

Stroke

(Cerebrovascular Accident, Cerebral Vascular Accident, Brain Attack, Cerebral Hemorrhage, Transient Ischemic Attack, Multi-Infarct Dementia)

Description of the Disability

A stroke is an interruption in the blood flow to parts of the brain, often resulting in a brain injury. A stroke only lasts a few minutes and the permanent symptoms of the stroke are due to the brain injury it causes. As with other brain injuries, the specific symptoms a person has depends on the areas of the brain affected by the stroke. A wide range of symptoms is possible, including sensory, coordination, and motor problems, language problems, cognitive problems, and personality changes. However, the areas of the brain controlling motor activity are the ones most commonly affected, so physical problems are more common than cognitive problems. In the months after a stroke, a person will usually experience a spontaneous return of at least some functional ability. Different types of rehabilitation therapy can improve functional abilities further. However, significant, permanent losses are also involved.

The brain injury resulting from a stroke is usually more limited and better defined than that from a Traumatic Brain Injury (see entry on TBI). Because a stroke involves a specific blood vessel and the tissues near it, the functional implications are limited to the role those tissues play in the brain. In contrast, the damage from a traumatic brain injury is spread widely throughout the brain, although some areas of the brain receive more damage than others. The "typical" person with a TBI will show a wider array of functional issues than the "typical" person with a stroke. Unlike a TBI, the consequences of a person's stroke are usually easy to define in terms of a few specific functional issues.

There are two types of stroke: Ischemic and Hemorrhagic. **Ischemic Strokes** are more common and, usually, less severe. During an ischemic stroke, blood stops reaching parts of the brain because blood vessels have become blocked, and cells in those parts of the brain die. Usually, **Atherosclerosis** (the build up of plaque inside the arteries) has made the blood vessels more narrow. In the most common type of ischemic stroke, a blood clot or Thrombus, forms on top of the plaque and combines with the narrowing to stop the blood flow, causing a **Thrombotic Stroke**. In the other type of ischemic stroke, a clot forms in a blood vessel but breaks loose, floating through the circulatory system as an Embolus until it lodges in a narrow blood vessel, blocking the flow of blood and causing an **Embolic Stroke**. Both thrombotic and embolic strokes have the same result - tissue death because of lack of nutrients and oxygen - only the source of the clot is different.

In contrast, a **Hemorrhagic Stroke** (also called Cerebral Hemorrhage) is caused a blow-out in the wall of the blood vessel, allowing blood to flow directly onto the brain tissues. Strange as it seems, blood is toxic to cells and direct contact with it can kill brain tissue (normally, the walls of the capillaries filter and diffuse the oxygen and nutrients delivered by the blood while preventing actual contact). The blow-out in the artery wall is usually because of the rupture of

an **Aneurysm** - a sort of ballooning out of part of the artery wall that is often associated with atherosclerosis, although it can have other causes.

Besides the damage done by contact with the blood, two other factors kill brain tissue during a hemorrhagic stroke. One is the lack of fresh oxygen and nutrients because of the interruption in blood flow. The other factor is the build up of pressure inside the brain. Some of this pressure is from the released blood pushing on the brain cells. Additional pressure is caused by the body pumping extra fluid into the area as part of its normal response to tissue damage. In other parts of the body, this causes swelling which helps the body heal by immobilizing any joints and padding any damaged organs. But in the case of a hemorrhagic stroke, the increased fluid only makes things worse by squeezing the brain cells harder. In general, hemorrhagic strokes result in a greater loss of functional ability than ischemic strokes, but hemorrhagic strokes are also much less common.

During a stroke, the individual may experience: a sudden loss of feeling in one arm or leg or on one side of the face, facial drooping, difficulty speaking, difficulty understanding the speech of other people, difficulty seeing, difficulty walking, dizziness, dizziness and/or loss of consciousness. Some of these symptoms are similar to a heart attack, which is essentially the same event in the heart muscle rather than in the brain. For this reason, a stroke is sometimes called a "brain attack".

Transient Ischemic Attacks (TIAs) also resemble strokes, except that the symptoms fade within a few minutes or hours. Usually, TIAs are actually short-lived strokes caused by "micro clots" which only block the blood flow for a few seconds - enough to shut down the brain tissues without significantly damaging them. Although they do not cause permanent loss of functional ability, TIAs are often a sign that a stroke is on the way, and they should be treated very seriously.

Another related, but less common, disorder is **Multi-Infarct Dementia** (MID), which is brain damage caused by a series of small ischemic strokes throughout the brain. This is a progressive disorder, resulting in memory problems, personality changes, apathy, and, in advanced stages, delirium and hallucination. It is usually associated with atherosclerosis or high blood pressure and is usually limited to individuals above age 65.

