Explaining Stroke is a practical step-by-step booklet that explains how a stroke happens, different types of stroke and how to prevent a stroke.

Many people think a stroke happens in the heart, but it actually happens in the brain.

Read on to learn more.
# Introduction

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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 is either blocked or bursts. As a result, part of the brain does not get the blood it needs, so it starts to die. A transient ischemic attack (TIA) occurs when the blood supply to the brain is blocked for a short time. When this happens the brain temporarily malfunctions.
While all strokes happen in the brain, there are different types. Identifying the type of stroke leads to quicker treatment.

**Ischemic Stroke**

Ischemic stroke is the most common type of stroke. An ischemic stroke happens when an artery in the brain is blocked. There are two types of ischemic stroke:

- **Embolic Stroke:** During an embolic stroke, a blood clot or plaque fragment forms, usually in the heart or the large arteries leading to the brain, and then moves through the arteries to the brain. In the brain, the clot blocks a blood vessel and leads to a stroke.

- **Thrombotic Stroke:** A thrombotic stroke is a blood clot that forms inside an artery that supplies blood to the brain. The clot interrupts blood flow and causes a stroke.
Blood Flow in Normal and Blocked Arteries

Normal

Blood flows easily through a clear artery.

Blockage

An artery can become blocked by plaque (a fatty substance in the wall of the artery) or a blood clot, which reduces blood flow to the brain and causes a stroke. This picture shows atherosclerosis, a hardening of the arteries. Atherosclerosis is caused partly by cholesterol or plaque buildup.

Clot Dissolves

The plaque or blood clot breaks up and blood flow is restored to the brain. This may happen during a TIA (see page 8), in which brain cells recover and there are no permanent signs of a stroke.
A hemorrhagic stroke happens when a blood vessel in the brain bursts and spills blood into or around the brain. High blood pressure and aneurysms can make blood vessels weak enough to burst.

There are different types of hemorrhagic stroke, including intracerebral hemorrhage and subarachnoid hemorrhage.
One kind of hemorrhagic stroke is called an intracerebral hemorrhage. This kind of stroke is caused when a burst blood vessel bleeds into brain tissue. The bleeding causes brain cells to die and the part of the brain that is affected stops working correctly. High blood pressure, also called hypertension, is the most common cause of this type of stroke.
If an artery within the brain or one that goes to the brain is blocked for a short time, the blood flow to that area of the brain slows down or stops. This can cause a transient ischemic attack (TIA), sometimes called a mini-stroke.

Major symptoms of a TIA include:

- Numbness, weakness or loss of vision
- Trouble speaking
- Loss of balance or coordination

When a TIA happens, the artery either becomes unblocked after a short time or a new path opens up and blood flow goes back to normal. Because of that, the symptoms last for a short time and then disappear. A TIA is a serious warning sign that you might have a stroke. If you’ve had a TIA, you should see a doctor immediately.
The Sides of the Brain

The left side of the brain controls the right side of the body. You use the left side of your brain to move the right side of your body, figure out math and science problems and understand what you read and hear. You may have trouble doing these things if you have a stroke that damages parts of the left side of your brain.

The right side of the brain controls the left side of the body. You use the right side to move the left side of your body and do creative things like paint a picture, appreciate art or music, recognize the emotion in someone’s voice or find where you plan to go. You may have trouble doing these things if you have a stroke in the right side of your brain.
The human brain has different areas that control how the body moves and feels. When a stroke damages a certain part of the brain, that part may not work as well as it did before. This can cause problems with walking, speaking, seeing or feeling.
Some signs of stroke include:

- Sudden numbness or weakness of the 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 or loss of balance
- Sudden severe headache with no known cause

If you have any of these symptoms or see someone else having them, call 9-1-1 immediately! Fast treatment at the hospital can have better results.
Warning Signs of a Stroke

Learn the many warning signs of a stroke.
Act FAST and CALL 9-1-1 IMMEDIATELY at any sign of a stroke.
Use FAST to remember the warning signs.

FACE: Ask the person to smile.
Does one side of the face droop?

ARMS: Ask the person to raise both arms.
Does one arm drift downward?

SPEECH: Ask the person to repeat a simple phrase.
Is their speech slurred or strange?

TIME: If you observe any of these signs, call 9-1-1 immediately.

NOTE THE TIME WHEN ANY SYMPTOMS FIRST APPEAR.
If given within three hours of the first symptom, there is an FDA-approved clot-buster medication that may reduce long-term disability for the most common type of stroke.

