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Central Nervous System

The central nervous system is the centre of all neural activity. It integrates all incoming sensory information, performs all kinds of cognitive activities, and issues motor commands to muscles and glands. The CNS comprises (a) brain and (b) spinal cord.

Brain and Behavior: The human brain is estimated to contain at least 150 billion nerve cells, called neurons, each of which is connected to many others, making the number of connections immense. The connections between nerve cells are called synapses. But even though there are an enormous number of connections, research shows that they are arranged in an orderly fashion - certain cells connect only with certain others. The most amazing thing about the brain is its ability to guide human behavior and thought. The brain

is organised into structures and regions that perform specific functions.

Structure of the Brain

For the convenience of the study, the brain can be divided into three parts: Hindbrain, Midbrain and Forebrain.

Hindbrain: This part of the brain consists of the following structures:

- (i) **Medulla Oblongata:** It is lowest part of the brain that exist in continuation of the spinal cord. It contains neural centres, which regulate basic life supporting activities like breathing, heart rate, and blood pressure. This is why medulla is known as the vital centre of the brain. It has some centres of autonomic activities also.
- (ii) **Pons:** It is connected with medulla on one side and with the midbrain on the other. A nucleus (neural centre) of pons receives auditory signals relayed by our ears. It is believed that pons

is involved in sleep mechanism, particularly the sleep characterized by dreaming. It contains nuclei affecting respiratory movement and facial expression also.

(iii) **Cerebellum**: This highly developed part of the hindbrain can be easily recognised by its wrinkled surface. It maintains and controls posture and equilibrium of the body. Its main function is coordination of muscular movements. Though the motor commands originate in the forebrain, the cerebellum receives and coordinates them to relay to the muscles. It also stores the memory of movement patterns so that we don't have to concentrate on how to walk, dance, or ride a bicycle.

Midbrain: It connects the hindbrain with the forebrain. A few neural centres related to some special reflexes and visual and auditory sensations are found here. An important part of midbrain known as Reticular Activating System, is responsible for our arousal. It makes us alert and active by regulating sensory inputs. It also helps us in selecting information from the environment.