

Gross Anatomy of the Brain and Cranial Nerves

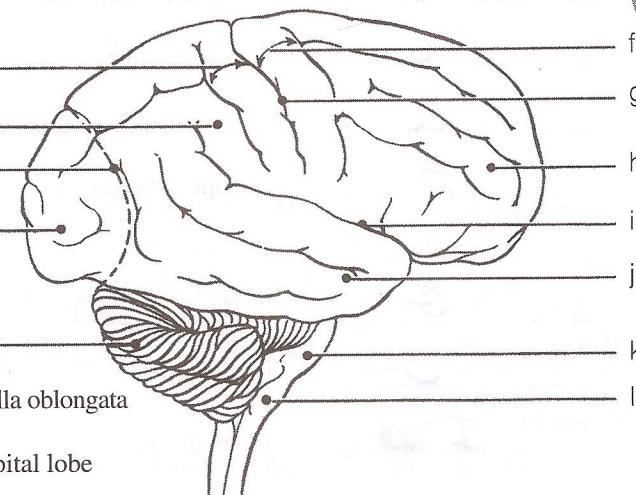
The Human Brain

1. In which of the cerebral lobes (frontal, parietal, occipital, or temporal) would the following functional areas be found?

auditory area TEMPORAL olfactory area TEMPORAL
 primary motor area FRONTAL visual area OCCIPITAL
 somatic sensory area PARIETAL Broca's area FRONTAL

2. Match the letters on the diagram of the human brain (right lateral view) to the appropriate terms listed at the left:

| | | | |
|----------------|-----------------------------|----------------|-----------------------|
| <u>H</u> _____ | 1. frontal lobe | a _____ | f _____ |
| <u>B</u> _____ | 2. parietal lobe | b _____ | g _____ |
| <u>J</u> _____ | 3. temporal lobe | c _____ | h _____ |
| <u>F</u> _____ | 4. precentral gyrus | d _____ | i _____ |
| <u>C</u> _____ | 5. parieto-occipital sulcus | e _____ | j _____ |
| <u>A</u> _____ | 6. postcentral gyrus | | k _____ |
| <u>I</u> _____ | 7. lateral sulcus | <u>L</u> _____ | l _____ |
| <u>G</u> _____ | 8. central sulcus | <u>D</u> _____ | |
| <u>e</u> _____ | 9. cerebellum | <u>K</u> _____ | |
| | | | 10. medulla oblongata |
| | | | 11. occipital lobe |
| | | | 12. pons |



3. Which of the following structures are *not* part of the brain stem? (Circle the appropriate response or responses.)

cerebral hemispheres pons midbrain cerebellum medulla

4. Complete the following statements by writing the proper word or phrase in the corresponding blank at the right.

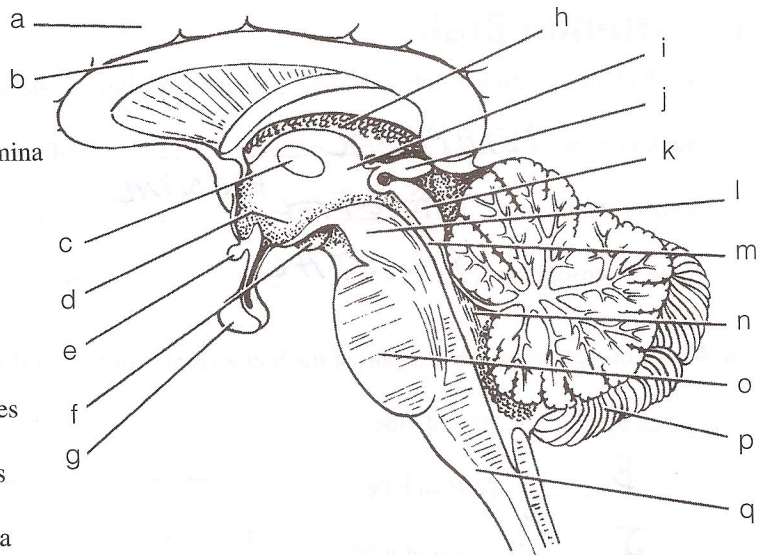
1. GYRUS
2. FISSURES
3. SULCI
4. NEURON CELL BODIES
5. AXONS
6. COMMISSURAL TRACTS

A(n) 1 is an elevated ridge of cerebral tissue. Inward folds of cerebral tissue are called 2 or 3. Gray matter is composed of 4. White matter is composed of 5. A bundle of fibers that provides for communication between different parts of the CNS is called a(n) 6, whereas one that carries impulses between the periphery and CNS areas is called a(n) 7. Nuclei deep within the cerebral hemisphere white matter are collectively called the 8.

