

# Stroke Education Booklet





## What is a stroke?

A stroke happens when a blood vessel that carries oxygen and nutrients to the brain either bursts or is blocked. This blockage or rupture of the blood vessel causes parts of the brain to die.

# Table of Contents

## 04 About Stroke

My Diagnosis

What is a stroke?

Types of Stroke

Ischemic Stroke

Hemorrhagic Stroke

Transient Ischemic Attack (TIA)  
or Mini Stroke

## 05 Stroke Signs & Symptoms

Common Signs & Symptoms of Stroke

## 06 Diagnosing Stroke

## 07 Stroke Risk Factors & Prevention

Know Your Numbers

What does your blood pressure mean?

What is Total Cholesterol?

What is LDL?

What is HDL?

What are triglycerides?

What is hemoglobin A1c (HbA1c or A1c)?

What is body mass index (BMI)?

Know Your Risk Factors

Risk Factors You **Cannot Change**

Risk Factors You **Can Change**

Diet & Nutrition

Lack of Exercise, Physical Inactivity

Drug Abuse

Excessive Alcohol Use

Use of Tobacco

Risk Factors You **Can Manage**

High Blood Cholesterol

High Blood Pressure

Diabetes Mellitus

Obesity

Atrial Fibrillation (AFib)

Cardiac Structural Abnormalities (PFO  
or ASD)

Carotid Artery Stenosis and Peripheral  
Artery Disease

Heart Disease

Obstructive Sleep Apnea (OSA)

Chronic Stress & Depressive Symptoms

Sickle Cell Disease

Migraine Headaches

Oral Contraceptive Pills (OCP)

Post-Menopausal Hormone Therapy

Recent Pregnancy (within 6  
weeks postpartum)

## 17 The Effects of Stroke

What happens when a person has a stroke?

Speech Problems

Trouble Swallowing

Movement Problems

Spatial Neglect

Partial Loss of Sensation

Fatigue

Vision Changes

Problems with Bladder Control

Problems Thinking Clearly or Interacting with  
Others

Depression

Intimacy After Stroke

Medication Self-Management

## 20 Stroke Rehabilitation

What happens during recovery from a stroke?

What are the chances of full recovery after a  
stroke?

Rehabilitation after a stroke

Acute care rehabilitation services in hospital

Acute Care Rehabilitation in extended  
care facility

Sub-Acute Care Rehabilitation

Home Health

Outpatient Rehabilitation Services

General Safety Tips

# About Stroke

## My Diagnosis

### I have been diagnosed with:

- ☐ Ischemic Stroke
- ☐ Hemorrhagic Stroke
- ☐ Transient Ischemic Attack (TIA) or Mini Stroke

Other:

- ☐ \_\_\_\_\_
- ☐ \_\_\_\_\_
- ☐ \_\_\_\_\_

## Types of Stroke

### Ischemic Stroke

Ischemic Strokes happen when blood flow to the brain is blocked, usually caused by a blood clot. Within minutes, brain tissue begins to die from the lack of oxygen and nutrients. Ischemic Strokes account for the majority of all strokes.

#### There are different types of Ischemic Stroke:

- **Thrombotic stroke** happens when a blood clot (thrombus) forms in an artery that supplies blood to the brain. The clot blocks the blood flowing to a part of the brain. Blood clots commonly form in arteries that are stiff and narrow.
- **Embolic stroke** happens when floating blood clots, made anywhere in the body, travel to the brain and get stuck in arteries. The clot blocks blood flowing to parts of the brain. These blood clots usually form in the heart and neck arteries.

### Hemorrhagic Stroke

Hemorrhagic Strokes happen when a weakened blood vessel bursts and bleeds in or around the brain. The blood collects and compresses brain tissue, causing cells to die.

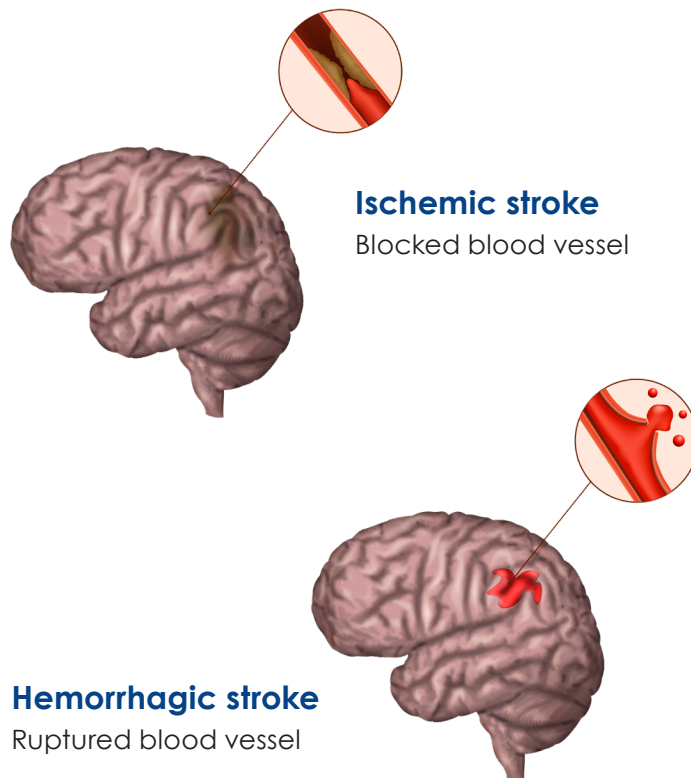
#### There are two types of Hemorrhagic Stroke:

- **Intracerebral Hemorrhage** happens when there is bleeding within the brain from a broken blood vessel.
- **Subarachnoid Hemorrhage** happens when there is bleeding around the brain in the space between the brain and the surrounding tissues that cover it, usually caused by an aneurysm or an arteriovenous malformations (AVMs).

