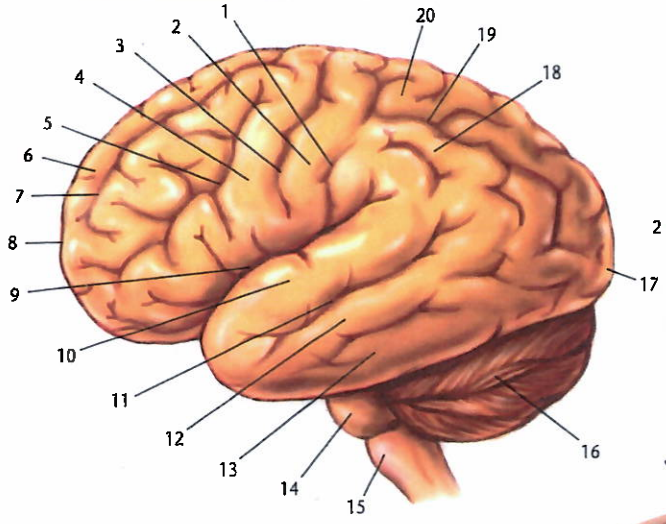


Figure 2: Lobes (Lateral View)

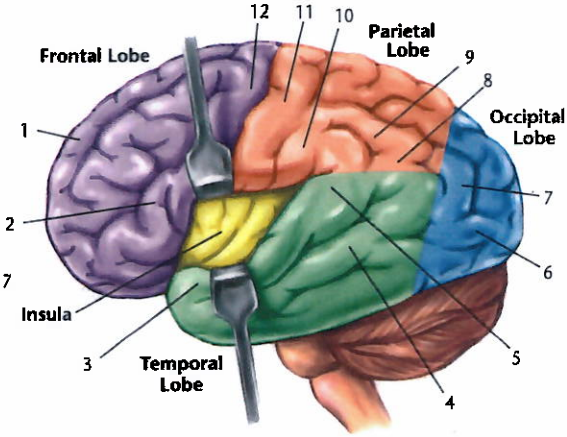


Figure 3: Ventricles & Flow of Cerebrospinal Fluid

- **Cerebrospinal fluid (CSF)** is produced by the choroid plexi of the lateral, third, and fourth ventricles • After flowing through the ventricles, CSF passes via the central canal of the spinal cord and the cerebral and spinal subarachnoid space, moving upward over the cerebral hemispheres • It is then absorbed into the venous blood mainly through the arachnoid villi
- Changes in the carbon dioxide content of CSF affect the respiratory center in the medulla, which helps to regulate breathing
- The volume of CSF in the average adult is about 140 mL, with about 23 mL in the ventricles and 117 mL in the subarachnoid space of the brain

