

University of Anbar
College of Dentistry



Year: First

Course: Terminology

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Terminology

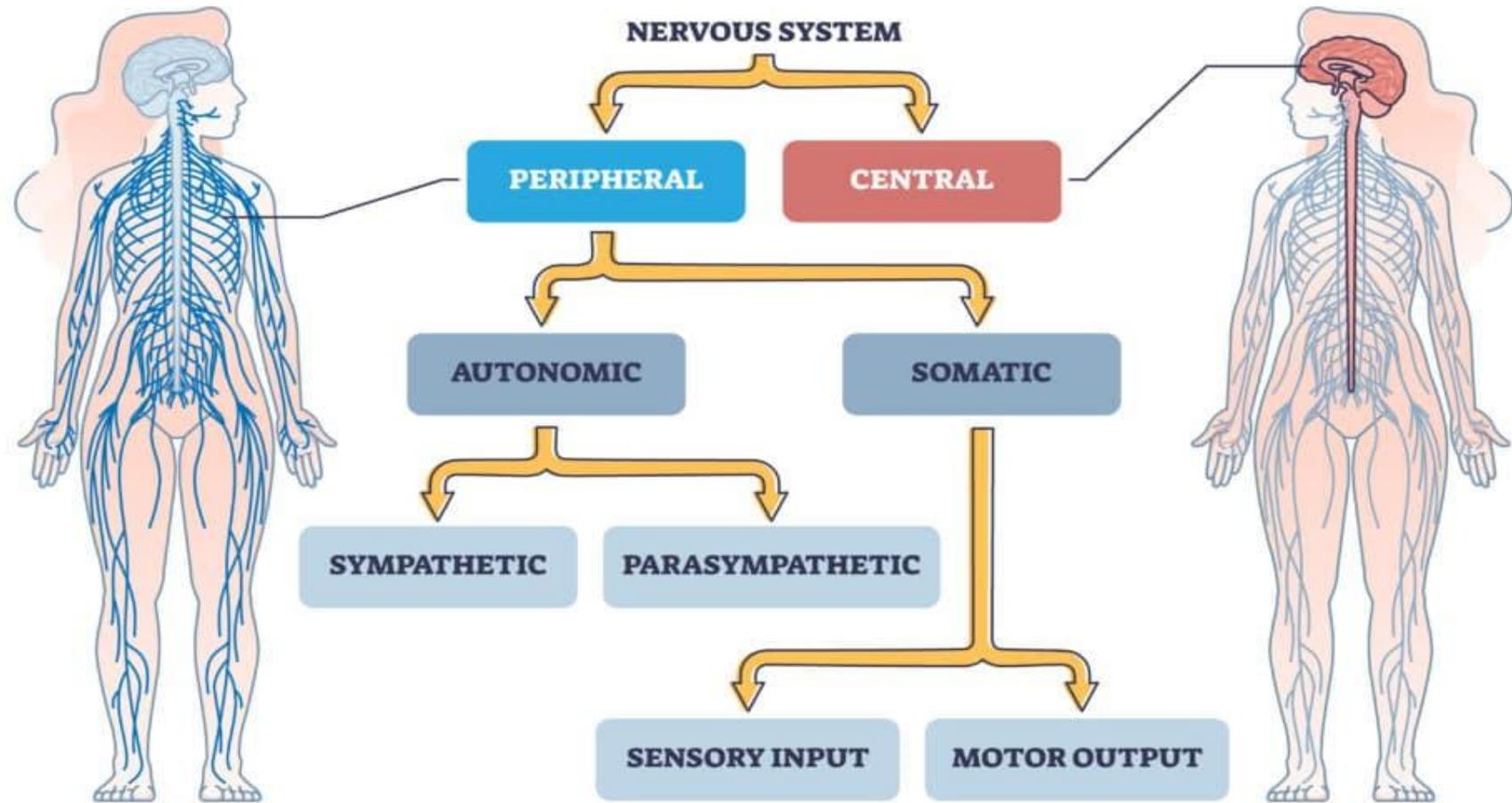
Nervous System

Nervous System

2

- The basic purpose of the **Nervous System** is to **coordinate** all of the activities of the body. It enables the Body to **respond** and **adapt** to changes that occur both inside and outside the body.
- The **nervous system** can be divided **structurally** into two parts:
 - The **central nervous system (CNS)**, consisting of the brain and spinal cord.
 - The **peripheral nervous system (PNS)**, consisting of all nervous tissue outside the brain and spinal cord.
- **Functionally**, the **nervous system** can be divided into the:
 - **Somatic nervous system**, which controls skeletal muscles.
 - **Visceral or Autonomic nervous system (ANS)**, which controls smooth muscle, cardiac muscle, and glands; regulates responses to stress; and helps to maintain homeostasis.

DIVISIONS OF THE NERVOUS SYSTEM



Nervous System

4

- ▶ Two types of cells are found in the nervous system:
 - **Neurons**, or **nerve cells**, that make up the conducting tissue of the nervous system.
 - **Neuroglia**, the connective tissue cells of the nervous system that support and protect nervous tissue.

▶ The Neuron

The **neuron** is the nervous system's **basic functional unit**. Each neuron has two types of **fibers** extending from the cell body:

- A **dendrite** carries impulses **toward** the cell body.
- An **axon** carries impulses **away** from the cell body.

NERVES

5

- ▶ **Neurons** have long extensions called **fibers** (axons). These fibers are **grouped together in bundles**, similar to how electrical wires are bundled inside a cable.
 - When this **bundle of fibers** is part of the **Peripheral Nervous System (PNS)**, it is called a **nerve**.
 - Along the path of a nerve, there are sometimes clusters of neuron **cell bodies** grouped together. These clusters are known as **ganglia** (singular: **ganglion**).
- ▶ There are **different types of nerves** based on the **kind of neurons** they contain:
