



## Fact Sheet:

# Stroke

### Definition

A stroke is an injury to the brain caused when the brain's blood supply is interrupted or greatly reduced. The brain is deprived of oxygen and nutrients, and brain cells begin to die within minutes. For that reason, a stroke is considered a medical emergency and requires prompt diagnosis and treatment.

### Facts

Stroke, often called a "brain attack," is a leading cause of disability and death worldwide. Strokes strike nearly 800,000 Americans each year - killing approximately 137,000 and forever altering the lives of those who survive. There are an estimated 6.5 million stroke survivors living in the U.S. today. Many years ago strokes were believed to be untreatable, but this is no longer the case, especially with newer techniques now available.

### Major Types of Stroke

- **Ischemic stroke:** Caused by a blockage in an artery, is responsible for about 85% of all strokes. Despite extensive evaluation, many strokes of this type are of unknown etiology. Fortunately, preventative treatments are effective for all types of ischemic stroke. The most common ischemic stroke subtypes are:
  - **Thrombotic stroke:** A blood clot (thrombus) forms in an artery in the neck or brain. These arteries may have a build-up of fatty deposits called plaques.
  - **Embolic stroke:** A blockage caused by blood clots which form elsewhere in the body (usually the heart) and travel to the brain. A common source is an abnormal rhythm in the heart's two upper chambers (*atrial fibrillation*), which may cause clots to form.
- **Hemorrhagic stroke:** Hemorrhage means bleeding. This type of stroke is caused by a leak or rupture of an artery in the brain or on its surface. Such ruptures can be caused by an *aneurysm* (a thin, weak area on an artery wall) or by a malformation of the brain's blood vessel system. Hemorrhages may occur within the brain itself, or in the space between the brain and its protective outer layer. Approximately 15% of all strokes are caused by hemorrhage.
- **Transient ischemic attacks (TIAs):** Often called mini-strokes, TIAs are actually short episodes of stroke symptoms, often lasting only a few minutes. TIAs are caused by a temporary decrease in the supply of blood to part of the brain, and do not leave obvious lasting effects.

But TIAs are considered warnings that indicate greater risk for a stroke, and need to be evaluated by a physician immediately.

## Symptoms

Stroke and TIA warning signs are the same, and include the sudden or intermittent development of:

- Acute numbness, weakness or paralysis of the face, arm, or leg, especially on one side of the body. If you are unable to raise both arms over your head at the same time, or if you are unable to smile normally, you may be having a stroke.
- Sudden loss of balance, dizziness, loss of coordination.
- Sudden blurred or decreased vision in one or both eyes, or seeing double.
- Sudden confusion, difficulty speaking or understanding simple statements. If you are unable to repeat a simple sentence, you may be having a stroke.
- Severe, unexplained, localized headache with rapid onset; may be accompanied by vomiting.

Stroke is more likely if more than one of these signs are present. However, there are many other conditions which may mimic stroke and it is essential to have a medical professional determine the cause of these symptoms. It's important to learn to recognize these symptoms, and if possible, to note when they began. Although they may not cause pain and may even disappear quickly, they are clear warning signs that a stroke has occurred or may soon follow. Every minute counts: the sooner you get treatment (ideally within 60 minutes), the greater the chance that permanent damage will be reduced. If you

experience any stroke warning signs, contact your doctor or healthcare provider, go to the emergency room, or call 911 ***immediately!***

## Diagnosis

Correctly determining the underlying cause and location of the stroke will determine the treatment. Improved medical technology has greatly increased the ability to accurately diagnose strokes and assess the damage to the brain. However, it is not always easy to recognize small strokes because symptoms may be dismissed by the patient and family as changes due to aging, or may be confused with symptoms of other neurological illnesses. As noted earlier, any episode of stroke warning signs requires immediate medical evaluation. As healthcare professionals will tell you, "time lost is brain lost."

## Risk Factors

Several risk factors make a person more likely to experience a stroke. These risks include controllable factors (those you can change) and uncontrollable (those you cannot change). The good news is that more than half of all strokes can be prevented through medical attention and lifestyle changes.

