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## Education

### Stroke (Cerebrovascular Accident)

#### What is a stroke?

A stroke is damage to part of the brain when its blood supply is suddenly reduced or stopped. A stroke may also be called a cerebral vascular accident, or CVA. The part of the brain deprived of blood dies and can no longer function.

#### How does it occur?

Blood is prevented from reaching brain tissue when a blood vessel leading to the brain becomes blocked (ischemic) or bursts (hemorrhagic).

- An **ischemic stroke** is the most common kind. This type of stroke may occur when a blood clot (thrombus) forms in one of the brain's arteries and blocks blood flow to a part of the brain. It could be caused by a blood clot or plaque that forms in a blood vessel somewhere else in the body and travels through the bloodstream to the brain. The clot or clump of plaque then blocks an artery in the brain.
- A **hemorrhagic stroke** occurs when an artery in the brain tears or bursts, causing blood to spill out. A hemorrhage often happens without warning. It usually occurs as a result of high blood pressure. Less often it may result from a blood vessel defect present since birth.

Any of the following factors can increase the risk of a stroke:

- high blood pressure
- diabetes
- high cholesterol level
- cigarette smoking
- being overweight
- family history of stroke
- heart valve or heart muscle disease called endocarditis
- hardening of the arteries (atherosclerosis, or fatty cholesterol deposits on artery walls)
- heart disease or coronary artery disease)
- heart rhythm problems such as atrial fibrillation
- sleep apnea
- sickle cell anemia
- cocaine use.

Research has identified metabolic syndrome as doubling the risk of stroke. It also increases the risk of heart disease and diabetes. Metabolic syndrome, also known as syndrome X, is defined as the presence of 3 or more of the following health conditions:

- excess weight around the waist (waist measurement of more than 40 inches for men and more than 35 inches for women)
  - triglycerides blood level of 150 mg/dL or more
  - HDL cholesterol levels below 40 mg/dL for men and below 50 mg/dL for women
  - blood pressure of 130/85 mm HG or higher
  - prediabetes (a fasting blood sugar between 100 and 125) or diabetes (a fasting blood sugar level over 125)
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mg/dL).

### **What are the symptoms?**

The symptoms of a stroke differ, depending on the part of the brain affected and the extent of the damage. Symptoms following a stroke come on suddenly and may include:

- severe headache with no known cause
- weakness, numbness, or tingling in the face, arm, or leg, especially on one side of the body
- trouble walking, dizziness, loss of balance, or coordination
- inability to speak or difficulty speaking or understanding
- trouble seeing with one or both eyes, or double vision
- confusion or personality changes
- difficulty with muscle movements, such as swallowing, moving arms and legs
- loss of bowel and bladder control
- loss of consciousness.

Warnings known as transient ischemic attacks (TIAs) may happen before the actual stroke. TIAs occur when the blood supply to the brain is reduced for a short time without causing permanent damage. A TIA is sometimes referred to as a ministroke because it causes the same symptoms as a stroke but the symptoms go away within minutes to a few hours.

**Call 911** if you see or have any of these symptoms. Treatment can be more effective if given quickly. Every minute counts.

### **How is it diagnosed?**

If symptoms of a stroke occur, someone should call an ambulance or take you to an emergency room right away.

Your health care provider will know from your symptoms and physical exam whether you are having a stroke.

The following tests may be done:

- lab tests of your blood
- electrocardiogram (ECG) to see how well your heart is working
- x-ray of your chest
- brain scans (CT or MRI) to verify that you are having a stroke and determine whether it is from a clot or from bleeding into the brain from a leaking artery (hemorrhage).

### **How is it treated?**

It is important to get to the hospital as soon as possible if you suspect a stroke. Many large hospitals are now treating strokes caused by blood clots with clot-dissolving medicines. These medicines can cause the symptoms to stop very quickly. They can prevent long-term disability or death. This treatment works only if the medicines are given within the first 3 to 6 hours after the stroke began.

All strokes require careful observation, especially in the first 24 hours. In addition to bed rest, you will probably need an IV and oxygen. Underlying medical problems that may have caused the stroke, such as high blood pressure or heart rhythm problems, will be treated.

Depending on the severity of your symptoms and how soon you are alert and able to start exercises, in the bed or out of the bed, you will begin your rehabilitation (rehab) program. Most stroke rehab programs last several weeks to several months after you leave the hospital. The program consists of physical therapy, occupational therapy and, if needed, speech therapy.

- Physical therapy helps you regain muscle strength and teaches you ways to move safely with weak or paralyzed muscles.
  - Occupational therapy helps you relearn ways of eating, dressing, and grooming.
  - Speech therapy may help you if you have problems with swallowing, speaking, or understanding words.
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### **How long will the effects last?**

Recovery depends on the extent of the brain injury. Some improvement may occur rapidly within the first few days and weeks after the stroke. Other improvement may occur more gradually. Rehabilitation may include physical therapy to strengthen muscles, occupational therapy to teach such things as dressing and eating, and speech therapy, if needed. If recovery does not begin within 1 to 2 weeks of the stroke, some muscle movement and speech may not return. However, some people continue to regain speech and muscle strength up to 1 year after a stroke. By the end of the rehab program, your health care provider can tell you more accurately what further recovery you can expect.

### **How can I take care of myself?**

Discuss with your health care provider the cause of your stroke, and follow his or her advice on how to avoid another one. Your provider may advise diet changes, regular exercise, and programs for stress management.

Ask your provider if you should take aspirin. Low-dose aspirin therapy reduces the risk of stroke for women. For men, aspirin has been found to lower the risk of a first-time heart attack but has little effect on the risk of stroke.

### **How can I prevent a stroke from occurring?**

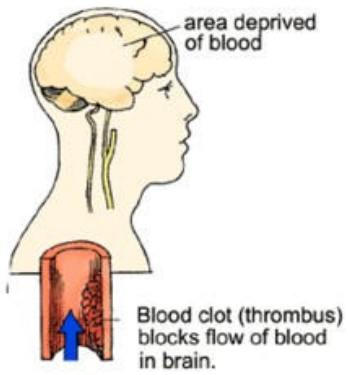
- If you have high blood pressure, it is essential that you control it with medicine.
- If you have diabetes, monitor and control your blood sugar.
- If you have an irregular or fast heart rate, you may need to take medicine such as warfarin, aspirin, or clopidogrel. Talk with your health care provider about this.
- If you smoke, quit.
- Keep your diet low in fat to decrease the risk of developing fatty deposits in your blood vessels.
- Exercise every day according to your health care provider's recommendations.
- Keep a healthy weight.

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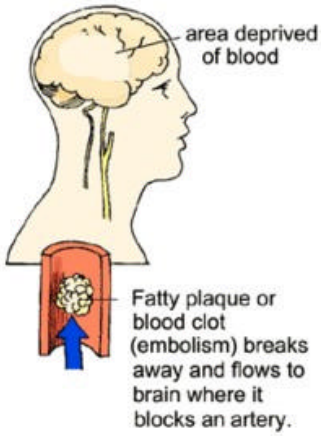
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### Thrombotic Stroke



### Embolic Stroke



### Cerebral Hemorrhage