LEARN ABOUT SUDDEN SIGNS OF A STROKE AT:
www.stroke.org/symptoms
If you recognize that you or someone around you is showing any of the warning signs, act immediately. Your fast actions may save a life. **DO NOT WAIT!!** Remember the following tips when you think you may need to call for help:

- **What time is it?** Note the time the symptoms started, some treatment options are only available for use within 3 hours of symptom onset.
- **Call 9-1-1 or EMS.** If EMS isn’t available, drive to the nearest Emergency Room **RIGHT AWAY!**
- **Insist that the person experiencing symptoms cooperate,** they may feel they are fine.
- **The ER doctor will run tests to determine if the problem was a TIA, or blocked artery (ischemic stroke) or a ruptured blood vessel (hemorrhagic stroke)** and prescribe treatment accordingly.
Did you know that you can reduce your risk of having a stroke? You can do this by knowing what your personal risk factors are and managing them as best as you can.

Seek out help from your healthcare provider, together you can make a plan to help reduce, control or prevent many of the risk factors that lead to strokes.

In this section, we have listed some of the most common risk factors for stroke and some tips from the American Heart Association and the American Stroke Association on how to help control these risk factors.

Risk Factor: Increasing Age
One risk factor that you cannot control is your age. Unfortunately, you are more likely to have a stroke as you get older.

Risk Factor: Sex (Gender)
Latest research shows that more women will have strokes than men. This can be attributed to women having increased chance of migraine with aura, using hormonal therapies and often living longer than men.

Risk Factor: Heredity and Race
Know your family. Has anyone in your immediate family had a stroke? If so, you are at higher risk of having a stroke. Research shows that African Americans, more so than Caucasians, are at higher risk of stroke.

Keep reading to find out ways to control those risk factors that you are able to control.
Risk Factor: High Blood Pressure

High blood pressure (also known as Hypertension) is often called the “silent killer” because most people are not aware they have it. High blood pressure doesn’t have typical symptoms or warning signs. Having high blood pressure causes your heart to work harder than normal therefore making your heart and arteries more easily injured.

Get your blood pressure checked and use this chart as a guide to help you make the decision to see a doctor:

<table>
<thead>
<tr>
<th></th>
<th>Prehypertension</th>
<th>High (Hypertension)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systolic</strong></td>
<td>120—139 mm Hg</td>
<td>140 mm Hg or above</td>
</tr>
<tr>
<td><strong>Diastolic</strong></td>
<td>80—89 mm Hg</td>
<td>90 mm Hg or above</td>
</tr>
</tbody>
</table>

Risk Factor: Tobacco Smoke

If you smoke cigarettes, you are at a higher risk for stroke than someone who does not smoke. However, if you are a non-smoker and are routinely exposed to secondhand smoke, your risk is also higher. Avoid smoking firsthand and avoid constant exposure to secondhand smoke. Once you limit your exposure, your risk factor lowers.

Risk Factor: High Blood Cholesterol

The desired total cholesterol level is 200mg/dL. If your cholesterol level is 240mg/dL or higher, you are at double the risk than someone in the normal range. Have you cholesterol levels checked out by a doctor to determine medications are needed to bring your levels in check.

Risk Factor: Physical Inactivity

Being physically inactive can lead to high blood pressure, high cholesterol, high blood sugar levels, and even type 2 diabetes which may contribute to stroke. You can reduce your chance of developing these conditions by adding 30 minutes of moderate-intensity activity to your routine on most days of the week. The 30 minute time can be broken down into 10 or 15 minute intervals. Get moving!
Risk Factor: Overweight and Obesity
Excess fat, particularly in the waist area, can lead to many health problems including stroke. Take a moment to measure your waistline and determine if yours is in the high-risk category by using this chart:

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 inches or more</td>
<td>35 inches or more</td>
</tr>
</tbody>
</table>

In addition, knowing your Body Mass Index (BMI) is just as important. You can calculate your BMI by multiplying your weight in pounds by 705, then divide by your height in inches, then divide again by your height in inches.

Risk Factor: Diabetes
Diabetes is a manageable condition; however, it contributes greatly to your risk of stroke. Do your best to manage your diabetes and keep your blood pressure, cholesterol and weight in check to avoid increasing the risk even more.

Risk Factor: Previous Heart Attack, Stroke or TIA
If you have had a previous heart attack, stroke or TIA, your chances of having a stroke are significantly increased.

Risk Factor: Heart Disease or Other Artery Disease
Talk to your doctor to determine if you have atrial fibrillation (uncoordinated quivering in the heart’s upper chambers). If you have atrial fibrillation, your risk for stroke are increased. Also, be aware if you have diseased arteries in your heart, neck or legs as these conditions also contribute to higher risk for stroke.

Risk Factor: Certain Blood Disorders
Blood tests can determine if you have a high red blood cell count. High red blood cell counts make blood clots more likely which contribute to strokes. Doctor’s often prescribe “blood thinners” to help control this problem.
Let’s talk about

High Blood Pressure and Stroke

What is high blood pressure (HBP)?

