

The Nervous System

Introduction:

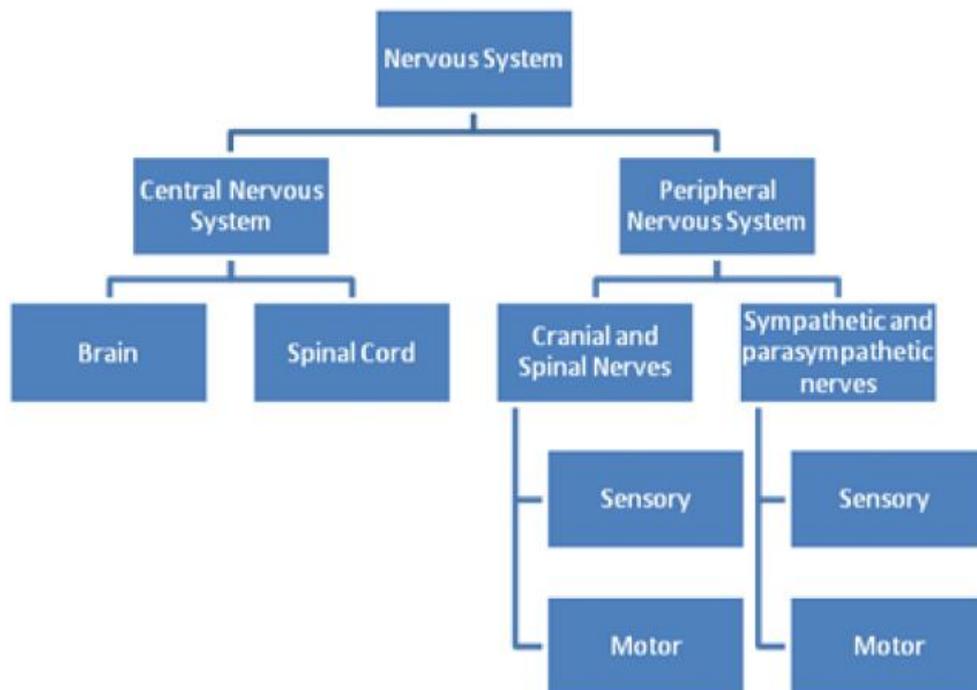


Nervous control system enables organisms to respond quickly to stimuli. In humans the major control centre is the **Central Nervous System (CNS)**, consisting of the brain and spinal cord.

Explanation:

Nervous control functions are just like any other homeostatic mechanism. A shift away from the norm has to be detected first. Once detected, a control mechanism begins to operate, so that the shift away from the norm that is a change in the environment or stimulus is detected. The stimulus is detected or picked up by a receptor which may be a cell or organ. The message is taken by conductors - sensory nerve fibres, to the control centre that is the brain or spinal cord. The message is interpreted here and the appropriate response to the stimulus is sent again by conductors, this time the motor nerve fibres, to the effectors, which may be glands or muscles. The effector brings about the necessary change to correct the condition.

