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### USP41

Anatomy and Physiology for Sports Massage

### Learning Outcome 6





### Learning Outcome 6:

Know the structure and function of the nervous system

Learning Outcome 6: Know the structure and function of the nervous system

At the end of this learning outcome, you will be able to:

- a) Describe the structure of the nervous system
- b) Outline the functions of each subdivision of the nervous system
- c) Explain the characteristics of the different types of nerves





# The following slides are presented by sections a-c

# a. Describe the structure of the nervous system



# a. Describe the structure of the nervous system *What is the nervous system?*





Your nervous system guides almost everything you do, think, say or feel.

It controls complicated processes like movement, thought and memory. It plays an essential role in the things your body does without thinking, such as breathing, blushing and blinking.

Your nervous system affects every aspect of your health, including your:

- Thoughts, memory, learning, and feelings.
- Movements, such as balance and coordination.
- Senses, including how your brain interprets what you see, hear, taste, touch and feel.
- Sleep, healing and aging.
- Heartbeat and breathing patterns.
- Response to stressful situations.
- Digestion, as well as how hungry and thirsty you feel.
- Body processes, such as puberty.

# a. Describe the structure of the nervous system *Structure*



The nervous system is the major controlling, regulatory, and communicating system in the body.

The nervous system is made up from two main parts:

- The brain
- The spinal cord

All of the nerves from the spinal cord supply the body.



### b. Outline the functions of each subdivision of the nervous system



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## b. Outline the functions of each subdivision of the nervous system *Function*

- Monitor internal and external environment through sensory receptors
- Integrating the information it has received
- Initiating and coordinating a response by activating muscles (cardiac, smooth, skeletal) and glands (endocrine)



## b. Outline the functions of each subdivision of the nervous system *Structure and Function CNS / PNS*





The main parts of the nervous system are:

**Central nervous system (CNS):** Your brain and spinal cord make up your CNS. Your brain uses your nerves to send messages to the rest of your body. Each nerve has a protective outer layer called myelin. Myelin insulates the nerve and helps the messages get through.

**Peripheral nervous system (PNS)**: Your peripheral nervous system consists of many nerves that branch out from your CNS all over your body. This system relays information from your brain and spinal cord to your organs, arms, legs, fingers and toes.

Your peripheral nervous system contains your:

- *Somatic nervous system,* which guides your voluntary movements.
- *Autonomic nervous system,* which controls the activities you do without thinking about them. 10

b. Outline the functions of each subdivision of the nervous system *Structure and Function CNS / PNS* 



### c. Explain the characteristics of the different types of nerves





c. Explain the characteristics of the different types of nerves *Neurons* 

Types of Neuron

There are several types of neuron, those important at this stage to know are:

- Motor neurons (efferent): is the resultant response/action
- Sensory neurons (afferent): detection of stimuli – initial signal



#### SENSORY NEURONS

 Neurons that carry sensory impulse from sensory organs to the central nervous system are known as sensory neurons

#### **MOTOR NEURONS**

 A neuron that carries motor impulses from the central nervous system to specific effectors is known as motor neurons.

#### Afferent signals

Efferent signals

c. Explain the characteristics of the different types of nerves *Motor neuron structure* 





c. Explain the characteristics of the different types of nerves *Function of a neuron* 



Example of the differences between Motor and Sensory Neurons:

- Motor neuron (efferent) = Muscle contraction
- Sensory Neuron (afferent) = detection of stretch, feeling of hot/cold, pain



**Motor neuron (efferent) =** Muscle contraction

## c. Explain the characteristics of the different types of nerves *Function of a neuron*



Example of the differences between Motor and Sensory Neurons:

- Motor neuron (efferent) = Muscle contraction
- Sensory Neuron (afferent) = detection of stretch, feeling of hot/cold, pain



Sensory Neuron (afferent) detection of stretch, feeling of hot/cold, pain

## c. Explain the characteristics of the different types of nerves *Structure of the brain*





#### c. Explain the characteristics of the different types of nerves *Cranial nerves*



### • There are 12 pairs of cranial nerves.

• They have different locations in the brain for different functions.

Locations of the Cranial Nerves	
LOCATION	NERVES
Anterior of the Brain	1, 2
Midbrain	3, 4
Pons	5, 6, 7, 8
Medulla	9, 10, 11, 12

#### **12** Cranial Nerves



### What next?

- All sections of learning outcome 6 will be assessed in the end of course examination paper.
- Have a go at the practice examination questions for Learning Outcome 6.
- These can be found on the website in the learners link for each learning outcome.

