

# Stroke Patient Education Guide

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## Introduction

When you or a loved one are brought to the hospital with a stroke, we know that you may have many emotions, such as fear and anxiety. While this is a difficult time for you and your family, it is good to know that Bronson Methodist Hospital is a Primary Stroke Center certified by The Joint Commission and has been designated a Stroke Center of Excellence by NeuStrategy. Our goal is to provide you with the highest quality medical care so that you can get back to your life as quickly and fully as possible.

Bronson offers the expertise you need to recover from a stroke. Our neurological team is a carefully selected group of highly trained specialists, including the only fellowship-trained vascular neurologist who treats stroke, epileptologist who treats epilepsy, geriatric psychiatrist who treats memory loss, and pediatric neurologists who specialize in treating children. The neurosurgery team has special expertise in the areas of minimally invasive brain and spine surgery and the neurointerventionalists have advanced training to treat the most complex stroke and aneurysms non-invasively.

One of the reasons for our high quality patient outcomes is our unique team approach to meet your recovery needs. At Bronson, healthcare professionals from many specialties work together to determine the best treatment plan to meet each patient's individual needs. Your team includes:

- You and your family
- Doctors and nurses
- Registered dietitians, physical and occupational therapists
- Pharmacists, speech and language pathologists
- Respiratory therapists, medical social workers, case managers and chaplains.

Recovery is a journey. Stroke survivors and their families and caregivers face many challenges in the weeks, months and years to come. We hope this booklet will be informative and helpful to you. If you have any questions along the way, feel free to ask any of the neurological services team staff.

## Warning signs of stroke

**Stroke is a medical emergency.  
Call 9-1-1 if you have any of these warning signs.**

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

Recognizing stroke is the first important step in getting the treatment you need. The National Stroke Association recommends remembering the acronym “FAST” to recognize and respond to stroke.

- **F= Face** Ask the person to smile. Does one side of the face droop?
- **A= Arm** Ask the person to raise both arms. Does one drift downward?
- **S= Speech** Ask the person to repeat a simple phrase. Does the speech sound slurred or strange?
- **T= Time** If you see any of these signs, it’s time to call 9-1-1

## What are stroke risk factors?

Now that you know the warning signs of stroke and what to do if you see the signs of a stroke, you may consider how you can prevent having one. There are ways you can control your risk for having a stroke. Healthy lifestyle choices and taking prescribed medications will help to reduce your risk.

Stroke is one of the most preventable of all life-threatening health problems. Learning how to control your risk factors is one of the most effective ways you can prevent a stroke. There are risk factors that you can control and risk factors that you cannot control. By controlling the risk factors you can, you may greatly reduce your chance of having a stroke.

### Controllable risk factors include:

- **High blood pressure:** Also known as hypertension, high blood pressure is the number one cause of stroke. High blood pressure increases your risk for stroke by 4-6 times. A high blood pressure is a blood pressure over 140/90. Many people who have high blood pressure do not realize it because they do not have any warning signs. Have your blood pressure checked at least once a year to be sure your blood pressure is at a safe level. Limit the amount of salt in your diet by not adding any salt to the foods you cook and limit the amount of processed food you eat. Many processed foods have high salt content. Other important lifestyle changes include regular exercise, not smoking, and weight loss. Follow your doctor's suggestions on diet, exercise, and medicines.
- **Atrial fibrillation:** Atrial fibrillation is an irregular heartbeat that can lead to blood clots forming in your heart and traveling to your brain. If you have atrial fibrillation, follow your doctor's plan for control.
- **Smoking:** If you smoke, stop. Smoking doubles your risk of stroke. Your risk of stroke starts to drop the day you stop smoking. After 5-15 years of being smoke free, your risk is the same as a person who never smoked.