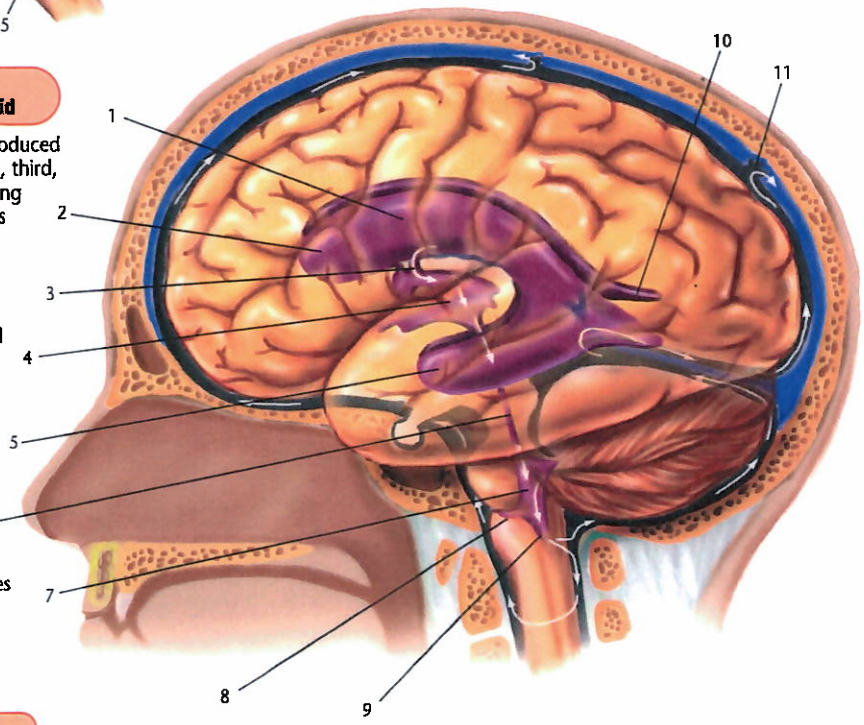
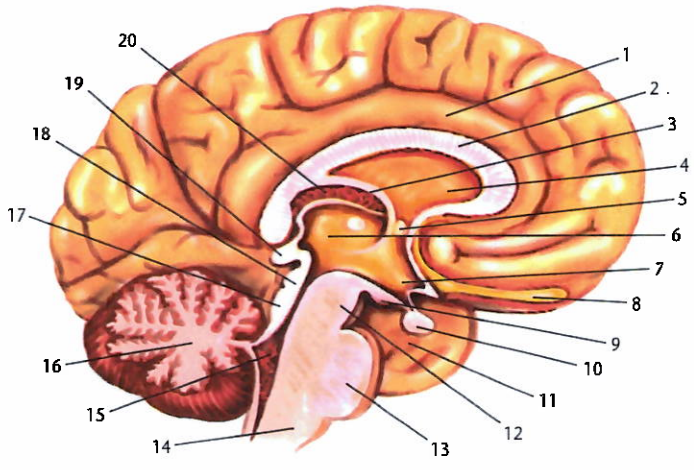


Figure 4: Midsagittal Section



- The brain consists of three main regions: the **forebrain**, **midbrain**, and **hindbrain**
- The forebrain contains the **diencephalon**, which includes the thalamus, hypothalamus, and other structures associated with the limbic system, and the **telencephalon**, which includes the cerebrum
- The diencephalon deals primarily with behavior and emotions, and the telencephalon performs sensory functions, motor functions, and functions associated with various mental activities
- The main parts of the midbrain are the **superior colliculi**, which receive and integrate visual information, and the **inferior colliculi**, which receive and integrate auditory information
- The hindbrain consists of the **cerebellum**, **medulla oblongata**, and **pons**, which function in movement coordination, homeostasis, and signal conduction, respectively

Figure 1: Gross Anatomy

1 Postcentral sulcus
2 Postcentral gyrus
3 Central sulcus
4 Precentral gyrus
5 Precentral sulcus
6 Superior frontal gyrus
7 Superior frontal sulcus
8 Frontal pole
9 Lateral sulcus (of Sylvius)
10 Superior temporal gyrus
11 Superior temporal sulcus
12 Middle temporal gyrus
13 Inferior temporal gyrus
14 Pons
15 Medulla oblongata
16 Cerebellum
17 Occipital pole
18 Inferior parietal lobule
19 Intraparietal sulcus
20 Superior parietal lobule

Figure 2: Lobes

- Each hemisphere of the cerebrum is divided into five lobes: **frontal** (purple), **parietal** (orange), **temporal** (green), **occipital** (blue), and **insula** (yellow)

1 Frontal association area (Right hemisphere: non-verbal, artistic ability; Left hemisphere: speech, language, and calculation)
2 Speech (Broca's area)
3 Olfaction
4 Auditory association area
5 Hearing
6 Vision
7 Visual association area
8 Reading
9 Somatic association area
10 Speech (Wernicke's area)
11 Primary sensory area
12 Primary motor area

Figure 3: Ventricles & Flow of Cerebrospinal Fluid

1 Lateral ventricle
2 Anterior horn of lateral ventricle
3 Foramen of Monro
4 Third ventricle
5 Inferior horn of lateral ventricle
6 Cerebral aqueduct
7 Fourth ventricle
8 Foramen of Luschka
9 Foramen of Magendie
10 Posterior horn of lateral ventricle
11 Arachnoid granulation