### Transient Ischemic Attack (TIA) or Mini Stroke

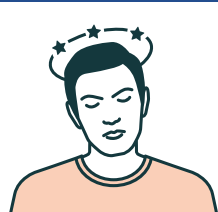
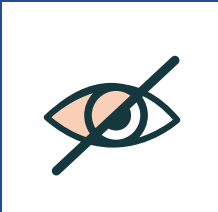
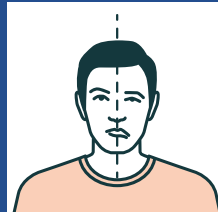
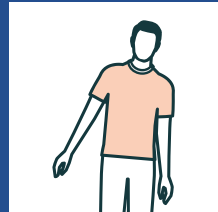
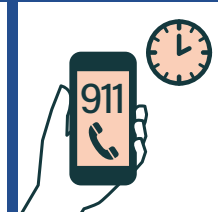
A TIA happens when blood flow to a part of the brain is blocked for a short time. Unlike a stroke, the blockage reopens on its own and usually causes no permanent damage. The symptoms are like a stroke but typically last only a few seconds or minutes.

A TIA is a major warning sign for future strokes. It is important to seek urgent medical care if you suspect you have had a TIA.



# Stroke Signs & Symptoms

signs of a stroke

| B                                                                                 | E                                                                                 | F                                                                                 | A                                                                                  | S                                                                                   | T                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| <b>BALANCE</b><br>Loss of Balance,<br>Headache or Dizziness                       | <b>EYES</b><br>Blurred vision                                                     | <b>FACE</b><br>Is one side of the<br>face droopy?                                 | <b>ARMS</b><br>Is one arm (or leg)<br>weak or numb?                                | <b>SPEECH</b><br>Is the speech slurred or<br>hard to understand?                    | <b>TIME</b><br>Call for ambulance<br>immediately!                                   |

**DO NOT** ignore these warning signs even if they go away. Call **911** or seek emergency medical attention immediately!

## Common Signs & Symptoms of Stroke

- 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 brief loss of consciousness such as:**

- Fainting
- Confusion
- Convulsion



## Why it is important to call 911 when you recognize stroke signs or symptoms:

- You may be eligible to receive a clot-buster medicine.
- You may be able to receive this medicine if you can get to the hospital as soon as you recognize stroke symptoms.
- Check the time when the stroke symptoms started; this information is very important to the healthcare providers who will be treating you.
- You should always call 911 if you recognize stroke symptoms. **DO NOT DRIVE!**

# Diagnosing Stroke

## CT/CTA (Computerized Tomography)

- CT uses X-rays to take pictures of the brain. This shows if you had a hemorrhagic (bleed) or an ischemic (clot) stroke. It does use radiation.
- CT is valuable because it is fast and can be performed on almost any patient, including those with pacemakers
- CTA is used to examine blood vessels inside your brain and neck, requiring intravenous contrast.

## MRI/MRA (Magnetic Resonance Imaging)

- MRI is used to diagnose a stroke by providing a detailed picture of the brain. It uses strong magnets and radio waves. It does not use radiation.
- It can show even very small strokes anywhere in the brain.
- MRA is used to examine blood vessels inside your brain and neck.

## Echo (Echocardiogram)

- An echocardiogram is an ultrasound of the heart.
- An echocardiogram uses sound waves to evaluate the structure of the heart, including the heart valves and the size of your heart. It can also show clots in your heart and how well your heart is working.
- After a stroke, it is important to detect if abnormalities in your heart may have contributed to your stroke.
- There are two types of echocardiograms that look at the heart from different angles.



- 1) A trans-thoracic echocardiogram (TTE) uses an ultrasound wand on the surface of your chest to show your heart from the front.
- 2) A trans-esophageal echocardiogram (TEE) uses a thin, flexible ultrasound wand that is slid down your throat to show your heart from the back.

## Carotid Ultrasound

- Carotid arteries are major blood vessels to the brain that are located on either side of your neck.
- A carotid ultrasound can see if your carotid arteries are narrow, stiff or blocked.
- The test is also used to look at the blood flow in the carotid arteries.

## ECG (Electrocardiogram)

An ECG is a test that records a person's heart rate (how fast it beats) and rhythm. It does this by measuring the electrical activity in the heart.

# Stroke Risk Factors & Prevention

## Know Your Numbers

| ITEM                   | GOAL                                     | YOUR RESULT |
|------------------------|------------------------------------------|-------------|
| Blood Pressure         | < 120/80 mm Hg                           |             |
| Total Cholesterol      | < 200 mg/dL                              |             |
| LDL (Bad Cholesterol)  | < 70 mg/dL                               |             |
| HDL (Good Cholesterol) | > 40 mg/dL in men<br>> 50 mg/dL in women |             |
| Triglycerides          | < 150                                    |             |
| Hemoglobin A1c         | < 7%                                     |             |
| Body Mass Index (BMI)  | < 25                                     |             |

## What does your blood pressure mean?

### Your blood pressure always has two numbers:

- **Systolic blood pressure** (first number, top number) – the pressure in your arteries when your heart beats.
- **Diastolic blood pressure** (second number, bottom number) – the pressure in your arteries when your heart rests between beats.