Receptor → Brain or Spinal Cord → Effector



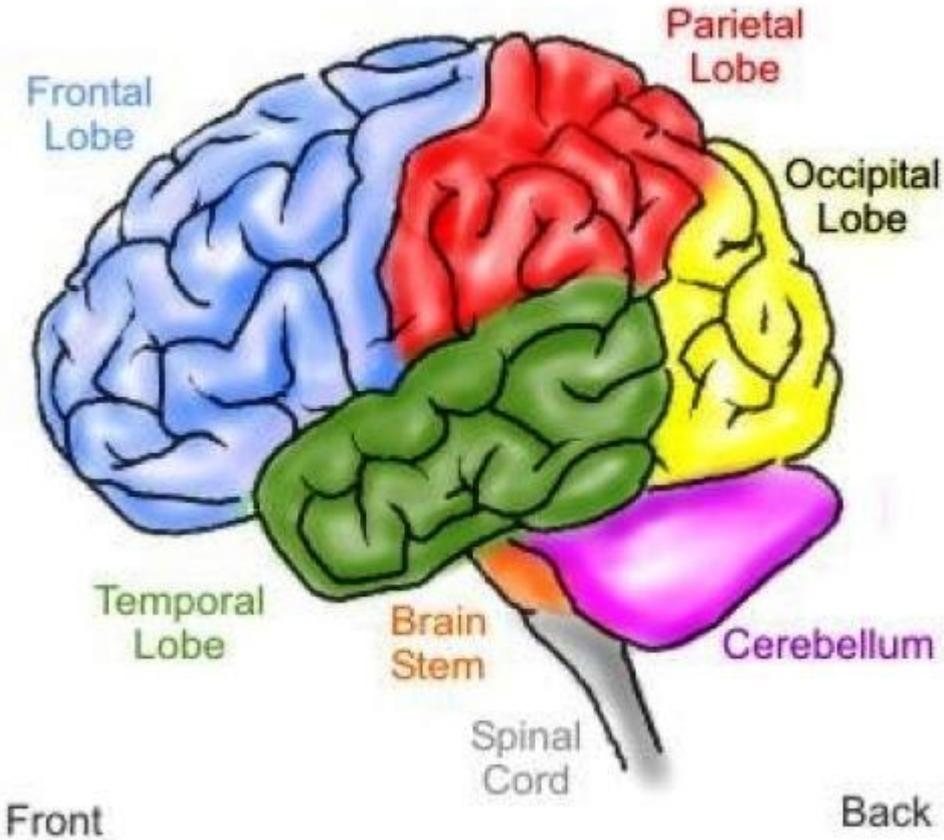
The other part of the nervous system is the **Peripheral Nervous System (PNS)**. The PNS consists of cranial and spinal nerves as well as the sympathetic and parasympathetic. The cranial and spinal nerves contain sensory and motor neurons. The sympathetic and parasympathetic nerves contain sensory and motor neurons.

THE BRAIN

The spinal cord runs straight into the base of the brain without breaking. The region at the base of the brain, the medulla oblongata contains important centres which control involuntary activities of internal organs such as the heart beat, breathing and temperature control.

The cerebellum handles muscular co-ordination, balance and posture and muscle tone. The mid-brain functions mainly as a message centre. It is concerned with some sight, hearing and orientation responses. The cerebrum co-ordinates incoming or sensory messages and sends out motor messages that produce the appropriate responses. It also functions in speech, reasoning, emotions and personality.

Regions of the Human Brain



THE SPINAL CORD



Human spine

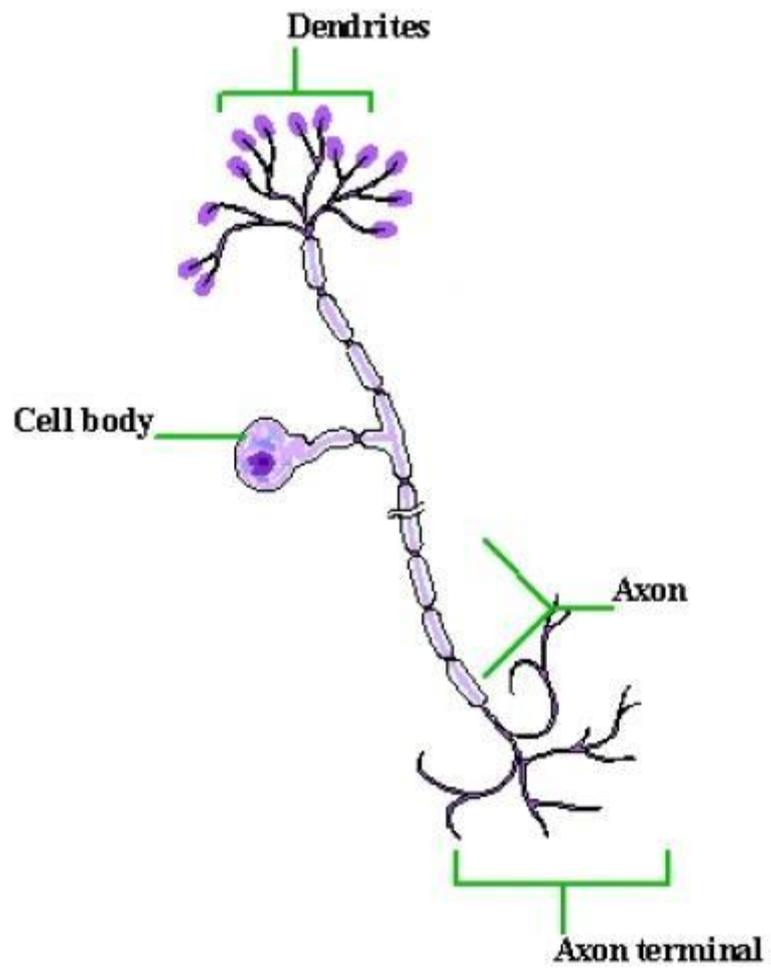
It extends from the base of the brain, protected all the way down by the backbone, to the caudal end of the vertebral column. Spinal nerves emerge between vertebrae. The spinal cord is concerned with spinal reflex actions and conduction of impulses to the brain for interpretation and from the brain to the effector organs.

