

Brain Injury Awareness

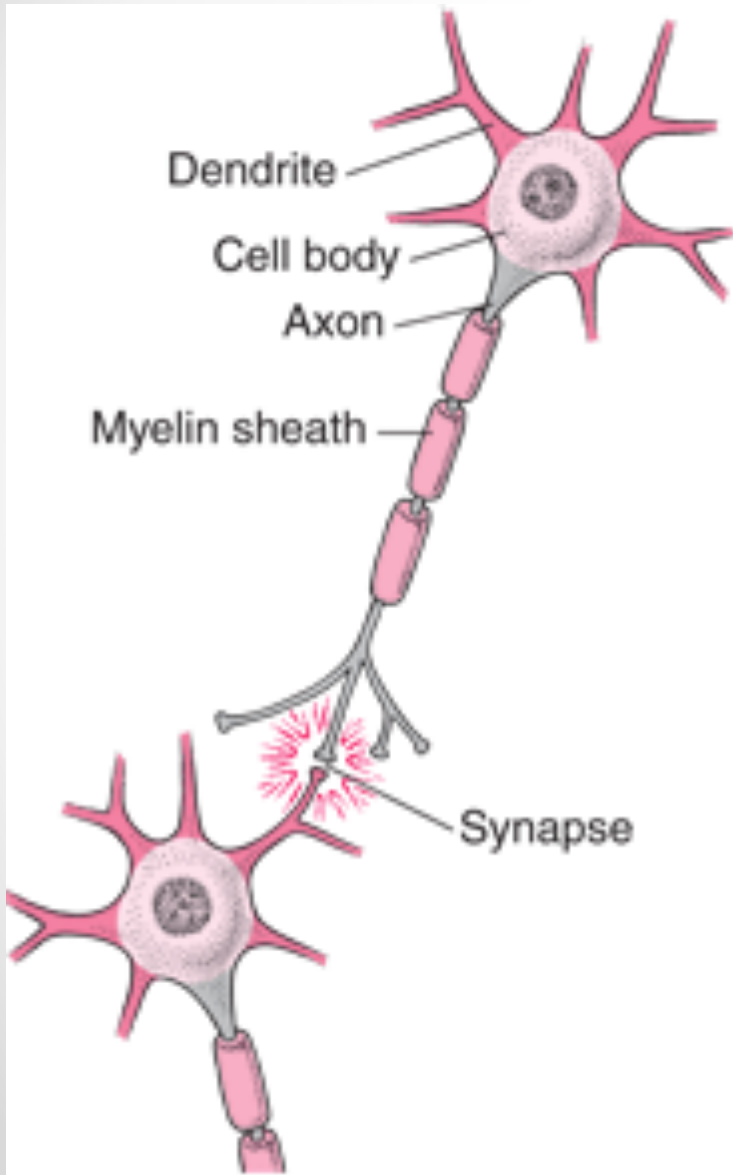


QEF Brain Injury Centre

Aim

- To understand how the brain can be damaged
- To learn the basic structures within the brain.
- To gain insight into the cognitive, emotional and behavioural changes post brain injury.
- To consider some common misperceptions about behaviour after brain injury.

Some Brain Facts



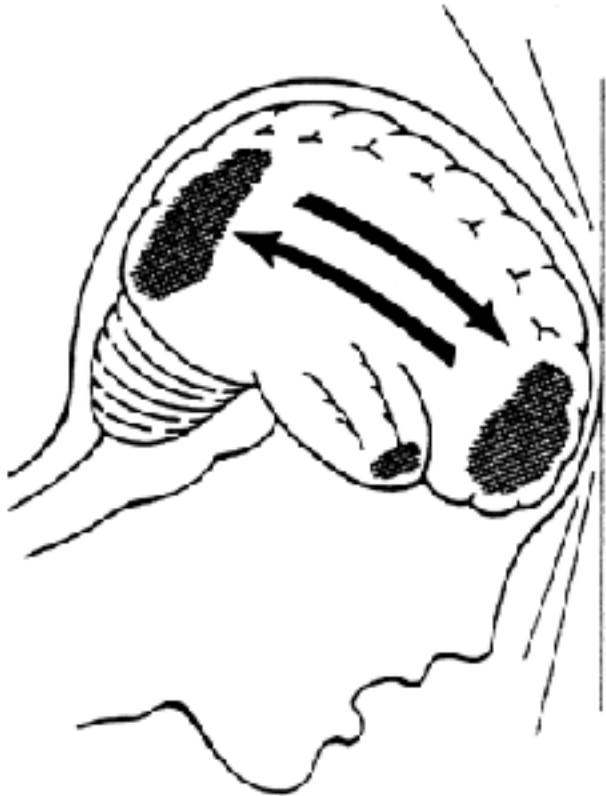
- The brain weighs over 1 kg (about 3lbs), and has the texture of blancmange.
- The brain consists of billions of nerve cells that communicate with each other - enabling us to process information and initiate activities.

How can a person damage their brain?

- **It's estimated that 1 million people in the UK are living with the long-term effects of a brain injury.**
- Blunt trauma to the head – traffic accidents, falls, objects to the head etc.
- Brain Tumour
- Infections
- Stroke

Primary damage

At the moment of impact, the brain may suffer bruising and widespread tearing or stretching of its nerve fibres



Bruising of the Brain

- Damage can occur at the site of impact or the opposite point of impact (coup or contrecoup).
- Bruising most commonly occurs where the head is hit first.
- The most common sites of injury in the brain are the frontal and temporal lobes.

