

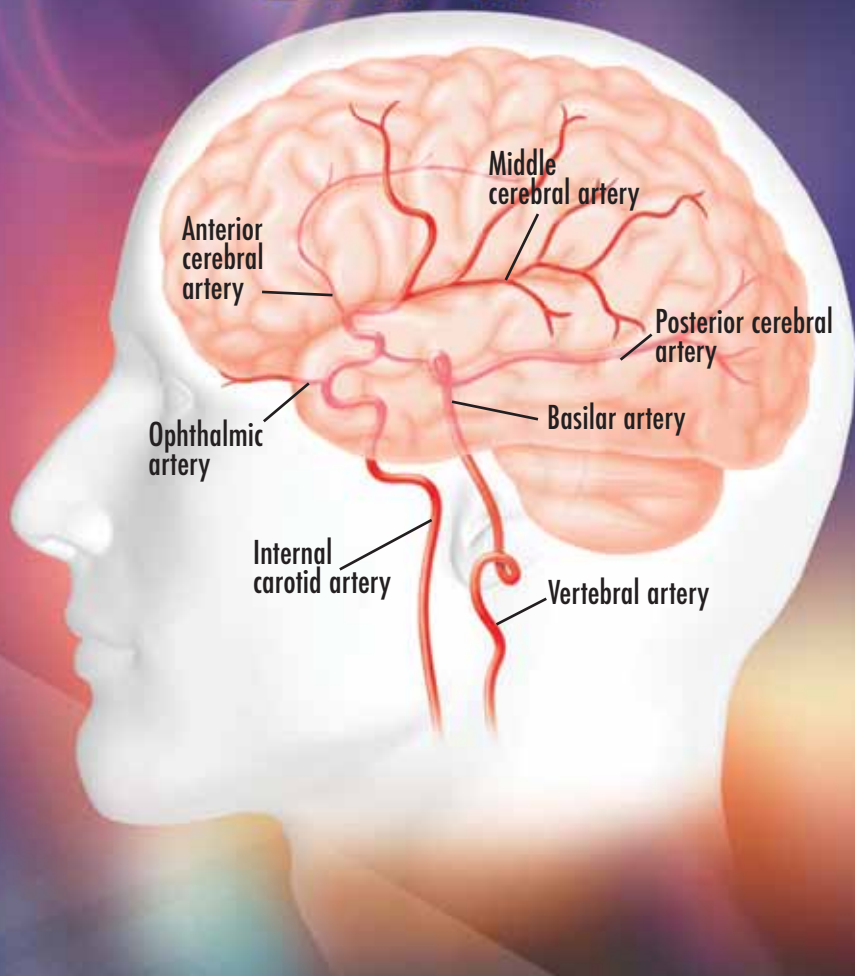
EXPLAINING STROKE



**National Stroke
Association™**

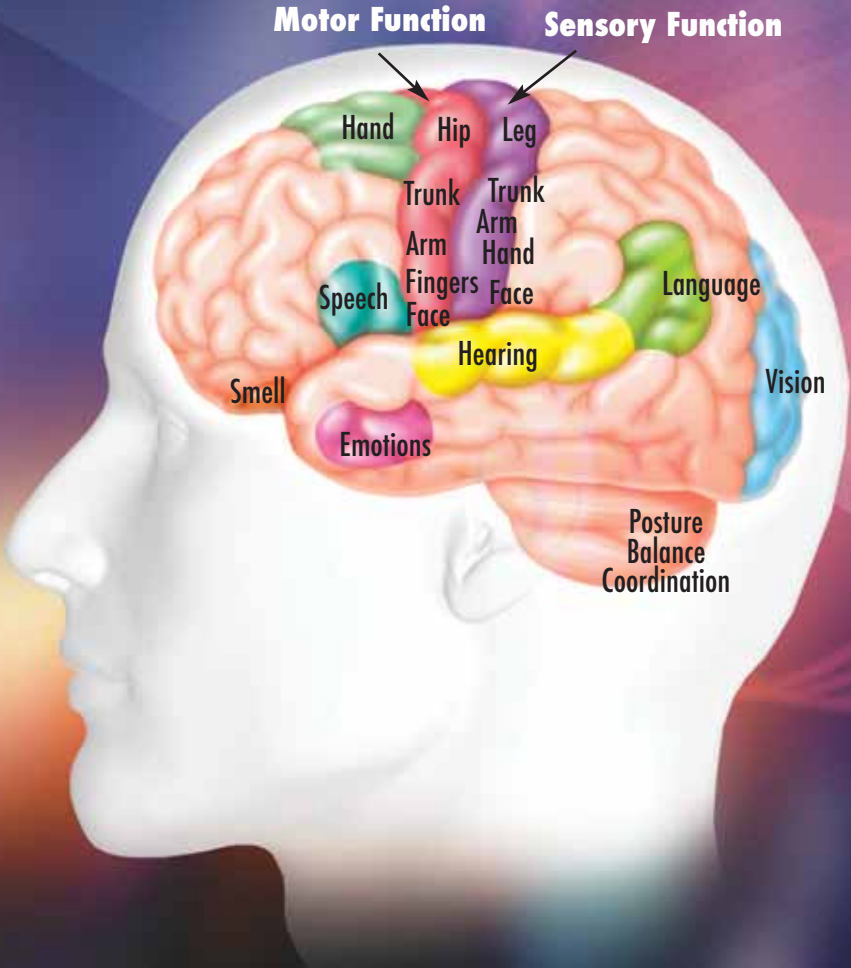
www.stroke.org

Blood supply to the **BRAIN**



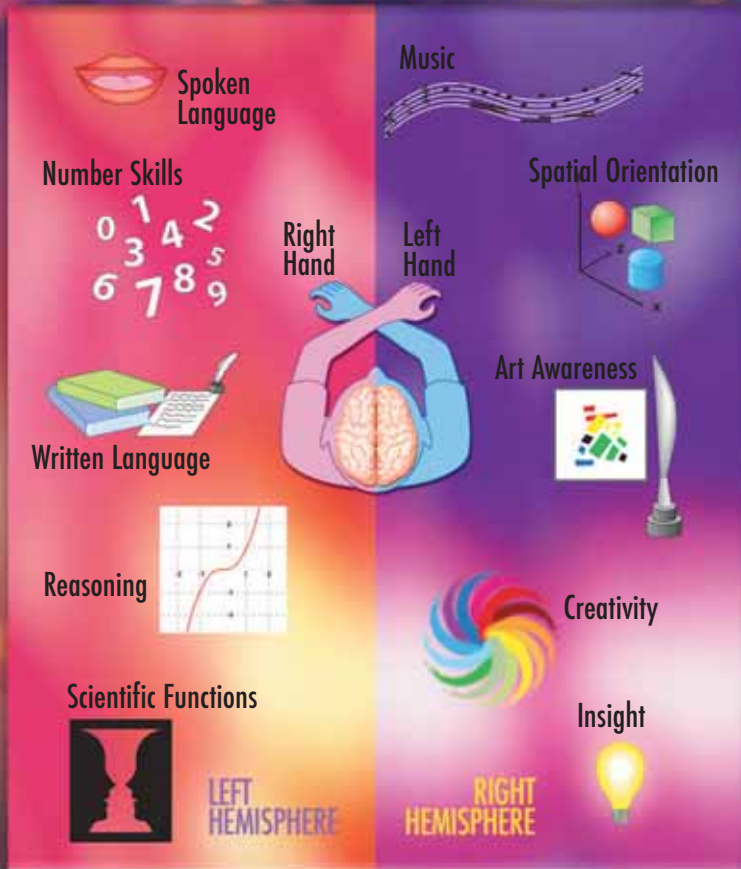
Blood vessels that carry blood to the brain from the heart are called arteries. The brain needs a constant supply of blood, which carries the oxygen and nutrients it needs to function. Each artery supplies blood to specific areas of the brain. A stroke occurs when one of these arteries to the brain either is blocked or bursts. As a result, part of the brain does not get the blood it needs, so it starts to die.

The human brain is divided into several areas that control movement and sensory function, or how the body moves and feels. This picture of the left side of the brain shows some of these areas. When a stroke damages a certain part of the brain, that area may no longer work as well as it did before the stroke. This can cause problems with walking, speaking, seeing or feeling.