## Blood Pressure Categories

| Blood Pressure Category                                  | Systolic mm Hg<br>(upper number) |        | Diastolic mm Hg<br>(lower number) |
|----------------------------------------------------------|----------------------------------|--------|-----------------------------------|
| Normal                                                   | Less than 120                    | and    | Less than 80                      |
| Elevated                                                 | 120 - 129                        | and    | Less than 80                      |
| High Blood Pressure<br>(Hypertension) Stage 1            | 130 - 139                        | or     | 80 - 89                           |
| High Blood Pressure<br>(Hypertension) Stage 2            | 140 or Higher                    | or     | 90 or Higher                      |
| Hypertensive Crisis<br>(consult your doctor immediately) | Higher than 180                  | and/or | Higher than 120                   |

# Stroke Risk Factors & Prevention

## What is Total Cholesterol?

Cholesterol is a type of fat that is made in your liver and comes from the food you eat. Your body uses cholesterol to build cells and keep you healthy, but when there is too much cholesterol in the blood, it builds up in fatty deposits (plaque) on the lining of your blood vessels. A total cholesterol test measures the amount of cholesterol and triglycerides in your blood.

## What is LDL?

Low-density lipoprotein (LDL) is a type of cholesterol that moves cholesterol from the liver to the cells that need it. If there is more cholesterol than your cells can use, the LDL backs up like a traffic jam in your blood vessels. LDL is often called “bad” or “lousy” cholesterol because it sticks in fatty deposits that can damage blood vessels and clog arteries. Clots can form on the damaged lining, or a piece of plaque (fatty deposit) may break off, travel to the brain and cause a stroke.

## What is HDL?

High-density lipoprotein (HDL) is another type of cholesterol that is often called the “good” or “healthy” cholesterol because it carries other cholesterol away from your cells back to the liver where it can be broken down or passed out of the body.

## What are triglycerides?

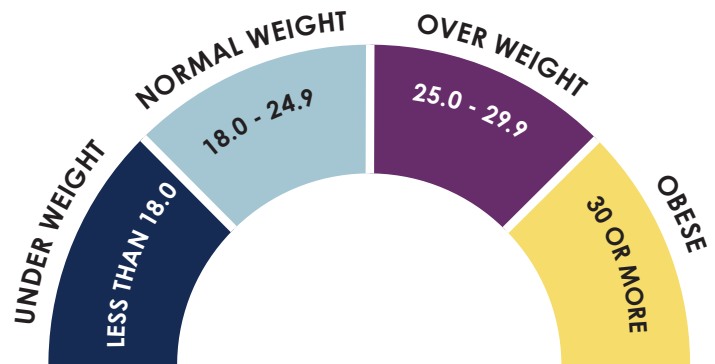
Triglycerides, like cholesterol, are types of fat that move around in your blood stream. Your body uses triglycerides to store unused calories and provide energy between meals. Extra triglycerides are stored in fat cells. If your triglycerides are too high, they build up in your blood vessels and make them narrow and stiff (atherosclerosis). Clots can also form on the damaged lining, or a piece of plaque may break off, travel to the brain and cause a stroke.

## What is hemoglobin A1c (HbA1c or A1c)?

Hemoglobin is a protein in red blood cells that carries oxygen where it's needed. Glucose (sugar in the blood) sticks to hemoglobin. The A1c looks at how much sugar is stuck to your red blood cells. Since red blood cells live about 2-3 months, this test gives you a picture of your average blood glucose (blood sugar) for the past 2 to 3 months. The results give you a good idea of how well your diabetes treatment plan is working. Like high blood pressure, high cholesterol and high triglycerides, having too much glucose in the blood can damage the lining of your blood vessels. Clots can form on the damaged lining, then travel to the brain and cause a stroke.

## What is body mass index (BMI)?

Body Mass Index (BMI) is a number calculated from a person's height and weight. This number is a tool to screen for possible weight problems in adults.



A BMI greater than 25 may mean you are overweight which increases your risk of stroke. If you are overweight, you are more likely to have high blood pressure, sleep apnea, high cholesterol, high triglycerides or diabetes. Your nurse or dietitian can assist you in calculating your BMI during your stay.

# Stroke Risk Factors & Prevention

## Know Your Risk Factors

Listed are your  
risk factors  
for stroke.

Ask your doctor about  
preventing  
or treating these  
risk factors.

Check what is  
applicable for you:

| Risk Factors You <b>CANNOT CHANGE</b> |                                               |
|---------------------------------------|-----------------------------------------------|
|                                       | Age                                           |
|                                       | Gender                                        |
|                                       | Race & Ethnicity                              |
|                                       | Heredity & Genetic Factors                    |
|                                       | History of Prior Stroke or TIA                |
| Risk Factors You <b>Can Change</b>    |                                               |
|                                       | Diet & Nutrition                              |
|                                       | Lack of Exercise, Physical Inactivity         |
|                                       | Drug Abuse                                    |
|                                       | Excessive Alcohol Use                         |
|                                       | Use of Tobacco                                |
| Risk Factors You <b>Can Manage</b>    |                                               |
|                                       | High Blood Cholesterol and Fat                |
|                                       | High Blood Pressure                           |
|                                       | Diabetes                                      |
|                                       | Obesity                                       |
|                                       | Atrial Fibrillation                           |
|                                       | Cardiac Structural Abnormalities (PFO or ASD) |
|                                       | Carotid Artery Stenosis                       |
|                                       | Heart Disease                                 |
|                                       | Obstructive Sleep Apnea (OSA)                 |
|                                       | Chronic Stress & Depressive Symptoms          |
|                                       | Sickle Cell Disease                           |
|                                       | Migraine Headaches                            |
|                                       | Oral Contraceptives                           |
|                                       | Postmenopausal Hormone Therapy                |
|                                       | Recent Pregnancy (within 6 weeks postpartum)  |