Secondary damage

Secondary damage is injury to the brain caused by the development of medical complications

Bleeding

- A blood clot (called a *haematoma*) inside the skull, can exert pressure on the brain, and cause damage.
- Neurosurgery may be needed to drain the clot and stop bleeding.



Brain swelling

Swelling of the brain may reduce the flow of blood and oxygen to the brain cells.



Stroke

(cerebrovascular accident/CVA)

- The brain has a very rich supply of blood
- Strokes occur when the normal supply of blood to the brain becomes disrupted
- This may be due to bleeding from a blood vessel (*haemorrhage*) or blockage / disruption of the blood supply

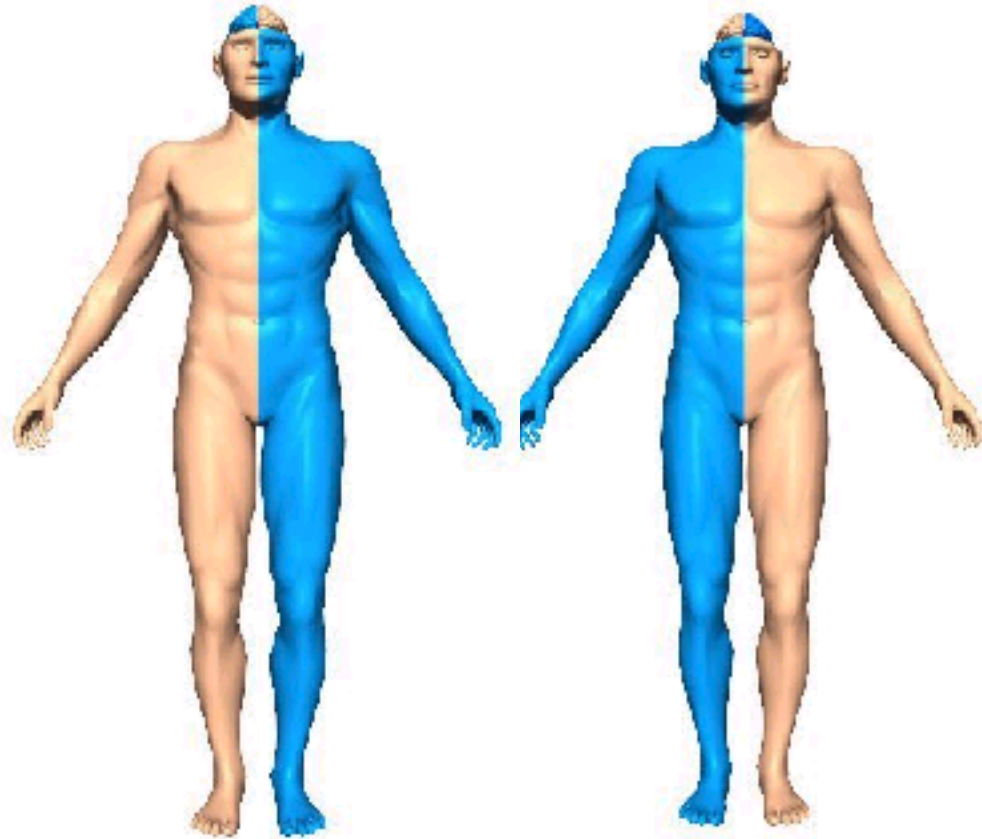
The Structure of the Brain

Facts about the brain

- The 2 hemispheres
- Main areas of the brain & their names
- Functions of different parts of the brain
- Questions & discussion

Hemisphere Brain Functions

- The brain is divided into two halves (hemispheres).
- Usually, the left half of the brain controls the right side of the body.
- The right half of the brain controls the left side of the body
- **LEFT BRAIN DAMAGE**
Problems seen on the right side of the body.
- **RIGHT BRAIN DAMAGE**
Problems seen on the left side of the body.



The structure of the brain

The brain is split into different sections

Frontal lobes:

- Located just behind the forehead
- There is no other part of the brain where lesions can cause such a wide variety of symptoms (Kolb & Wishaw, 1990).



Frontal lobes

Important for:

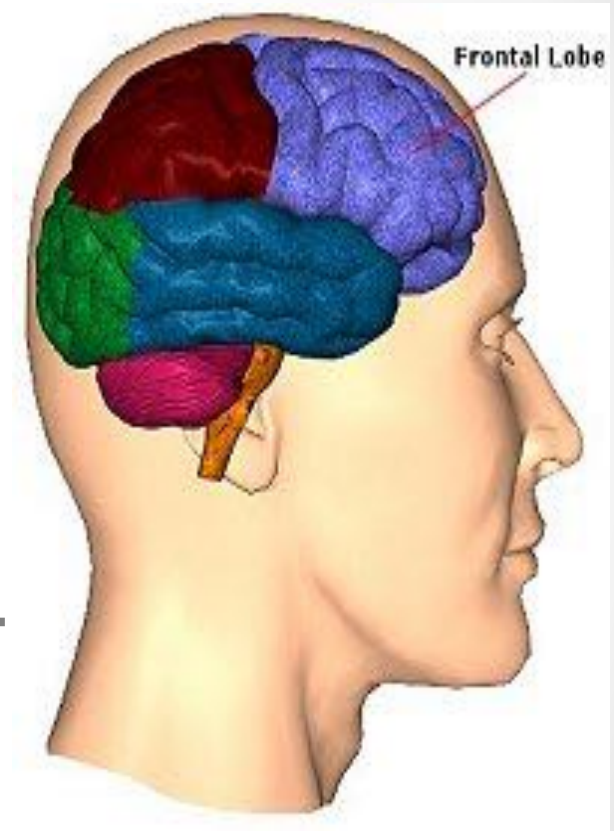
Planning

Organisation

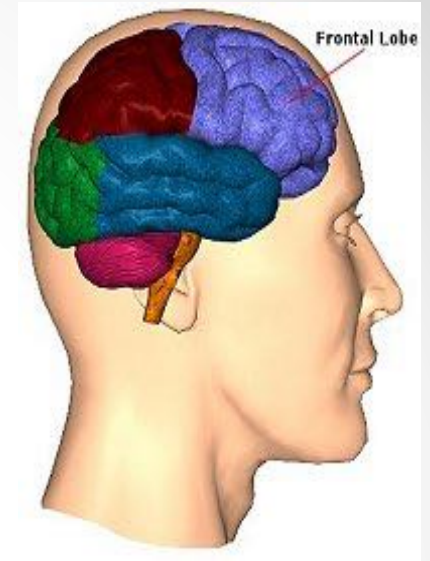
Initiating (activities/
conversation)

Problem-solving and judgement

Personality and mood



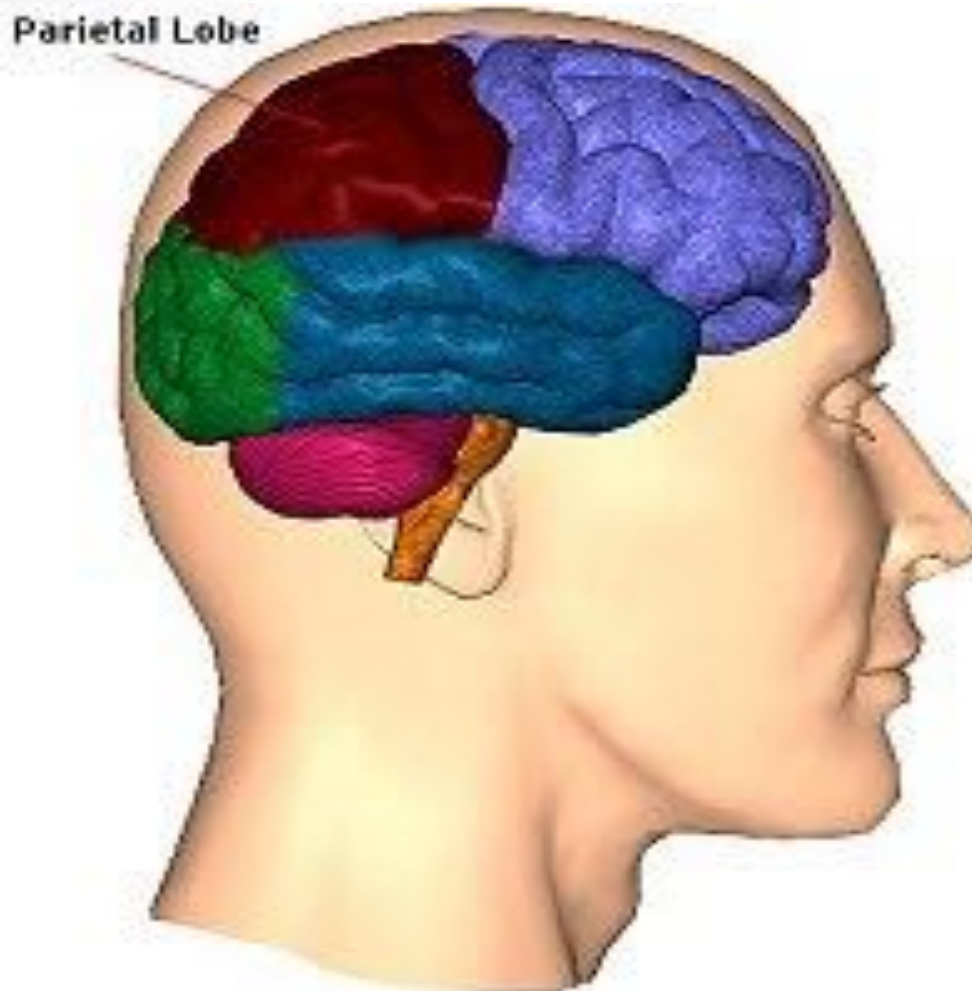
Frontal lobes



Observed Difficulties:

- Inability to plan a sequence of movements needed to complete multi-stepped tasks, such as making coffee
- Loss of spontaneity in interacting with others and changes in social behaviour
- Loss of flexibility in thinking
- Persistence of a single thought or action
- Inability to focus on task
- Personality and Mood changes