Motor and Sensory FUNCTION

Left and Right HEMISPHERES



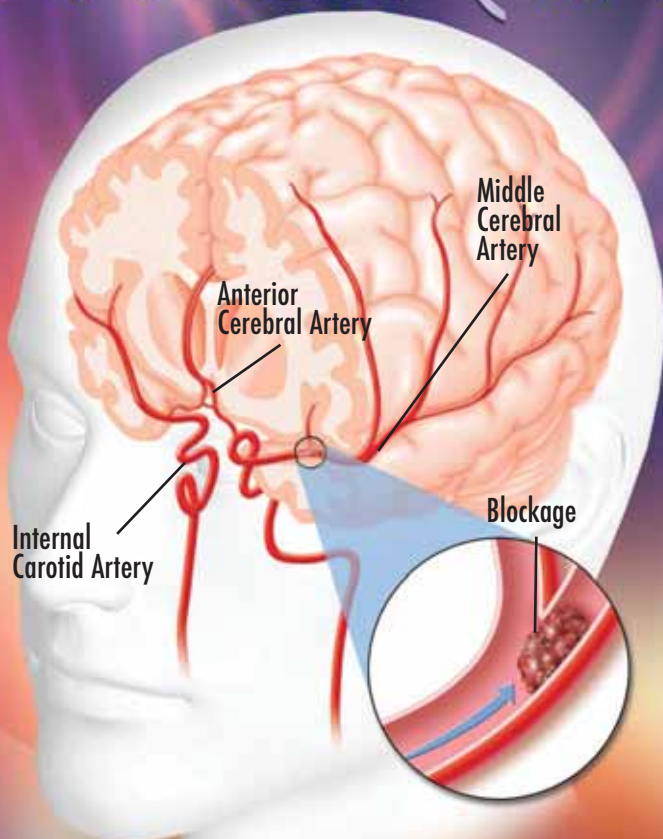
The left side, or hemisphere, of the brain controls how the opposite (right side) of the body moves and feels, and is responsible for how well we can figure out problems with science, understanding what we read and what we hear people say, number skills such as adding and subtracting, and reasoning. The right side of the brain controls the movements and feelings on the left side of the body and is in charge of how artistic we are, including musical and creative talents.

ARTERIOGRAPHY



A dye, injected into the arteries of the brain, shows up on x-ray pictures called arteriograms, or angiograms. An arteriogram can be taken to locate abnormal and blocked blood vessels in the brain.

Transient Ischemic ATTACK (TIA)

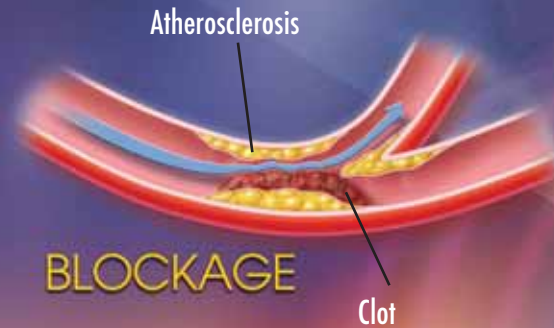


If an artery leading to the brain, or inside the brain, becomes blocked for a short period of time, the blood flow to an area of the brain slows or stops. This lack of blood (and oxygen) can cause a Transient Ischemic Attack (TIA) or mini-stroke, with symptoms such as numbness, trouble speaking, and loss of balance or coordination. It is common for these symptoms to last for a very short period of time and then disappear. While TIAs cause no permanent brain damage, they are a serious warning sign of stroke and should not be ignored.



Normal Artery - Blood flows easily through a clear artery.

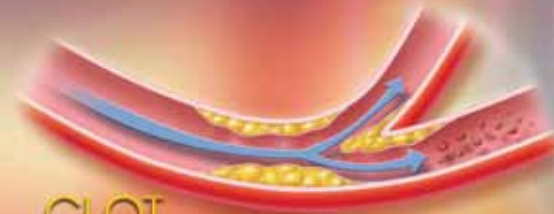
NORMAL



Blockage - An artery can become blocked by plaque (a fatty substance that clogs the artery) or a blood clot, which reduces blood flow to the brain and may cause a stroke. In this picture, atherosclerosis, a hardening of the arteries, is caused by cholesterol or plaque build-up.