# Stroke Risk Factors & Prevention

## Risk Factors You **CANNOT CHANGE**

|                                   |                                                                                                                                                                                                                                                                                                              |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Age                               | <ul style="list-style-type: none"><li>• The chance of having a stroke approximately doubles for each decade of life after age 55.</li><li>• While stroke is common among the elderly, many people under 65 also have strokes.</li></ul>                                                                      |
| Gender                            | Each year, women have more strokes than men, and strokes kill more women than men.                                                                                                                                                                                                                           |
| Race & Ethnicity                  | <ul style="list-style-type: none"><li>• African-Americans have a much higher risk of death from a stroke than Caucasians.</li><li>• This is partly because African-Americans have a higher risk of high blood pressure, diabetes and obesity.</li></ul>                                                      |
| Heredity & Genetic Factors        | Your stroke risk may be greater if a parent, grandparent, sister or brother has had a stroke.                                                                                                                                                                                                                |
| Prior Stroke, TIA or Heart Attack | <ul style="list-style-type: none"><li>• The risk of stroke for someone who has already had one is higher than that of a person who has not.</li><li>• Having a TIA in the past increases your chance of having a stroke.</li><li>• Having a heart attack increases your chance of having a stroke.</li></ul> |

## Risk Factors You **CAN CHANGE**

### Diet & Nutrition

- Diets high in fat and salt (sodium) increase your risk of stroke.
- Eating a healthy diet reduces your risk of high blood pressure, diabetes, high cholesterol and heart disease which are all risk factors for stroke.

Following a **Mediterranean-style** eating plan may reduce your risk of stroke and heart disease. A Mediterranean eating style includes plenty of fruits, vegetables, fish, nuts and olive oil. As you look at the food listed in the table, focus on what you can **ADD** more of.



# Stroke Risk Factors & Prevention

## Foods to eat **LESS** of

### Animal protein foods

- Eat less red meat (steak, hamburger), poultry with skin on (turkey, chicken) and pork.
- If you want to eat meat, have smaller amounts.
- Many yogurts have lots of added sugar, so try eating Greek or plain yogurt.

### Saturated fats

- Instead of butter, shortening and coconut oil, try heart-healthy fats like canola oil and olive oil.

### Added sugars

- Eating natural sugars from fruit and vegetables is part of a healthy Mediterranean eating style.
- Read labels for added sugars like honey, syrups, agave and fructose. Your body treats raw sugar and brown sugar the same way as white table sugar.

### Refined grains

- Refined grains can be found in white bread, all-purpose flour, crackers, some cereal, pasta and baked goods. Aim for whole grains when possible.

### Sugary drinks and processed foods

- Fruit juices and soda have lots of added sugar, so try diluting your juice with sparkling water.
- Adding fresh fruit to unsweetened iced tea will naturally sweeten the drink.
- If eating snack foods like popcorn or chips, don't eat directly out of the bag. Limit your snack to about 1 cup.

## Foods to eat **MORE** of

### Fruits

- All fruit is great! Choose fresh fruit or look for frozen, dried and/or canned fruits without added sugars.
- Fresh fruit is a great, healthy option for dessert.

### Vegetables

- All vegetables are part of a Mediterranean eating plan.
- Fresh vegetables will have the least amount of added salt (sodium). Look for "low sodium" or "no added salt" if you eat frozen or canned vegetables.
- Rinsing canned foods can remove 40% of the added salt!
- Choose vegetables with a variety of colors - dark green, red, orange and yellow.
- Make a goal to eat at least 1 vegetarian meal a week for dinner.
- Try filling half your plate with vegetables at lunch and dinner!

### Fish and other lean animal protein

- Aim for eating fish 2-3 times per week.
- Rinse canned fish to remove added salt.
- As a main course, have smaller portions (3 ounces or less) of chicken or other lean meats.
- Eggs are a healthy and low-cost source of protein.

### Beans and lentils

- Adding beans and lentils to your diet can help add fiber and reduce cholesterol intake.
- Try chickpeas on a salad, black beans in tacos, cannellini beans in soup or great northern beans in pasta sauce.
- Eat less meat by adding in beans and lentils; add 2-4 cups beans to your family's pasta sauce or taco filling.

# Stroke Risk Factors & Prevention

## Risk Factors You **CAN CHANGE** *continued*

### Nuts and seeds

- Try dry roasted, unsalted nuts for a snack or add to yogurt, cottage cheese, salads, or use in place of meat.

### Whole grains

- Try oats, brown rice, whole wheat pasta and quinoa.
- Whole grain breads are a great option for sandwiches.

### Other healthy-eating tips:

- Learn to cook with herbs and spices and limit your salt. Cinnamon, cumin, curry powder, thyme, rosemary, fresh basil and fresh mint are just a few examples that can add excellent flavor to a dish.
- Wanting seconds? Try taking a 10-to-15-minute break and see if you are still hungry.
- Prepare more food than you need, so you have leftovers that can be quickly reheated on busy days.
- When eating out at a restaurant, eat half (or less) of the food that's served, and take the rest home for lunch or dinner the next day.
- Share meals with others and sit down with your family and friends. Invite them to join you in this healing journey.



### Lack of Exercise, Physical Inactivity

- Not getting enough physical activity can lead to health conditions such as obesity, high blood

pressure, high cholesterol and diabetes that can increase your risk of stroke.

- The American Heart Association recommends moderate exercise 30 minutes a day, 5 to 7 days per week. This could be broken into three 10-minute walks throughout the day.
- Before beginning any exercise program, consult with your PCP to discuss what is right for you and your health.

