

# Stroke

## Fact Sheet

### What is stroke?

A stroke is a serious **life-threatening medical condition** caused by an interruption of the blood supply to the brain, usually because it is blocked by a blood clot (thrombosis) or a blood vessel bursts (bleeding). This cuts off the supply of oxygen and nutrients, causing damage to the brain tissue resulting in a number of physical symptoms.<sup>1</sup> Disability following a stroke varies greatly depending on factors such as the part of the brain affected, how quickly treatment was given, and the extent of the damage to the brain. A very severe stroke can cause sudden death.

### Key facts



Every year, around **17 million people** suffer a stroke worldwide.<sup>2</sup>



It is estimated that **1 in 4 persons** will have a stroke during their lifetime.<sup>3</sup>



Stroke is **the second cause of death** worldwide and **the first cause of acquired disability**.<sup>4</sup>



Across Europe, it is estimated that only **30% of patients receive stroke unit care**.<sup>5</sup>

# History

Hippocrates, the father of medicine, first recognized stroke over 2,400 years ago. At that time, stroke was called apoplexy, which means "struck down by violence" in Greek. This was due to the fact that a person developed sudden paralysis and change in well-being. Doctors had little knowledge of the anatomy and function of the brain, the cause of stroke or how to treat it.

It was not until the mid-1600s that Jacob Wepfer found that patients who died with apoplexy had bleeding in the brain. He also discovered that alternatively, a blockage in one of the brain's blood vessels could cause apoplexy.

Medical science continued to study the cause, symptoms and treatment of apoplexy and, finally, in 1928, apoplexy was divided into categories based on the cause of the blood vessel problem. This led to the terms stroke or "cerebral vascular accident (CVA)." Stroke is now often referred to as a "brain attack" to denote the fact that it is caused by a lack of blood supply to the brain, very much like a heart attack is caused by a lack of blood supply to the heart. The term brain attack also conveys a more urgent call for immediate action and emergency treatment by the general public.<sup>6</sup>

Prevention and treatment of stroke has changed substantially in the recent history. As the understanding of stroke pathophysiology advanced, the beneficial effects of antiplatelet and anticoagulant drugs were recognized. Imaging of blood vessels by angiography made surgical therapies possible. Later noninvasive computerized tomography and magnetic resonance imaging distinguished hemorrhagic from ischemic stroke and gave new insight into stroke mechanisms. Stroke prevention became possible by selective management of stroke risk factors. Thrombolytics introduced 15 years ago provided the first actual treatment of ischemic stroke. The field of stroke continues to advance as medical and surgical treatments are refined and indications made clear, organized systems of care become standard, and new imaging techniques and endovascular therapies are developed.<sup>7</sup>

## Risk factors



### Age

The largest number of people who have strokes are aged over 55 and the risk increases with age. This is because our arteries naturally become narrower and harder as we get older.



### Medical conditions

Certain medical conditions can increase the risk of stroke. These include high blood pressure, diabetes, atrial fibrillation and high cholesterol. An important way to reduce the risk of stroke is to find out presence of these conditions and work with a doctor to manage them.



### Lifestyle factors

The way we live has a big impact on our risk of stroke. Things such as drinking too much alcohol, being overweight, eating unhealthy foods, and above all smoking, can damage blood vessels, increase blood pressure and make blood more likely to clot. There are lots of lifestyle changes that can be made to reduce the risk of stroke.



### Family history

If a close relative has had a stroke, the risk is likely to be higher.



### Your ethnicity

Strokes happen more often to people from African and Caribbean families, as well as people from South Asian countries. People from these groups are more likely to have some risk factors for stroke because of a variety of risk factors like diabetes and high blood pressure.<sup>8</sup>

# Symptoms

The loss of blood flow to the brain damages brain tissue within the brain. Symptoms of a stroke show up in the body parts normally controlled by the damaged areas of the brain. The sooner, a person having a stroke, gets care, the better their outcome is likely to be.

Use the acronym BE FAST to remember the signs of stroke, and what to do if someone near you is experiencing them.

## BE FAST Reminder of Stroke Signs

- **B - Balance:** Is the person suddenly having trouble with balance or coordination?
- **E - Eyes:** Is the person experiencing suddenly blurred or double vision or a sudden loss of vision in one or both eyes?
- **F - Face Drooping:** Does one side of the face droop or is it numb? Ask the person to smile.
- **A- Arm Weakness:** Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?
- **S - Speech Difficulty:** Is speech slurred, are they unable to speak, or are they hard to understand? Ask the person to repeat a simple sentence like, "The sky is blue." Is the sentence repeated correctly?
- **T - Time to call 911:** If the person shows any of these symptoms, even if the symptoms go away, call 911 and get them to the hospital immediately.<sup>11</sup>

# Diagnosis

Stroke comes suddenly. For the best outcome, a person should receive treatment at a hospital as soon as possible, preferentially within the first hours after onset. There are several different diagnostic tests a doctor can use to determine the type of stroke. These include:

- **Physical examination:** A doctor will ask about the person's symptoms and medical history. They will check muscle strength, reflexes, sensation, vision, and coordination. They may also check blood pressure and examine the blood vessels at the back of the eyes.
- **Blood tests:** A doctor may perform blood tests to determine if there is a high risk of bleeding or blood clots, measuring cholesterol and levels of particular substances in the blood, including clotting factors and checking whether or not an infection is present.
- **CT (computed tomography) scan:** CT scan can show hemorrhages, strokes, tumors and other conditions within the brain.
- **MRI (magnetic resonance imaging) scan:** These use radio waves and a strong magnet to create an image of the brain, which a doctor can use to detect damaged brain tissue.
- **Carotid ultrasound:** A doctor may carry out an ultrasound scan to check blood flow in the carotid arteries and to see if there is any narrowing or plaque present.
- **Cerebral angiogram:** A doctor may inject a dye into the brain's blood vessels to make them visible under X-ray or MRI. This provides a detailed view of the blood vessels in the brain and neck.
- **Echocardiogram:** This creates a detailed image of the heart, which doctors can use to check for any sources of clots that could have traveled to the brain.

It is only possible to confirm the type of stroke using a brain scan in a hospital environment.<sup>9</sup>

# Classification

There are three main types of stroke:

- **Ischemic stroke:** This is the most common type of stroke, making up < 87% of all cases. A blood clot prevents blood and oxygen from reaching the brain.
- **Hemorrhagic stroke:** This occurs when a blood vessel ruptures. This is usually the result of aneurysms or arteriovenous malformations (AVMs).
- **Transient ischemic attack (TIA):** The acute management of TIA presents distinct challenges but also golden opportunities to prevent stroke. Patients and clinicians are often uncertain about the diagnosis and prognosis of TIA because symptoms can be varied and ephemeral. Therefore, many patients with TIA do not seek urgent medical attention and clinicians sometimes do not have an appropriate sense of urgency during the acute evaluation, especially when symptoms have already resolved or might have been prematurely attributed to a TIA mimic.<sup>10</sup>

# Treatment

Treatment depends on the type of stroke, including which part of the brain was affected and what caused it. Strokes are usually treated with medication. This includes medicines to prevent and dissolve blood clots, reduce blood pressure and reduce cholesterol levels. In some cases, procedures may be required to remove blood clots. Surgery may also be required to treat brain swelling and reduce the risk of further bleeding if this was the cause of stroke.<sup>12</sup>

Despite improvements in care, around one third of the 1.3 million people who have a stroke in Europe each year will not survive. One third will make a good recovery, but the remaining third will live with long-term disability. Furthermore, stroke results in post stroke dementia, depression, epilepsy and falls that cause substantial extra morbidity and economical costs.<sup>13</sup>

Some stroke survivors may experience a disability following stroke. The level of seriousness and permanence of this disability will depend on which part of the brain has been injured and how severely it has been affected.

## Common stroke disabilities

- Problems relating to paralysis or movement
- Problems with speech or understanding language
- Thinking and memory difficulties
- Sensory disturbances eg visual problems
- Emotional problems

**Rehabilitation support**, which may vary between countries, may be available to help a stroke survivor adjust to life after stroke. If available, rehabilitation may involve the skills of a multidisciplinary team of professionals, and generally begins when the patient's condition has stabilised after the stroke.<sup>16</sup>

# Life after stroke

**Recovery** from stroke is a long and challenging process for stroke survivors and their families. The after effects can vary widely, depending on the following:

- Severity of the stroke
- Area of the brain affected
- Speed of emergency medical response
- Stroke patient's health


Recovery from stroke may take weeks, months or even years. Some stroke survivors may face lifelong disabilities, while others may recover completely. For all survivors, the recovery process involves making changes in the physical, social and emotional aspects of life. These lifestyle changes can help to prevent additional strokes and facilitate lifelong recovery.<sup>17</sup>

**Rehabilitation therapy** can be very successful in helping stroke survivors recover much of their lost physical and cognitive function. Maximum recovery from stroke occurs in the first three to six months, so treatment should be started as soon as possible — usually well before a patient leaves the hospital.

**Emotional and physical health** of stroke survivors are inseparable and are therefore addressed in unison.<sup>18</sup> Support from health care professionals, carers, family, friends as well as peer support are therefore invaluable during rehabilitation.

## Further information

### European Stroke Association

 [eso-stroke.org](https://eso-stroke.org)


### World Stroke Association

 [world-stroke.org](https://world-stroke.org)

### SAFE Stroke Alliance for Europe

 [safestroke.eu](https://safestroke.eu)

### EAN (European Academy of Neurology) Scientific Panel - Stroke

 [ean.org/home/organisation/scientific-panels/stroke](https://ean.org/home/organisation/scientific-panels/stroke)

### Stroke Association

 [stroke.org.uk](https://stroke.org.uk)

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