 - **Sensory nerves** carry information **toward** the CNS (like signals from your skin or eyes). They contain only **sensory neurons**.
 - **Motor nerves** carry instructions **away** from the CNS to muscles or glands. They contain only **motor neurons**.
 - Most nerves are **mixed nerves**, meaning they contain **both sensory and motor fibers**, allowing them to carry information in **both directions**—to and from the CNS.

The Brain: Structure and Protection

6

1. What is the Brain?

- The **brain** is **nervous tissue** contained within the **cranium (skull)**.
- It consists of **four main parts**:
 - **Cerebrum** – the **largest** part of the brain.
 - **Diencephalon** – a central part containing structures like the thalamus and hypothalamus.
 - **Brainstem** – connects the brain to the spinal cord and controls basic life functions.
 - **Cerebellum** – responsible for balance and coordination.

2. The Cerebrum

- This is the biggest and most complex part of the brain.
- It consists mainly of **white matter** (inner part) and a **thin outer layer of gray matter** called the **cerebral cortex**.
- The **cerebral cortex** is where the higher brain functions of **memory, reasoning, and abstract thought** occur.

The Brain: Structure and Protection

7

3. Protecting the Brain

- Within the brain are four **ventricles** (cavities) in which **cerebrospinal fluid (CSF)** is formed. This fluid circulates around the brain and spinal cord, acting as a **protective cushion** for these tissues.
- Covering the **brain** and the **spinal cord** are three **protective layers**, together called the **meninges** (singular: **meninx**). All are named with the Latin word *mater*, meaning “**mother**,” to indicate their **protective** function. They are the:
 - 1) **Dura mater**, the **outermost and toughest** of the three. *Dura* means “**hard**.”
 - 2) **Arachnoid mater**, the thin, **web-like middle** layer. It is named for the Latin word for **spider**, because it resembles a spider web.
 - 3) **Pia mater**, the **thin, vascular inner** layer, attached directly to the tissue of the brain and spinal cord. *Pia* means “**tender**.”

