



American Stroke Association®
A division of the American Heart Association.

Together to End Stroke®

Life after Stroke

Our Path Forward





There is life – and hope – after stroke. With time, new routines will become second nature. Rehabilitation can build your strength, capability and confidence. It can help you continue your daily activities despite the effects of your stroke.

If you are the caregiver, family member or friend of a stroke survivor, your role is vital. You should know the prevention plan and help your loved one to comply with the plan. With a committed health care team and a rehabilitation plan specific to their needs, most stroke survivors can prevent another stroke and thrive.

We hope this guide will help you and your loved ones understand the effects of stroke and how to maximize your rehabilitation and recovery.



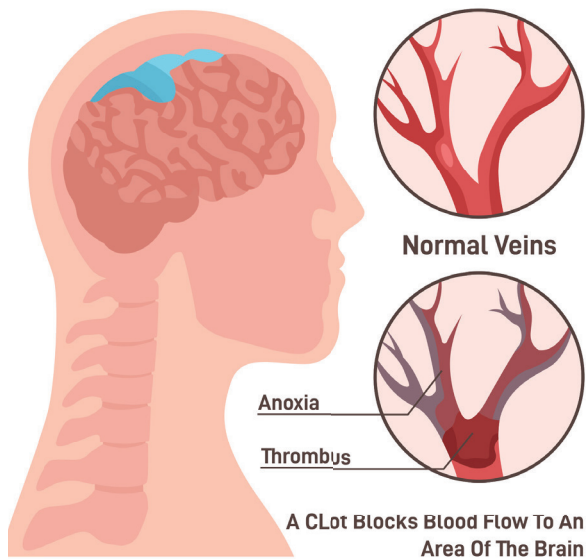
WHAT IS A STROKE?

Stroke is an event that affects the arteries of the brain. A stroke occurs when a blood vessel bringing blood to the brain gets blocked or ruptures (bursts). This means that the area of the brain the blocked or ruptured blood vessel supplies can't get the oxygen and nutrients it needs. Without oxygen, nerve cells can't function.

Your brain controls your ability to move, feel, think and behave. Brain injury from a stroke may affect any of these functions. Several factors affect the ways people experience a stroke. They include:

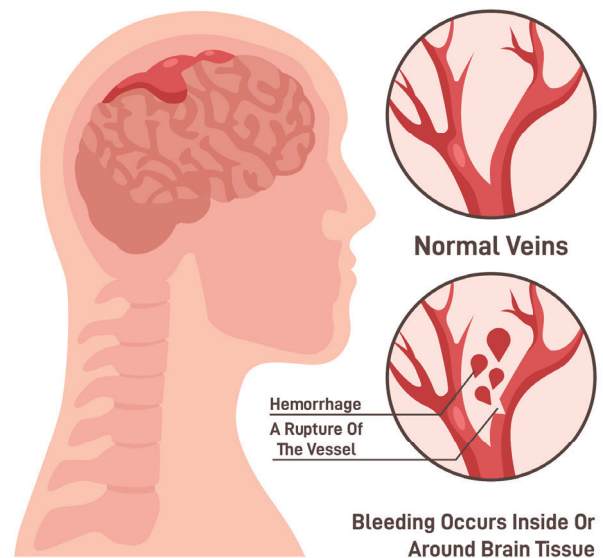
- The location of the blood vessel that is affected
- The area and extent of the brain injury
- The type of stroke (Ischemic vs. Hemorrhagic)

TYPES OF STROKE



Ischemic stroke occurs when a clot blocks a vessel supplying blood to the brain. The artery becomes narrowed or clogged, cutting off blood flow to brain cells. Ischemic strokes are the most common type of stroke.

Hemorrhagic stroke happens when a blood vessel bursts (ruptures) in the brain. This type of stroke may affect large arteries in the brain or the small blood vessels deep within the brain. The rupture keeps the surrounding areas of the brain from getting needed oxygen. Hemorrhagic strokes are less common than ischemic strokes.



