Bio101
Laboratory 13

Neuron/Spinal Cord Histology
Brain Anatomy
Ear & Eye Anatomy

1

Brain, Cranial Nerves, and Spinal Cord

- Objectives for today's lab
  - Become familiar with the gross anatomy of the brain and spinal cord
  - Become familiar with the histology of nerve tissue and the spinal cord
  - Become familiar with the gross anatomy of the ear and the eye (Remember: you are responsible ONLY for the structures listed in your Laboratory Guide – please see Addendum and revised Study Guide)

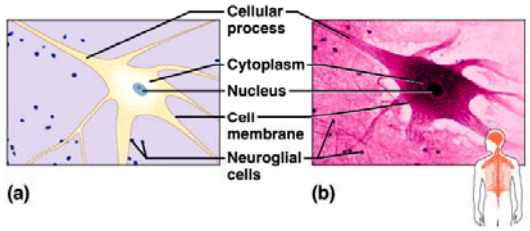
2

Nervous Tissue (slide # 1525)

- Major characteristics
  - Mononucleated (usually central)
  - Many cytoplasmic extensions
  - Usually surrounded by small, glial cells (supporting cells)
- Major Functions
  - Transmission of nerve impulses
  - Sensory reception

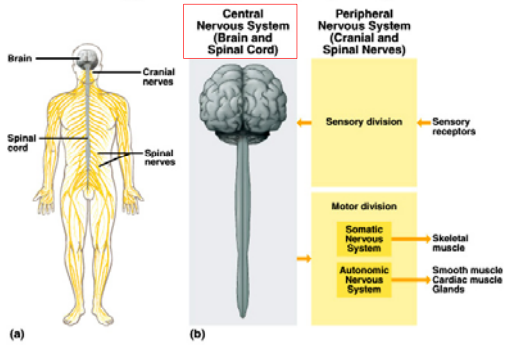
3

Nervous Tissue



4

Overview of the Nervous System



5

Parts of the Brain

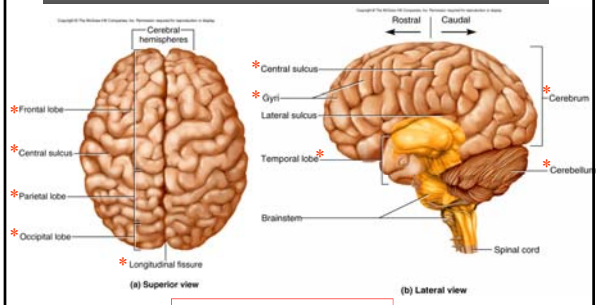


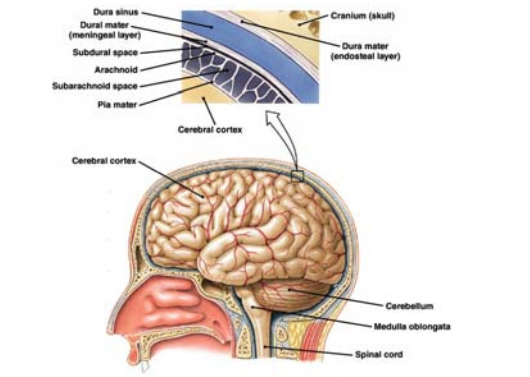
DIAGRAM TO KNOW FOR EXAM

Average male brain ≈ 1,600g, average female brain ≈ 1,450g

Figure from: Saladin, *Anatomy & Physiology*, McGraw Hill, 2007

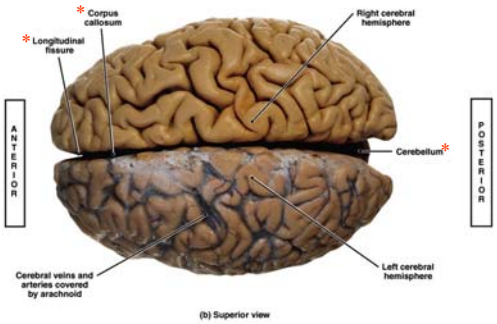
6

Relationship of the Brain and Skull



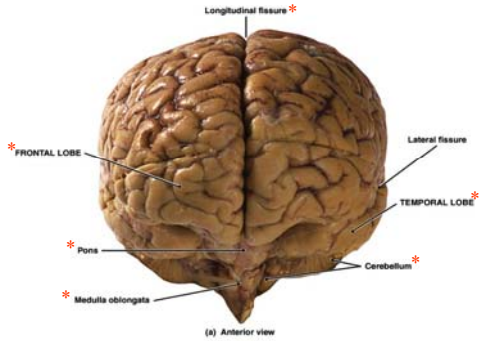
7

Brain – Superior View



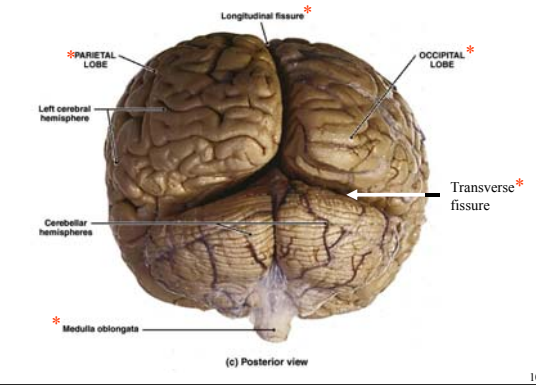
8

Brain – Anterior View



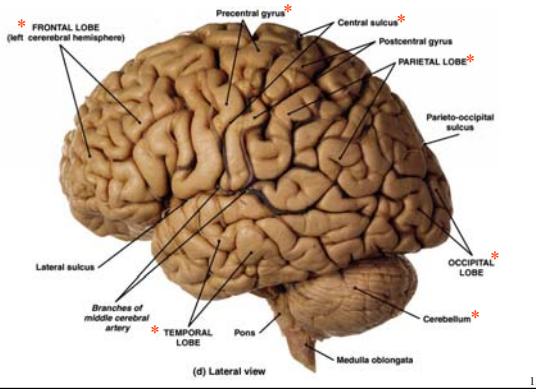
9

Brain – Posterior View



10

Brain



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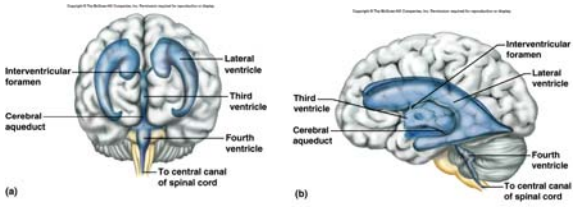
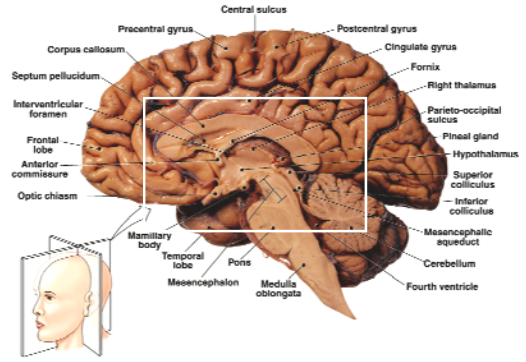
Ventricles of the Brain



