What is the Brainstem?

Worksheet

The brainstem is made of the midbrain, pons, and medulla oblongata; it relays signals between the brain and spinal cord and controls vital, mostly automatic functions such as breathing, heartbeat, and swallowing.

Questions

1. Which brainstem region is closest to the spinal cord?

A) Midbrain
B) Pons
C) Medulla oblongata
D) Thalamus

2. Damage to the medulla oblongata is especially dangerous because it controls

A) Memory
B) Heart rate and breathing
C) Vision
D) Hearing

3. Which brainstem region links the cerebrum and cerebellum?

A) Midbrain
B) Pons
C) Medulla
D) Thalamus

4. The midbrain primarily controls

A) Digestion
B) Eye movement and visual/auditory reflexes
C) Blood pressure only
D) Hair growth

5. A patient loses the ability to control heart rate and breathing rhythm after a brainstem injury. Which region is most likely damaged?

6. A person has trouble moving their eyes up and down after a midbrain lesion. Why?

7. Which brainstem structure connects the cerebrum to the cerebellum?

8. Define: What are the three parts of the brainstem?

9. Define: Which brainstem region controls heart rate and breathing?

10. Define: What does 'pons' mean and why?

Answer Key

1. C) Medulla oblongata - The medulla oblongata is the lowest brainstem region, continuous with the spinal cord.

2. B) Heart rate and breathing - The medulla houses vital cardiac and respiratory centers.

3. B) Pons - The pons acts as a bridge connecting cerebral cortex signals to the cerebellum.

4. B) Eye movement and visual/auditory reflexes - The midbrain houses nuclei for eye movement and reflex responses to sound and light.

5. Heart rate and breathing centers are located in the medulla oblongata, the lowest part of the brainstem. Damage here is often life-threatening because these are vital, involuntary functions.

6. The midbrain contains nuclei (superior colliculus, cranial nerve III/IV nuclei) controlling eye movement. Damage here disrupts vertical gaze and pupil reflexes.

7. The pons ('bridge' in Latin) contains fiber tracts linking the cerebral cortex to the cerebellum. This is why pons damage often causes coordination problems alongside breathing issues.

8. Midbrain, pons, and medulla oblongata.

9. The medulla oblongata.

10. Pons means 'bridge' in Latin - it bridges the cerebrum and cerebellum with fiber tracts.