

# DETERMINING BRAIN DEATH IN ADULTS



This fact sheet may help you understand how doctors diagnose brain death in adults.

Neurologists from the American Academy of Neurology are doctors who identify and treat diseases of the brain and nervous system. The following information is provided by experts who carefully reviewed all available scientific studies on how to determine brain death in adults.

A 1995 AAN guideline studied the evidence for the ways brain death is determined in adults. This fact sheet summarizes the AAN's 2010 guideline update, "Determining Brain Death in Adults." (See [www.aan.com/guidelines](http://www.aan.com/guidelines) to read the full-text guideline.)

When a loved one suffers a severe brain injury, all brain function may be lost. This is known as brain death. Doctors can accurately determine brain death. This fact sheet may help clarify the process of making a brain death diagnosis.

## What does it mean to be brain dead?

When a person is brain dead, the brain can no longer function. The doctors have done all they can to treat the person's condition. However, the brain will not recover function, and the person is considered dead. The doctors will support the heart with medication. They will also provide oxygen through a ventilator, or breathing machine. The person's body can be supported for days and, sometimes, even weeks. However, there is no reason to do so.

A brain death diagnosis is final and cannot be reversed. The person will never awaken.

## What causes brain death?

Brain death results from a major injury to the entire brain. Often brain swelling has injured the brainstem, which connects the brain to the body. This injury cannot be reversed.

Brain death is often caused by traumatic head injury. Other causes are brain hemorrhage (bleeding) and cardiac arrest followed by CPR.

## How can doctors know for sure when a person is brain dead?

The doctor will examine the person carefully. He or she also will use several tests to make the diagnosis. The AAN's 2010

guideline update provides the steps needed to determine brain death. It stresses three signs doctors must look for. First, the person is in a permanent coma, and the cause of the coma is known. Second, all brainstem reflexes have permanently stopped working. Third, breathing has permanently stopped. A ventilator must be used to keep the body functioning. Tests given to stimulate breathing show the person cannot breathe without the ventilator. The doctor also will rule out any conditions that may make the examination unreliable. Examples are extremely low body temperature and evidence of alcohol or drug use (prescription or other drugs).

Sometimes the doctor will confirm the examination results with a laboratory test. However, usually the examination is enough for diagnosis.

## What happens after a brain death diagnosis is made?

After the examination, the doctor will spend time with the surviving family members. They will be given the amount of time they need to say good-bye to their loved one. The doctor will go over next steps the family must take to make important decisions. These include discussion of organ donation. If organ donation does not take place, the doctor will turn off the ventilator and any other support machines.

This statement is provided as an educational service of the American Academy of Neurology. It is based on an assessment of current scientific and clinical information. It is not intended to include all possible proper methods of care for a particular neurologic problem or all legitimate criteria for choosing to use a specific procedure. Neither is it intended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions are the prerogative of the patient and the physician caring for the patient, based on all of the circumstances involved.

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