Figure 4: Midsagittal Section

1 Cingulate gyrus
2 Corpus callosum
3 Fornix
4 Septum pellucidum
5 Anterior commissure
6 Thalamus
7 Hypothalamus
8 Olfactory bulb
9 Mammillary body
10 Pituitary gland
11 Amygdaloid body (phantomed)
12 Cerebral peduncle
13 Pons
14 Medulla oblongata
15 Choroid plexus of fourth ventricle
16 Cerebellum
17 Inferior colliculus
18 Superior colliculus
19 Pineal body
20 Choroid plexus of third ventricle

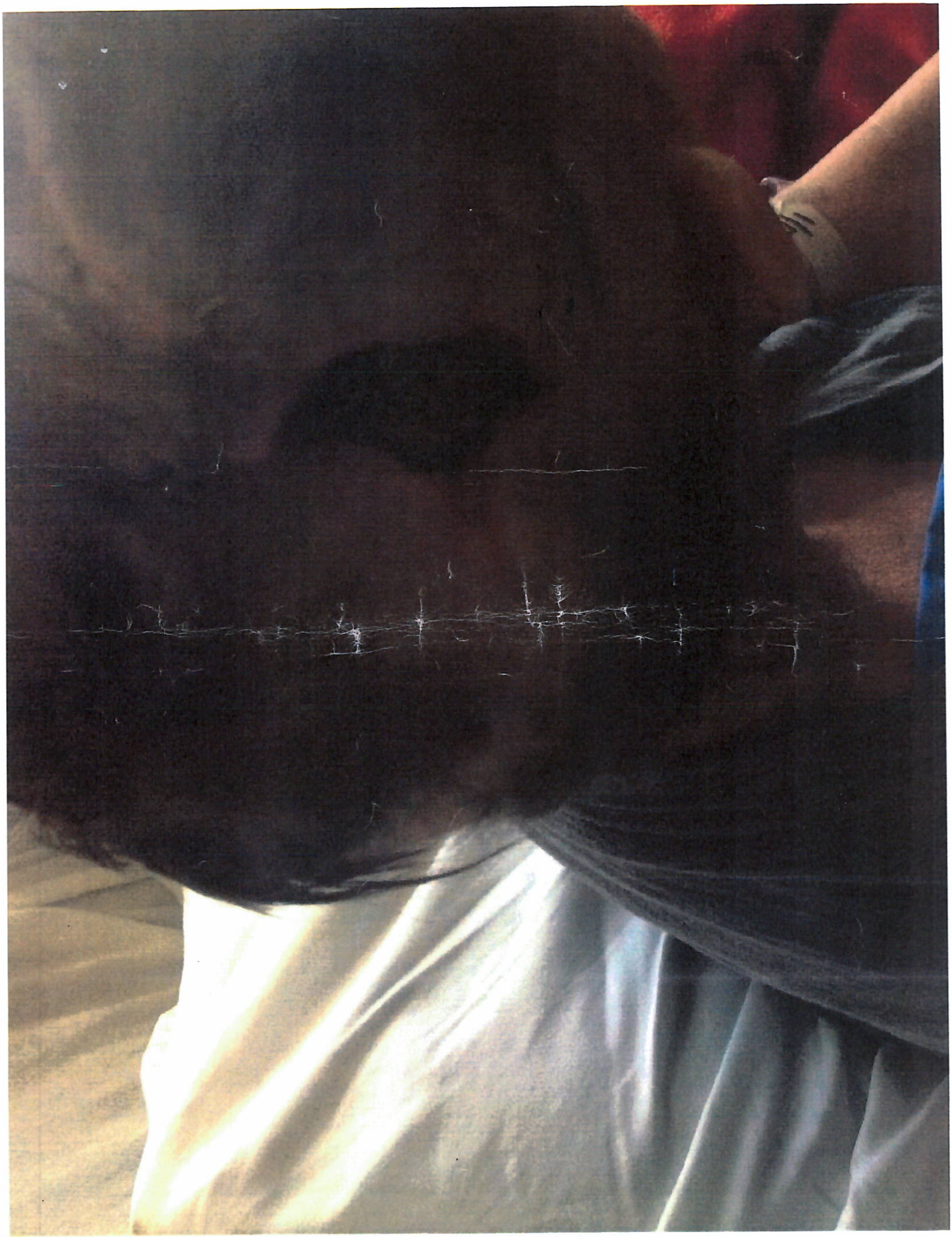


Figure 5: Arteries & Cranial Nerves

1 Olfactory nerve (CN I)
2 Optic nerve (CN II)
3 Optic chiasma
4 Oculomotor nerve (CN III)
5 Trochlear nerve (CN IV)
6 Ophthalmic branch of trigeminal nerve (CN V1)
7 Maxillary branch of trigeminal nerve (CN V2)
8 Mandibular branch of trigeminal nerve (CN V3)
9 Abducens nerve (CN VI)
10 Facial nerve (CN VII)
11 Nervus intermedius
12 Vestibulocochlear nerve (CN VIII)
13 Glossopharyngeal nerve (CN IX)
14 Hypoglossal nerve (CN XII)
15 Vagus nerve (CN X)