### Drug Abuse

- Drugs that are abused, including cocaine, amphetamines and heroin, have been associated with an increased risk of stroke.
- Drug addiction is serious and often a chronic relapsing disorder with many serious complications and consequences.
- Partner with your provider about overcoming substance abuse and possible addiction.

### Excessive Alcohol Use

- Alcohol abuse can lead to multiple medical complications, including stroke.
- If you drink alcohol, no more than two drinks per day for men and no more than one drink per day for non-pregnant women is recommended to reduce stroke risk.

### Use of Tobacco

- Studies have shown tobacco use doubles your risk factor for ischemic stroke.
- Tobacco increases the risk for clot formation (thrombus) in small arteries, buildup of fatty deposits (atherosclerosis) and heart disease, which are all risk factors for stroke.
- The use of oral contraceptives combined with cigarette smoking greatly increases stroke risk.
- Being around people who smoke tobacco also increases your risk for stroke because you are breathing in the smoke.
- Deciding to stop using tobacco is a big decision and is not easy, but you can do it! Seek support from others and partner with your PCP for possible medications and treatments to help.

# Stroke Risk Factors & Prevention

## Risk Factors You **CAN MANAGE**



### High Blood Cholesterol

- People with high blood cholesterol have an increased risk of stroke.
- When there is too much cholesterol in the blood, it builds up in fatty deposits (plaque) on the lining of your blood vessels. These deposits make your blood vessels narrow and stiff (stenosis) so it is harder for blood to flow. Clots can also form on the damaged lining, or a piece of plaque may break off, travel to the brain, and cause a stroke.
- You can make lifestyle changes at home to manage your cholesterol levels, including eating a healthy diet, maintaining a healthy weight, and exercising.
- For some people, lifestyle changes may not be enough, and you may be prescribed medications to help lower your cholesterol levels. Partner with your PCP after discharge.



### High Blood Pressure

- High blood pressure is the leading cause of stroke and the most important controllable risk factor for stroke.
- High blood pressure damages the lining of your blood vessels. Clots can form in the damaged lining, and when a clot gets pushed to the brain, it causes a stroke. High blood pressure also increases your risk of a hemorrhagic (bleeding) type of stroke because it weakens your blood vessels and makes them more likely to burst or leak.
- Effective treatment of high blood pressure is a key reason for the reduction of death rates in stroke.

- If you are diagnosed with high blood pressure, you may be discharged from the hospital on medications to help control your blood pressure. Make sure to partner with your PCP to create a plan to lower and control your blood pressure long term.
- At home, it is important to monitor your blood pressure, take your medications regularly, eat a healthy diet, maintain a healthy weight, and exercise.



### Obesity

- People with excess weight or obesity are at increased risk of developing high blood pressure, diabetes, sleep apnea, and heart problems that all increase the risk of having a stroke.
- Manage your weight through diet and exercise. Losing as little as 5 to 10 pounds can make a significant difference to your risks.
- Seek support from family and friends when making the needed lifestyle changes, and partner with your PCP.



### Diabetes Mellitus

- Diabetes is a risk factor for stroke.
- If diabetes goes untreated, too much sugar (glucose) collects in the blood, which can increase fatty deposits (plaques) or clots in blood vessels, which can lead to narrowing or blockage of arteries in the brain or neck.
- While diabetes is manageable with medicine and lifestyle modification, the presence of the disease still increases your risk of stroke.
- If you are diagnosed with diabetes, you may be discharged from the hospital on medications to keep your blood sugar under

# Stroke Risk Factors & Prevention

## Risk Factors You **CAN MANAGE** *continued*

control. Make sure to partner with your PCP to create a plan to lower and control your blood sugar long term.

- At home, make sure to monitor your blood sugar levels, take your medications regularly, eat a healthy diet, maintain a healthy weight, and exercise.



### **Atrial Fibrillation (AFib)**

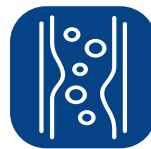
- Atrial Fibrillation is an irregular heart rhythm.
- The heart's upper chambers (the atria) beat irregularly, which can cause the blood to collect in these chambers and clot.
- If a clot breaks off, enters the bloodstream, and lodges in an artery leading to the brain, a stroke results.
- You may be prescribed medication that will keep your blood thin. This can prevent clots from forming and can also ensure that blood is able to flow around a small clot to supply oxygen to the cells that need it, avoiding a stroke.
- There are procedures that may be able to control or stop your AFib; discuss options with your cardiologist.



### **Cardiac Structural Abnormalities (PFO or ASD)**

- A Patent Foramen Ovale (PFO) and Atrial Septal Defect (ASD) are holes in between the upper chambers of the heart
- A PFO occurs when a hole between the two chambers does not close the way it should have after birth.

- An ASD occurs when the wall between the two upper chambers of the heart does not form correctly. This is considered a congenital heart defect.
- In a heart with a PFO or ASD, some blood from the upper right chamber may leak through the hole. Small clots may be able to travel through the hole to the left side of the heart and then to the brain where they can cause a stroke.



### **Carotid Artery Stenosis and Peripheral Artery Disease**

- Arteries are blood vessels that carry oxygen-rich blood to cells that need it. When fatty deposits (plaque) build up in the lining of arteries, it makes them narrow and stiff (stenosis). Narrow, stiff arteries are not as good at moving blood.
- Peripheral artery disease (PAD) is when arteries carrying blood to leg and arm muscles are too narrow to carry enough blood to the cells that need it. Carotid artery stenosis (CAS) is when the arteries carrying blood to the head are too narrow and stiff.
- Controlling your cholesterol (with diet and medications) helps prevent CAS and PAD.
- Use of medications that make your blood thinner help the blood flow better through narrow, stiff arteries.
- There are procedures that may be done to remove plaque from certain arteries, especially the carotid arteries; discuss options with your vascular surgeon.