Ventricles make and circulate cerebrospinal fluid, CSF

12

Brain



13

The Brain

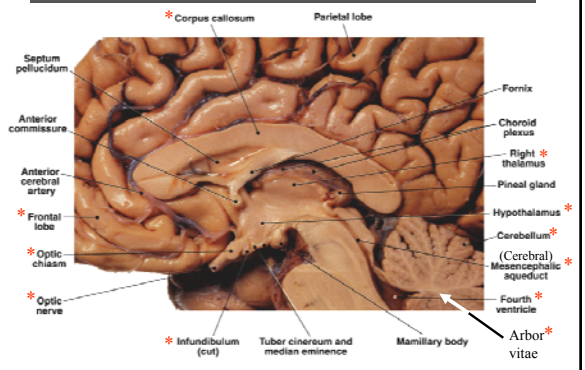


DIAGRAM TO KNOW FOR EXAM

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Brain – Coronal Section

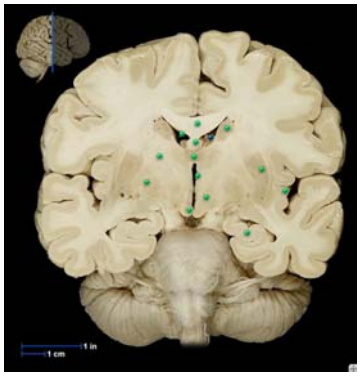

Figure from: *Anatomy & Physiology Revealed*, McGraw Hill, 2007

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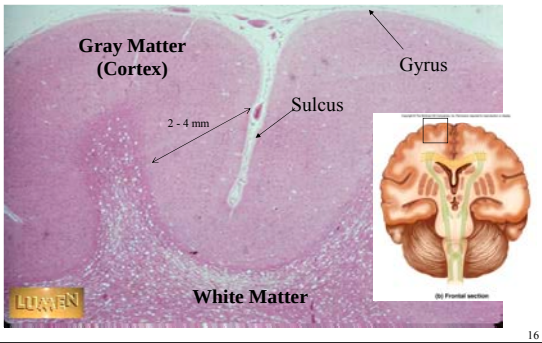
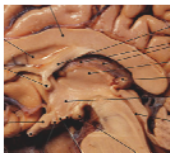
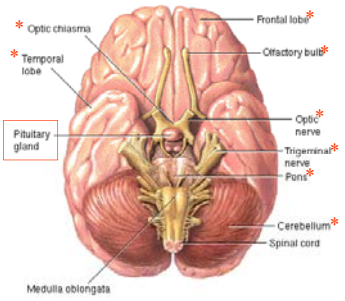
Histology of Cerebral Cortex



16

The Brain





Inferior View

ADAM
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Cranial Nerves (CN or N)

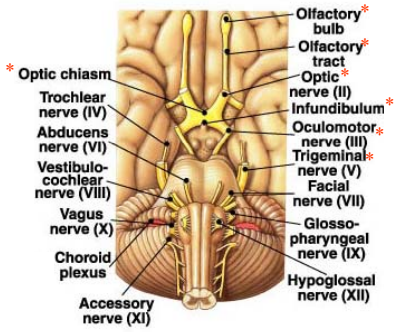

DIAGRAM TO KNOW FOR EXAM

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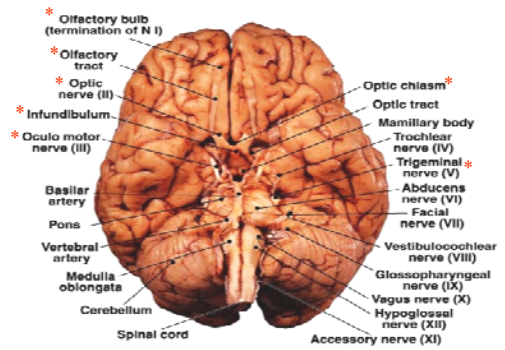
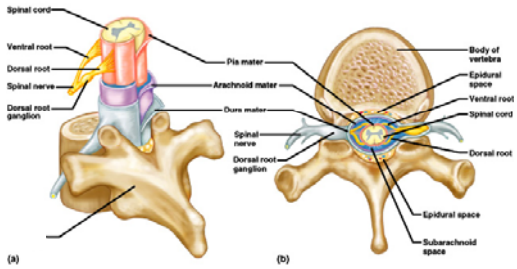
Cranial Nerves



(a)

19

Spinal Cord



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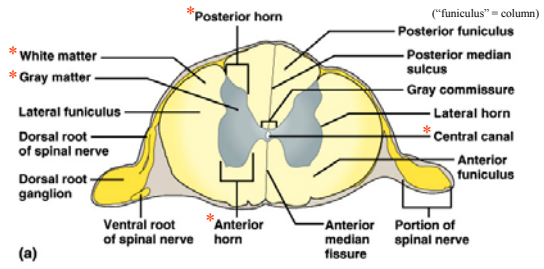
Spinal Cord