High blood pressure means that the force of the blood pushing against the sides of your arteries is consistently in the high range. This can lead to stroke, heart attack, heart failure or kidney failure.

Two numbers represent blood pressure. The higher (systolic) number shows the pressure while the heart is beating. The lower (diastolic) number shows the pressure when the heart is resting between beats. The systolic number is always listed first. A blood pressure reading of less than 120 over 80 is considered normal for adults. A blood pressure reading equal to or higher than 140 over 90 is high. Blood pressure between 120-139/80-89 is considered “prehypertension” and requires lifestyle changes to reduce the risk of stroke.

How does high blood pressure increase stroke risk?

High blood pressure is the single most important risk factor for stroke because it’s the No. 1 cause of stroke. HBP adds to your heart’s workload and damages your arteries and organs over time. Compared to people whose blood pressure is normal, people with HBP are more likely to have a stroke. About 87 percent of strokes are caused by narrowed or clogged blood vessels in the brain that cut off the blood flow to brain cells. This is an ischemic stroke. High blood pressure causes damage to the inner lining of the blood vessels. This adds to any blockage that is already within the artery wall. About 13 percent of strokes occur when a blood vessel ruptures in or near the brain. This is a hemorrhagic stroke. Chronic HBP or aging blood vessels are the main causes of this type of stroke. HBP puts more pressure on the blood vessels until they can no longer maintain the pressure and the blood vessel ruptures over time.
Who is at higher risk for HBP?

- People with a family history of high blood pressure
- African Americans
- People 35 years old and older
- People who are overweight or obese
- People who eat too much salt
- People who drink too much alcohol
- Women who use birth control pills
- People who aren’t physically active
- Pregnant women

How can I control high blood pressure?

Even if you have had a prior stroke or heart attack, controlling high blood pressure can help prevent another one. Take these steps:

- Lose weight if you are overweight.
- Eat a healthy diet that’s low in salt, saturated fat and trans fat.
- Eat fruits and vegetables and low-fat dairy products.
- Enjoy regular physical activity.
- Limit alcohol to no more than two drinks a day if you are a man and one drink a day if you are a woman. Check with your doctor about drinking alcohol; it can raise blood pressure.
- Take all medications as prescribed to control blood pressure.
- Know what your blood pressure should be and try to keep it at that level.

How can I learn more?

1. Call 1-888-4-STROKE (1-888-478-7653) to learn more about stroke or find local support groups or visit StrokeAssociation.org.
2. Sign up to get Stroke Connection magazine, a free publication for stroke survivors and caregivers at strokeconnection.org.
3. Connect with others sharing similar journeys with stroke by joining our Support Network at strokeassociation.org/supportnetwork.

Do you have questions for the doctor or nurse?

Take a few minutes to write your questions for the next time you see your healthcare provider. Such as:

- What should my blood pressure be?
- How often should my blood pressure be checked?
Your healthcare provider will provide you specific information about the medications you are to continue taking at home.

Included in this section are common medications that doctors prescribe for stroke patients (note: they may not be your specific medications). It is very important that you understand your medications and how to take them.

Your healthcare providers are giving you the tools to help you minimize your risk of having another stroke. If you are unclear about any instructions given to you, ask for help before you leave.
The most common type of stroke is ischemic (iss-KEY-mik) stroke. This type of stroke occurs when a clot blocks a blood vessel and stops blood flow to the brain.

Drug therapy may be given to patients with ischemic stroke or those at risk of having ischemic stroke. The medicines that are used most often fall into 2 groups: anticoagulants (an-tee-ko-AG-you-lents) and antiplatelets (An-tee-PLATE-lets).

**Anticoagulants**

Drugs in this group help to keep blood clots from forming. Sometimes these drugs are called anti-clotting agents or blood thinners. They work by making your blood take longer to clot. There is some risk for bleeding when you take anticoagulants, so your doctor will monitor you closely.

**Heparin**

When a CT scan of a stroke patient’s brain shows no signs of bleeding, heparin may be prescribed. Heparin may not dissolve a blood clot that already exists, but it helps to keep the blood clot from getting bigger. This drug also helps to prevent new clots from forming. Heparin is given by intravenous (IV) line or by injection.