16 Accessory nerve (CN XI)
17 First spinal nerve (C1)
18 Spinal cord
19 Anterior communicating artery
20 Anterior cerebral artery
21 Internal carotid artery
22 Middle cerebral artery
23 Posterior communicating artery
24 Posterior cerebral artery
25 Superior cerebellar artery
26 Pontine artery
27 Basilar artery
28 Vertebral artery
29 Anterior spinal artery
30 Posterior inferior cerebellar artery

Figure 6: Membranes & Venous Sinuses

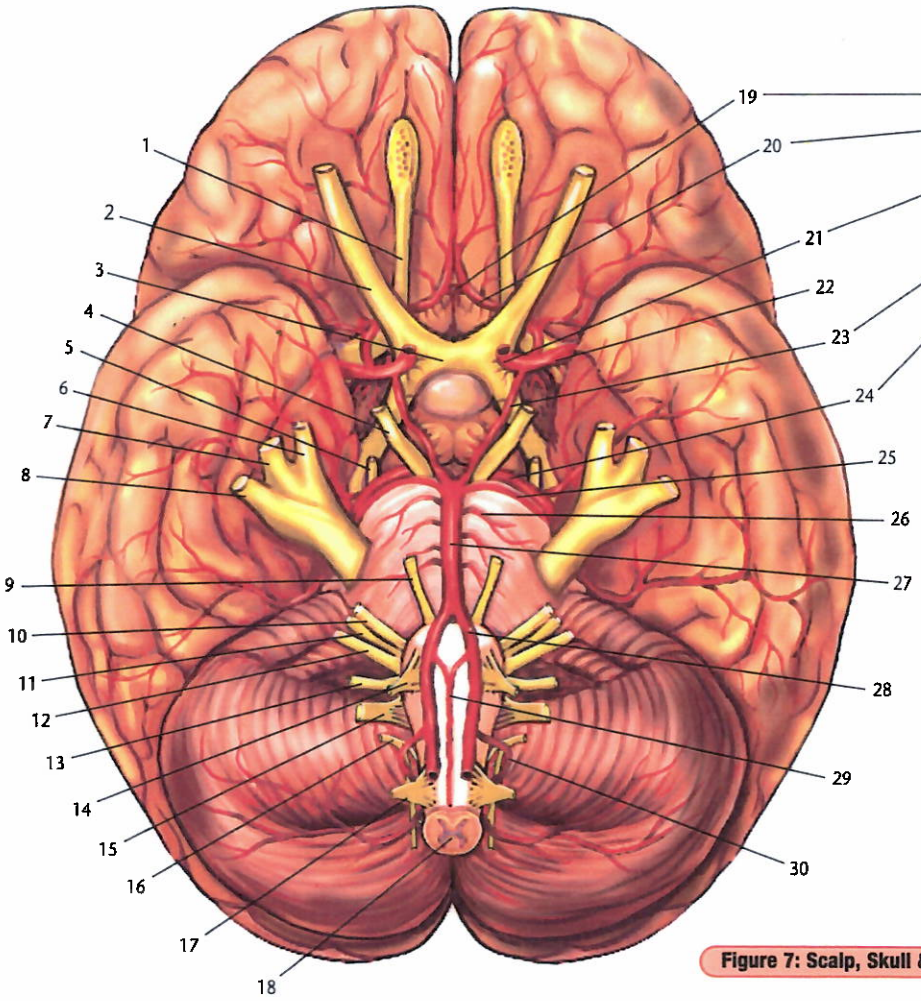
1 Cavernous sinus
2 Pituitary gland
3 Optic nerve (CN II)
4 Internal carotid artery
5 Oculomotor nerve (CN III)
6 Inferior petrosal sinus
7 Middle meningeal vessels
8 Inferior sagittal sinus
9 Falx cerebri
10 Superior petrosal sinus
11 Tentorium cerebelli
12 Sigmoid sinus
13 Superior sagittal sinus
14 Great cerebral vein
15 Superior cerebral veins
16 Straight sinus
17 Occipital sinus
18 Confluence of sinuses
19 Transverse sinus
20 Falx cerebelli
21 Sphenoparietal sinus