BLOCKAGE

Clot

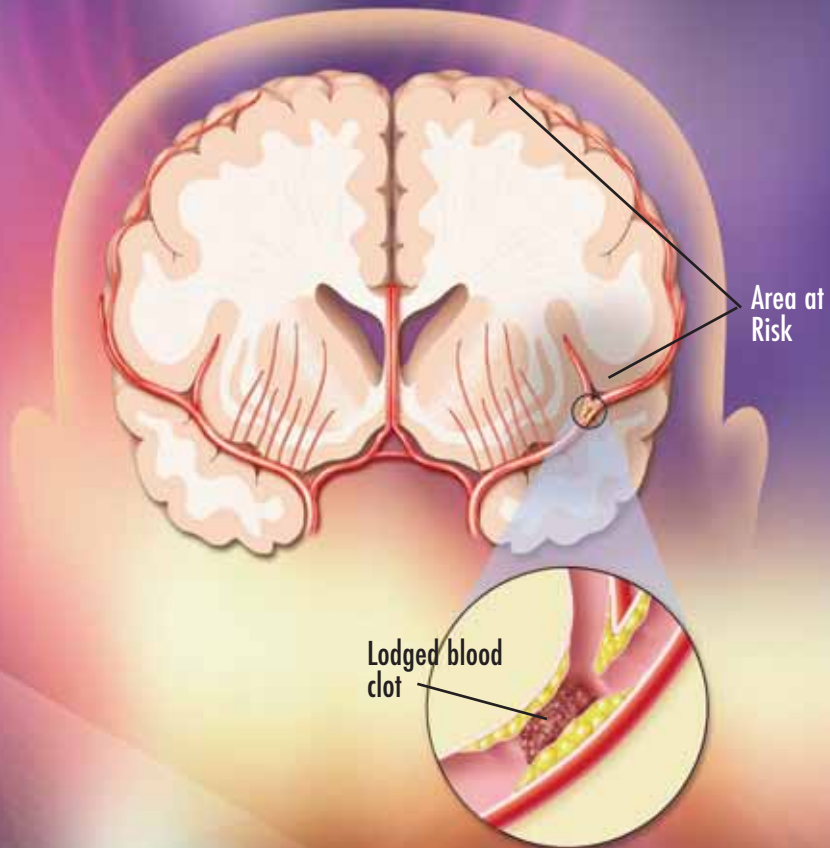


Blockage Cleared - The plaque or blood clot breaks up quickly and blood flow is restored to the brain. This may happen during a TIA, where brain cells recover with no permanent brain damage.

**CLOT
DISSOLVES**

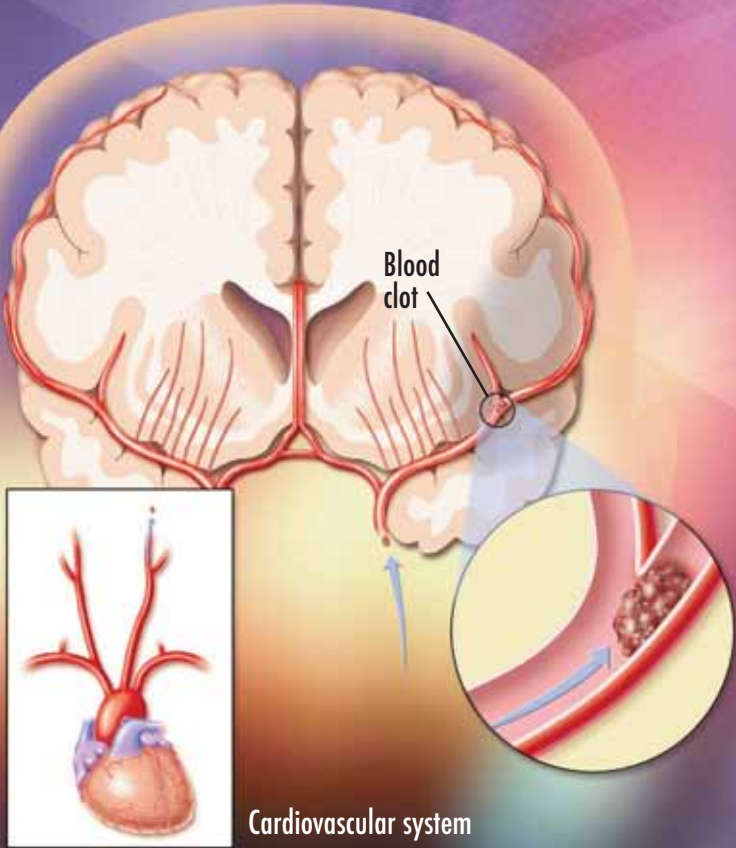
Mechanism of Normal and Blocked Artery **BLOOD FLOW**