7. PROJECTION TRACTS
8. BASAL NUCLEI

5. Identify the structures on the following sagittal view of the human brain by matching the lettered areas to the proper terms at the left:

- P _____ 1. cerebellum
- M _____ 2. cerebral aqueduct
- A _____ 3. cerebral hemisphere
- L _____ 4. cerebral peduncle
- H _____ 5. choroid plexus
- K _____ 6. corpora quadrigemina
- B _____ 7. corpus callosum
- N _____ 8. fourth ventricle
- D _____ 9. hypothalamus
- F _____ 10. mammillary bodies
- C _____ 11. intermediate mass
- Q _____ 12. medulla oblongata
- E _____ 13. optic chiasma
- J _____ 14. pineal body
- G _____ 15. pituitary gland
- O _____ 16. pons
- I _____ 17. thalamus



6. Using the anatomical terms from item 5, match the appropriate structures with the following descriptions:

- HYPOTHALAMUS 1. site of regulation of body temperature and water balance; most important autonomic center of brain
- CORPORA QUADRIGEMINA 2. located in the midbrain; contains reflex centers for vision and hearing
- CEREBELLUM 3. coordinates complex muscular movements
- MEDULLA OBLONGATA 4. contains autonomic centers regulating heart rate, respiration, and other visceral activities
- CORPUS CALLOSUM 5. large fiber tract connecting the cerebral hemispheres
- PITUITARY GLAND 6. part of the endocrine system
- CEREBRAL AQUEDUCT 7. canal that connects the third and fourth ventricles
- THALAMUS 8. the intermediate mass is part of it

7. Explain why trauma to the base of the brain is often much more dangerous than trauma to the frontal lobes. (Hint: Think about the relative function of the cerebral hemispheres and the brain stem structures. Which contain centers more vital to life?)

DAMAGE TO BRAINSTEM AREA WILL CAUSE LOSS OF HEARTRATE
+ BREATHING CONTROL HENSE IT'S MORE DANGEROUS THAN FRONTAL
DAMAGE

Meninges of the Brain

8. Identify the meningeal (or associated) structures described below:

- DURA MATER 1. outermost layer; tough fibrous connective tissue
- PIA MATER 2. innermost vascular layer covering the brain; follows every convolution
- ARACHNOID VILLUS 3. drains cerebrospinal fluid into the venous blood in the dural venous sinuses
- CHOROID PLEXUS 4. structure that forms the cerebrospinal fluid
- ARACHNOID MATER 5. middle layer; delicate with cottony fibers
- FALX CEREBRI 6. a dural fold that attaches the cerebrum to the crista galli of the skull

Cerebrospinal Fluid

9. Fill in the following flowchart to indicate the path of cerebrospinal fluid from its formation site (assume that this is one of the lateral ventricles) to where it is reabsorbed into the venous blood:

