Description of the Cranium Anatomy in Sheep

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Intended Audience

This document is intended to help biology and anatomy students to learn the basic overview of the structures inside a sheep's brain and their functions that could be used as an aid during a dissection.

Introduction

What is it and what is its purpose?

The brain is a vital organ that serves as the center of the nervous system in all vertebrate and most invertebrate animals including sheep. As the most complex organ in the body, it serves many purposes including but not limited to motor function, vision, and processing which all are important functions needed to keep the animal self-sustainable.

What does it look like?

The cranium of sheep is not unlike that of humans other than the proportions. The sheep have a smaller cerebellum, this is the main part of the brain that offers controlling movements, senses and thinking. Another difference is the sheep brain is positioned anterior to posterior as the human brain is superior to inferior.

What are the principal parts?

There are 14 regions and parts to the sheep's cranium all of which play important parts in daily functions in the body. The spinal cord, arbor vitae, medulla, pons, and cerebellum are all positioned towards the back of the brain whereas the colliculus', thalamus', pineal, gyrus, olfactory, sulcus, and corpus colosseum reside in the frontal part of the lobe.

How does it work?

So, depending on what exactly the body is asking of the brain there are different functions, but the overall view of functioning would be through neurons, the pathways in which sensory pulses and electrical signals travel to different parts of the body. The brain uses these to communicate back and forth with each of these labeled parts as well as with the body itself to support the needs of the animal.

An Overview of the Sheep Cranium

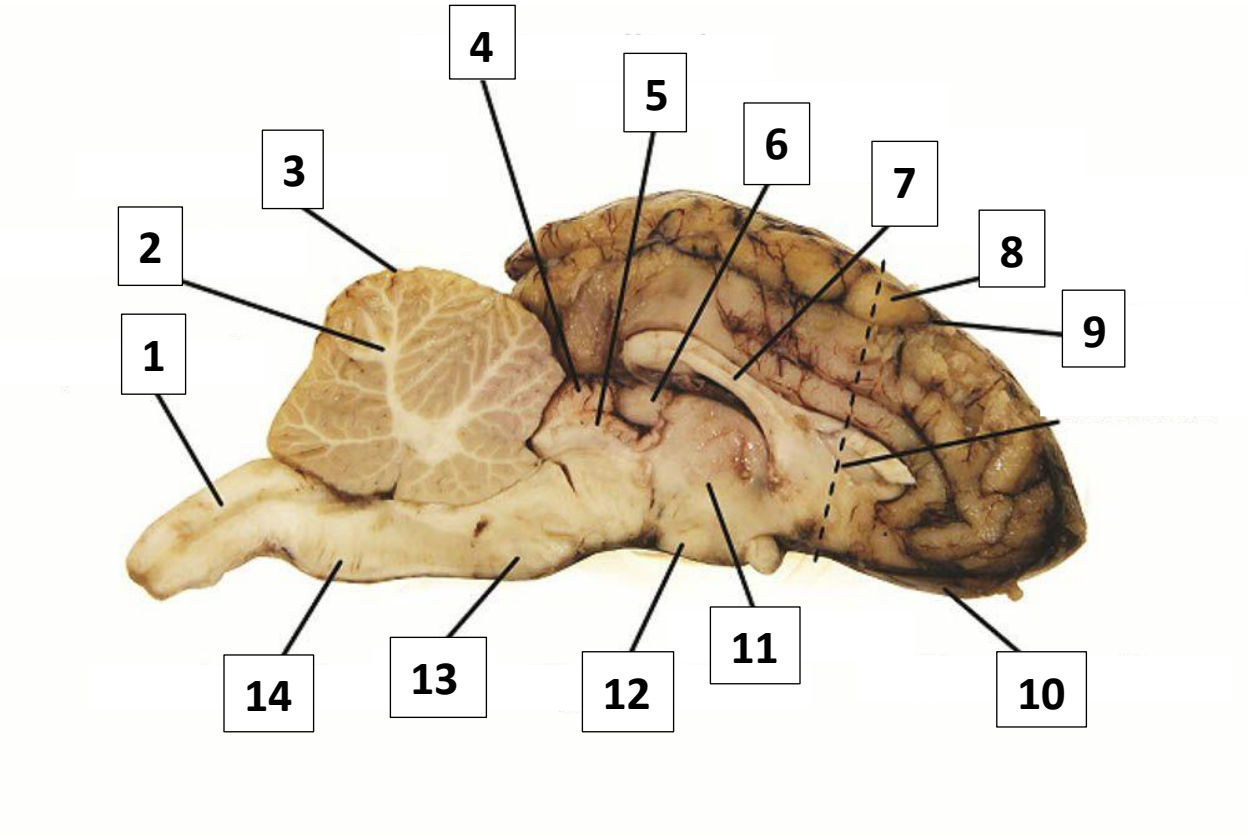


Figure 1. Diagram of a Sheep Brain

Parts Description

Parts are listed in clockwise order around the cranium.

1. **Spinal Cord**- The spinal cord is a thick white stem that conducts sensory and motor information from the body to the brain
2. **Arbor Vitae**- Arbor vitae is a branching, white matter in the cerebellum known for its role in passing motor and sensory information through this region of the cranium
3. **Cerebellum**- The cerebellum is a smaller lobe behind the main cranium and it is used for regulation and coordination of balance, posture and movement

4. **Superior colliculus**- The superior colliculus is located in the center of the brain and is a white matter center for the certain visual refluxes, such as moving your eyes to view something as your head turns
5. **Inferior colliculus**- Inferior colliculus is the white matter center for the certain auditory refluxes, such as turning your head to hear sounds better
6. **Pineal gland**- The pineal gland is the small pink dot centered in the brain and is labeled as an endocrine gland that secretes the hormone melatonin and it plays many roles in sleep, aging, and reproduction
7. **Corpus callosum**- Corpus callosum is the firm white strip that separates the frontal lobes and is responsible for communication between brain hemispheres, eye movement, maintaining the balance of arousal and attention and tactile localization
8. **Gyrus**- The gyrus is a rounded region that is the primary motor area of nerves, perceiving pain, touch, pressure, and temperature
9. **Sulcus**- The sulcus is the large deep groove or indentation that acts as a separating wall between the lobes and hemispheres of the brain
10. **Olfactory bulb**- The olfactory bulb is a small lobe located on the underside of the frontal lobe and it can sense stimuli, relays sensory signals to olfactory tract and is used for sense of smell
11. **Thalamus**- The Thalamus is the main center of the brain and is responsible for all motor control, receiving auditory, somatosensory nerves, visual sensory signals, relaying sensory to cerebral cortex, plus controlling sleep and awake states
12. **Hypothalamus**- Hypothalamus is located behind the thalamus and is involved in autonomic function control, endocrine function, homeostasis, motor function, food/water intake regulation and sleep cycle regulation
13. **Pons**- Pons is hidden under the cerebellum and is responsible for arousal, controlling autonomic functions, and relaying sensory information from the cerebrum and cerebellum
14. **Medulla**- The medulla is located at the base of the spinal cord and is in almost total control of autonomic functions, relaying of nerve signals between the brain and spinal cord, and coordination of body movements

Conclusion

The brain is a vital organ that is the center of the nervous system and plays many roles in the body of a sheep. From muscle control to the use of each vital organ, the roles every section of the brain plays are imperative for the full operation and function of the entire body.

References

Figure 1. Imagine of a Sheep Brain

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