Front Cross-Sectional View of a Brain with a **BLOCKED ARTERY**



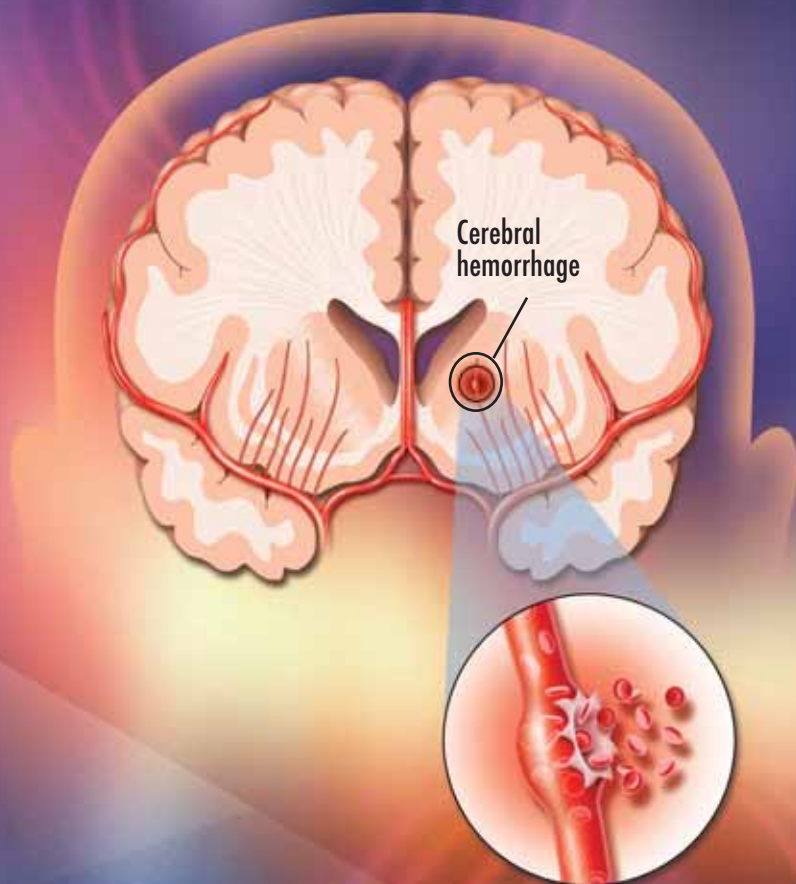
An ischemic stroke occurs when a blood clot blocks an artery, cutting off the flow of oxygen-rich blood to a part of the brain. Unless nearby blood vessels can deliver enough blood to the affected area, brain cells will begin to die and stroke survivors will start to have problems using certain parts of their bodies or completely lose some abilities. Ischemic stroke is the most common type of stroke.

There are two types of ischemic strokes: embolic and thrombotic. In an embolic stroke, a blood clot or plaque fragment forms somewhere in the body (usually the heart or in the large arteries leading to the brain) and moves through the bloodstream to the brain. Once in the brain, the clot blocks a blood vessel and leads to a stroke. A thrombotic stroke is a blood clot that does not travel but forms inside an artery which supplies blood to the brain. The clot may interrupt the blood flow and cause a stroke.



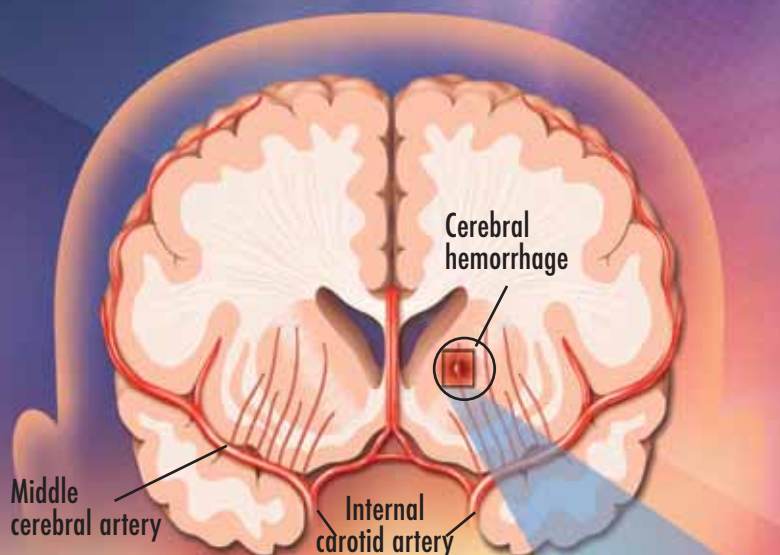
Ischemic STROKE

Hemorrhagic STROKE



Strokes caused by a bursting blood vessel in the brain that spills blood into the brain are called hemorrhagic strokes. High blood pressure and brain aneurysms can both cause the blood vessel to be weak and possibly cause this type of stroke (see page 11).