When you take heparin, you may have some risk for bleeding. You need frequent blood tests to check how clotting is affected. A dose of heparin is active for only 4 to 6 hours, so it is easy to control. **Tell your doctor right away if you have any signs of bleeding:**

- large bruises
- blood in your urine or stool
- black or dark stools
- bleeding gums

**Low-Molecular-Weight Heparin**

This type of heparin may give you less risk for bleeding. It is given 1 or 2 times a day. This form of heparin is given by injection under the surface of the skin (subcutaneous). Some common brand names for this type of heparin are Lovenox and Fragmin. **Tell your doctor right away if you have any signs of bleeding:**

- large bruises
- blood in your urine or stool
- black or dark stools
- bleeding gums

**Coumadin**

Coumadin can help patients who have high risk for having a stroke. This includes patients who have had a mini-stroke (TIA) or have abnormal heart valves. It also includes patients with an abnormal heart rhythm called “AF” (atrial fibrillation). Coumadin is the brand name for this drug; warfarin is the generic name. Coumadin comes as a pill that is taken by mouth.
Common Medicines

This drug works by reducing the effect of Vitamin K, a vitamin that helps your blood to clot. Because many foods contain Vitamin K, it is very important to keep the same amount of Vitamin K in your diet every day when you are taking Coumadin. Foods that are high in Vitamin K include:

- Beverages: herbal teas containing tonka beans, melilot (sweet clover) or woodruff; green teas
- Fats: mayonnaise
- Oils: soybean oil, canola oil
- Vegetables: broccoli, brussel sprouts, cabbage, cauliflower, collard greens, green scallions, kale, lettuce, mustard greens, parsley, spinach, turnip greens

You must take Coumadin exactly as your doctor prescribes. You will need frequent blood tests to check if the dosage needs to be changed. Tell your doctor right away if you notice any signs of bleeding:

- Black or dark stools
- Bloody urine
- Bleeding gums

Whenever you go to any kind of dentist or doctor, be sure they know that you take Coumadin. You should also wear a medical alert tag that says you are taking the blood thinner Coumadin.

**Antiplatelets**

Platelets are blood cells that are sticky and help the blood to clot. Antiplatelets are drugs that keep platelets in the blood from sticking together. This helps to prevent blood clots that could cause stroke. These drugs can help patients who have had a mini-stroke (TIA) or a past stroke. These drugs may also be given to patients who are at risk for a stroke. Take these drugs with food because they may irritate your stomach. Antiplatelets give you less risk for bleeding than anticoagulants do.

**Aspirin**

Aspirin helps to keep platelets from “clumping” in patients who have some risk for mini strokes (TIAs) or stroke. Aspirin is also an anti-inflammatory drug. Inflammation in the arteries seems to play a role in stroke. So this is another reason why aspirin helps prevent stroke. You must take aspirin for about 8 days before it starts to slow “clumping.”

Many over-the-counter (OTC) drugs contain some aspirin, so it’s important to avoid them when you are taking aspirin. Check with your doctor before you take any OTC drug. Before you have surgery or other procedures that are invasive, you may need to stop taking aspirin. Tell your doctor if you have any of the following:

- Ringing in your ears
- Dizziness
- Confusion
- Pain in your belly
Common Medicines

**Plavix**
Plavix is a pill taken by mouth once a day. This drug may cause headache or dizziness when you first start taking it. **Tell your doctor if you have any of the following:**
- skin rashes
- chest pain
- fainting
- severe headache
- large bruises

**Aggrenox**
This new medicine combines 2 drugs: aspirin and Persantine. Both drugs help to keep blood clots from forming. Together, the drugs are effective in reducing mini-strokes (TIAs) and strokes. This medicine is a capsule taken by mouth 2 times a day. **Tell your doctor if you have any of the following signs of bleeding, such as:**
- black or dark stools, bloody urine, or bleeding gums
- skin rash
- stomach upset
- dizziness

**Statins**
Treats high cholesterol (LDL $>$ 70) and triglyceride levels. The latest guidelines suggest all patients who have experienced, or at risk for, a stroke or TIA be prescribed a statin medication. This medication reduces the risk of angina, stroke, heart attack, or certain heart and blood vessel problems.

Some medicines can affect how atorvastatin works. **Tell your doctor if you also use birth control pills, boceprevir, cimetidine, colchicine, cyclosporine, digoxin, niacin, rifampin, spironolactone, telaprevir, medicine to treat an infection, or medicine to treat HIV/AIDS.**

This medication is usually taken once a day at bedtime. **Tell your doctor if you have any of the following signs:**
- Allergic reaction: Itching or hives, swelling in your face or hands, swelling or tingling in your mouth or throat, chest tightness, trouble breathing
- Blistering, peeling, red skin rash
- Change in how much or how often you urinate dark urine or pale stools, nausea, vomiting, loss of appetite, stomach pain, yellow skin or eyes. Fever
- Muscle pain, tenderness, or weakness
- Unusual tiredness, Diarrhea, Joint pain

**Names of Commonly prescribed statin medication:**
- atorvastatin (Lipitor),
- fluvastatin (Lescol, Lescol XL),
- lovastatin (Mevacor, Altoprev),
- pravastatin (Pravachol),
- rosvastatin (Crestor),
- simvastatin (Zocor), and.
- pitavastatin (Livalo).
Anticoagulants and antiplatelet agents are medicines that reduce blood clotting in an artery, vein, or the heart. Blood clots can block the blood flow to your heart muscle and cause a heart attack. They can also block blood flow to your brain, causing a stroke. Doctors use these medicines to help patients prevent strokes caused by a blood clot.

