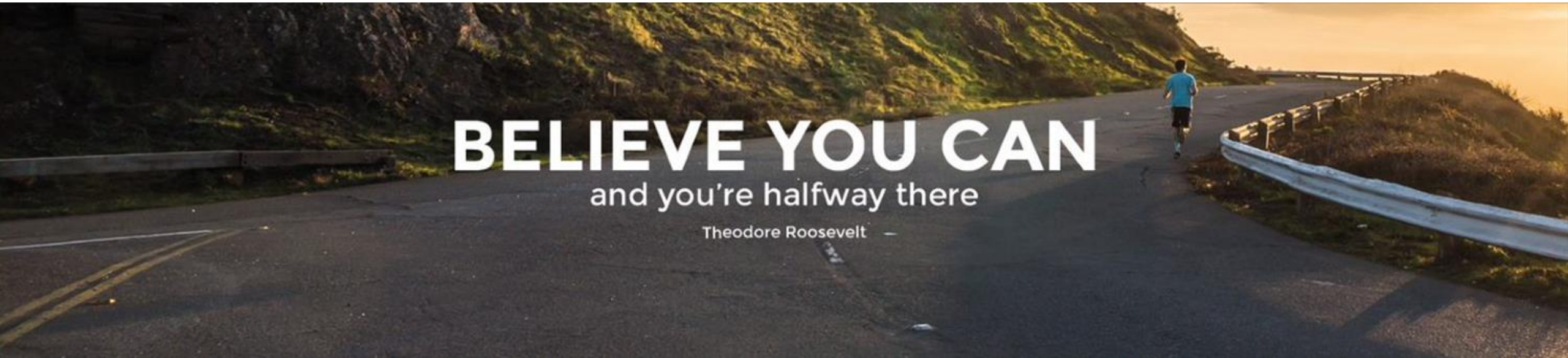


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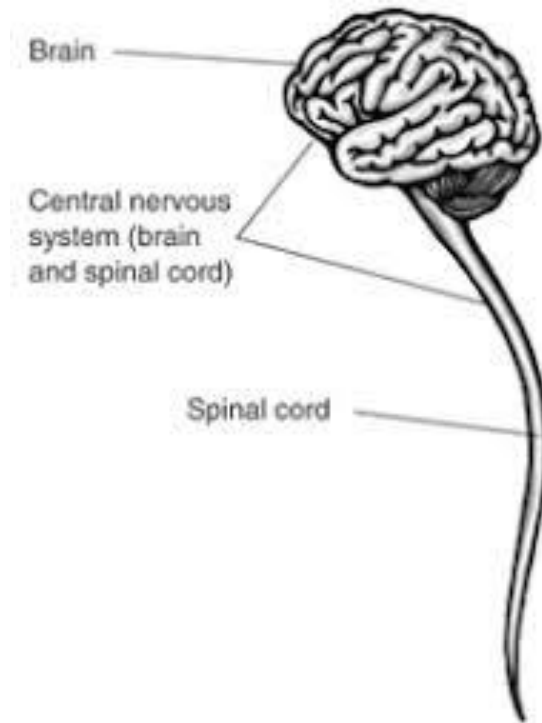


How to work with the Nervous System: Part 2

The Central Nervous System

What is it?

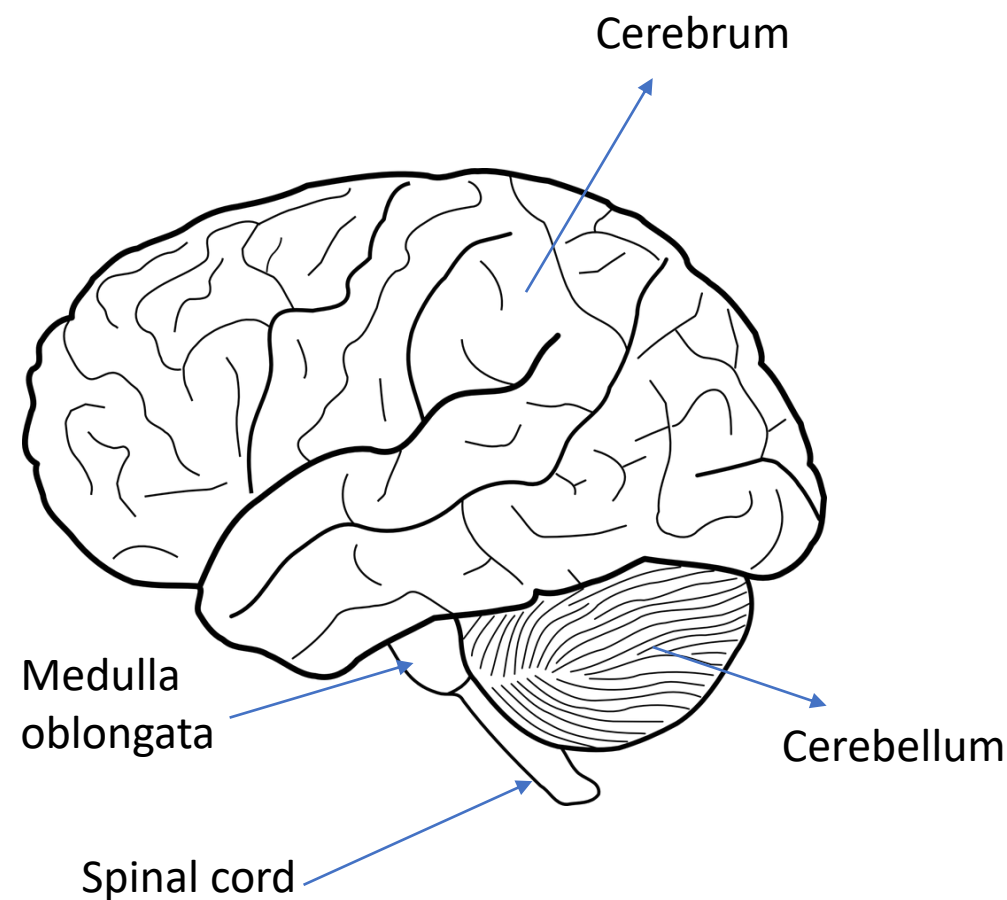
- The central nervous system is made up of the brain and spinal cord.
- The spinal cord is a long column of neurones (nerve cells) running from the base of the brain down the spine.
- Neurones branch off from the spine to connect with different parts of the body.
- Information is passed between the brain and the body via the spinal cord.