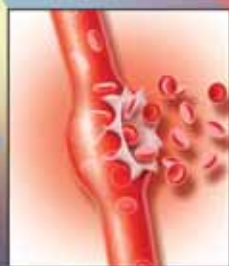
Intracerebral HEMORRHAGE



Normal vessel



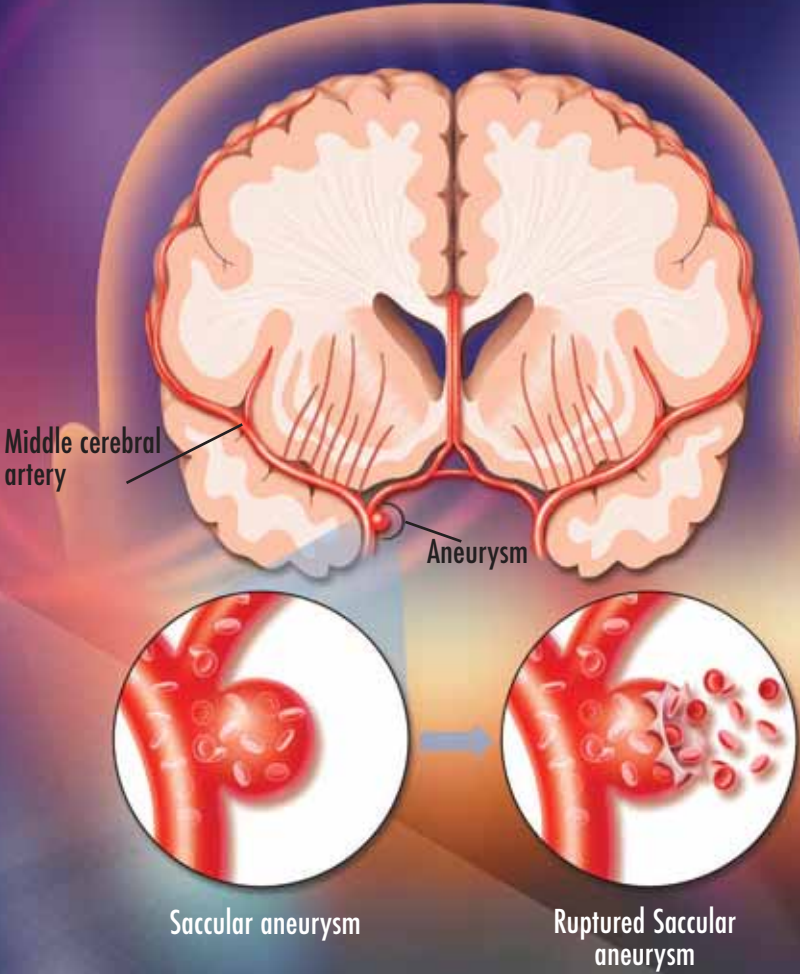
Bulging vessel



Burst vessel

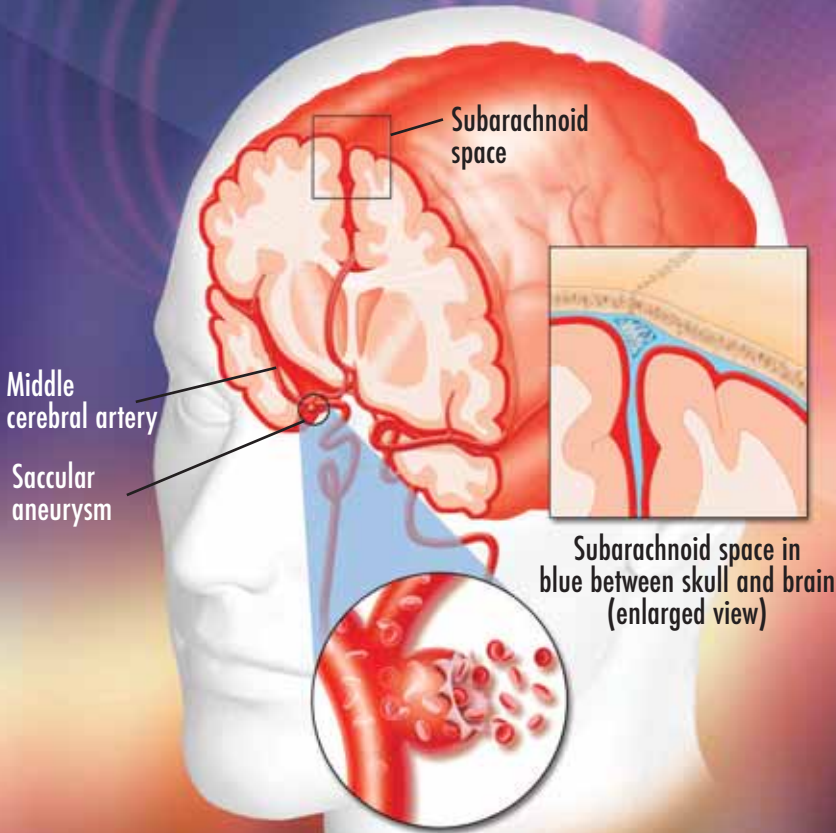
An intracerebral hemorrhage, a type of hemorrhagic stroke, is caused when a burst blood vessel bleeds into the brain. High blood pressure, also called hypertension, is the most common cause of this type of stroke. The bleeding causes brain cells to die, and that part of the brain no longer works correctly.

An aneurysm is a weak spot on the wall of an artery that may balloon out, forming a thin-walled bubble (see inset). As it gets bigger, the aneurysm gets weaker and can burst, leaking blood into or outside of the brain.



ANEURYSM

Subarachnoid HEMORRHAGE



In a subarachnoid hemorrhage, the other type of hemorrhagic stroke, a blood vessel bursts near the surface of the brain and blood pours into the area around the outside of the brain. This bleeding may increase pressure in the brain, injuring brain cells. This type of stroke has many possible causes, but is usually the result of a burst aneurysm.

National Stroke Association's Stroke Prevention GUIDELINES

1. Know your blood pressure. If it is high, work with your doctor to lower it.

- **High blood pressure (hypertension) is one of the most common causes of stroke.**
- **Your blood pressure is expressed in two numbers, for example 120/80. The first number, known as systolic blood pressure, is a measurement of the force your blood exerts on blood vessel walls as your heart pumps. The second, diastolic blood pressure, is a measurement of the force your blood exerts on blood vessel walls when your heart is at rest between beats.**
- **For people over age 18, good blood pressure is considered lower than 120/80. A blood pressure reading consistently higher than 120/80, up to 139/89, is considered pre-hypertension. High blood pressure is a measurement of 140/90 or higher.**
