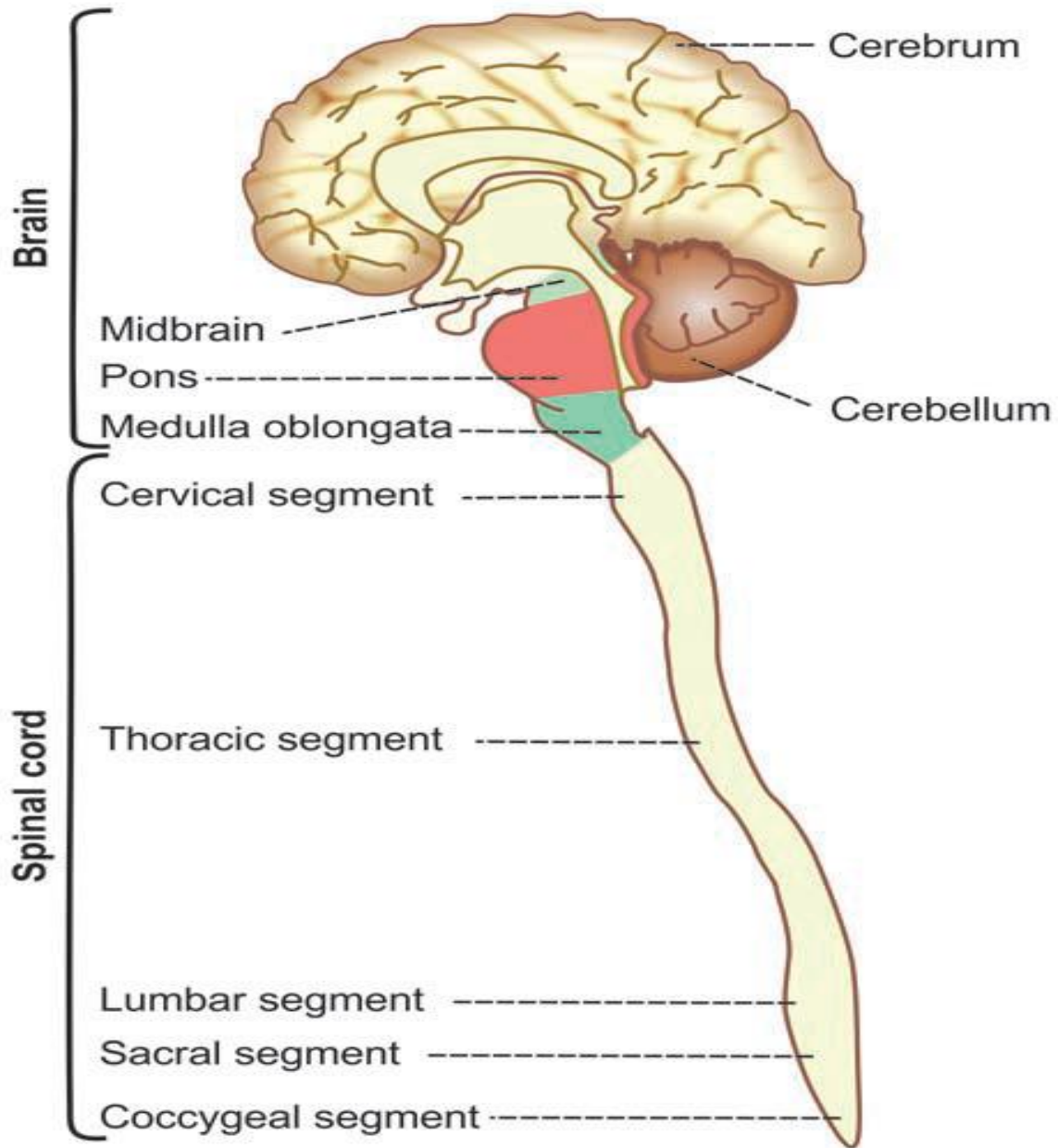


INTRODUCTION TO NERVOUS SYSTEM

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INTRODUCTION TO NERVOUS SYSTEM

The nervous system is composed basically of specialized cells called **neuron**, whose function is to receive sensory stimuli and to transmit them to effector organs, whether muscular or glandular.

The sensory stimuli that arise either outside or inside the body are correlated within the nervous system, and the efferent impulses are coordinated so that the effector organs work harmoniously together to complete the particular task.

DIVISIONS OF NERVOUS SYSTEM:

Nervous system controls all the activities of the body. It is quicker than other control system in the body, namely endocrine system. Primarily, nervous system is divided into two parts:

1. Central nervous system
2. Peripheral nervous system.

CENTRAL NERVOUS SYSTEM

Central nervous system (CNS) includes **brain and spinal cord**. It is formed by neurons and supporting cells called **neuroglia**.

Structures of brain and spinal cord are arranged in two layers, namely **gray matter and white matter**.

Gray matter is formed by nerve cell bodies and the proximal parts of nerve fibers, arising from nerve cell body.

White matter is formed by remaining parts of nerve fibers.

In brain, white matter is placed in the inner part and gray matter is placed in the outer part. In spinal cord, white matter is in the outer part and gray matter is in the inner part.

Brain is situated in the skull. It is continued as spinal cord in the vertebral canal through the foramen magnum of the skull bone.

Brain and spinal cord are surrounded by three layers of meninges called the outer dura mater, middle arachnoid mater and inner pia mater.

The space between arachnoid mater and pia mater is known as **subarachnoid space**. This space is filled with a fluid called **cerebrospinal fluid**. Brain and spinal cord are actually suspended in the **cerebrospinal fluid**.