Posterior



Anterior

DIAGRAM TO KNOW FOR EXAM

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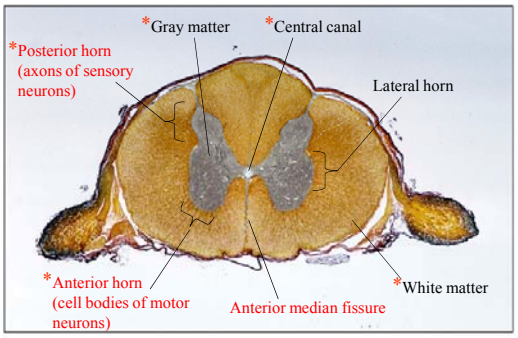
Spinal Cord



(b)

DIAGRAM TO KNOW FOR EXAM

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The Ear

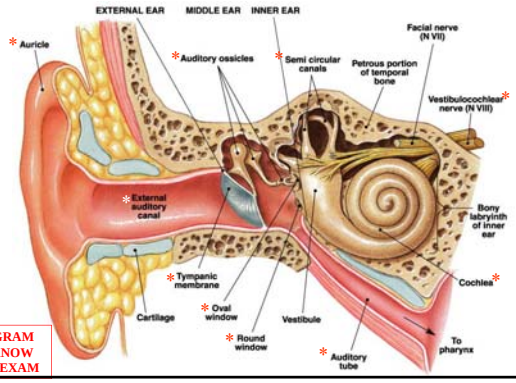

DIAGRAM TO KNOW FOR EXAM

23

The Middle Ear

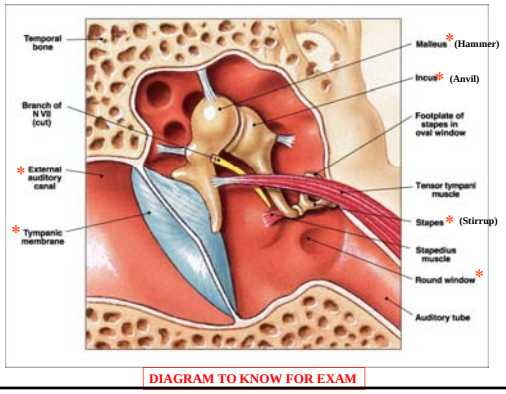

DIAGRAM TO KNOW FOR EXAM

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The Inner Ear

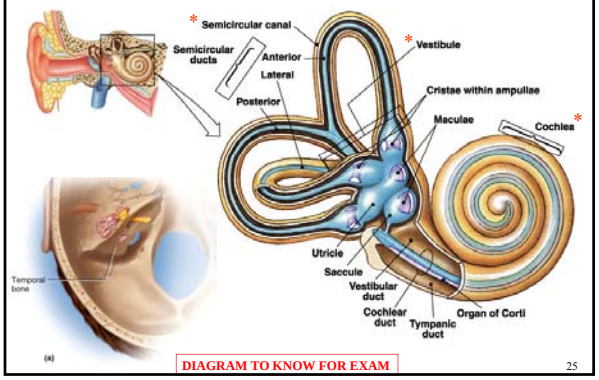

DIAGRAM TO KNOW FOR EXAM

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The External Eye

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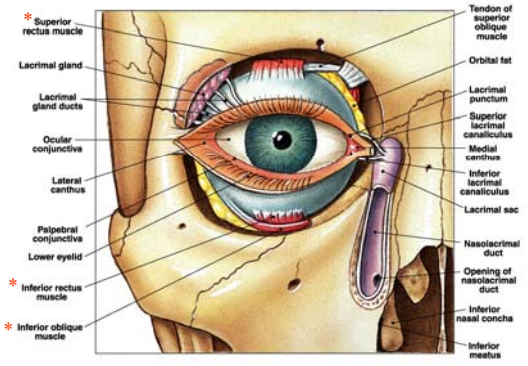
The External Eye