- **You can check your blood pressure at your doctor's office, at health fairs, at home with an automatic blood pressure machine, or at your local pharmacy or supermarket.**
- **Have your blood pressure checked at least once a year – more often if you have a history of high blood pressure, have had a heart attack or a stroke, are diabetic, have kidney disease, have high cholesterol, or are overweight.**
- **If you have high blood pressure, your doctor may recommend changes in your diet, regular exercise and/or medicines you can take to control it.**

2. Find out if you have atrial fibrillation. If you do, work with your doctor to manage it.

- Atrial fibrillation (AF) is an irregular heartbeat that changes how your heart works and can cause blood to pool in parts of your heart. This blood can form clots and cause a stroke.
- Your doctor can often tell if you have AF by carefully checking your pulse, or by running medical tests such as an electrocardiogram (ECG), or a recording of the electrical activity of the heart.
- If you have AF, your doctor may choose to lower your risk for stroke by having you take medicines.

3. If you smoke, stop.

- Smoking doubles the risk for stroke.
- If you stop smoking today, your risk for stroke will immediately begin to drop.
- Within five years of quitting, your stroke risk may be the same as that of someone who never smoked.

4. If you drink alcohol, do so in moderation.

- Drinking a glass of wine, beer or one mixed drink each day may lower your risk for stroke, provided there is no other medical reason that you should not drink alcohol.
- Heavy drinking can actually increase your risk for stroke.
- Remember alcohol is a drug - it can interact with other drugs you are taking, and alcohol is harmful if you drink too much. If you do not drink, don't start.

National Stroke Association's Stroke Prevention GUIDELINES (cont.)