- Drinking alcohol: Limit the amount of alcohol you drink. Drinking more than two drinks a day increases your risk of stroke.
- High cholesterol: Cholesterol is a fat-like substance in blood that may lead to narrowing and clogging of your blood vessels. A cholesterol level is considered high when it is over 200. You should eat a diet with 30 percent or fewer total calories from fat. Your diet should also be low in unhealthy fat from meat or dairy products. Eat a diet rich in vegetables, lean meats, whole grains, and fruits. Exercising at least 30 minutes a day, for at least three days a week, will strengthen your heart and lungs and reduce your risk of cholesterol build-up in your arteries. Medicines may be needed to control your cholesterol levels. Follow your doctor's suggestions for cholesterol control.
- Weight: Extra weight puts a strain on your heart and blood vessels. It makes you more likely to have other stroke risk factors such as high cholesterol, high blood pressure, and diabetes. A healthy diet and regular exercise are important to maintaining a healthy weight.

**Uncontrollable risk factors include:**

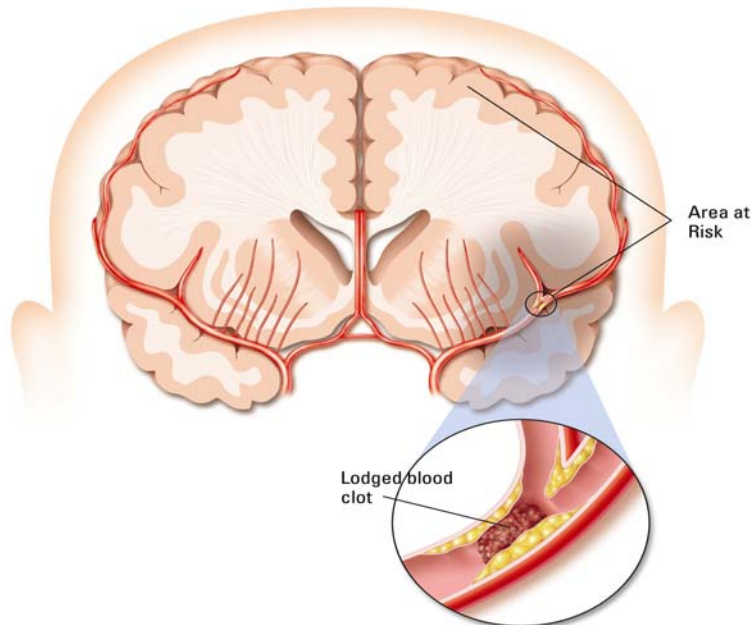
- Age: 66% of strokes occur in people over the age of 65.
- Gender: Men have a slightly higher risk of stroke than women.
- Race: African Americans have a higher stroke risk than some other racial groups.
- Family history of stroke or Transient Ischemic Attack (TIA): A TIA is a brief interruption of blood flow to the brain.
- Personal history of diabetes: High blood sugar levels lead to blood flow problems that may cause a stroke. A stroke is likely to be more serious if blood sugar levels are high at the time the stroke occurs. People with diabetes have a higher risk of stroke even when their blood sugars are well controlled.

## What is a stroke?

A stroke happens when blood flow to the brain stops. There are two types of stroke – ischemic and hemorrhagic.

- **Ischemic stroke** is caused when plaque or clots block a blood vessel in your brain or neck.
- **Hemorrhagic stroke** is caused when a vessel in your brain breaks causing bleeding in the brain.

**Ischemic strokes** are the most common type of stroke. They are caused by a blood clot that travels through the bloodstream to the brain, or by the build-up of plaque in the arteries of the brain. When the artery is blocked, oxygen rich blood can no longer reach the brain tissue and the tissue begins to die.