What should I know about anticoagulants?

Anticoagulants (sometimes knowns as “blood thinners”) are medicines that delay the clotting of blood. Examples are heparin, warfarin, dabigatran, apixaban and rivaroxaban.

Anticoagulants make it harder for clots to form or keep existing clots from growing in your heart, veins or arteries. Treatment should be managed by your healthcare provider.

- Follow your doctor’s (or other healthcare provider’s) instructions.
- If you take warfarin or heparin, have regular blood tests so your doctor can tell how the medicine is working.
- The test for people on warfarin is called a prothrombin time (PT) or International Normalized Ratio (INR) test.
- The test for persons on heparin is called an activated partial thromboplastin time (PTT) test.
- Never take aspirin with anticoagulants unless your doctor tells you to.
- You must tell other healthcare providers that you’re taking anticoagulants.
- Always check with your doctor before taking other medicines or supplements, such as aspirin, vitamins, cold medicine, pain medicine, sleeping pills or antibiotics. These can affect the way anticoagulants work by strengthening or weakening them.
- Let your doctor know if you have been started on any new medications that might interfere with the action of warfarin.
- Discuss your diet with your healthcare providers. Foods rich in Vitamin K can reduce the effectiveness of warfarin. Vitamin K is found in leafy, green vegetables, fish, liver, lentils, soybeans and some vegetable oils.
- Tell your family that you take anticoagulant medicine and carry your emergency medical ID card with you.
Could anticoagulants cause problems?

Yes. Tell your doctor if:

- Your urine turns pink or red. This could be a sign of urinary tract bleeding.
- Your stools turn red, dark brown or black. This could be a sign of intestinal bleeding.
- You bleed more than normal when you have your menstrual period.
- Your gums bleed.
- You have a very bad headache or stomach pain that doesn’t go away.
- You get sick or feel weak, faint or dizzy.
- You think you are pregnant.
- You often find bruises or blood blisters.
- You have an accident of any kind.

What should I know about antiplatelet agents?

Antiplatelet medicines keep blood clots from forming by preventing blood platelets from sticking together. They are used to treat patients with atherosclerosis or with increased clotting tendencies. In atherosclerosis, deposits of cholesterol (plaque) form along inner walls of blood vessels, creating the conditions for blood clots to form on top of the plaque, blocking the blood vessel.

- Antiplatelets are generally prescribed preventively, when atherosclerosis is evident but there is not yet a large blockage in the artery.
- Antiplatelet drugs include aspirin, ticlopidine, clopidogrel and the combination of aspirin and dipyridamole.
- Aspirin can help prevent an ischemic stroke. It can also help if you have had a TIA or if you have heart problems. You must use aspirin just as your doctor tells you.

How can I learn more?

1. Call 1-888-4-STROKE (1-888-478-7653) to learn more about stroke or find local support groups or visit StrokeAssociation.org.
2. Sign up to get Stroke Connection magazine, a free publication for stroke survivors and caregivers at strokeconnection.org.
3. Connect with others sharing similar journeys with stroke by joining our Support Network at strokeassociation.org/supportnetwork.

Do you have questions for the doctor or nurse?

Take a few minutes to write your questions for the next time you see your healthcare provider. Such as:

- What kind of aspirin or other antiplatelet agent should I take?
- What is the right dose for me?
Tests

Your doctor will order a variety of lab tests and radiology tests in an effort to discover why you had a TIA or Stroke.

CT/CTA
Non-Contrast Head CT
A cranial CT scan of the head is a diagnostic tool used to create detailed pictures of the skull, brain, paranasal sinuses, ventricles and eye sockets. CT stands for “computed tomography,” but is known by a variety of names, including brain scan, head scan, skull scan, sinus scan and CAT scan.

CTA
Computed tomography angiography (CTA) uses an injection of iodine-rich contrast material and CT scanning to help diagnose and evaluate blood vessel disease or related conditions, such as aneurysms or blockages.

MRI/MRA
Head MRI
Magnetic resonance imaging (MRI) of the brain is a safe and painless test that uses a magnetic field and radio waves to produce detailed images of the brain and the brain stem. An MRI differs from a CAT scan (also called a CT scan or a computed axial tomography scan) because it does not use radiation.