Transient ischemic attacks (TIAs) are often called “warning strokes.” TIAs produce symptoms just like stroke, but typically last a shorter amount of time. They don’t usually cause lasting damage. But they are major predictors of future stroke. If you suspect you’ve had or are having a TIA, don’t ignore it! Call 9-9-9. Get immediate medical attention, even if the symptoms go away.

DIAGNOSIS AND EARLY TREATMENT



When someone has symptoms of a stroke or a TIA, a doctor will gather information and make a diagnosis. They will review the events that have occurred and will:

- Take a medical history
- Do a physical and neurological examination
- Have certain laboratory (blood) tests done
- Order a CT and/or MRI scan of the patient's brain
- Study the results of other diagnostic tests that might be needed

Diagnostic tests examine how the brain looks, works and gets its blood supply. They can identify the injured brain area. Most of them are safe and painless. Diagnostic tests you may have fall into three categories.



Imaging tests give a picture of the brain like X-rays (CT scan or MRI).



Electrical tests record the electrical impulses of the brain.



Blood flow tests show any problem that may cause changes in blood flow to the brain.

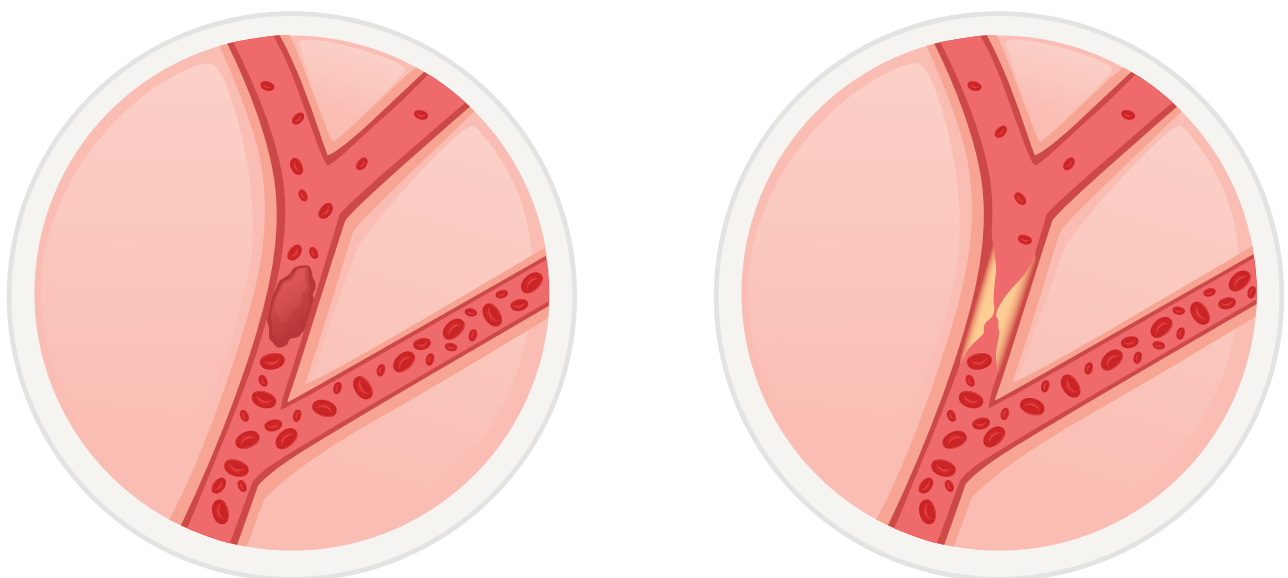
EARLY TREATMENT

Early Treatment of Ischemic Stroke

Ischemic stroke happens when a blood clot blocks a vessel supplying blood to the brain. It's the most common type, accounting for 87% of all strokes. The treatment goal is to dissolve or remove the clot.

To dissolve a clot, a medicine called alteplase (tPA) is given through an IV (intravenous line). It works by dissolving the clot so blood can flow again. Alteplase can save lives and reduce the long-term effects of stroke. It needs to be given within three hours of the start of stroke symptoms (up to 4.5 hours for some eligible patients).