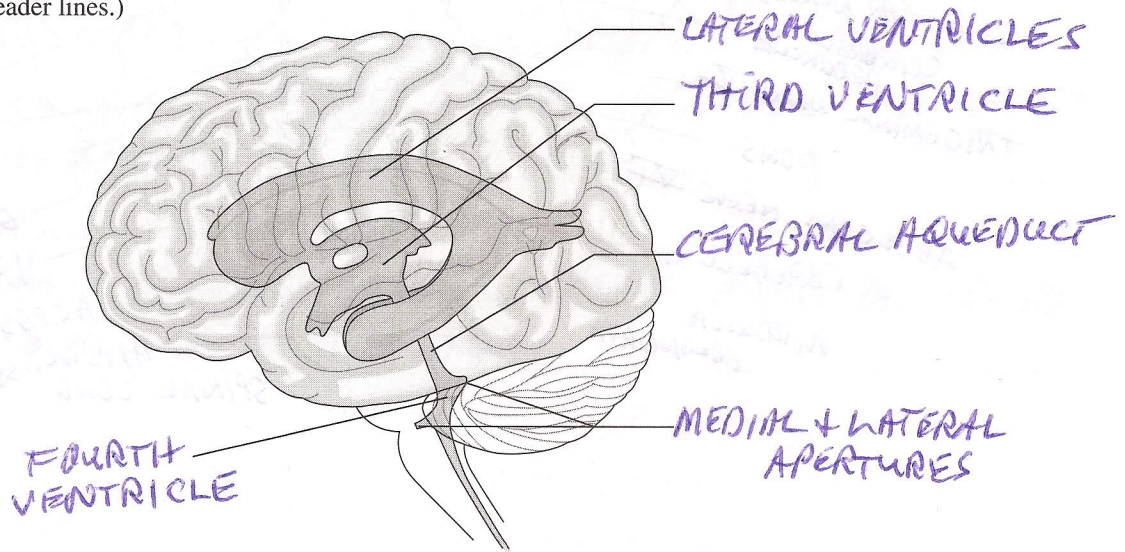
Lateral ventricle → THIRD VENTRICLE → CEREBRAL AQUEDUCT
 → FOURTH VENTRICLE → CENTRAL CANAL OF SPINAL CORD

via openings in the wall of the 4th ventricle

SUB-ARACHNOID SPACE surrounding the brain and cord (and central canal of the cord) → arachnoid villi →

SUPERIOR SAGITTAL SINUS containing venous blood

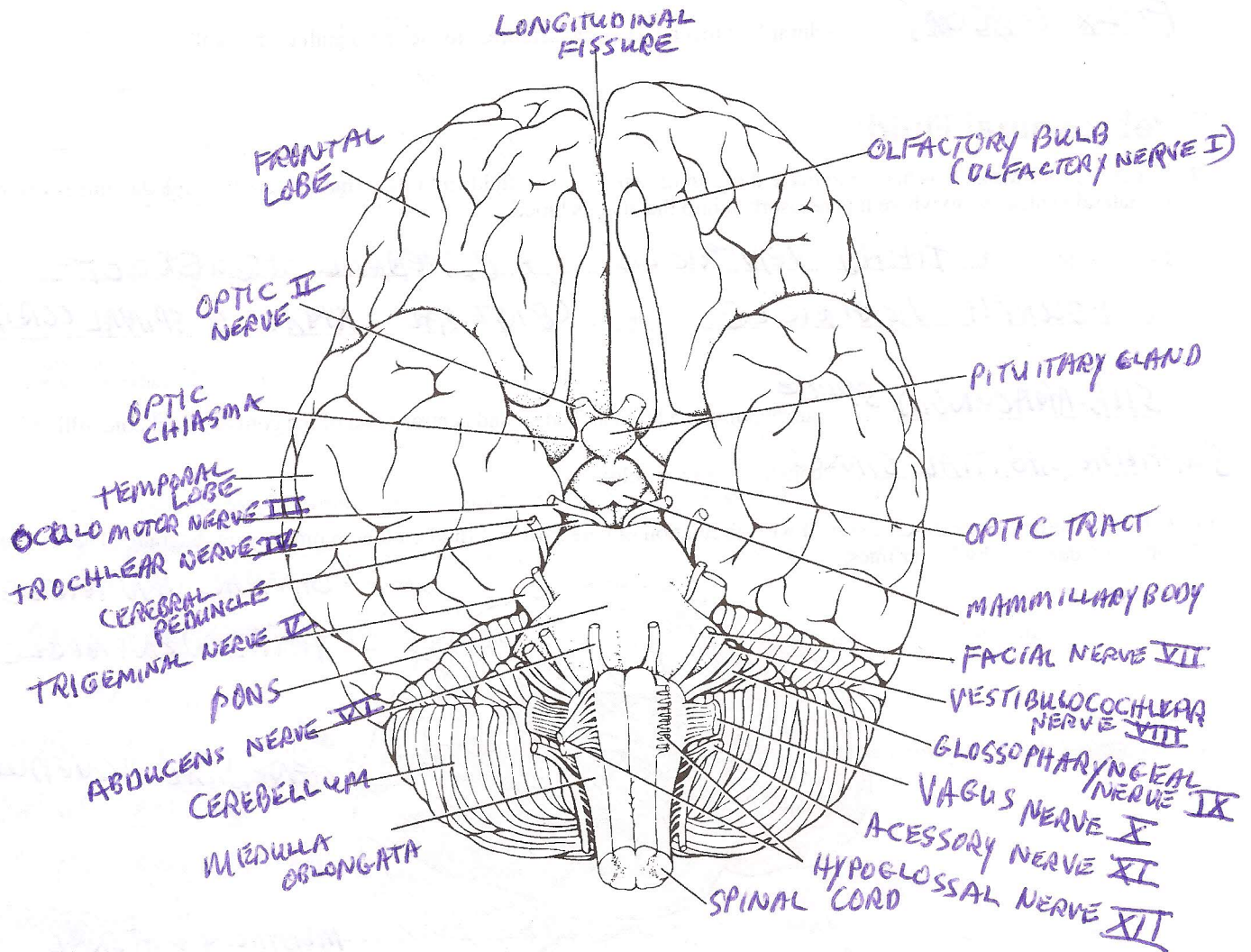
10. Label correctly the structures involved with circulation of cerebrospinal fluid on the accompanying diagram. (These structures are identified by leader lines.)