Parietal Lobes



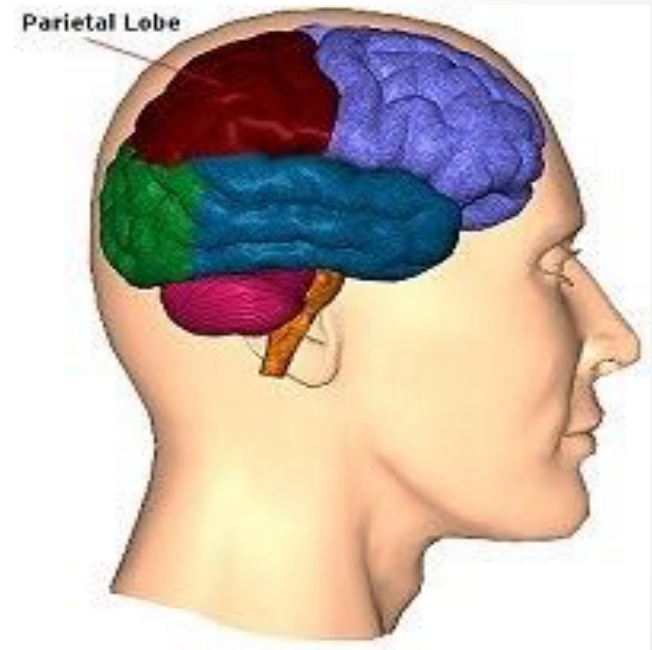
- located behind the ears and towards the back of the head
- (red area in the diagram)

Parietal lobes

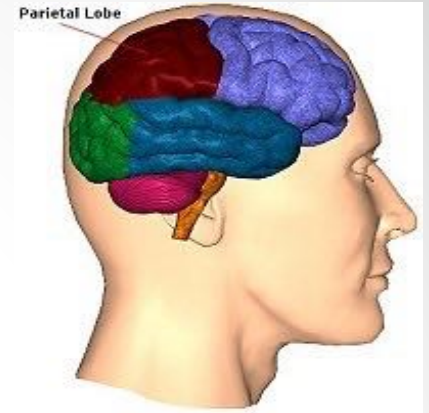
Important for:

Integrating sensory
information

Spatial judgement



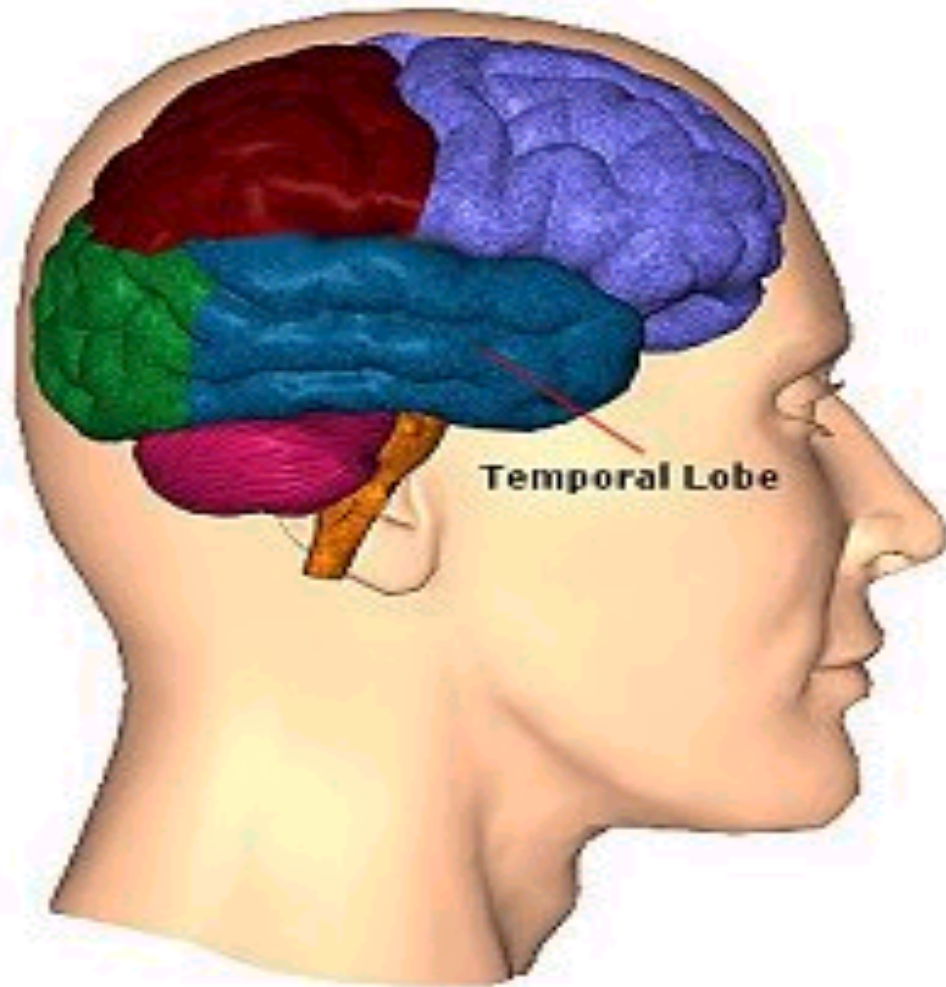
Parietal lobes



Some Observed difficulties:

- Inability to attend to more than one object at a time.
- Inability to locate the words for writing
- Problems with reading
- Difficulty with drawing objects.
- Lack of awareness of certain body parts and/or surrounding space that leads to difficulties in personal-care.
- Inability to focus visual attention.
- Difficulties with eye and hand coordination

Temporal lobe



- Located just above the ears
- Often damaged in head injury
- (dark blue/green area on diagram)

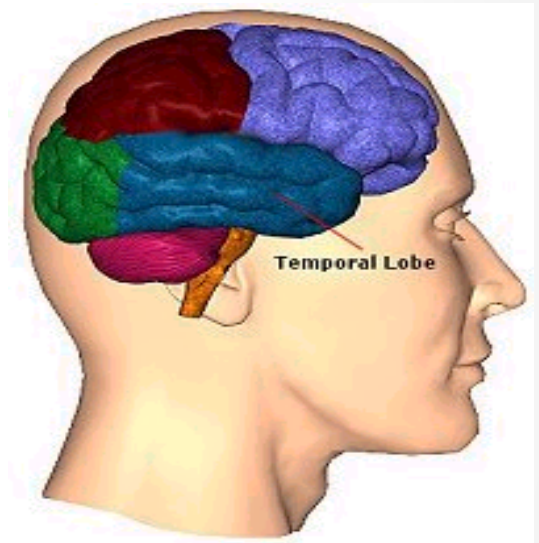
Temporal lobe

Important for:

Memory

Hearing

Understanding
speech



Temporal lobe

Some observed difficulties:

Difficulty in recognizing faces

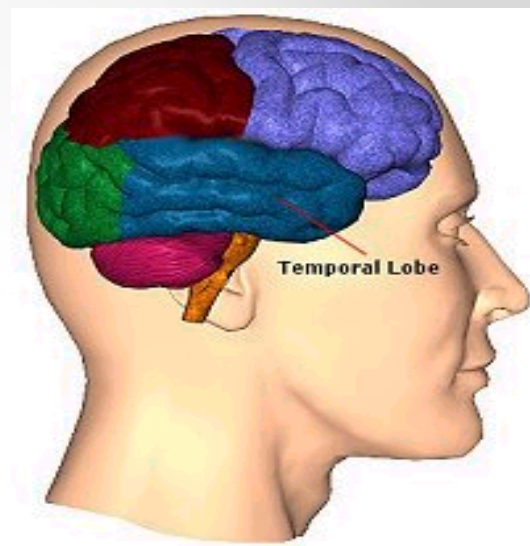
Difficulty in understanding spoken words

Short-term memory loss

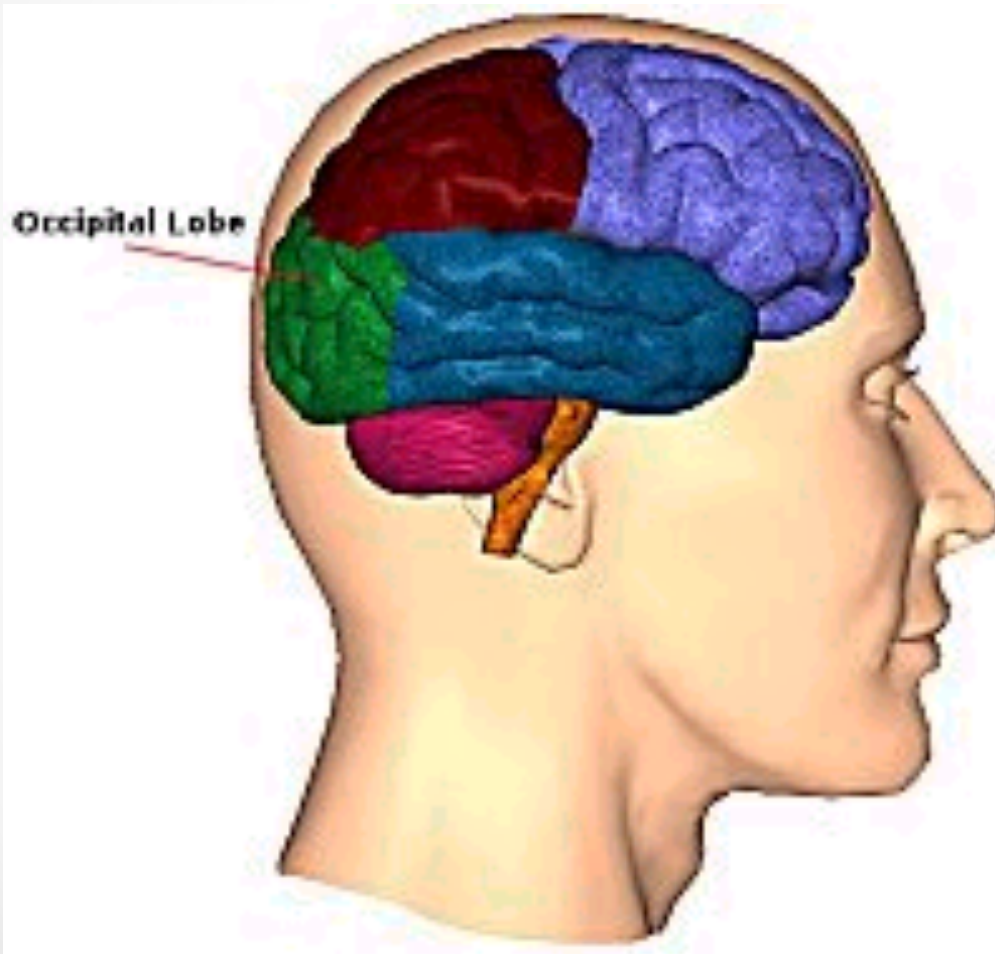
Interference with long-term memory

Persistent talking.