- **Hypertension (high blood pressure):** Stroke risk begins to increase when blood pressure is consistently higher than 115/75. High blood pressure, which is the leading cause of stroke, damages artery walls and can increase blood clotting action, leading to the formation of stroke-causing clots. While high blood pressure can increase stroke risk two to six times, controlling blood pressure reduces the risk substantially. A number of medications are available to help control high blood pressure.

- **Smoking:** Smoking can double your stroke risk. In addition to harming the lungs, smoking also injures blood vessel walls, speeds up hardening of the arteries, makes your heart work harder, and raises blood pressure. Exposure to second-hand smoke also increases the risk of stroke. The good news is that if you stop smoking today, within two to five years your stroke risk will be the same as that of someone who never smoked.
- **High cholesterol and excess weight:** A cholesterol level of 200 or lower is best for adults. Excess cholesterol can settle on artery walls and lead to the eventual blockage of these vessels. Being overweight strains the entire circulatory system and predisposes you to other stroke risk factors, such as high blood pressure. A sedentary lifestyle adds to the risk. Taking cholesterol-lowering statin drugs can decrease the risk of stroke.

You may not be able to change the following factors, but you can greatly minimize their impact on your overall stroke risk by concentrating efforts on the controllable factors listed above.

- **Age:** Although young people can have strokes, the risk doubles with each decade past age 55.
- **Gender:** Men have a slightly higher stroke risk than women.
- **Race:** African-Americans have nearly double the risk of stroke as Caucasians.
- **Family history:** A family history of stroke can mean you are at higher risk.
- **Diabetes:** Circulation problems associated with the disease may

increase stroke risk even if blood sugar and insulin levels are closely managed.

- **Cardiovascular disease:** Having a heart attack can increase your stroke risk. An additional risk factor is a heart irregularity called *atrial fibrillation (AF)*, a particular type of abnormal heartbeat affecting more than one million Americans. Normally, all four chambers of your heart beat in the same rhythm, somewhere between 60 and 100 times a minute. In someone with AF, the left atrium may beat rapidly and uncontrollably as many as 400 times a minute. If left untreated, AF can increase your stroke risk four- to six-fold. Medications can help treat this condition.
- **Recurrent Stroke:** A personal history of stroke increases your risk of having another stroke. The increased risk lasts approximately five years and declines over time; the greatest risk is in the first few months. In addition to addressing controllable stroke risk factors, stroke survivors may benefit from prescription medication to reduce their stroke risk.
- **TIAs:** Having a transient ischemic attack (TIA) increases your risk of having a major stroke within the month, often within two days. Medications, including aspirin, may be prescribed to help prevent a future stroke.

In addition to the risk factors above, stroke has also been associated with heavy alcohol use (especially binge drinking); use of illegal drugs such as cocaine and methamphetamines; elevated red blood cell counts; migraine headaches with aura (visual disturbances); birth control pills or

hormone replacement therapy with estrogen. No direct relationship has yet been demonstrated between stress and stroke risk. As with many conditions, exercising for as little as 30 minutes most days of the week reduces your stroke risk.

## Treatment

One reason for the urgency in evaluating stroke warning signs is that researchers have discovered that stroke-related brain damage can extend beyond the area directly involved in the stroke, and can worsen over the first 24 hours. Medical staff seek to limit or prevent this secondary damage by administering, if appropriate, specific medications within the first few hours post-stroke.

When a stroke occurs, hospitalization is necessary to determine the cause and type of stroke and to treat or prevent further complications. Treatment with surgery as well as medications may be needed.

Once the stroke survivor's condition is stabilized and neurological deficits no longer appear to be progressing, rehabilitation begins. Rehabilitation does not cure a stroke. Instead, it focuses on minimizing permanent damage and enhancing adaptation. Rehabilitation may include intensive retraining in a variety of areas including movement, balance, perception of space and body, bowel / bladder control, language, and new methods of psychological and emotional adaptation. Stroke rehabilitation programs consist of the coordinated efforts of many health professionals.

