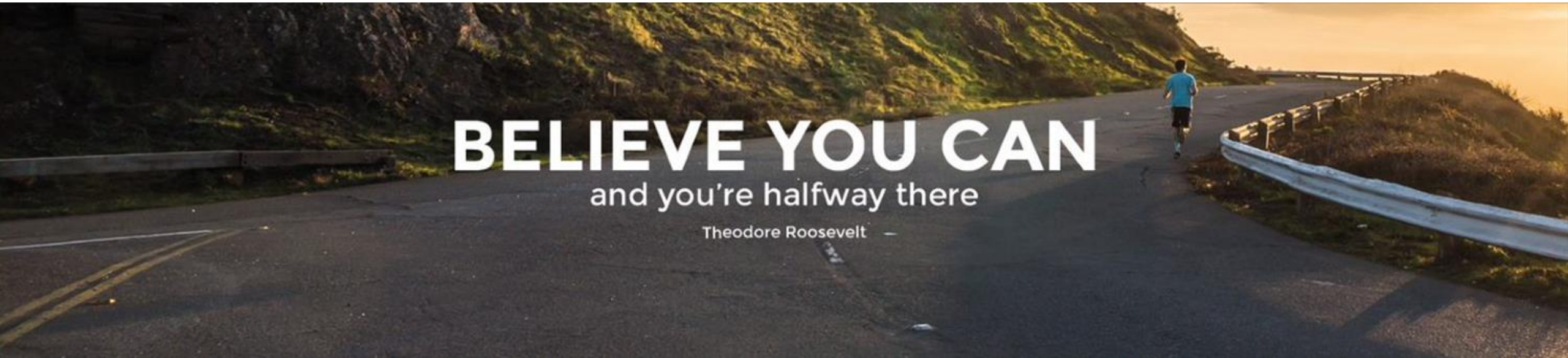


EB Education Revision Guide



How to work with the Nervous System: Part 1

The Nervous System

What is it?

- The nervous system enables us to react to our surroundings. It consists mainly of the brain, the spinal cord, nerve cells (“neurons”) and receptors.
- There are many sensory **receptors** in the body. These are groups of cells that can detect a change in the environment (a **stimulus**).

Types of receptor:

- 1) Light receptors in the eyes
- 2) Sound receptors in the ears
- 3) Taste receptors on the tongue
- 4) Smell receptors in the nose
- 5) Touch, pressure and temperature receptors in the skin
- 6) Changes of position receptors in the ears (balance)

Neurones

TOP TIP: Make sure you recognise the structure of the different neurones.

What is a neurone?

Neurones transmit information quickly as electrical impulses.

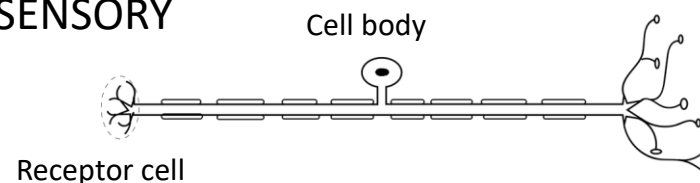
Neurones have a **cell body** with a nucleus. There are extensions on the cell body that connect to other neurones.

Dendrites and **dendrons** carry impulses towards the cell body, and **axons** carry impulses away from the cell body.

A **myelin sheath** surrounds some axons. It speeds up the electrical impulse by acting as an insulator.

Neurones can be very long as this reduces the number of times neurones need to connect with each other. Every connection slows the impulse down.