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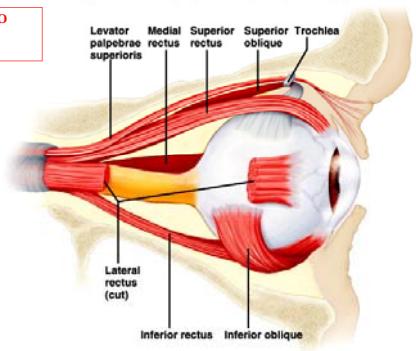
The Extrinsic Muscles of the Eye

DIAGRAM TO KNOW FOR EXAM

Be able to identify all the extrinsic eye muscles shown;

Note the position and insertion of the tendon of the superior oblique



Right eye, lateral view

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Internal Structure of the Eye

Transverse section through right eye

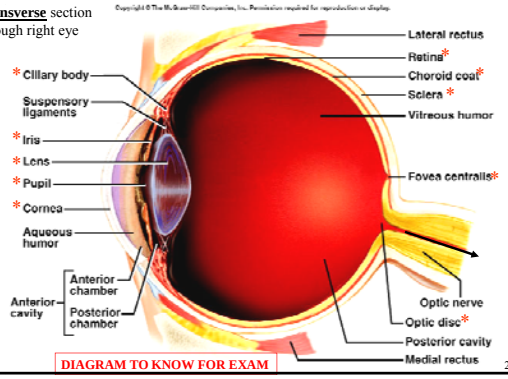

DIAGRAM TO KNOW FOR EXAM

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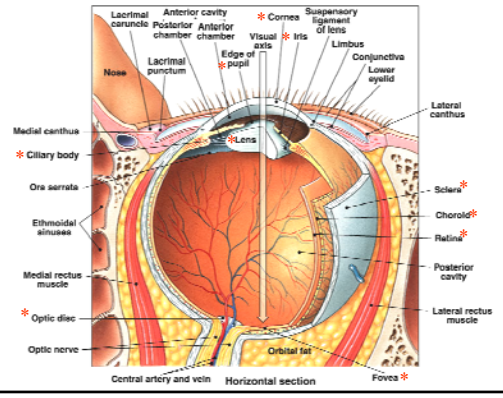
Structure of the Eye



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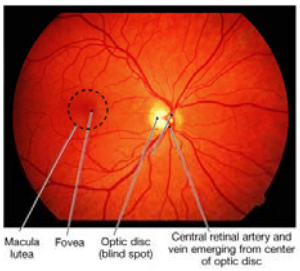
The Retina as Seen Though the Pupil



Normal

"Cotton Wool" spots

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What You Need to Know for Lab Exam 3

SEE THE REVISED STUDY GUIDE FOR LAB EXAM 3

1. **Muscle Histology**
   - Identify the type of muscle shown in a photomicrograph.
   - List the characteristics for each type of muscle that enabled you to make the identification in a above.
   - State where each type of muscle is found in the body (see Figure 6.7, a-c, in Marieb's Lab Manual for complete info and photomicrographs).
   - Identify unique structures in the photomicrographs, e.g., striations, intercalated disks, nuclei, etc.
2. **Skeletal Muscle Gross Anatomy** - Be able to identify and name the human and/or cat skeletal muscles listed in your Laboratory Study Guide when given:
   - a) A photograph/illustration of human muscles n Figures 15.2 and 15.3 in Marieb's Laboratory Manual
   - b) A dissected cat or photograph of a dissected cat

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What You Need to Know for Lab Exam 3

3. **Human Brain Models and Sheep Brains**
   - Be able to identify and name the structures listed in your Lab Study Guide using the human brain models or photographs of the human brains (from designated slides in Lab 13)
   - Be able to identify and state the number and name of four of the twelve cranial nerves: I, II, III, and V on the human brain models/photographs. (See designated slide in Lab 13.)
4. **Spinal Cord Models**
   - Label parts of a spinal cord given either a silver stained micrograph, an illustration of the spinal cord, or a spinal cord model (use the two slides given here and learn those)
   - Be able to name the horns (ventral, dorsal, lateral) of the spinal cord and the TYPES of cells found in each horn (motor vs. sensory), given either a model of the spinal cord or a microscope slide. (use the same two slides designated in lab)
5. **Eye/Ear**
   - Label diagrams of the Eye and Ear from the slides designated for Lab 13 (be sure to know both the common and Latin names for middle ear bones)