To remove a clot involves a procedure called mechanical thrombectomy. Doctors use a wire-cage device called a stent retriever to remove a large blood clot. They thread a catheter through an artery in the groin up to the blocked artery in the brain. The stent opens and grabs the clot, allowing doctors to remove the stent with the trapped clot. Special suction tubes may also be used to remove the clot. This procedure must be done within up to six to 24 hours of stroke symptom onset and after the patient has received alteplase, if eligible. Patients must meet certain criteria to be eligible for this procedure.



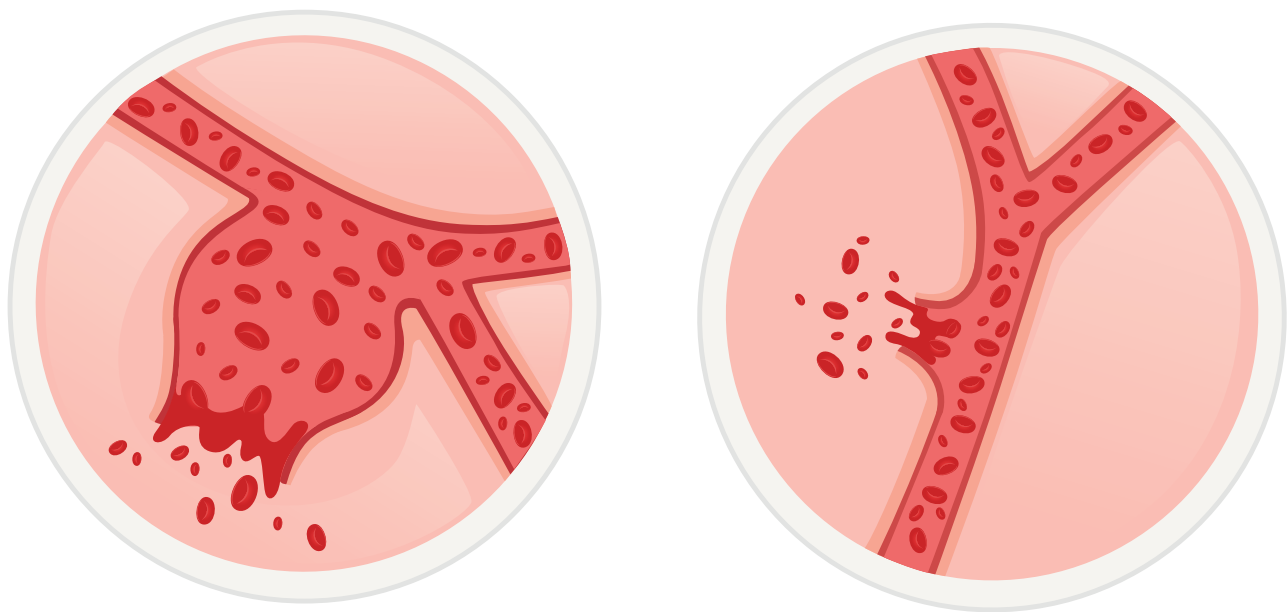
Early Treatment of Hemorrhagic Stroke

Hemorrhagic stroke happens when a blood vessel bursts (ruptures) and bleeds within or around the brain.

Blood vessels can become weak due to a ballooning of part of the vessel (aneurysm). Other times there may be a tangle of blood vessels within the brain that didn't form normally, making them weak (arteriovenous malformation or AVM). When high blood pressure isn't controlled, it puts strain on weakened blood vessels that can lead to the ruptures that cause stroke. The treatment goal is to stop the bleeding.

For some patients, a small tube (catheter) with a camera is threaded through a major artery in an arm or leg and guided to the area of the bleed in the brain. The camera gives the surgeon a detailed view of the area to help fix the problem. Once the catheter is guided to the source of the bleeding, it leaves a mechanism, such as a coil, to prevent further rupture. This type of procedure is less invasive than standard surgical treatment.

Sometimes surgery is required to secure a blood vessel at the base of the aneurysm.



COMMON PHYSICAL CHANGES AFTER A STROKE

Physical changes that follow a stroke are the result of injury to the brain and may include one or more effects.