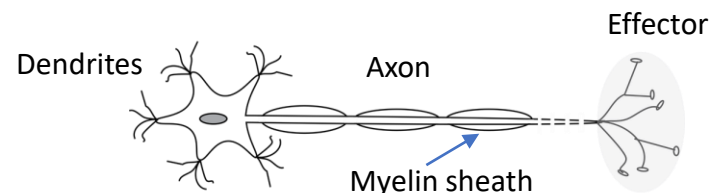
SENSORY



RELAY



MOTOR



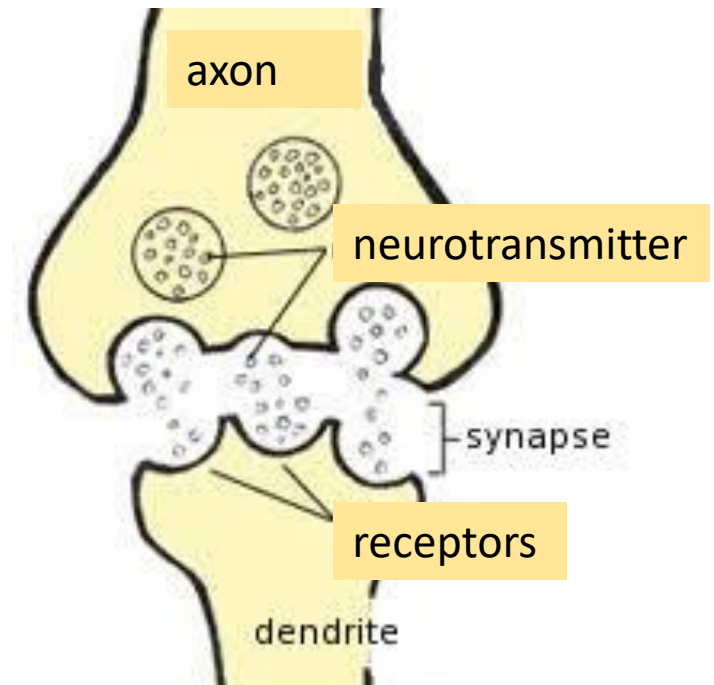
Synapses

What is a synapse?

The connection between two neurones is called a **synapse**.

Electrical impulses cannot travel across a synapse, so the signal is transferred by chemicals called **neurotransmitters**.

The neurotransmitters diffuse across the gap and set off a new electrical signal in the next neurone.



Reflex Arc

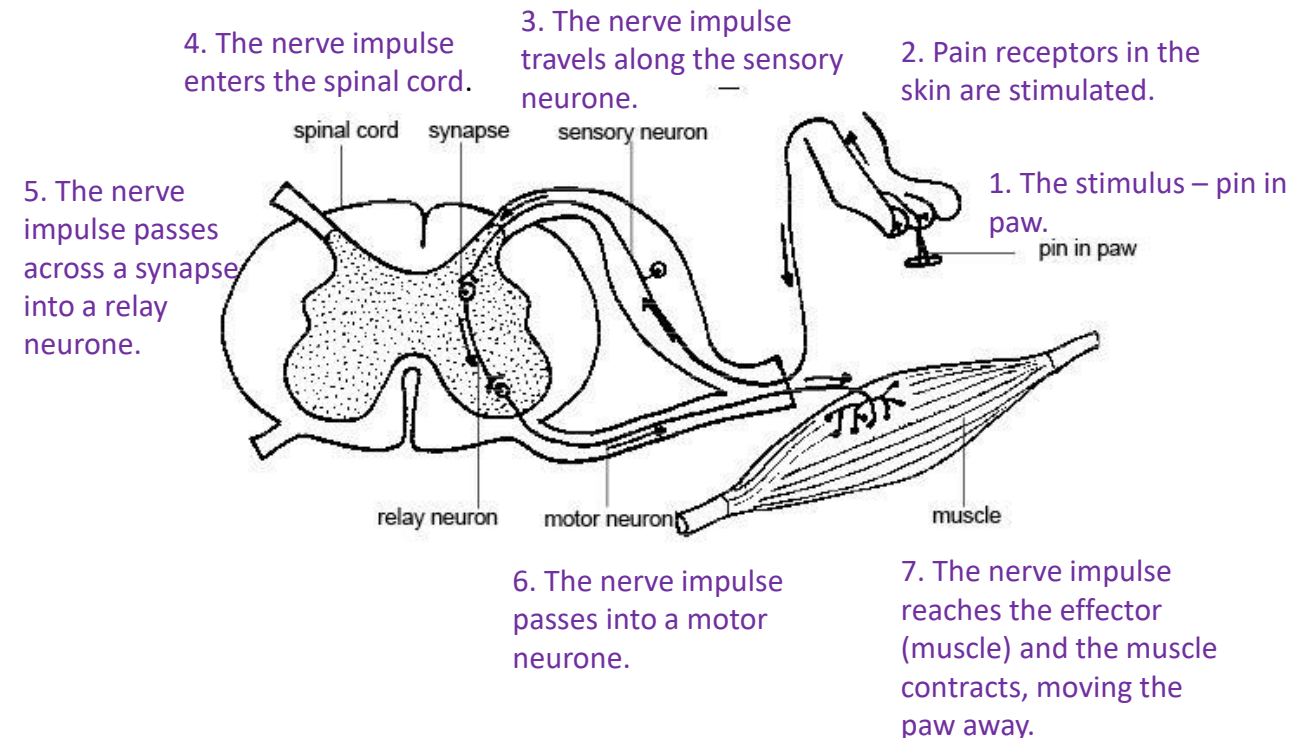
Reflexes

Reflexes are designed to allow you to respond to a potentially dangerous situation very quickly. As there is no time to think, the brain does not need to be involved. These actions are coordinated by the central nervous system (CNS).