Head/Neck MRA
MRA can find problems with the blood vessels that may be causing reduced blood flow. With MRA, both the blood flow and the condition of the blood vessel walls can be seen. The test is often used to look at the blood vessels that go to the brain, kidneys, and legs.

Echocardiogram/TEE
Echocardiogram
An echocardiogram (also called an echo) is a type of ultrasound test that uses high-pitched sound waves that are sent through a device called a transducer. The device picks up echoes of the sound waves as they bounce off the different parts of your heart.
A transesophageal echocardiogram or TEE is an alternative way to perform an echocardiogram. A specialized probe containing an ultrasound transducer at its tip is passed into the patient's esophagus. This allows image and Doppler evaluation which can be recorded.

**Carotid Ultrasound**

Carotid ultrasound is a painless imaging test that uses high-frequency sound waves to create pictures of the inside of your carotid arteries. This test uses an ultrasound machine, which includes a computer, a screen, and a transducer. The transducer is a handheld device that sends and receives sound waves.

**EKG or Halter Monitor**

An electrocardiogram (EKG or ECG) is a test that checks for problems with the electrical activity of your heart. An EKG shows the heart's electrical activity as line tracings on paper. The spikes and dips in the line tracings are called waves. You will wear a monitor while you are in the hospital called “telemetry.” This allows staff to monitor the electrical activity of your heart continuously while you are in the hospital.

**EEG**

An electroencephalogram (EEG) is a test that detects electrical activity in your brain using small, flat metal discs (electrodes) attached to your scalp. Your brain cells communicate via electrical impulses and are active all the time, even when you're asleep. This activity shows up as wavy lines on an EEG record.
Stroke Surgical Treatment

Types of surgery
After receiving emergency care, some stroke patients may be helped by surgery.

For Strokes from Blockage
Most strokes occur when a blood vessel in the brain is blocked and blood flow stops. This type of stroke is called an ischemic (iss-KEYmik) stroke. The blockage may be caused by a blood clot, and severe brain swelling may result. Life-saving surgery may be necessary to remove the clot and the brain tissue that has died from lack of oxygen. A blockage also can occur when the artery itself narrows. A harmful fatty deposit, called plaque (PLAK), may build up in an artery and then block it. Sometimes clots form, which can then break off and travel to block another artery in the brain. Some patients can be helped by a procedure called angioplasty (AN-jee-oh-plass-tee). During the procedure, a tiny balloon at the end of a long, thin tube is pushed through the artery to the blockage. When the balloon is inflated, it opens the artery. In addition, a mesh tube may be placed inside the artery to help hold it open. The tube is called a stent. The procedure usually requires a hospital stay of several days.

For Blockage in the Neck
The main arteries in the neck help supply the brain with blood. They are called the carotid (kuh-RAW-tid) arteries. When patients have a serious blockage in these arteries, surgery may be done to prevent a stroke or a ministroke, which is also called a TIA. The operation is called a carotid endarterectomy (endar-ter-EK-tuh-mee).

This procedure cleans out and opens up the narrowed artery. During the operation, the surgeon scrapes away plaque from the wall of the artery. Blood can then flow freely through the artery to the brain. A patient usually stays in the hospital 2 to 3 days for this operation.

For Strokes from Altered Blood Flow
Blood flow to the brain may decrease temporarily in some patients. This is called a ministroke or a TIA, which stands for transient (TRANS-yent) ischemic (iss-KEY-mik) attack. While the brain is not getting enough blood, it cannot work properly. Patients who have TIs get symptoms for a short time that make it difficult for them to function. Bypass surgery may be advised for some patients who continue to have TIAs. During the operation, an artery on the outside of the scalp is rerouted to the part of the brain that is not getting enough blood flow. When blood flow is restored, the brain works normally, and the symptoms disappear. The hospital stay for this type of bypass surgery is about one week.
For Strokes from Bleeding
Bleeding in the brain causes some strokes. These strokes are called hemorrhagic (HEMer - RAJ-ik). The bleeding may occur when a weakened blood vessel leaks or bursts. This is called an aneurysm (AN-your-izm). When an aneurysm occurs, the weakened artery may become like a balloon filled with blood. Patients usually describe an aneurysm as the worst headache of their life. There are several types of surgery to repair an aneurysm. A clip may be placed across the neck of the aneurysm (like a clip at the end of a balloon) to stop the bleeding. A newer approach is to thread a long, thin tube through the artery that leads to the aneurysm. Then a tiny coil is fed through the tube into the aneurysm “balloon” to fill the space and seal off the bleeding. Based on the type of surgery, the hospital stay ranges from several days to a week or longer.
Rehabilitation

The *American Heart Association (AHA)* reports that not only is stroke the #5 killer in the United States but it’s also a leading cause of serious, long-term disability.