CONDUCTION WITHIN THE NERVOUS SYSTEM

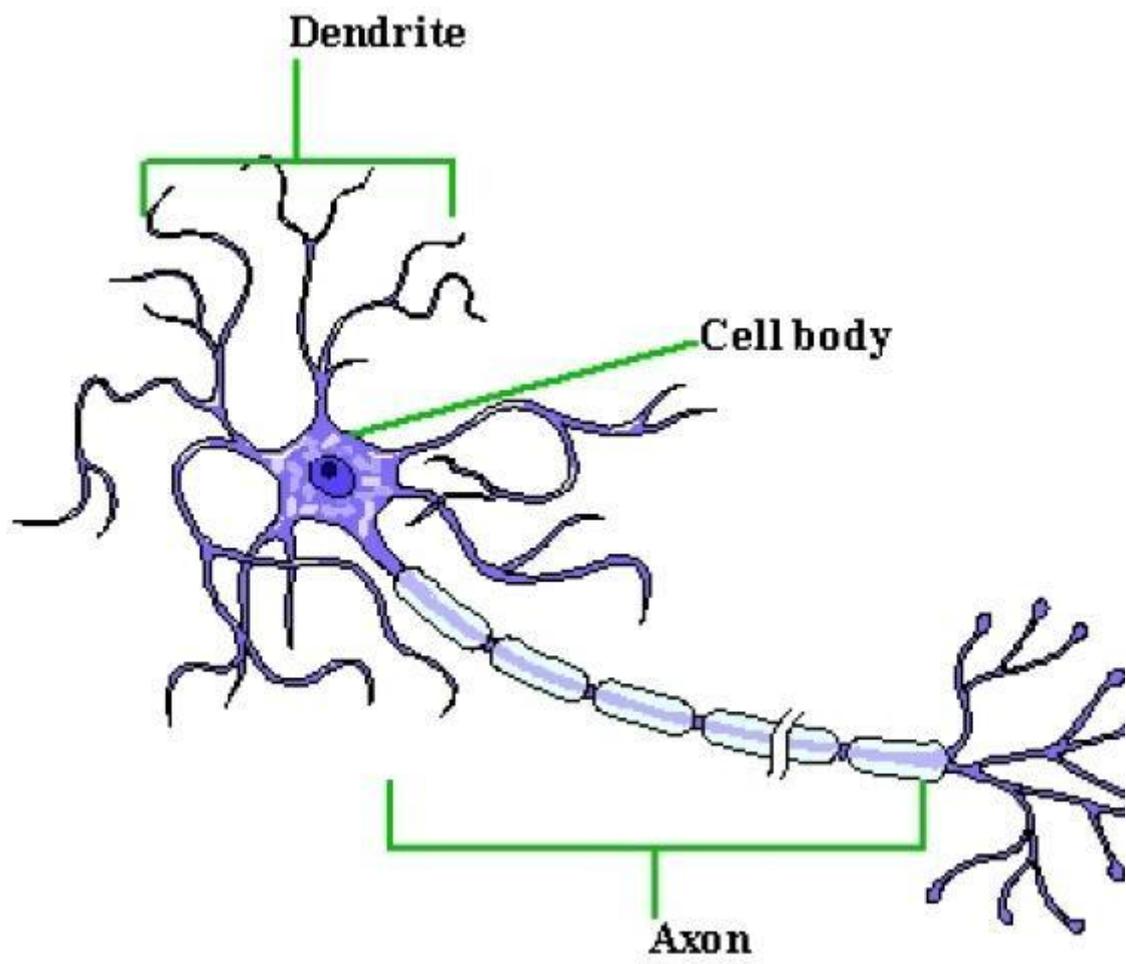
The principal component of the nervous system is the nerve. Each nerve is made up of a group of nerve fibres. The basic unit of the system is the nerve cell or neuron. It contains the same basic components as all other animal cells along with a structure/function adjustment. This adjustment enables it to carry messages very rapidly. The long thin strands of the cytoplasm projecting from the cell body are called nerve fibres. Fibres which conduct impulses towards the cell body are called dendrons. Those which conduct impulses away from the cell body are called axons. Short fibres are called dendrites.