The route taken from receptor through to effector is known as a reflex arc.

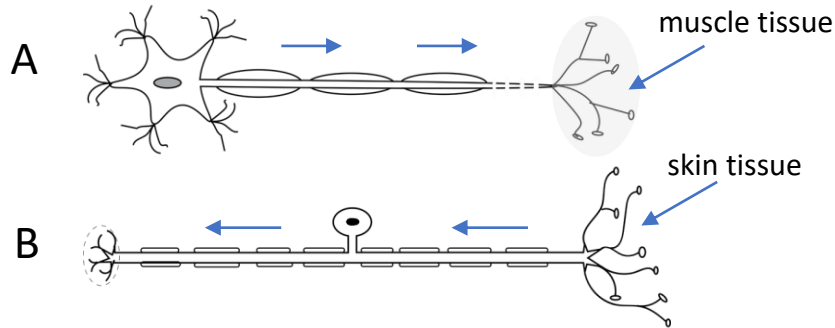
The neurones in a reflex arc go through the spinal cord.

Each reflex action follows the pathway:
stimulus → receptor → sensory neurone → synapse → relay neurone → synapse → motor neurone → effector → response



Your turn:

1. The diagrams below show the structure of two neurones.



a) Where does neurone B send information to?

- A: Hormones which results in a response
- B: Muscle tissue
- C: Brain and spinal cord
- D: Receptor cells in the skin

b) What kind of neurone is neurone A?

.....

c) Nerve impulses control movement in the body.

Explain how a reflex arc prevents a person from injuring themselves.

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Your turn:

2a) Nerve impulses travel along the axon of a sensory neurone.
Explain how this information travels along the neurone.

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b) Describe the purpose of the myelin sheath.

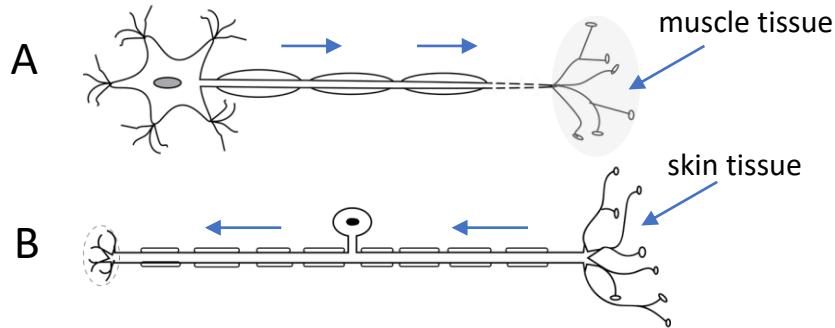
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c) A reflex arc prevents injury.
Describe the path a nerve impulse takes through a reflex arc.

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Answers:

1. The diagrams below show the structure of two neurones.



a) Where does neurone B send information to?

A: Hormones which results in a response

B: Muscle tissue

C: Brain and spinal cord

D: Receptor cells in the skin

b) What kind of neurone is neurone A?

Motor neurone

c) Nerve impulses control movement in the body.

Explain how a reflex arc prevents a person from injuring themselves.

- A reflex response is involuntary.
- Reflex responses do not involve the brain.
- Receptors detect the stimulus.
- The message travels from the receptor along the sensory neurone to the spinal cord.
- The axon is insulated by a myelin sheath to ensure the electrical signal does not lose energy.
- The junction between two neurones is a synapse.
- The message travels across the synapse by neurotransmitters to the relay neurone.
- The message travels from the relay neurone to the motor neurone via another synapse.
- The effector (muscle or gland) produces the response.

Answers:

2a) Nerve impulses travel along the axon of a sensory neurone.
Explain how this information travels along the neurone.

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The impulses travel from the receptor cells to the CNS/spinal
cord/synapse/brain as an electrical impulse
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b) Describe the purpose of the myelin sheath.

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Insulates the axon to speed up the electrical impulse.
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c) A reflex arc prevents injury.
Describe the path a nerve impulse takes through a reflex arc.

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Receptor detects the stimulus – sensory neurone –synapse (by chemicals)
- relay neurone – synapse – motor neurone – effector.
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For more help and resources, or
to work with us as a tutor, please
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