Wrightington, Wigan and Leigh Teaching Hospitals
NHS Foundation Trust

# About Brain Stem Death

Version number: **7**
Last modified date: **12th November 2026**

Relative and Carer Information

# Intensive Care Unit

- Author ID: NM
- Leaflet Ref: Surg 048
- Date Produced: January 2026
- Expiry Date: January 2028

## Introduction

This leaflet explains about brain stem death and the tests carried out to confirm this. We realise this is a difficult time for you and your family, and hope that this leaflet helps answer your questions.

## What is the brain stem?

The brain stem is at the base of the brain and is connected to the spinal cord. It is responsible for keeping the body alive by providing the functions of:

- Breathing
- Heartbeat
- Blood pressure

The brain stem also relays all information to and from the brain to the rest of the body, so it plays a vital role in core functions such as consciousness, awareness and movement.

## What is brain stem death?

If the brain stem dies, messages to and from the brain stop. Vital functions will no longer take place and life cannot continue. Breathing will stop, the heart rate and blood pressure will be affected, and the person will not regain consciousness. When the brain stem dies there is no chance of recovery.

## When does brain stem death happen?

Brain stem death happens when the brain has been injured. It may be caused by one of the following:

- A head injury
- Bleeding into or around the brain
- After a cardiac arrest
- Infection, such as meningitis
- A tumour.

When the brain is injured, it becomes swollen and, because it is enclosed in the skull, at some point it cannot swell any more. This puts pressure on the brain stem. When this happens, blood and oxygen cannot reach the brain stem, and it dies.

## How do you know when brain stem death has occurred?

If an injury to the brain has taken place, doctors will monitor the person's responses and progress.  The doctors will then decide if a test need to be carried out to see if brain stem death has occurred. The tests follow strict guidelines and are carried out by two experienced doctors. The test is completed twice to make sure the findings are correct. The time between the sets of tests can vary.

## The tests will check for:

**Reaction to light** – a torch is shone into both eyes to see they react to the light

**Blink reflex** – the cornea, which is normally very sensitive, is stroked with a piece of cotton wool.

**Response to pain** – pressure is applied to the forehead to see if there is any response to pain.

**Natural eye movement** – ice cold water is squirted into each ear which normally should cause the eyes to move.

**Cough reflex** – a tube is placed down the throat to see if it provokes a gagging or coughing reflex.

**Breathing** – the ventilator that has been breathing for the person is switched off for a short period. This makes the carbon dioxide levels in the body rise. Usually, the brain would react to this by making the person breathe to get rid of the carbon dioxide. If the brain stem has died this message cannot get through even if the carbon dioxide levels are allowed to become higher than normal.

The person is monitored to see if there is any attempt to breathe on their own. The person is then reconnected to the ventilator.

If the brain stem is dead, then there will be no reaction to any of these tests. If there is a response to any of these tests, the tests are stopped.

## Frequently asked questions

### If my relative has died why is their heart still beating?

While the ventilator puts oxygen into the lungs, the heart will continue to beat. Without the ventilator the heart would stop beating. Even with a ventilator the heart will stop beating within a period of hours.

### Why is the chest moving and the body warm and pink?

The chest is moving because the ventilator is pushing oxygen in and out of the lungs. The chest expands just like in normal breathing, but it is artificial. Because the heart is still pumping blood around the body it keeps it warm and pink.

Sometimes, you may still see movement in your relative's arms or legs after the brain stem has died. This is not a sign of life and is due to reflexes in the spinal cord.

## Can my relative feel pain?

No, when the brain stem has died, the body can no longer feel pain. This is why one of the tests includes a test for a reaction to pain.

Can I stay with my relative while the tests take place?

Yes, some people wish to be present, others prefer not to. Talk to the staff caring for your relative about your wishes and possible options.

## Once the tests have shown my relative has died, what happens next?

You may be asked to consider donating your relative's organs and tissues to help others. If you decide to donate your relative's organs, your relative will remain on the ventilator and the Donor Transplant Co-ordinator will come and speak to you to discuss this further.

If you do not want to consider organ donation, we will discontinue treatment when you feel ready. Shortly after this your relative's heart will stop beating. You will be able to stay with your relative for as long as you want.

Some families find that a lock of hair or a handprint can be of some comfort in the future. Ask the nurse if you would like this.

## Further information

If you would like to discuss anything during this difficult time, please do not hesitate to talk to the medical and nursing staff.  If you would like to talk to one of the hospital chaplains, please ask the nurse to contact them for you.



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