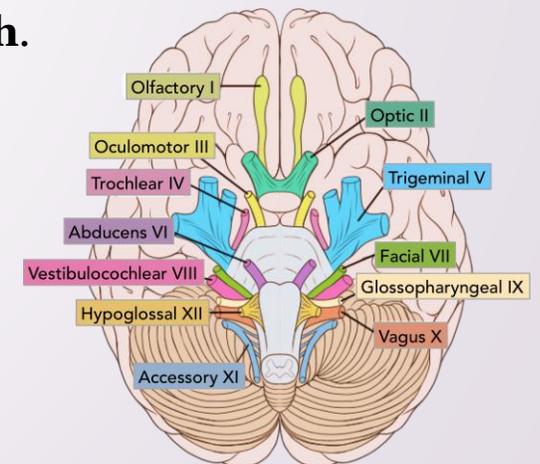
These layers work together to shield the brain and spinal cord from harm and infection.

The Cranial Nerves

8

Number	Name	Main Function
I	Olfactory nerve	Smell
II	Optic nerve	Vision
III	Oculomotor nerve	Eye movement, pupil constriction
IV	Trochlear nerve	Eye movement (looking downward)
V	Trigeminal nerve	Facial sensation and chewing
VI	Abducens nerve	Eye movement (side-to-side)
VII	Facial nerve	Facial expressions, taste, salivation
VIII	Vestibulocochlear nerve	Hearing and balance
IX	Glossopharyngeal nerve	Taste, swallowing, saliva secretion
X	Vagus nerve	Heart rate, digestion, voice
XI	Spinal Accessory nerve	Neck and shoulder movement
XII	Hypoglossal nerve	Tongue movement

- ▶ The **cranial nerves** are **12 pairs** of nerves that come directly from the **brain** (not from the spinal cord).
- ▶ They mainly control the **head and neck** functions, like **smell, vision, taste, eye movement, facial expressions**, and some **internal organ activities**.
- ▶ Each cranial nerve has a **number** (I to XII) and a **specific function**.
- ▶ Some are **sensory** (feel things), some are **motor** (move muscles), and some are **both**.



The Spinal Cord

9

- It is the **nervous tissue** contained within the **spinal column**; extends from the **medulla oblongata** (the lower part of the brainstem) to the second lumbar vertebra.
- The spinal cord is the **link** between the **brain** and the **nerves** in the rest of your body.

➤ The Spinal Nerves

31 pairs of spinal nerves connect with the spinal cord. These nerves are grouped in the segments of the cord as follows:

- Cervical: 8
- Thoracic: 12
- Lumbar: 5
- Sacral: 5
- Coccygeal: 1

Word Parts Pertaining to the Nervous System

10

Roots for the Nervous System and the Spinal Cord			
Root	Meaning	Example	Definition of example
neur/o, neur/i	nervous system, nervous tissue, nerve	neurotrophin [<i>nu-ro-TRO-fin</i>]	factor that promotes nerve growth (troph/o means “nourish”)
gli/o	neuroglia	glial [GLI-al]	pertaining to neuroglia
gangli/o, ganglion/o	ganglion	ganglioma [<i>gang-gle-O-mah</i>]	tumor of a ganglion
mening/o, meninge/o	meninges	meningocele [<i>meh-NING-go-sele</i>]	hernia of the meninges
myel/o	spinal cord (also bone marrow)	hematomyelia [<i>he-mah-to-mi-E-le-ah</i>]	hemorrhage into the spinal cord
radicul/o	spinal nerve root	radiculopathy [<i>rah-dik-u-LOP-ah-the</i>]	any disease of a spinal nerve root