# Stroke Risk Factors & Prevention



## Heart Disease

- People with coronary heart disease, angina or a history of a heart attack are at higher risk of having a stroke.
- Heart failure, dilated cardiomyopathy (an enlarged heart), heart valve disease and some types of congenital heart defects also increase the risk of stroke.
- Partner with your PCP or cardiologist to manage these conditions.



## Migraine Headaches

- There is consistent evidence that individuals with migraine are approximately two times more likely to develop an ischemic stroke and is limited to patients with migraine with aura and stronger among younger women under age 55, particularly if they smoke or/and use oral contraceptives.
- Talk with your healthcare provider about treatment options and management of migraine.



## Obstructive Sleep Apnea (OSA)

- Obstructive sleep apnea means your breathing stops while you are sleeping. It happens when the muscles in the back of your throat and tongue relax too much, and your airway narrows or closes when you take a breath. As a result, you can't get enough air, and your body wakes you up so that you start breathing again.
- The most common sign of OSA is snoring. Other signs are waking up choking or gasping

for air, being extremely sleepy during the day, having difficulty concentrating and morning headaches.

- Untreated sleep apnea is associated with stroke because each time the oxygen level in the blood drops, damage can occur to the cells and vessels in the brain.
- Treatment options for sleep apnea include maintaining a healthy weight, using a machine that helps you breathe (CPAP or BiPAP), using something that keeps your airway open or helps you stay in a safer position while you sleep and surgical options. Discuss sleep apnea with your PCP to develop a personal treatment plan.



## Chronic Stress & Depressive Symptoms

- Chronic stress and depression have been linked to an increased stroke risk, and they increase the risk of poor outcomes after a stroke.
- The link between chronic stress/depression and stroke is not yet fully understood. It may cause your blood pressure and blood sugar to increase, and it also may increase the likelihood that a person who is depressed or chronically stressed may be less likely to take care of themselves. They may eat less healthfully, be less likely to take their medications and may engage in unhealthy behaviors, like smoking, that increase their stroke risk.
- Talk with your PCP about your stress and mood, and develop a treatment plan together.

# Stroke Risk Factors & Prevention

## Risk Factors You **CAN MANAGE** *continued*



### Sickle Cell Disease

- Normal red blood cells are round, but in sickle cell disease, some red blood cells are shaped like a hook or the letter C.
- Sickle cells get caught on each other. If they clump together and block blood flow, a stroke can happen.
- Sickle cells can damage the lining of blood vessels. Clots can form on the damaged lining, travel to the brain and cause a stroke.
- While there is not yet a cure for sickle cell disease, there are things you can do to manage it and minimize your risk of complications, including stroke. Partner with your PCP to develop a plan that works for you.



### Oral Contraceptive Pills (OCP)

- Oral contraceptive pills are made of hormones called estrogen and progesterone. The overall risk of developing a stroke in women who take oral contraceptive pills is low. However, OCPs use may cause blood pressure to rise or make the blood more likely to clot.
- In women who are obese, suffer from migraines, have hypertension, smoke cigarettes or take a high dose of estrogen, the risk of stroke is higher.
- Talk with your doctor about the risks of oral contraceptive use and stroke. Ask your doctor to prescribe the lowest dose of hormones that will still prevent pregnancy.



### Post-Menopausal Hormone Therapy

- Women often take hormones after menopause to treat symptoms such as hot flashes and vaginal discomfort.
- Oral post-menopausal hormone use has been associated with strokes and with the formation of blood clots in the legs.
- For women under age 60 who take oral post-menopausal hormones, the overall risk of developing a stroke is low. However, the risk of stroke increases with advancing age. Studies have shown the risk of stroke increases with higher doses of hormones and with longer length of use.
- Talk with your doctor about what dose of hormone and length of treatment is best for you.



### Recent Pregnancy (within 6 weeks postpartum)

- Most women have healthy pregnancies and deliveries, but pregnancy does put women at higher risk for stroke.
- Your body makes a substance during pregnancy that makes the blood more likely to clot. Your body makes this substance so there is not too much bleeding during your baby's birth. This, along with other problems such as obesity and high blood pressure, all raise the risk for stroke.
- High blood pressure can occur because the amount of blood in a woman's body increases during pregnancy and the heart must work harder to pump this extra blood throughout the body.
- High blood pressure during pregnancy is the leading cause of stroke in pregnant women or in women who have recently given birth.

# The Effects of Stroke

## What happens when a person has a stroke?

- Strokes affect people in different ways. Some people who have a stroke have no lasting effects. Others lose important brain functions. For example, some people become partly paralyzed or unable to speak.
- Strokes may also affect a person's behavior and thought patterns, memory and emotions. Each patient's stroke experience is different and depends on the type of stroke and which areas of the brain are damaged.

