

What happens to the body during a coma?

Introduction:

What is a coma?

A coma is a **deep state of unconsciousness**. Unlike sleep or brain death, the person is alive yet **unable to normally respond to the surrounding environment**.

Causes:

- **traumatic brain injuries with blows to the head can cause comas**; this may include car accidents, injuries during sports or other attacks to the head.
- **excessive alcohol consumption, drug overdoses and exposure to other toxins can all lead to a coma**; for example, **carbon monoxide** entering the bloodstream prevents oxygen from binding to red blood cells which can reduce the oxygen supply to the brain, causing a stroke which could result in a coma due to oxygen deprivation – **hypoxia**.
- **diabetes**: blood sugar levels rising too much is known as **hyperglycemia** and blood sugar levels dropping too low is **hypoglycemia**, both of which can lead to a coma.
- **Infections**: severe inflammation of the spinal cord, brain or tissues surrounding it can cause a coma.

Symptoms:

- closed eyes
- only reflex movements in limbs and no voluntary response
- only reflect responses to painful stimuli

Effect on brain and body:

Brain:

Generally, on a neurological level, during a coma the brain shows **no awareness or cognitive processing**, and does not respond to any external stimuli, unless by reflex. This is due to **communication between the brain stem and cerebrum being interfered**; these parts of the brain control cognitive consciousness and so a lack of communication between these parts due to the **malfunctioning of the reticular activating system**, is responsible for the comatose state.

Body:

Breathing, heart rate and digestion are all part of the **autonomic nervous system** and can continue whilst the brain is in a coma. However, in different cases, depending on the type of coma or injury people in comas may require respiratory help or IV injections to keep them hydrated and fed.

A problem can arise when people in comas are unable to reflexively swallow and clear the airways of mucus and saliva which can result in breathing issues or infections such as pneumonia.

Comas also most commonly cause people to develop **muscle atrophy** due to prolonged inactivity, the level of which is determined by the period of unconsciousness.

Research:

In 2015, findings reported that functional MRI tests showed patients retaining a particular strength of neuronal communication were more likely to recover from a coma. Using fMRI neurologists may therefore be able to predict a person's likelihood of recovery.



Diagnosis may be carried out by measuring brain activity, conducting physical tests, blood tests, or using the Glasgow Coma Scale (GCS)