Cranial Nerves

11. Using the following terms, correctly identify all structures indicated by leader lines on the diagram.

- | | | |
|---------------------------------------|--------------------------|--|
| ✓ abducens nerve (VI) | ✓ longitudinal fissure | ✓ pituitary gland |
| ✓ accessory nerve (XI) | ✓ mammillary body | ✓ pons |
| ✓ cerebellum | ✓ medulla oblongata | ✓ spinal cord |
| ✓ cerebral peduncle | ✓ oculomotor nerve (III) | ✓ temporal lobe of cerebral hemisphere |
| ✓ facial nerve (VII) | ✓ olfactory bulb | ✓ trigeminal nerve (V) |
| ✓ frontal lobe of cerebral hemisphere | ✓ optic chiasma | ✓ trochlear nerve (IV) |
| ✓ glossopharyngeal nerve (IX) | ✓ optic nerve (II) | ✓ vagus nerve (X) |
| ✓ hypoglossal nerve (XII) | ✓ optic tract | ✓ vestibulocochlear nerve (VIII) |



12. Using choices from the key, provide the name and number of the cranial nerves involved in each of the following activities, sensations, or disorders.

- OLFACTORY 1. smelling a flower
VAGUS 2. slowing the heart
TRIGEMINAL 3. chewing food
OPTIC 4. reading the newspaper
TRIGEMINAL 5. feeling a toothache
FACIAL 6. tasting well-seasoned food
VESTIBULOCOCHLEAR 7. listening to music
ACCESSORY 8. rotating the head
OCULOMOTOR 9. raising the eyelids

Key:

abducens
 accessory
 facial
 glossopharyngeal
 hypoglossal
 oculomotor
 olfactory
 optic
 trigeminal
 trochlear
 vagus
 vestibulocochlear

Dissection of Sheep Brain

13. In your own words, describe the relative hardness of the sheep brain tissue as noticed when you were cutting into it.

SHEEP BRAIN SEEMS PRETTY SOFT & EASY TO CUT

Given that formalin hardens all tissue, what conclusions might you draw about the relative hardness and texture of living

brain tissue? MUST BE VERY SOFT & SQUISHY

14. How does the relative size of the cerebral hemispheres compare in sheep and human brains? HUMAN CEREBRAL

HEMISPHERES ARE MUCH BIGGER THAN SHEEP

What is the significance of this difference? HUMANS ARE MUCH MORE INTELLIGENT

THAN SHEEP

15. What is the significance of the fact that the olfactory bulbs are much larger in the sheep brain than in the human brain?

MEANS THAT SHEEP RELY ON SMELL MUCH MORE SO THAN HUMANS FOR SURVIVAL