Parts of Brain:

Brain consists of three major divisions:

1. Prosencephalon - Forebrain
2. Mesencephalon - Midbrain
3. Rhombencephalon - Hindbrain

1. Prosencephalon:

Prosencephalon is otherwise known as **forebrain**. It is further divided into two parts:

- i. Telencephalon, which includes cerebral hemispheres, basal ganglia, hippocampus and amygdaloid nucleus
- ii. Diencephalon, consisting of thalamus, hypo thalamus, metathalamus and subthalamus.

2. Mesencephalon

Mesencephalon is also known as **midbrain**.

3. Rhombencephalon

Rhombencephalon or hindbrain is subdivided into two portions:

- i. Metencephalon, formed by pons and cerebellum
- ii. Myelencephalon or medulla oblongata.

Midbrain, pons and medulla oblongata are together called the brainstem.

PERIPHERAL NERVOUS SYSTEM

Peripheral nervous system (PNS) is formed by neurons and their processes present in all regions of the body. It consists of cranial nerves, arising from brain and spinal nerves, arising from the spinal cord.

It is again divided into two subdivisions:

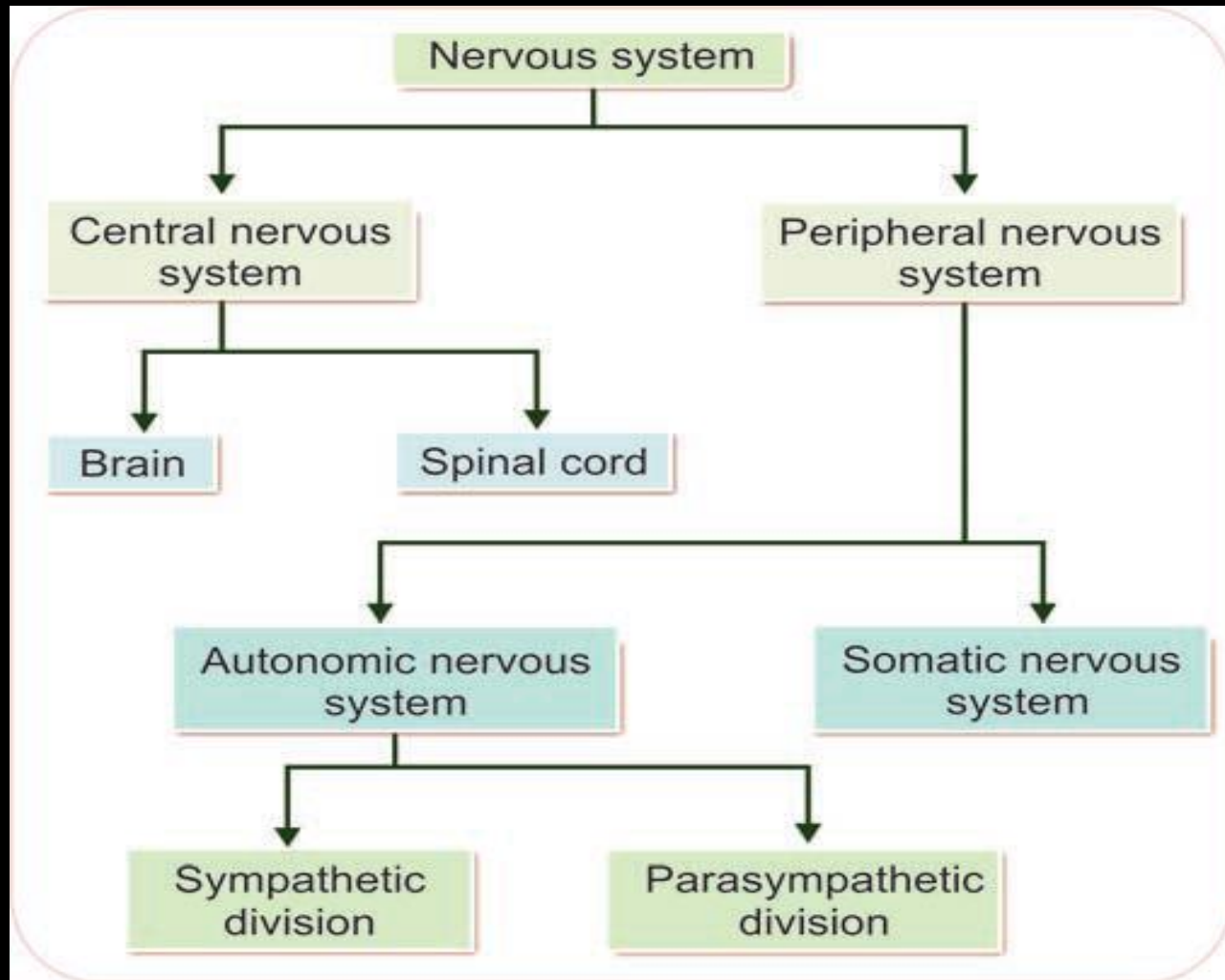
1. Somatic nervous system
2. Autonomic nervous system.

1. Somatic Nervous System

Somatic nervous system is concerned with **somatic functions**. It includes the nerves supplying the skeletal muscles. Somatic nervous system is responsible for muscular activities and movements of the body.

2. Autonomic Nervous System

Autonomic nervous system is concerned with **regulation of visceral or vegetative functions**. So, it is otherwise called **vegetative or involuntary nervous system**. Autonomic nervous system consists of two divisions, sympathetic division and parasympathetic division.



Brain

Prosencephalon
(forebrain)

Mesencephalon
(midbrain)

Rhombencephalon
(hindbrain)

Telencephalon

Diencephalon

Metencephalon

Myelencephalon
(medulla oblongata)

Cerebral hemispheres
Basal ganglia
Hippocampus
Amygdaloid nucleus

Thalamus
Hypothalamus
Metathalamus
Subthalamus

Pons
Cerebellum