

DISTINGUISH BETWEEN...

Central nervous system	Peripheral nervous system
1) It consists of Brain and spinal cord.	1) It consists of nerves that arise from brain and spinal nerves.
2) Both of them have nerve cells and glial cells.	2) It has 43 pairs of nerves. Among them 12 pairs are cranial nerves and 31 pairs are spinal nerves.
3) Brain and spinal cord are continuous with each other.	3) Cranial nerves take their origin from brain and spinal nerves take their origin from spinal cord.
4) Brain and spinal cord receive information.	4) The cranial nerves carry information to the sense organs and spinal nerves from organs to spinal cord.
5) Central nervous system coordinates all neural functions.	5) These supply information required for the movement of the muscles.

Brain (CNS)

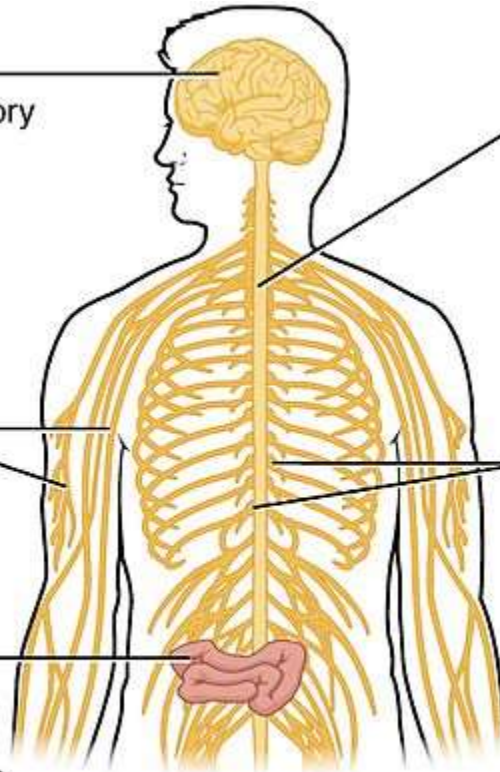
Perception and processing of sensory stimuli (somatic/autonomic)
Execution of voluntary motor responses (somatic)
Regulation of homeostatic mechanisms (autonomic)

Nerves (PNS)

Fibers of sensory and motor neurons (somatic/autonomic)

Digestive tract (ENS)

The enteric nervous system (ENS), located in the digestive tract, is responsible for autonomous functions and can operate independently of the brain and spinal cord.



Spinal cord (CNS)

Initiation of reflexes from ventral horn (somatic) and lateral horn (autonomic) gray matter
Pathways for sensory and motor functions between periphery and brain (somatic/autonomic)

Ganglia (PNS)

Reception of sensory stimuli by dorsal root and cranial ganglia (somatic/autonomic)
Relay of visceral motor responses by autonomic ganglia (autonomic)

CENTRAL NERVOUS SYSTEM VERSUS PERIPHERAL NERVOUS SYSTEM

Central nervous system consists of the brain and spinal cord

Nerve axons consist of slender projections and carry significantly short nerve impulse

Major function is to organize and analyze the information obtained from sensory organs

A damage causes a global effect on the body

Most of the nerves are incapable of regenerating its nerve fibers

Peripheral nervous system consists of sensory receptors, sensory neurons, and motor neurons

Composed of long nerve fibers with a length up to 1m

Major function is to transmit sensory information to the central nervous system and pass out motor impulses to the effector organs

A damage causes a local effect on the body

Most of the nerves can be regenerated

Comparison of the Somatic and the Autonomic Divisions of the Nervous System.

Somatic	Autonomic
Involves both afferent and efferent pathways	Involves only the efferent pathway
Voluntary activities, including locomotion (effectors are skeletal muscles)	Involuntary activities (effectors are cardiac muscle, smooth muscles, fat cells, and glands)
Efferent signals originate at the cerebral cortex as a conscious decision and activate neurons in the brainstem or spinal cord	Unconscious signals originate in hypothalamus, brain stem, and spinal cord and activate target neurons that lie in the peripheral nervous system
Brainstem and spinal cord neuron exerts direct control over skeletal muscle (One neuron system, where there are no intermediate synapses between the CNS and the target organs).	Target neurons in the peripheral nervous system are grouped in ganglia and their axons exert direct control over smooth muscle, cardiac muscle, glands, and fat cells. (Two neuron system, where the efferent neurons synapse once outside the CNS before the signals reach the target organs.)
Efferent axons are myelinated (fast conduction)	Postsynaptic axons are non-myelinated (slow conduction); presynaptic axons are myelinated.
Neuromuscular junctions are specific and localized	Synapses at the target organs for the axons of the ANS may be diffuse (varicosities).
Target organs (skeletal muscles) are always stimulated into action.	ANS used several different neurotransmitter molecules (predominantly ACh and norepinephrine, NE)