## Speech Problems

People who have a stroke sometimes lose the ability to speak or understand speech. The medical term for this is "aphasia." Some people might have slurred speech. The medical term for this is "dysarthria."

| What is Aphasia?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | What is Dysarthria?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Aphasia is the term doctors use when a person loses the ability to use or understand language. It happens when the brain is damaged in some way, usually because of a stroke.</p> <p><b>Aphasia may make it difficult to:</b></p> <ul style="list-style-type: none"><li>• Speak</li><li>• Read</li><li>• Write</li><li>• Use non-verbal gesturing</li><li>• Use numbers and do calculations</li><li>• Understand spoken language</li></ul> <p><b>Aphasia does not affect intelligence.</b></p> <ul style="list-style-type: none"><li>• Speak directly to the person with aphasia, slowly and clearly.</li><li>• People with aphasia often understand emotional tone and respectful behavior but not the words being said.</li><li>• Aphasia can affect any of the languages the stroke survivor speaks.</li></ul> | <p>Dysarthria is the term doctors use when a person loses the ability to control his or her mouth and throat to form speech.</p> <p>It can happen along with aphasia, which impairs a person's ability to understand language. People who have only dysarthria can understand language; they just can't form words clearly.</p> <p><b>People with dysarthria might:</b></p> <ul style="list-style-type: none"><li>• Slur their speech and sound as though they are drunk.</li><li>• Speak very softly or in a whisper.</li><li>• Speak too quickly, too slowly, or mumble.</li><li>• Sound hoarse, nasal, or breathy when they talk.</li><li>• Drool or have trouble controlling their saliva.</li><li>• Have trouble chewing or swallowing.</li></ul> |

## Trouble Swallowing

- People who have a stroke sometimes have trouble swallowing. The medical term for this is "dysphagia."
- When a person eats, this trouble swallowing may cause food to go down the wrong way and into the lungs.
- This problem can be dangerous because it can lead to lung infections, such as pneumonia.

# The Effects of Stroke

## Movement Problems

- People who have a stroke sometimes have muscle weakness or “paralysis” of the left or right side of their body.
- Paralysis is the inability of a muscle or group of muscles to move voluntarily.
- Muscles are controlled by messages sent from the brain that trigger movement. The muscle weakness can affect the face, arm and leg.
- Those who are affected can have trouble performing everyday activities such as eating, dressing, using the bathroom and grabbing objects.

## Spatial Neglect

- Our brain “GPS” for moving the body in 3D space can be damaged by stroke.
- When this happens, people lose the ability to turn their body toward one side or notice what is happening on the side of their body that is weak.
- The stroke survivor may have poor eye contact and “miss” items that are easy to find such as food on a plate or part of a sentence they are reading.
- The stroke survivor may also keep looking and turning their head and body to one side when in bed or in a chair, and this can affect balance and increase fall risk.
- Unfortunately, strokes that cause spatial neglect can make it hard for stroke survivors to manage. As part of the stroke, they may be unaware of their errors. Their stroke may also reduce their awareness of other stroke issues such as weakness.

## Partial Loss of Sensation

People who have had a stroke sometimes have partial or total loss of sensation on the left or right half of their body. Those affected are not able to feel when someone is touching them.

## Fatigue

- Fatigue is a normal condition in healthy individuals; it alerts the body when it is time to rest or modify activity. This type of fatigue is usually related to one cause and is short lived.
- Post-stroke fatigue can be confused with “being tired.” It is not necessarily the same as tiredness because it arrives without warning, and rest does not always make it better. It is related to the degree of damage from the stroke.

## Vision Changes

- Blind spots in the field of vision, also known as visual field loss, are common after stroke.
- A common type of vision loss is called hemianopia, the loss of half of each eye’s visual field.
- Unfortunately, people are not always aware of their vision blind spots.

## Problems with Bladder Control

People who have a stroke sometimes lose bladder control or leak urine. The medical term for this is “urinary incontinence.”

## Problems Thinking Clearly or Interacting with Others

When people have difficulty with thinking and interacting, part of the problem is that brain systems that monitor performance are affected. Thus, stroke survivors with thinking issues are usually not aware they are making errors. This can be frustrating; however it is not a deliberate decision—the stroke itself prevents awareness.

### Examples of behavior changes include:

- Getting easily confused or have trouble staying focused.
- Personality changes that make them react differently to others.
- Mood swings for no obvious reason. For example, they might be sad one moment and angry the next.

# The Effects of Stroke

- Many people experience memory problems after a stroke such as remembering names, shapes, words, routes and faces. Sometimes, they may have trouble learning new things.

## Depression

People who have a stroke sometimes get depressed. This can make recovery even harder, so it is important to get treated for depression after a stroke. A stroke survivor's emotional health is just as important as his or her physical health and can promote or disrupt post-stroke recovery.

### Many stroke survivors experience feelings of:

- Anger
- Hopelessness
- Fear
- Anxiety
- Frustration
- Sadness

The National Institute of Neurological Disorders characterizes post-stroke depression by a feeling of hopelessness that interferes with functioning and inhibits quality of life. If not treated and managed appropriately, post-stroke depression can slow down recovery.

## Intimacy After Stroke

Sex is a normal part of any intimate relationship. A stroke can cause changes that can affect your ability or desire to have sex. These changes can be both physical and emotional. After a stroke, it may take some time before you feel ready to have sex again. It can also help you work with your partner to rebuild intimacy and find ways to enjoy sex again.

### Common questions and concerns:

- Will having sex cause another stroke?
- Will this stroke affect my desire to have sex?
- Will my medications interfere with sex?
- Will my physical impairment affect my ability to have sex?

### Your concerns are normal:

- If you and your partner are having problems resuming sex, it is OK to seek outside help. Try talking to your doctor, a nurse or a counselor. Try joining a support group to talk with other people who have had strokes and their partners.
- If you have trouble using one side of your body, use pillows for positioning. Also, experiment with your partner to find positions that make you both feel good.
- If you have spasticity, talk to your physical or occupational therapist. He or she can teach you specific stretches and positioning techniques that can help lessen the spasticity.
- If you have concerns about how your medications may affect your ability to have sex after your stroke, do not stop taking your medications.
- Medicines can often be prescribed to improve sexual function. Be sure to speak with your doctor before taking any medicines on your own.