According to AHA, successful rehabilitation depends on:

- How early rehabilitation begins
- The extent of the brain injury
- The survivor’s attitude
- The rehabilitation team’s skill
- The cooperation of family and friends

**You are not alone...**

**Health South Rehab Hospital**

meets the 2nd Wednesday of every month from 3-4 p.m.
(see next page for more details)

**Bay Medical Sacred Heart**

Heart Support Group meets the 2nd Tuesday of every month from 1-2 p.m. in the Medical Office Building Auditorium.

Joining the Stroke Support Group is not strictly for stroke survivors. It is also for family members and caregivers. Strokes affect more than the person who suffered the stroke. Pre-registration is permitted but not necessary.
### Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aphasia</strong></td>
<td>Speech and language problems caused by injury to the brain. People with aphasia may have problems in speaking, understanding, reading and writing.</td>
</tr>
<tr>
<td><strong>Aspiration</strong></td>
<td>Swallowing food, liquid or foreign objects in the airway or “windpipe.”</td>
</tr>
<tr>
<td><strong>Brain Attack</strong></td>
<td>The injury to the brain that occurs when the blood supply is interrupted in a major blood vessel in the brain.</td>
</tr>
<tr>
<td><strong>Diplopia</strong></td>
<td>Double vision or “seeing double.”</td>
</tr>
<tr>
<td><strong>Dysarthria</strong></td>
<td>Weakness or paralysis of the muscles of the face, mouth, neck and/or throat that may cause difficulties in talking, eating, swallowing and/or breathing.</td>
</tr>
<tr>
<td><strong>Dysphagia</strong></td>
<td>Difficulty or discomfort in swallowing, or the inability to swallow, usually caused by brain injury or physical injury to the face, mouth, neck or throat areas.</td>
</tr>
<tr>
<td><strong>Hemianopsia</strong></td>
<td>Partial blindness caused by injury to the brain in which the person’s vision is “blacked out” in the left or right visual field of both eyes.</td>
</tr>
<tr>
<td><strong>Hemiparesis/Hemiplegia</strong></td>
<td>A weakness or paralysis that occurs on one side of the body as the result of injury to the brain. May be a mild weakness or a complete inability to move the affected arm and/or leg at all. Often the hand and arm are more involved than the leg.</td>
</tr>
<tr>
<td><strong>Neurologist</strong></td>
<td>A physician who specializes in diagnosing and treating disease of the brain and other parts of the nervous system.</td>
</tr>
<tr>
<td><strong>Occupational Therapist</strong></td>
<td>A healthcare professional certified to teach people who have had a stroke or other injury to become as independent as possible in their daily activities at home, on the job and in the community.</td>
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</tbody>
</table>
Paralysis  
A temporary or permanent inability to move a muscle. It’s caused by injury to the brain, the spinal cord or the muscle itself.

Physical Therapist  
A healthcare professional certified to teach people who have had a stroke or other injury to become as independent as possible in gross motor activities such as rolling over in bed, walking or using a wheelchair.

Psychologist  
A healthcare professional certified to help patients and their families adjust to the emotional problems caused by disability.

Rehabilitation  
Process of restoring lost or impaired functions (i.e., walking, communicating, etc.) to the highest level that can be achieved after stroke or other injury.

Rehabilitation Team  
The group of specialists who work together to provide people with the medical care, therapy, counseling and family training needed to recover from an illness or injury. Team members usually include a physician, speech-language pathologist, physical therapist, occupational therapist, nurse, social worker and case manager.

Restraints  
A cloth device used to keep a patient safely in a bed or chair.

Social Worker  
A healthcare professional certified to help patients and their families adjust to problems caused by illness and disability, including financial problems and insurance.

Speech-Language Pathologist  
A healthcare professional certified to identify, test, diagnose and treat people with speech, language, voice, stuttering and/or swallowing disorders.

Splints  
A removable device applied to the hand, arm, or leg for support or positioning.

Stroke (Brain Attack)  
The injury to the brain that occurs when the blood supply is interrupted in a major blood vessel in the brain.
Caring for a Person with Aphasia

- Follow the home program given to you by your physician and therapists.

- Set up a systematic and regular daily routine. The structure will provide security and foster the sense that something consistent is being done to help.

- Remember that aphasia following a stroke rarely worsens over time, unless another stroke occurs. The abilities of a person with aphasia may fluctuate from day to day or even from morning to night.

- Be sure to include rest periods in the daily routine. Determine the time of day when the person is most receptive to working on communication skills. Try to use that time when possible.

- Encourage them to be as independent as possible and to continue to enjoy favorite activities. Some activities may now be difficult or impossible, but reasonable substitutions often can be made.