There are three types of neurons:

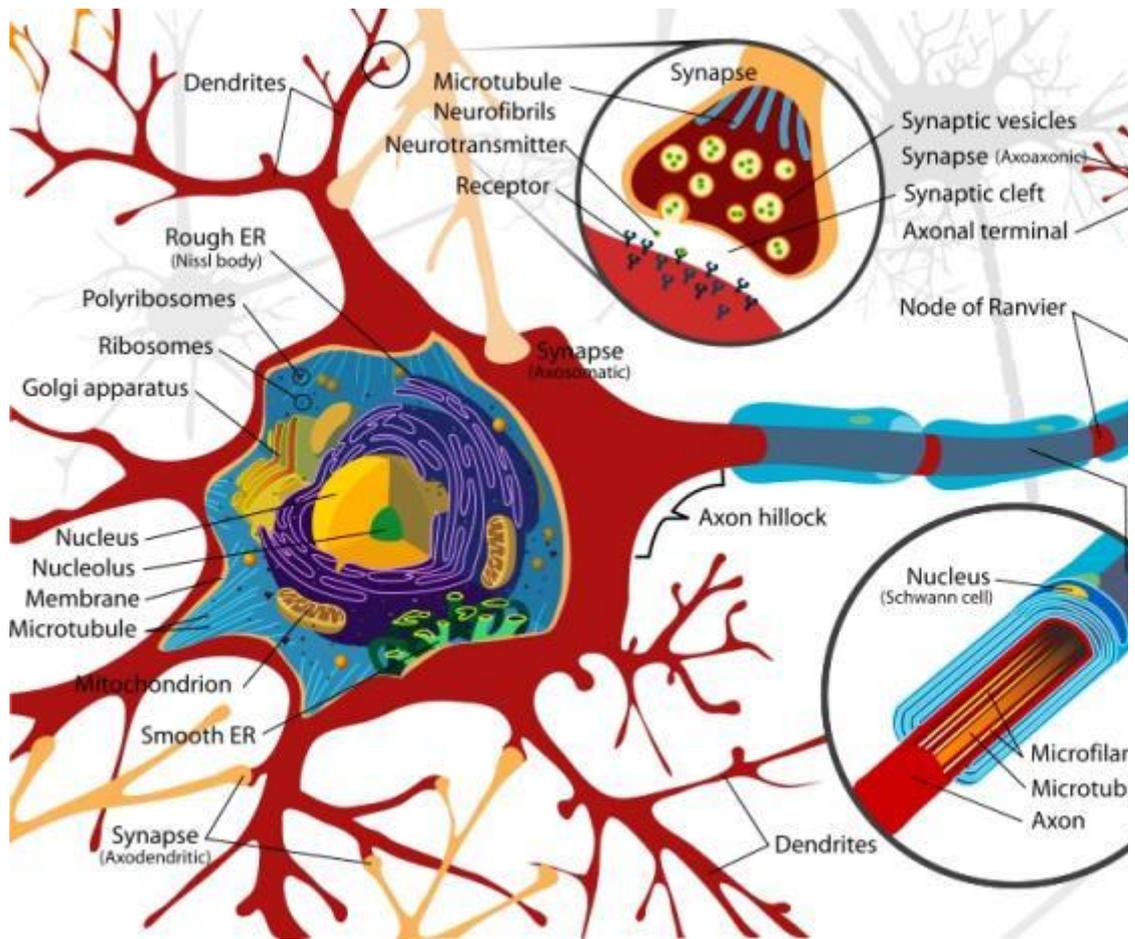
1.
Sensor
y



2.
Motor



3.
Relay



Complete
neuron
cell
diagram