## Medication Self-Management

- Because medications are so important to prevent future strokes and improve health for best recovery, it is very important to establish a medication routine.
- Using a pillbox, using a reminder system on a cell phone and receiving help from a companion or friend can avoid errors
- Ask your rehabilitation team for help in understanding your medication management. Sometimes, because of the stroke, people make medication errors and are not aware of them.

# Stroke Rehabilitation

The most important thing you can do to help with recovery is to stick with rehab and do all the exercises and therapies your health care team recommends. Also, be patient. It takes time to heal and learn new ways to cope, but work and patience can pay off.

## What happens during recovery from a stroke?

- It is important to know that most of the effects you are having from your stroke are not unusual. The key to recovering from a stroke is accepting that you have had a stroke and know that it will be a long process toward recovery.
- During recovery, people work to regain some of the abilities they lost.
- Even though a part of their brain was damaged by the stroke, their brain can relearn how to do some of the things it used to do.
- People who lose the ability to speak can often relearn how to speak or at least how to communicate to some degree.
- In the same way, people who lose the ability to walk can sometimes relearn how to walk. Some people need to use canes or other devices.

## What are the chances of full recovery after a stroke?

**The chances of making a full recovery depend on many factors such as:**

- How big the stroke was?
- What part of the brain was damaged by the stroke?
- How old the person is (younger people tend to recover better than older people)?

- What other medical problems the person has (such as heart failure or cancer).
- Whether the person was sick before the stroke.
- How soon the person was treated following the stroke.

## Rehabilitation after a stroke

Rehabilitation may start at the hospital or at a rehab facility. Most stroke rehab programs last several weeks to several months after you leave the hospital. The program includes physical therapy, occupational therapy and if needed, speech therapy.

## Acute care rehabilitation services in hospital

Therapists in these facilities are specialize in stroke, and the medical providers have advanced training in rehabilitation. The types of therapists you may see are:

- The **physical therapist** will help you improve your coordination, strength and endurance. You will learn to become more independent with mobility.
- The **occupational therapist** will assist you in developing skills so you can eat, dress, bathe and groom independently.
- In **speech therapy**, you will work on improving your speech, language and thinking skills. The therapist will also assist you should you have swallowing problems.

# Stroke Rehabilitation

## Acute care rehabilitation in extended care facility

Offers specialized inpatient comprehensive therapy for 3 hours per day for patients who meet the admission guidelines. The rehabilitation team includes a wide range of professionals trained to work closely with you and your family to develop a treatment plan. The team reviews your progress and goals. They will provide you with updates on your progress, length of stay and discharge needs.

## Sub-Acute care rehabilitation

Offers therapy services for patients who are medically stable but unable to return home or require less intense rehabilitation services. Physical, occupational and speech therapy services are offered for 1-2 hours per day 5 days per week.

## Home Health

Home Health services are for patients who are homebound. Therapists and nursing services will come to your home and focus on your mobility and daily living skills. They will teach you how to be as independent as possible in your own environment. Typically, therapists come 1-3 times per week.

## Outpatient Rehabilitation Services

Outpatient Rehabilitation Services are comprehensive and use equipment similar to a gym. This level of rehab is intensive and designed to ensure that you gain back the most function possible. Emory Healthcare provides physical, occupational and speech therapists that are specially trained to work with stroke survivors.

## General Safety Tips

1

Sit while getting dressed. Pull undergarments and pants up to your knees before standing, and then pull both up at one time.

2

Wear non-slip footwear. Avoid high-heeled shoes, open-back slippers and open-toe sandals.

3

If you have visual or hearing impairments, wear your glasses and/or use your hearing aid, so you can be more aware of your environment.

4

To maintain an adequate base of support, stand and walk with your feet slightly apart. If you feel like you are going to fall, keep your feet apart and crouch down. A lower center of gravity and wider base of support increases your stability.

5

Focus your vision on a stationary object as you move around.

6

Find a stable point of reference when changing positions.

7

Take your time with activities and avoid quick head movements or quick position changes.

8

It is important to keep the visual environment simple—try to avoid extra objects and clutter and remove throw rugs and extra furniture in important areas that can be obstacles to movement.

# Notes

[illegible]

# Notes

[illegible]

## Emory Stroke Center Locations

Emory Stroke Centers have dedicated stroke teams with fully equipped emergency departments for rapid diagnosis and treatment. Each emergency department has 24/7 neurology coverage and access to a multidisciplinary medical team to provide quality stroke care.

### Comprehensive Stroke Center

Emory University Hospital  
1364 Clifton Road  
Atlanta, GA 30322

### Primary Stroke Centers

Emory Decatur Hospital  
2701 N Decatur Road  
Decatur, GA 30033

Emory Hillandale Hospital  
2801 Dekalb Medical Parkway  
Lithonia, GA 30058

Emory Hospital Warner Robins  
1601 Watson Boulevard  
Warner Robins, GA 31093

Emory Johns Creek Hospital  
6325 Hospital Parkway  
Johns Creek, GA 30097

Emory Saint Joseph's Hospital  
5665 Peachtree Dunwoody Road  
Atlanta, GA 30342

Emory University Hospital Midtown  
550 Peachtree Street NE  
Atlanta, GA 30308

### Acute Stroke Ready

Emory Hospital Perry  
1120 Morningside Drive  
Perry, GA 31069

### Outpatient Stroke Center

Emory Stroke Clinic  
1365 Clifton Road, NE, Building B, Suite 2200  
Atlanta, GA 30322



For more information about care after your stroke, visit [emoryhealthcare.org/strokerecovery](https://emoryhealthcare.org/strokerecovery).



**404-778-3444**  
[emoryhealthcare.org/strokecenters](https://emoryhealthcare.org/strokecenters)

Additional resources about care after your stroke can be found at [stroke.org](https://stroke.org).