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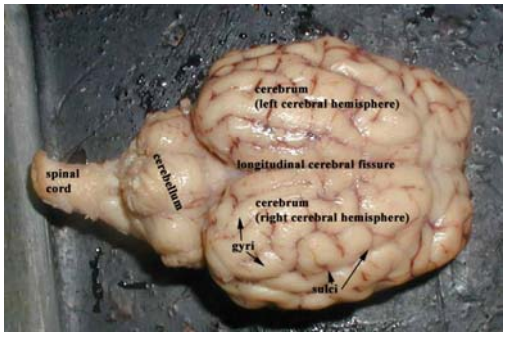
Sheep Brain

???

34

Sheep Brain



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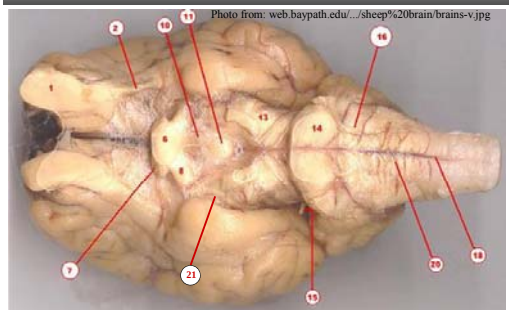
Sheep Brain

Photo from: web.baypath.edu/.../sheep%20brain/brains-v.jpg



1. olfactory bulb
2. olfactory tract
6. optic chiasma
7. optic nerve
8. optic tract
10. opening where the infundibulum attaches
11. mammilary body
13. trigeminal nerve
14. pons
15. trochlear nerve
16. abducens nerve
18. spinal cord
20. medulla oblongata
21. oculomotor nerve

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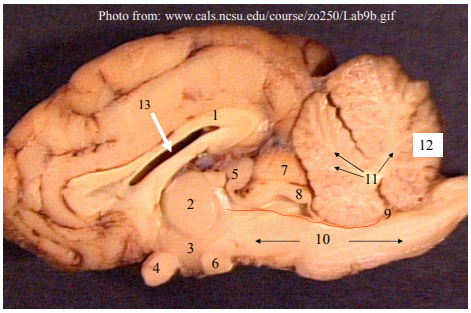
Sheep Brain

Photo from: www.cals.ncsu.edu/course/zo250/Lab9b.gif



1. Corpus callosum
2. Thalamus
3. Hypothalamus
4. Optic chiasm
5. Pineal gland (body)
6. Mammillary Body
7. Superior colliculus
8. Inferior colliculus
9. Fourth ventricle
10. Brain stem
11. Arbor vitae (white matter)
12. Cerebellar gray matter
13. Lateral ventricle

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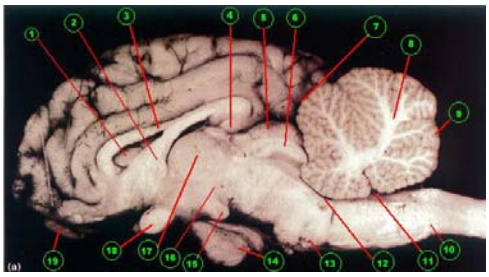
Sheep Brain – Sagittal Section

Photo from: web.baypath.edu/.../sheep%20brain/brains-vj.jpg



1. lateral ventricle
2. fornix
3. corpus callosum
4. pineal body
5. superior colliculus
6. inferior colliculus
7. transverse fissure
8. arbor vitae
9. cerebellar cortex (grey matter)
10. medulla oblongata
11. fourth venticle
12. cerebral aqueduct
13. pons
14. pituitary gland
15. mammillary body
16. hypothalamus
17. thalamus
18. optic chiasma
19. olfactory bulb

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