Approximately 80% of all stroke survivors have physical, perceptual and language deficits which can be helped through rehabilitation. Sometimes people do not receive the services they need because they are not referred to them or because insurers state that they do not cover the

cost. You may need to ask a lot of questions and be assertive to get the help you need. A hospital discharge planner should assist with referrals to rehabilitation centers. A social worker can also be useful in making special arrangements for long-term care and referrals to community resources.

## After-Effects of Stroke

Recovery from a stroke is variable: some people may have a full recovery while others will have slight, moderate or severe disabilities. The most rapid recovery occurs during the first 30 days after the stroke. The particular after-effects experienced by a stroke survivor will depend upon the location and extent of the stroke and how quickly he or she received treatment. Strokes which occur in the left hemisphere (half) of the brain can affect communication and memory as well as movement on the right side of the body. Strokes which occur in the right hemisphere of the brain can affect spatial and perceptual abilities as well as movement on the left side of the body.

Although no two stroke survivors will experience exactly the same injuries or disabilities, physical, cognitive and emotional symptoms common to many stroke survivors include:

- **Paralysis or weakness** - Usually on one side of the body, including the face and mouth. Patients may have difficulty swallowing or experience one-sided neglect (ignoring or forgetting the affected side of the body).
- **Vision problems** - The patient may be unable to focus, may have a blind spot, or may have problems with peripheral vision.
- **Communication difficulties** - *Aphasia* is a term used to describe

a collection of communication deficits, including problems with speaking, understanding, reading and writing.

- **Emotional lability** - Uncontrollable, unexplained outward displays of crying, anger or laughter which may have little connection to the patient's actual emotional state. Episodes generally come and go quickly and may decrease over time.
- **Depression** - Anxiety (especially over the possibility of having another stroke) and depression are not uncommon after a stroke, and may have both physiological and psychological causes. Medications may be recommended to help alleviate these symptoms.

## Caregiving

Caring for someone with a stroke is challenging. Behavior, memory, communication and physical capabilities can all be impacted by stroke. When a loved one is first hospitalized immediately after a stroke, families usually step in to help supply information about the patient's history and symptoms, check on treatments, convey patient care preferences and generally serve as the connection between the hospital staff and the patient. You suddenly become the patient's voice and chief advocate.

As treatment progresses, you, as primary caregiver, also might be involved in choosing a rehabilitation (rehab) facility, coordinating home care services, providing transportation, housekeeping and cooking, and communicating with physicians and rehab staff. As time goes on and there are continuing deficits, you also may be dealing with the patient's depression, physical care needs, coordinating home care and occupational, speech or physical

therapy, facilitating communication if there is speech impairment, and providing mental and social stimulation.

It's helpful to remember you're not alone in this task - there is help available in the community and it's important to seek it out. Rehab can be a long process with slow and sometimes erratic progress - every person's recovery journey is different. Your role as advocate will continue. During recovery, try to focus on the patient's capabilities rather than limitations, and to show encouragement for every new gain, small or large.

Although providing care for a loved one may feel all-consuming, try to be aware of your own health and the ways any resulting stress may be affecting you. To help avoid caregiver burn-out, try to get enough sleep, eat healthily, attend to your own medical needs and get exercise when you can.

Counseling and respite help (meaning a break in caregiving provided by a family member, friend or hired care provider) can allow you some alone time to regroup and renew your energy for the tasks ahead. Be sure to ask for help when you feel the need. Getting support for *yourself*, as well as your loved one, is necessary and beneficial for both the person you are caring for and you.

## Recommended Readings

***100 Questions and Answers About Stroke: A Lahey Clinic Guide***, Kinan K. Hreib, M.D., Ph.D., Jones and Bartlett Publishers, 2009

***My Stroke of Insight: A Brain Scientist's Personal Journey***, Jill Bolte Taylor. Ph.D., Penguin Group (USA), June 2008

***Stroke and Cerebrovascular Diseases: A Guide for Patients and Their Families***,

The Stanford Stroke Center, Palo Alto, CA.  
[strokecenter.stanford.edu/guide](http://strokecenter.stanford.edu/guide)