Increased aggressive behaviour



Occipital lobe



- Located at the back of the head
- Uncommon site of injury
- (green part on diagram)

Occipital lobe

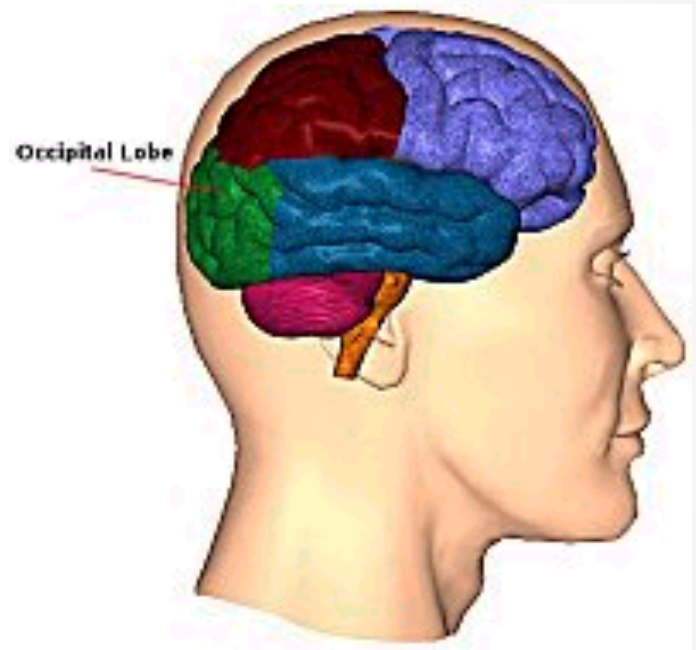
Important for:

Vision

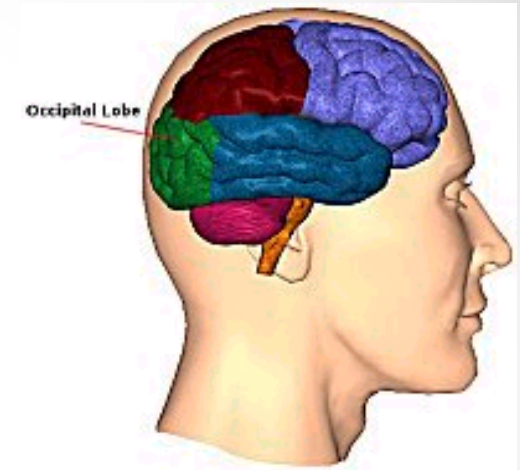
Recognising
objects

Identifying colour

Perceiving
movement



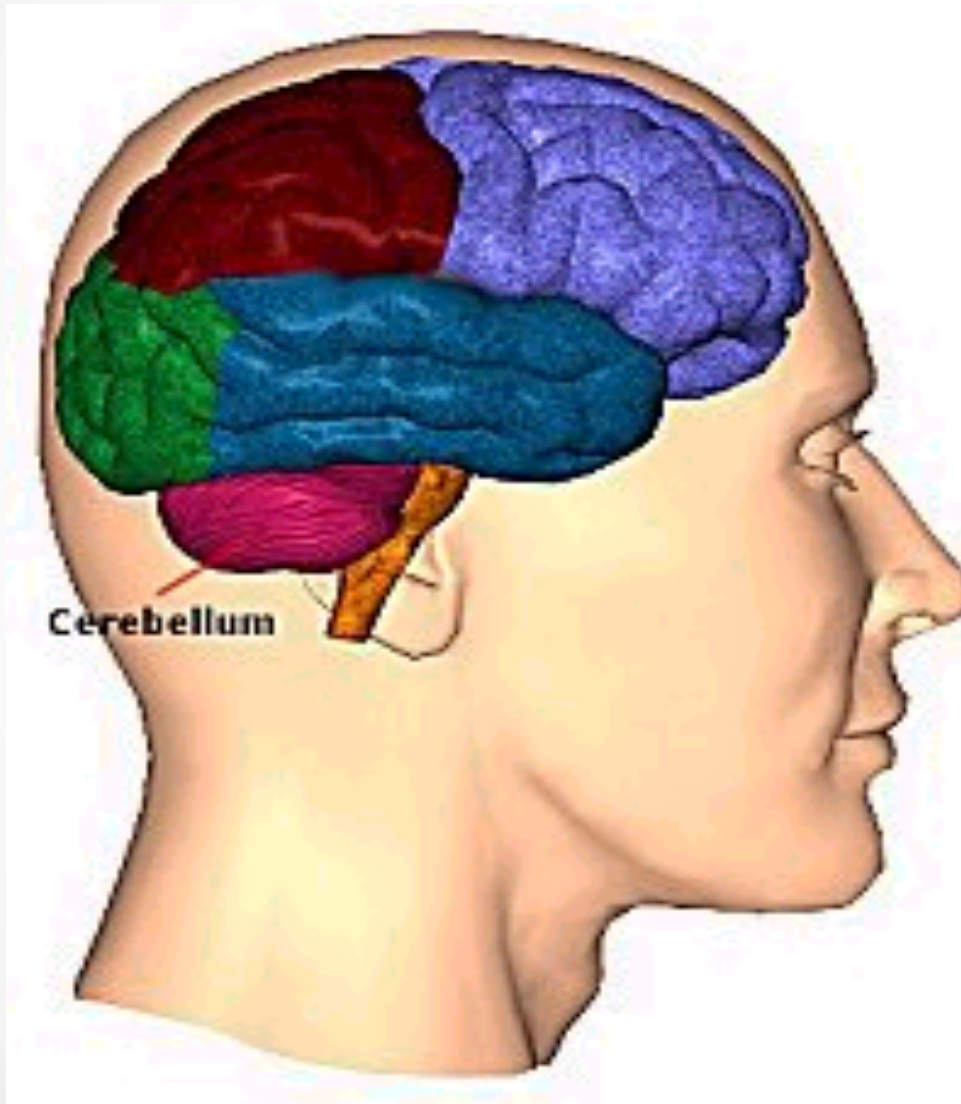
Occipital lobe



Some observed difficulties

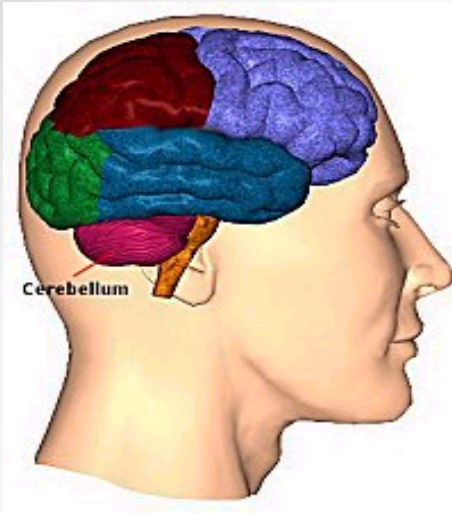
- Difficulty in recognizing objects.
- Difficulties with reading and writing.
- Scanning – miss out important information
- Oculomotor control
- Face or Object recognition
- Direction, distance, depth: Spatial awareness
- Spatial awareness in relation to self.

Cerebellum



Located below
the back of
the
cerebrum

(pink area on
diagram)



Cerebellum

Important for:

Co-ordination

Balance

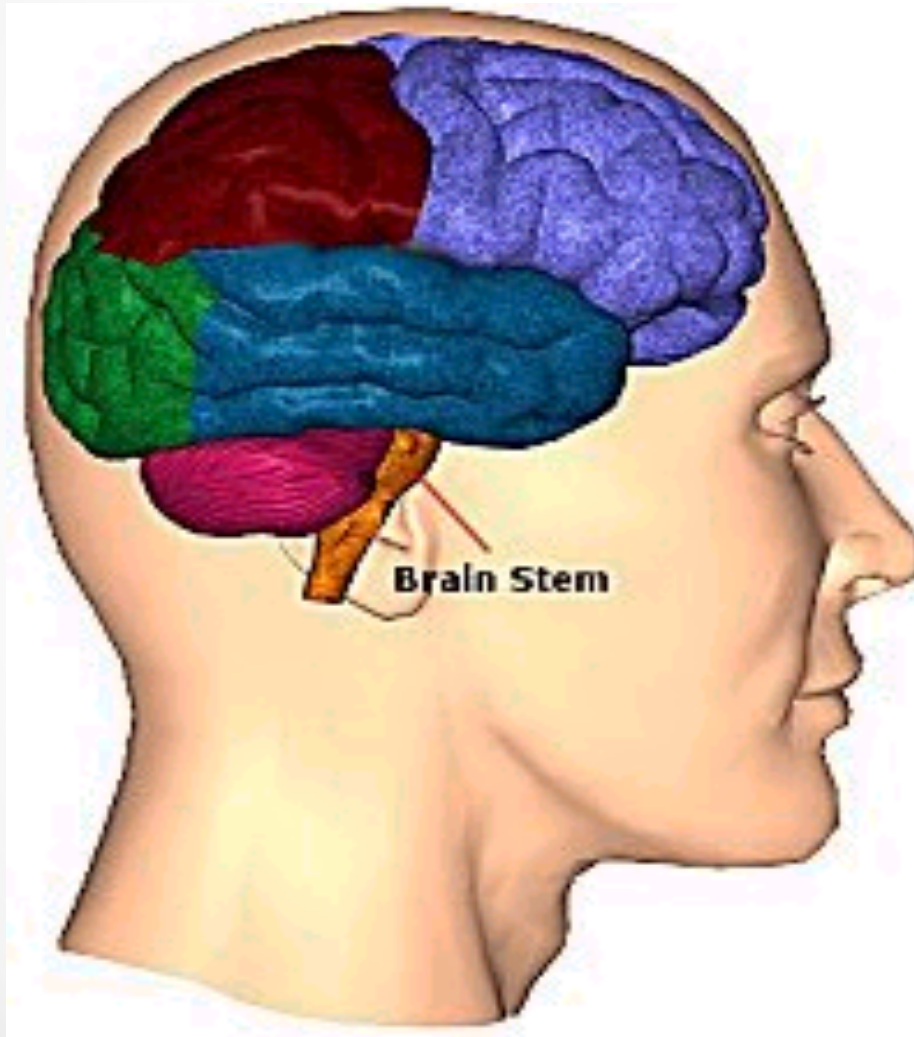
Walking

Articulation

Observed Problems:

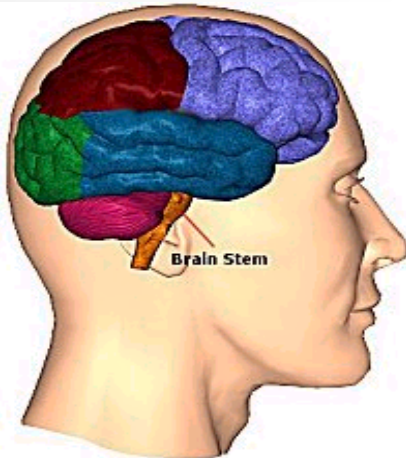
- Loss of ability to co-ordinate fine movements.
- Loss of ability to walk.
- Inability to reach out and grab objects.
- Dizziness
- Slurred Speech

Brain Stem



- The brain stem connects the cerebrum with the spinal cord
- It has different areas with different functions
- (small orange part on diagram)

Brain Stem



Important for:
Arousal and alertness
Breathing
Swallowing

Some observed difficulties

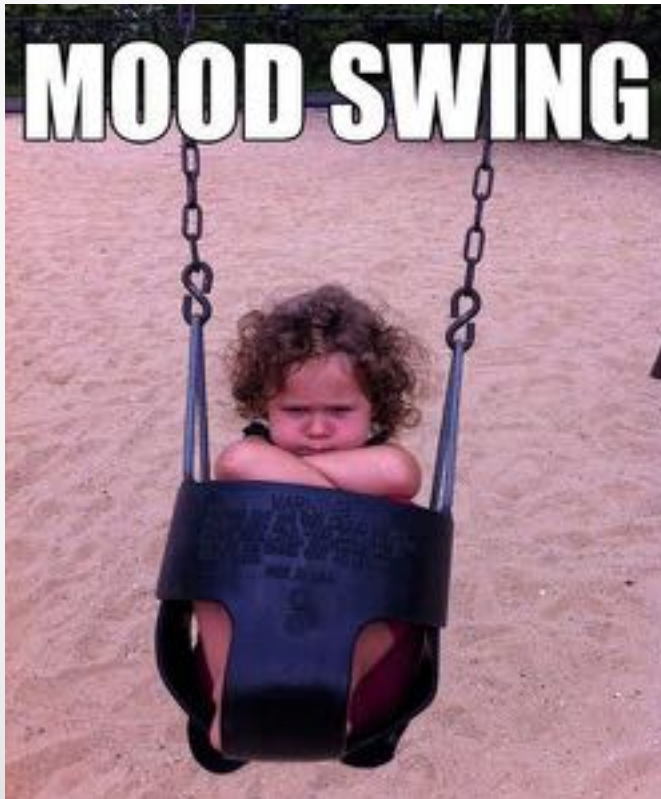
- Decreased vital capacity in breathing, important for speech.
- Swallowing food and water
- Problems with balance and movement.
- Sleeping difficulties (Insomnia, sleep apnea).

Some important points to remember...

- Each part of the brain is *dominant* in controlling certain functions, but that does not mean it works alone.
- The brain is made of vast connections, and most simple behaviours requires activity from several different brain structures.
- Brain injury is often known as “the hidden disability”.
- The most common complaints of families looking after someone with a brain injury are the emotional and behavioural changes, as opposed to the physical.



Emotions and behaviour after brain injury



Emotional Changes After Brain Injury

- Can be caused by several different factors
- Specific damage to brain structures which control emotions:
 - Amygdala – instinctive emotion
 - Frontal lobe – reasoning, regulating and controlling emotions
- This is combined with the trauma of brain injury, adjusting to a new lifestyle, and the difficulties involved in rehabilitation.

Mood changes

- Increased aggression
- Lowered tolerance to frustration
- Impatience
- Anxiety
- Depression
- Emotional lability
- Apathy/lack of motivation

Behavioural changes

- Disinhibition
- Impulsivity
- Self-monitoring
- Anger/aggression
- Childishness

Common Problems and Misperceptions After Brain Injury

What could be behind these cases seen in brain injury?

- “A client is being lazy and won’t join in...”
- “A client has been told what to do several times, but just isn’t listening...”
- “A client is deliberately being rude to wind me up...”
- “A client keeps calling the buzzer, and doesn’t understand that I’m busy...”

Common Problems and Misperceptions After Brain Injury

“A client is being lazy and won’t join in...” **Apathy, problems with initiation, problem solving, coordinating motor movements to get up...**

“A client has been told what to do several times, but just isn’t listening...” **Poor attention, problems understanding language, memory...**

“A client is deliberately being rude to wind me up...” **Disinhibited, reduced self-monitoring, not judging social cues, boredom...**

“A client keeps calling the buzzer, and doesn’t understand that I’m busy...” **Impatience, inflexible thinking, egocentrism, memory, persistence of thoughts...**