Weakness or paralysis on one side of the body

If the stroke occurs on the brain's right side, the left side of the body and face will be affected. It's the opposite for a stroke that occurs on the left side of the brain.

Fatigue

After a stroke, it's common to feel tired at some point. This is known as fatigue. Fatigue often starts to lessen a few months after the stroke. But for some people, tiredness may continue for years. If you're experiencing post-stroke fatigue, talk to your health care team about ways to reduce it.

Spasticity

When you try to move a limb, the muscles contract (shorten or flex). This creates stiffness and tightness, which is referred to as "spasticity." Spasticity also causes the tendons and soft tissue

around the muscle to become tight or stiff. This makes stretching the muscle much more difficult. If not treated, the muscle can freeze into an abnormal and often painful position. If you have spasticity, talk to your doctor about the best treatments for you. Physical therapy and medications can help.

Seizures

Seizures are brain malfunctions that alter a person's awareness. A seizure may last only a few seconds or minutes. It may trigger involuntary body movements, strange sensations or blackouts. Studies vary greatly about how often seizures happen after stroke. Seizures are painless. But they can be upsetting and disorienting. Often, seizures can be treated with medications. If you think you may have had a seizure, let your health care team know.

COMMON COMMUNICATION AND COGNITIVE CHANGES AFTER STROKE

The brain controls your ability to use language. Speaking, listening and understanding are complex processes. Each involves different parts of the brain. The location of the stroke injury controls the type of communication problem

Aphasia

Aphasia is a common communication problem after a stroke. There are three types: expressive, receptive and global.

- People with expressive (non-fluent) aphasia know what they want to say but have trouble saying it. They can't find the right words or have trouble "getting the words out." Or, they may use the wrong words or leave out words without knowing it.
- People with receptive (fluent) aphasia have trouble understanding words other people speak. They may not understand the order of the words or the relationship between the words.
- People with global aphasia may be unable to speak, name objects, repeat phrases or follow commands. They also have a hard time understanding what others are saying.

Dysarthria

Dysarthria affects control of the muscles in the face, tongue and mouth. People with dysarthria may know exactly what they want to say. But they may speak slowly. Their speech may sound slurred, muffled, hoarse or nasal.

Apraxia

Apraxia of speech affects the ability to speak. People with apraxia have trouble connecting speech messages from their brain to their mouth. Apraxia of speech may affect more than the power to speak. It often affects reading and writing as well.

Aphasia, dysarthria and apraxia do not cause a loss of intellect. Even though it's difficult for a survivor to speak, it's not because of a lack of intelligence.



MEMORY AND COGNITIVE CHALLENGES

Different parts of the brain control specific types of thinking. Depending on where stroke happens in the brain, problems with certain types of thought may occur. Stroke survivors can have trouble with memory. Planning, organizing ideas or making decisions can also be hard after stroke.

How stroke affects memory

Many stroke survivors face memory challenges. But not all memory problems are the same. A stroke survivor may:

- Remember for only a short span of time. For instance, they might remember only two or three steps in a set of instructions. Or, the person might forget whether they have taken their medications or eaten a meal.
- Have trouble absorbing new information. The survivor may need to have things repeated over and over.
- Have problems transferring learning from one setting to another. For example, in the hospital the survivor might be able to safely transfer from a wheelchair to a bed alone. But at home, the change in setting may make the person unable to do the same task.
- Mix up the details of an event. A stroke survivor might confuse when things happened or who was there. For example, he or she might think a family member visited in the morning instead of the evening before.

PATIENT PERSPECTIVE

Helpful Tips from Reed and Mary Harris

When Reed Harris had a stroke at the age of 50, it left him almost completely unable to communicate verbally or understand what others were saying. He also had partial paralysis on his right side, profound apraxia, and anomia, the inability to recall or say the correct words. Reed also had some auditory processing issues, causing difficulty with how his brain processed what he heard. Reed and his wife, Mary, worked together on Reed's stroke recovery and they share some of the most helpful things they've learned along the way:

Patience is a virtue

The Harrises emphasize that it's important to be PATIENT with all of the ATTEMPTS (successful or not). And remember, lack of speech does not mean there is a lack of hearing.