Word Parts Pertaining to the Nervous System

11

Roots for the Brain			
Root	Meaning	Example	Definition of example
encephal/o	brain	anencephaly [an-en-SEF-ah-le]	absence of a brain
cerebr/o	cerebrum (loosely, brain)	infracerebral [in-frah-SER-eh-bral]	below the cerebrum
cortic/o	cerebral cortex, outer portion	corticospinal [kor-tih-ko-SPI-nal]	pertaining to the cerebral cortex and spinal cord
cerebell/o	cerebellum	supracerebellar [su-prah-ser-eh-BEL-ar]	above the cerebellum
thalam/o	thalamus	thalamotomy [thal-ah-MOT-o-me]	incision of the thalamus

Word Parts Pertaining to the Nervous System

12

Roots for the Brain (Continued)

Root	Meaning	Example	Definition of example
ventricul/o	cavity, ventricle	intraventricular [<i>in-trah-ven-TRIK-u-lar</i>]	within a ventricle
medull/o	medulla oblongata (also spinal cord)	medullary [<i>MED-u-lar-e</i>]	pertaining to the medulla
psych/o	mind	psychogenic [<i>si-ko-JEN-ik</i>]	originating in the mind
narc/o	stupor, unconsciousness	narcosis [<i>nar-KO-sis</i>]	state of stupor induced by drugs
somn/o, somn/i	sleep	somnolence [<i>SOM-no-lens</i>]	sleepiness

Word Parts Pertaining to the Nervous System

13

Suffixes for the Nervous System

Root	Meaning	Example	Definition of example
-phasia	speech	heterophasia [het-er-o-FA-ze-ah]	uttering words that are different from those intended
-lalia	speech, babble	coprolalia [kop-ro-LA-le-ah]	compulsive use of obscene words (copro- means “feces”)
-lexia	reading	bradylexia [brad-e-LEK-se-ah]	slowness in reading
-plegia	paralysis	tetraplegia [tet-rah-PLE-je-ah]	paralysis of all four limbs
-paresis*	partial paralysis, weakness	hemiparesis [hem-e-pah-RE-sis]	partial paralysis of one side of the body
-lepsy	seizure	narcolepsy [NAR-ko-lep-se]	condition marked by sudden episodes of sleep
-phobia*	persistent, irrational fear	agoraphobia [ag-o-rah-FO-be-ah]	fear of being in a public place (from Greek agora, meaning “marketplace”)
-mania*	excited state, obsession	megalomania [meg-ah-lo-MA-ne-ah]	exaggerated self-importance; “delusions of grandeur”

* May be used alone as a word.

Disorders, Symptoms and Conditions

- **Alzheimer disease (AD):** A form of dementia caused by atrophy of the cerebral cortex; presenile dementia.
- **Coma:** State of deep unconsciousness from which one cannot be roused.
- **Dementia:** A gradual and usually irreversible loss of intellectual function.
- **Encephalitis:** Inflammation of the brain.
- **Epidural hematoma:** Accumulation of blood in the epidural space (between the dura mater and the skull).
- **Glioma:** A tumor of neuroglial cells.
- **Hemiparesis:** Partial paralysis or weakness of one side of the body.
- **Hemiplegia:** Paralysis of one side of the body.
- **Insomnia:** Insufficient or nonrestorative sleep despite ample opportunity to sleep.
- **Meningioma:** Tumor of the meninges.

Disorders, Symptoms and Conditions

- **Meningitis:** Inflammation of the meninges.
- **Narcolepsy:** Brief, uncontrollable episodes of sleep during the day.
- **Sleep apnea:** Brief periods of breathing cessation during sleep.
- **Anxiety:** A feeling of fear, worry, uneasiness, or dread.
- **Amnesia:** Loss of memory (from Greek word *mneme* meaning 'memory' and the negative prefix *a-*).
- **Apraxia:** Inability to move with purpose or to use objects properly.
- **Ataxia:** Lack of muscle coordination; dyssynergia.
- **Paraplegia:** Paralysis of the legs and lower part of the body.
- **Parasomnia:** Condition of having undesirable phenomena, such as nightmares, occur during sleep or become worse during sleep.
- **Quadriplegia:** Paralysis of all four limbs; *tetraplegia*.