5. Know your cholesterol number. If it is high, work with your doctor to control it.

- Lowering your cholesterol (a fat-like substance in your blood) may reduce your risk for stroke. Having high cholesterol puts you at greater risk for heart disease, which can increase your stroke risk.
- Combined HDL and LDL cholesterol should fall below 200.
- Often, high cholesterol can be controlled with diet and exercise; some people may need medicine.
- Recent studies have shown that even some individuals with normal cholesterol may lower their risk for stroke by taking certain cholesterol-lowering medicines.

6. If you are diabetic, follow your doctor's advice carefully to get your blood sugar level under control.

- Having diabetes puts you at an increased risk for stroke.
- Your doctor can suggest healthy meals, exercise, and medicine that can help control your diabetes.

7. Include exercise in your daily routine.

- Even a little bit of exercise - a brisk walk, bicycle ride, swim or yard work - can improve your health and may reduce your stroke risk.
- Adults should perform moderate physical activities for at least 30 minutes for five or more days a week, according to the Centers for Disease Control and Prevention.
- Try exercising with a friend; this may make it more likely that you'll make it a habit.
- Before starting a vigorous exercise program, check with your doctor.

8. Enjoy a lower sodium (salt), lower fat diet.

- By cutting down on salt and fat in your diet, you may lower your blood pressure and, more importantly, lower your risk for stroke.
- Try to eat a balanced diet each day, with plenty of fruits, vegetables, whole grains and a moderate amount of protein (meat, fish, eggs, milk, nuts, tofu, and some beans).

9. Ask your doctor if you have circulation (blood flow) problems which increase your stroke risk. If so, work with your doctor to control them.

- A build-up of fatty deposits can block the arteries, which carry blood from your heart to your brain. If left untreated, this blockage can cause stroke.
- You can be tested for this problem by your doctor. Doctors can listen to your arteries, just like they listen to your heart, or look at pictures of your arteries with the help of medical equipment.
- Circulation problems can usually be treated with medicines. If your doctor prescribes medicine, take it exactly as recommended.
- Occasionally, surgery is necessary to correct circulation problems such as a blocked artery.

10. If you have any stroke symptoms or see them in someone else, call 911. (See back cover for stroke symptoms).

About National Stroke Association

The mission of National Stroke Association is to reduce the incidence and impact of stroke by changing the way stroke is viewed and treated. We are the only national non-profit organization in the United States devoting 100 percent of our resources to stroke through a variety of programs.

National Stroke Association provides education and services in stroke prevention, treatment, rehabilitation and recovery. We serve both the public and professional communities – people at risk for stroke, health care providers, public health officials, stroke survivors, their families and caregivers. Our public and professional education programs have provided millions of Americans with life-saving tools to prevent stroke, recognize stroke symptoms, educate people on where to get the best stroke care and provide information to stroke survivors so they can get more enjoyment from their lives.

National Stroke Association services include:

- **Providing information and resources to the public and professionals through our Stroke Hotline, 1-800-STROKES, and our website, www.stroke.org.**
- **Print and audio-visual educational materials on stroke prevention, treatment and rehabilitation in both English and Spanish.**
- **Publishing StrokeSmart™ Magazine with information on current stroke issues for survivors, caregivers, health care providers and others who deal with stroke.**
- **Spearheading a public awareness campaign for National Stroke Awareness Month each May.**
- **Providing information and support on all aspects of stroke to hospitals through the National Stroke Association Stroke Center Network.**
- **Delivering tools and resources to advance post-stroke care through our groundbreaking stroke Rehabilitation and Recovery Network.**
- **Sponsoring medical programs and continuing education opportunities for health care professionals.**
- **Providing guidance and support to stroke survivors and their families through educational materials and referrals to our chapters and stroke support groups.**
- **Bringing together the nation's leading stroke experts to serve on National Stroke Association advisory boards.**

JOIN US in the fight against stroke!

Call 1-800-STROKES

or visit www.stroke.org

for more information about National Stroke Association.

STROKE SYMPTOMS

- Sudden numbness or weakness of face, arm or leg, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden severe headache with no known cause

Other important but less common symptoms include:

- Sudden nausea, and vomiting - different from a viral illness because of how fast it begins (minutes or hours vs. several days)
- Brief loss of consciousness or a period of decreased consciousness (fainting, confusion, convulsions or coma)

**If you have any of these symptoms or see them in someone else, call 911! Treatment can be more effective if given quickly.
Every minute counts!**

www.stroke.org
1-800-STROKES
(1-800-787-6537)