- Remember that someone with aphasia is neither “feeble-minded” nor “mentally incompetent.” Continue to treat the person as a mature, responsible adult. As much as possible, let him or her share in life-affecting decisions. Most important, don’t let others ignore the person with aphasia.

- Remember that communication difficulties may linger long after the brain attack. Don’t assume someone is unmotivated or lazy if recovery isn’t complete.

- Never assume that the person with aphasia can’t understand what’s being said, even if he or she seems unable to comprehend speech. *Never say anything you wouldn’t want the person with aphasia to understand completely.*

- Speak in a natural voice, unless you know there’s a hearing loss. Talking loudly won’t help the person understand you better. However, speaking slowly may help the person comprehend better.

- People with aphasia usually understand best if you say something simple and give them time to grasp one idea before moving on to another. Remember that people with aphasia often use hints from the environment, as well as gestures and facial expressions, to help them understand what’s being said.

- People with aphasia follow conversation better when talking to *one* person. They may become confused if conversation shifts quickly from one person to another or if there’s a lot of background noise. Turn off the TV and radio unless people are really watching or listening.

- People with aphasia may not want to see friends or relatives until they’ve adjusted to the disability or their communication skills have improved. Honor this desire for some time after the person leaves the hospital, but slowly reintroduce social situations as time passes.
Over the last 2 weeks, how often have you been bothered by any of the following?

<table>
<thead>
<tr>
<th>PART 1</th>
<th>Not At All</th>
<th>Several Days</th>
<th>More than half the days</th>
<th>Nearly Every Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Been bothered by feeling down, depressed, or hopeless?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Been bothered by little interest or pleasure in doing things?</td>
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</tbody>
</table>

Did you answer “YES” to any of the above questions? If so, complete Part 2.

In the past 2 weeks, how often are you bothered by:

<table>
<thead>
<tr>
<th>PART 2</th>
<th>Not At All</th>
<th>Several Days</th>
<th>More than half the days</th>
<th>Nearly Every Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little interest or pleasure in doing things?</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Feeling down, depressed or hopeless.</td>
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<tr>
<td>Trouble falling or staying asleep, or sleeping too much.</td>
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<tr>
<td>Feeling tired or having little energy. • Poor appetite or overeating.</td>
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<tr>
<td>Feeling bad about yourself or that you are a failure or have let yourself or your family down.</td>
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<tr>
<td>Trouble concentrating on things, such as reading the newspaper or watching television.</td>
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<td>Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual.</td>
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<tr>
<td>Thoughts that you would be better off dead, or of hurting yourself.</td>
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</table>

**TOTAL SCORE**

<table>
<thead>
<tr>
<th>Score Answers:</th>
<th>Depression Severity</th>
<th>Interpretation of Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all = 0;</td>
<td>Depression Severity</td>
<td>Minimal depression: 1-4</td>
</tr>
<tr>
<td>Several days = 1</td>
<td></td>
<td>Mild depression: 5-9</td>
</tr>
<tr>
<td>More than half the days = 2</td>
<td></td>
<td>Moderate depression: 10-14</td>
</tr>
<tr>
<td>Nearly Every Day = 3</td>
<td></td>
<td>Moderately severe depression: 15-19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Severe depression:20-27</td>
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</tbody>
</table>

Date Screening Completed: ___________________________
Patient Name ________________________________

Share these results with your healthcare professional.
Smoking Cessation Programs

The following services are available to assist you in smoking cessation:

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. American Lung Association</td>
<td>1-800-LUNG-USA</td>
</tr>
<tr>
<td>2. Great Start Quit Line (Pregnant Women)</td>
<td>1-866-66-START</td>
</tr>
<tr>
<td>3. American Cancer Society “Quit Line”</td>
<td>1-800-ACS-2345</td>
</tr>
<tr>
<td>4. Florida Department of Health</td>
<td>1-877-U-CAN-NOW</td>
</tr>
<tr>
<td>5. Tools to Quit Classes</td>
<td>1-386-956-5788</td>
</tr>
</tbody>
</table>

Bay Medical Auditorium—Medical Office Building
9:30 a.m.: 2nd Tuesday of the month
5:30 p.m.: 4th Tuesday of the month

If you have any questions, please call the Agency directly.
Bay Medical Sacred Heart (BMSH) is nationally certified by The Joint Commission as a Stroke Center of Excellence. BMSH has maintained this accreditation since 2004. What this means to you, the patient, is that the physicians and staff here at the hospital have the systems in place and have a proven track record of doing all the right things for stroke patients.

Please remember the key to optimizing treatment of stroke is for the patients themselves to recognize the symptoms and call 9-1-1 for help.