The Brain

What is it?

- The brain is made of billions of neurones which are interconnected. It controls complex behaviour and different parts of the brain have different functions.



The cerebrum

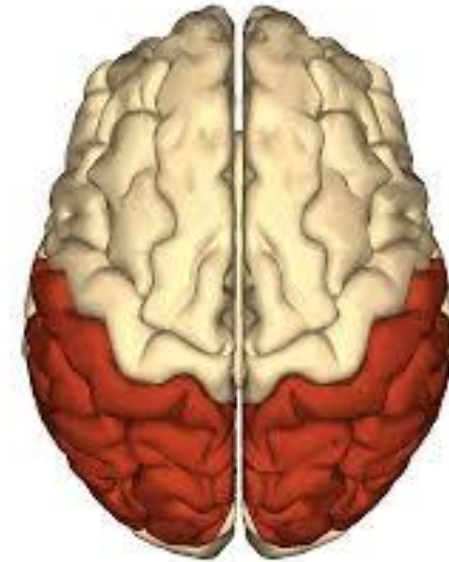
Cerebrum

This is the largest part of the brain.

It is divided into two halves called **cerebral hemispheres**.

The right hemisphere controls muscles on the left-hand side of the body, and the left hemisphere controls muscles on the right-hand side of the body.

The cerebrum is highly folded and is responsible for intelligence, memory, movement, language and vision.



Cerebellum and Medulla oblongata

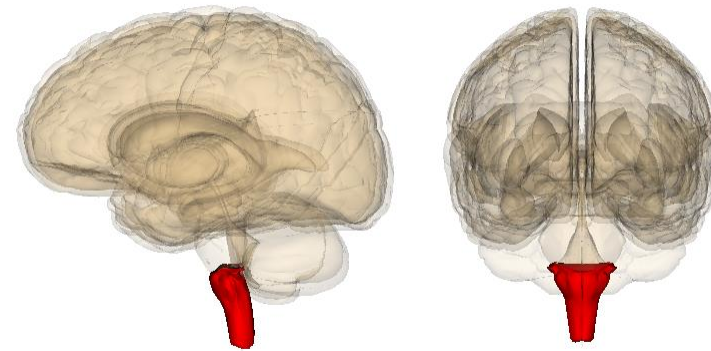
Cerebellum

- This is responsible for muscle co-ordination and balance.



Medulla oblongata

- This is responsible for unconscious activities like heart rate and breathing rate.



Neuroscientists are able to investigate brain function without surgery by using scanners.

CT Scanning

A CT scanner uses X-rays which produce an image of the brain.

They are useful in showing an image of the main structure of the brain but cannot show the functions of these structures.

If the brain has been damaged in some way, this can be seen on the scan and linked to any loss of function in the patient.

PET Scanning

A PET scanner uses radioactive chemicals to show the active parts of a brain while the patient is inside the scanner.

These scans allow the structure and function of the brain to be investigated in action and are very detailed.

They can be used to study disorders of the brain, as they can show if parts of the brain are showing unusual activity or inactivity when compared to a normal functioning brain.

Treating CNS Problems

How can CNS problems be treated?

Brain or spinal cord damage through injuries, tumours or diseases like Parkinson's and Alzheimer's are difficult to treat.

This is because:

- parts of the nervous system are difficult to access. The brain is complex and delicate and treating some areas is not possible.

- neurones in the CNS do not repair themselves and at present, scientists do not know how to repair nervous tissue.
- permanent damage can be caused by treating some areas of the brain or spinal cord and the benefits of surgery need to outweigh the risks.

Your turn:

1a) Maia suffers a head injury. After the injury she struggles to:

- Remember recent events
- Name familiar objects

Which part of her brain is likely to have been damaged?

.....

b) Liam also has a head injury. He staggers when he is walking.

Which part of his brain has been damaged?

.....

2. Explain why treating conditions affecting the brain is difficult.

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Your turn:

3. Explain how CT scanners and PET scanners are used to study disorders of the brain.

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Answers:

1a) Maia suffers a head injury. After the injury she struggles to:

- Remember recent events
- Name familiar objects

Which part of her brain is likely to have been damaged?

.....cerebrum.....

b) Liam also has a head injury. He staggers when he is walking.

Which part of his brain has been damaged?

.....cerebellum.....

2. Explain why treating conditions affecting the brain is difficult.

It is difficult to access some parts of the brain.

It is possible to cause permanent damage

when treating some areas. Surgery is hard as

the brain is not fully understood. Many areas

of the brain interact with each other so

damage can be extensive

Answers:

3. Explain how CT scanners and PET scanners are used to study disorders of the brain.

They are non-invasive.

CT scanners – use x-rays to show an image of the brain.

PET scanners – use radioactive chemicals to show the activity of the brain. Can be used to link structure to function.

For more help and resources, or
to work with us as a tutor, please
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