Incidence Statistics

- 600,000 Americans have strokes each year, 160,000 of them die
- Stroke is the third most common cause of death in America (heart disease is number one)
- 3/4 of all strokes happen to people age 65 or older, but they can happen at any age
- The risk of stroke doubles with every decade of life above age 50
- Individuals who have had one stroke are at a higher risk for further strokes
- Men are at higher risk than women
- More than 3 million Americans have disabilities caused by stroke

- 84% of strokes are ischemic and 16% are hemorrhagic
- 20% of ischemic strokes and 50% of hemorrhagic strokes are fatal
- 25% of hemorrhagic strokes are fatal within 24 hours, another 25% are fatal within 3 months. Of the survivors, 50% have a permanent disability.
- Of people who experience a TIA, 10% will have a stroke within one month, 20-25% will have a stroke within one year
- 80-90% of people who have atherosclerosis and have a stroke, had TIAs before the stroke
- 20% of Americans have high blood pressure
- Hemorrhagic strokes usually happen during the day when people are active.
- Ischemic strokes usually happen at night or within an hour of arising in the morning
- An estimated 5% of the population has an aneurysm, often undetected.

Common Treatments, Medications, and Side Effects

Although there are many medical procedures involved in critical care for stroke, long term care focuses almost entirely on the consequences of any brain injury the stroke caused. Treatment of the brain injury depends, in turn, on the specific features of the injury and its functional consequences for the individual.

Once an individual has a stroke, they are at higher risk for additional strokes. So the individual may be taking medicine to control risk factors such as high blood pressure, diabetes, or Atherosclerosis. See Drug entries on Antihyperlipidemics, Anticoagulants, Antihypertensives, Beta Blockers, and ACE Inhibitors for possible side effects. Also see entry on Diabetes.

Possible Functional Issues

As with other head injuries (see Traumatic Brain Injury), a wide variety of functional consequences are possible depending on which parts of the brain are affected by the stroke. Most stroke survivors will only experience a few of the following functional issues:

- Weakness of one arm or leg
- Hemiparesis - weakness on one side of the body
- Paralysis of one arm or leg, or on one side of the body
- Loss of part of the visual field in both eyes (for example, the right side of the visual field may be gone)
- Difficulty paying attention to sensations on one side of the body - for example, ignoring anything on their left side (known as “neglect”)

- Difficulty speaking intelligibly (aphasia, alogia, dysarthria) or understanding the speech of others
- Reduced short-term memory (less common)
- Difficulty writing or calculating (less common)
- Difficulty concentrating (less common)
- Difficulty making decisions or problem solving (less common)
- Confusion of left and right (less common)
- Difficulty with balance and coordination (less common)
- Difficulty with emotional control or impulse control (less common)
- Difficulty with bowel and bladder control (less common)
- Reduced stamina (less common)
- Difficulty sleeping
- Depression

Initial Interview Considerations

Initial Questions

- How has the stroke affected their life? What are the functional issues involved?
- How have they changed because of the stroke? (Gets at self-awareness. Watch for overly optimistic or overly pessimistic self-image.)
- What changes have they made around their home because of the stroke?
- What medications are they taking? Are there any side effects?
- How much trouble are they having with depression?
- How much trouble, if any, are they having with speech?
- How well are they able to drive?
- How much trouble do they have with fine motor skills?
- How much trouble have they had with balance or coordination?
- How much trouble have they had with their vision?

Initial Observations

- Are they able to write and speak understandably?
- Do they have any problems with coordination?
- Do they have any trouble understanding instructions?

- Do their social skills seem affected at all?
- Some individuals with stroke overreact to their limitations and become overly cautious about their abilities. Is there any sign of this in the person's portrayal of themselves?

Possible Accommodations and Assistive Technology

- Physical changes to the workplace to accommodate any physical issues (depends on individual's support needs)
- A jobsite visit by a rehabilitation engineer to assess the workspace
- Adaptive technology as applicable, including speech recognition software, word anticipation software, and alternative keyboard/mouse devices.
- Job Shadowing

Career Planning Issues

- Career issues will depend heavily on specific functional issues of the individual
- Talk with the person's physician. You will need to get a medical clearance from the physician before the individual can go to work, and physicians sometimes overstate limitations to protect the individual or "help" them with SSI/SSDI benefits. Explain that you are working on employment options and get a statement from the physician of functional abilities related to employment.

Emerging Issues

- Prevention, risk factors
- Awareness of warning signs
- Emergency room care to minimize brain injury (acute therapy)

Additional Information Resources

- Stroke Connection Magazine
www.StrokeAssociation.org/Consumer/support/magazine.html (issues available electronically as PDF files)
- American Heart Association (AHA): www.americanheart.org/
- American Stroke Association (part of AHA): www.strokeassociation.org/

- National Institute of Neurological Disorders and Stroke (Part of NIH):
www.ninds.nih.gov