Act with patience

- Demonstrate: Show how to perform the task.
- Break all actions into smaller steps.
- Clarify the next step.
- Repetition - Approach the 20th time as if it were the first.

Communicate with patience

- SLOW it down.
- E-NUN-CI-ATE.
- Come close/make eye contact/touch.
- Do NOT finish sentences unless asked to.
- When questioning: MULTIPLE CHOICE is better than YES/ NO.
- BE specific. Allow time to respond.

Long-haul tips

For couples new to stroke recovery and aphasia, Mary says, "Reed and I resoundingly respond together with the words, 'Never give up!'" Through their own experience and that of so many people they have come to know, it's critical to:

- Be creative and customize the plan for recovery. Everyone is different. Remember that even a conversation with a pharmacist can be a source of motivation and speech therapy!
- Be creative and customize the plan for recovery. Everyone is different. Remember that even a conversation with a pharmacist can be a source of motivation and speech therapy!
- Be persistent in the endeavor to recover.
- Celebrate the tiny steps of progress.
- Life is the best therapy, so live it!



COMMON EMOTIONAL AND PERSONALITY CHANGES AFTER STROKE

After a stroke, people often experience emotional and behavioral changes. This is because the brain controls our behavior and emotions. A stroke may make a person forgetful, careless, annoyed or confused. Stroke survivors may also feel anxiety, anger or depression. Their behavior depends on which part of the brain is affected and how extensive the injury is.

Depression

Depression is common after stroke, affecting about one-third to two-thirds of all survivors. The symptoms can be mild or severe, often starting in the early stages of stroke recovery. Stroke survivors should be assessed for depression and treated when it occurs. It's important to identify and treat post-stroke depression (PSD) as soon as possible. Untreated, it can lead to being in the hospital longer and can limit a survivor's functional recovery.

The symptoms of PSD may vary and change over time, but patients and families should watch for:

- Persistent sad, anxious or “empty” mood
- Depressed mood; loss of interest/pleasure
- Sleeping problems
- Decreased motivation
- Responding with little or no emotion
- Feelings of hopelessness
- Feelings of guilt, worthlessness, helplessness (feeling like a burden)
- Decreased energy, fatigue, being “slowed down”
- Difficulty focusing, remembering, making decisions
- Appetite changes
- Thoughts of death or suicide

When five or more of the above symptoms last for two or more weeks, a survivor may be having PSD.

Anxiety

Changes related to stroke can lead to worry and anxiety. Getting around may be harder. There may be financial strains. Other sources of anxiety after stroke may be fear of falling because of balance problems or being anxious about speaking because of aphasia. Counseling can be helpful for anxiety. Sometimes anxiety and depression are both in play. If you're anxious, talk with your health care team about potential treatments.

Pseudobulbar affect (PBA)

When parts of the brain that control emotions are injured, PBA (also called emotional lability or reflex crying) occurs. Most often, people cry easily. Some may laugh uncontrollably or have sudden mood swings. These are physical effects of the stroke. Telling the person not to cry won't help. Instead, ask them how they want to be treated during an episode. Many people prefer that it be treated as a reflex, such as hiccups, and that conversation continue. Lability often lessens over time. If PBA is a problem for you, ask your health care provider about available treatments.



WHY REHABILITATION IS IMPORTANT

The rehabilitation and support a survivor receives can greatly influence health outcomes and recovery. Stroke affects so many different functions — paralysis and weakness; gross motor skills; fine motor skills; speech and language; cognition; vision; and emotions. Appropriate, quality rehabilitation with a strong team specially trained to meet your needs improves the chances for the best possible recovery.

For the first three months after a stroke, the brain is much like a new brain. It's ready to learn, ready to make new connections. This ability for our brains to adjust is known as neuroplasticity and it plays a vital role in recovery. It takes about three months after the stroke for neuroplasticity to return to a more normal state. After that, a survivor can still work on regaining function and practice for improvement, but those improvements may come at a slower pace.

The American Stroke Association is dedicated to providing education and resources to stroke survivors and their families. You can find out more about these and other offerings by visiting **stroke.org**.





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