***Stroke and the Family: A New Guide***,  
Joel M. Stein, M.D., Harvard University  
Press Family Health Guides, 2004

***Stronger After Stroke: Your Roadmap to  
Recovery***, Peter G. Levine. Demos  
Health, 2008

***The Aphasia Handbook: A Guide for  
Stroke and Brain Injury Survivors and  
Their Families***, Eds.: Joan Peters, Martha  
Taylor Sarno. National Aphasia  
Association, 2004. [www.aphasia.org](http://www.aphasia.org)

## **Fact Sheets**

*Hiring In-Home Help*

*Hospital Discharge Planning: A Guide for  
Families and Caregivers*

## **Resources**

**Southern Caregiver Resource Center**  
3675 Ruffin Road, Suite 230  
San Diego, CA 92123  
(858) 268-4432; (800) 827-1008 (in CA)  
Fax: (858) 268-7816  
E-mail: [scrc@caregivercenter.org](mailto:scrc@caregivercenter.org)  
Web site: [www.caregivercenter.org](http://www.caregivercenter.org)

The Southern Caregiver Resource Center offers services to family caregivers of adults with chronic and disabling health conditions, and is for residents of San Diego and Imperial counties. Services include information and referral, counseling, family consultation and case management, legal and financial consultation, respite care, education and training, and support groups.

**Family Caregiver Alliance  
National Center on Caregiving**  
235 Montgomery Street, Suite 950  
San Francisco, CA 94104  
(415) 434-3388; (800) 445-8106

Web site: [www.caregiver.org](http://www.caregiver.org)  
E-mail: [info@caregiver.org](mailto:info@caregiver.org)

Family Caregiver Alliance (FCA) seeks to improve the quality of life for caregivers through education, services, research and advocacy. FCA's National Center on Caregiving offers information on current social, public policy and caregiving issues and provides assistance in the development of public and private programs for caregivers.

**Next Step in Care**  
[www.nextstepincare.org](http://www.nextstepincare.org)

United Hospital Fund contains comprehensive information and advice to help family caregivers and healthcare providers plan transitions for patients. Spanish translations available.

**National Stroke Association**  
9707 E Easter Lane  
Centennial, CO 80112  
(800) 787-6537; (800) STROKES  
[www.stroke.org](http://www.stroke.org)

The National Stroke Association provides education, information and referral, and research on stroke for families, health care professionals and others interested in or affected by stroke.

**American Stroke Association**  
A division of the American Heart Association  
7272 Greenville Avenue  
Dallas, TX 75231  
(888) 4-STROKE; (888) 478-7653  
[www.strokeassociation.org/STROKEORG](http://www.strokeassociation.org/STROKEORG)

The American Stroke Association offers information and sponsors programs and support groups throughout the nation for stroke survivors and family members.

**Peninsula Stroke Association**  
3801 Miranda Avenue

Building 6, Room A162  
Palo Alto, CA 94304  
(650) 565-8485  
Fax: (650) 565-8482  
[support@psastroke.org](mailto:support@psastroke.org)

Peninsula Stroke Association offers information about prevention for the community and provides support and advocacy to stroke survivors and their family.

**National Easter Seal Society**

230 West Monroe Street, Suite 1800  
Chicago, IL 60606  
(312) 726-6200; (800) 221-6827 toll-free  
[www.easterseals.com](http://www.easterseals.com)

Easter Seal Society chapters sponsor rehabilitation and stroke resocialization programs.

**AbleData**

8630 Fenton Street, Suite 930  
Silver Spring, MD 20910  
(301) 608-8998; (800) 227-0216 toll-free  
[www.abledata.com](http://www.abledata.com)

AbleData provides objective information about assistive technology products and rehabilitation equipment.

*Reviewed by Thelma Edwards, R.N., National Stroke Association, and Freddi Segal-Gidan, P.A., Ph.D., Keck School of Medicine, University of Southern California, Rancho Los Amigos National Rehabilitation Center, 2007. Updated December 2010 by the Peninsula Stroke Association. Funded by the Palo Alto Medical Foundation and the California Department of Mental Health. © 2007, 2010, 2011 Family Caregiver Alliance. All rights reserved.*

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