Figure 7: Scalp, Skull & Meninges

Note: SCALP is conveniently spelled out using the first letters of its 5 layers

1 Skin
2 Connective tissue
3 Aponeurosis (epicranial)
4 Loose areolar tissue
5 Pericranium
6 Diploë of cranium
7 Diploic vein
8 Dura mater
9 Arachnoid granulation
10 Subdural space
11 Arachnoid
12 Subarachnoid space
13 Pia mater
14 Grey matter (cerebral cortex)
15 White matter

Figure 5: Arteries & Cranial Nerves (Inferior View)



- Together, the anterior communicating, anterior cerebral, internal carotid, posterior communicating, and posterior cerebral arteries form the vascular network known as the **Circle of Willis**

Figure 6: Membranes & Venous Sinuses

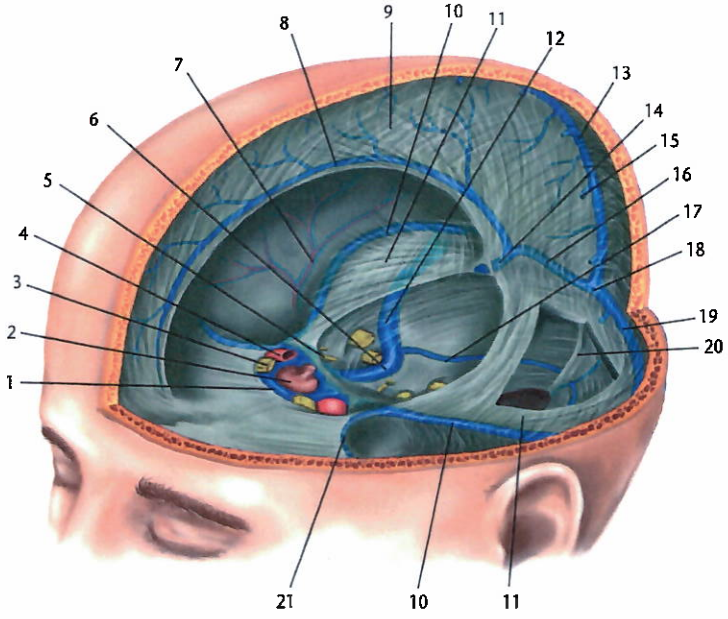
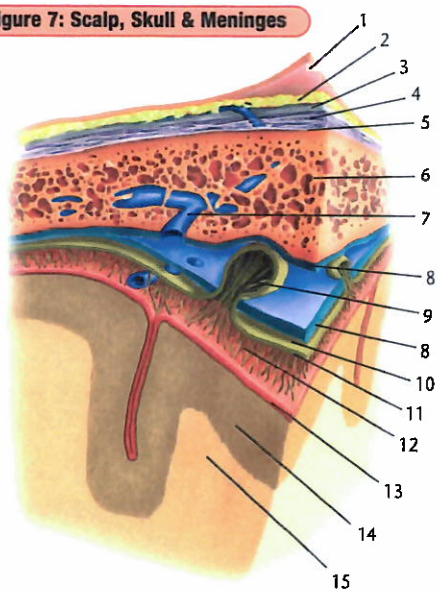


Figure 7: Scalp, Skull & Meninges



- The **meninges** are the three membranes that enclose the brain and spinal cord
- The outermost and most fibrous layer is the **dura mater**, followed by the thin, delicate **arachnoid**, and the blood-rich **pia mater**
- The pia mater helps to form the choroid plexi of the third, lateral, and fourth ventricles

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ISBN: 1-55080-120-1 **$3.75 U.S./$5.00 CDN**

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