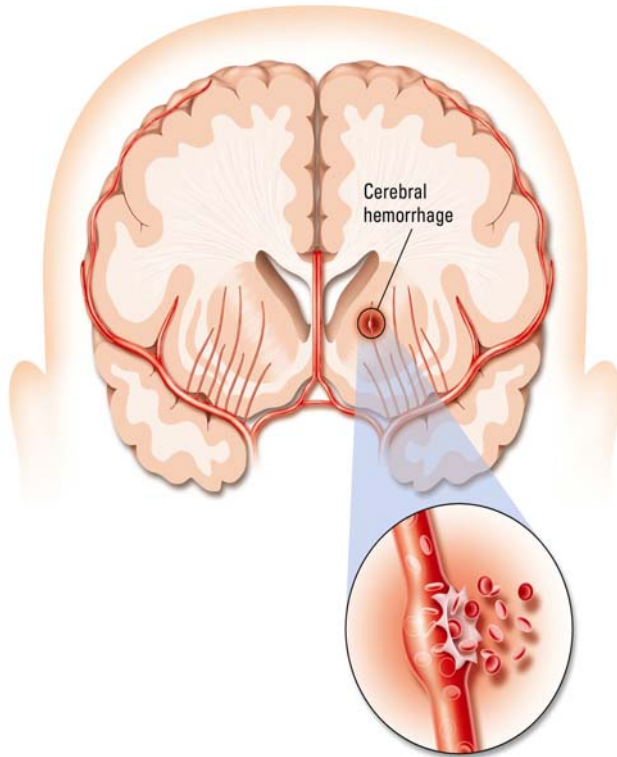


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**TIA (Transient Ischemic Attack):** A TIA happens when there is a brief interruption of blood flow to the brain. TIA is a warning that a stroke may be coming. You should see a doctor right away, even if the symptoms go away quickly. Your stroke risk increases ten-fold once you have had a TIA. Medical attention can help to treat your risk factors and help to prevent a stroke.

**Hemorrhagic stroke** happens when there is a weakened blood vessel that bursts or leaks blood into the brain. There are two types of hemorrhagic stroke:

- Intracerebral (ICH) hemorrhage is when the blood is in the brain's tissue
- Subarachnoid (SAH) hemorrhage is when the blood is around the brain's surface, but under the protective layer (dura).

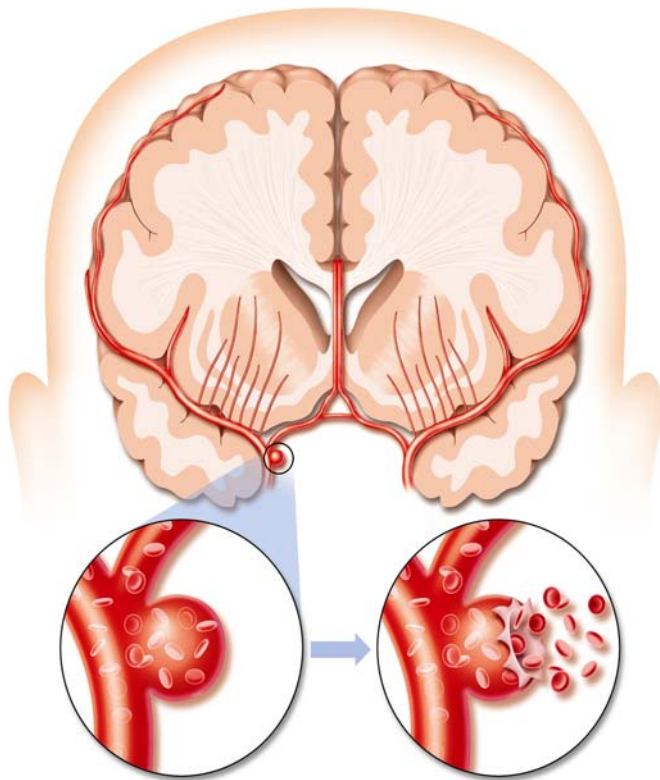


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**Warning signs of hemorrhagic stroke include:**

- Sudden onset of a very bad headache. Often described as the “worst headache of my life.”
- Feeling sick to your stomach or throwing up, especially when combined with other warning signs such as headache
- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- Loss of consciousness or confusion, especially when combined with a terrible headache

**Intracerebral hemorrhage** is the most common type of hemorrhagic stroke. This type of stroke happens when a weakened spot on a blood vessel ruptures and leaks blood into the surrounding brain tissue. An **aneurysm** is a weak spot on the wall of the artery that balloons out from a blood vessel. As an aneurysm grows, the blood vessel wall becomes thinner and weaker, increasing its risk of rupturing. If it bursts, blood can no longer move through the vessel to supply the brain with oxygen rich blood and the brain tissue begins to die. The most common cause of this type of stroke is high blood pressure.

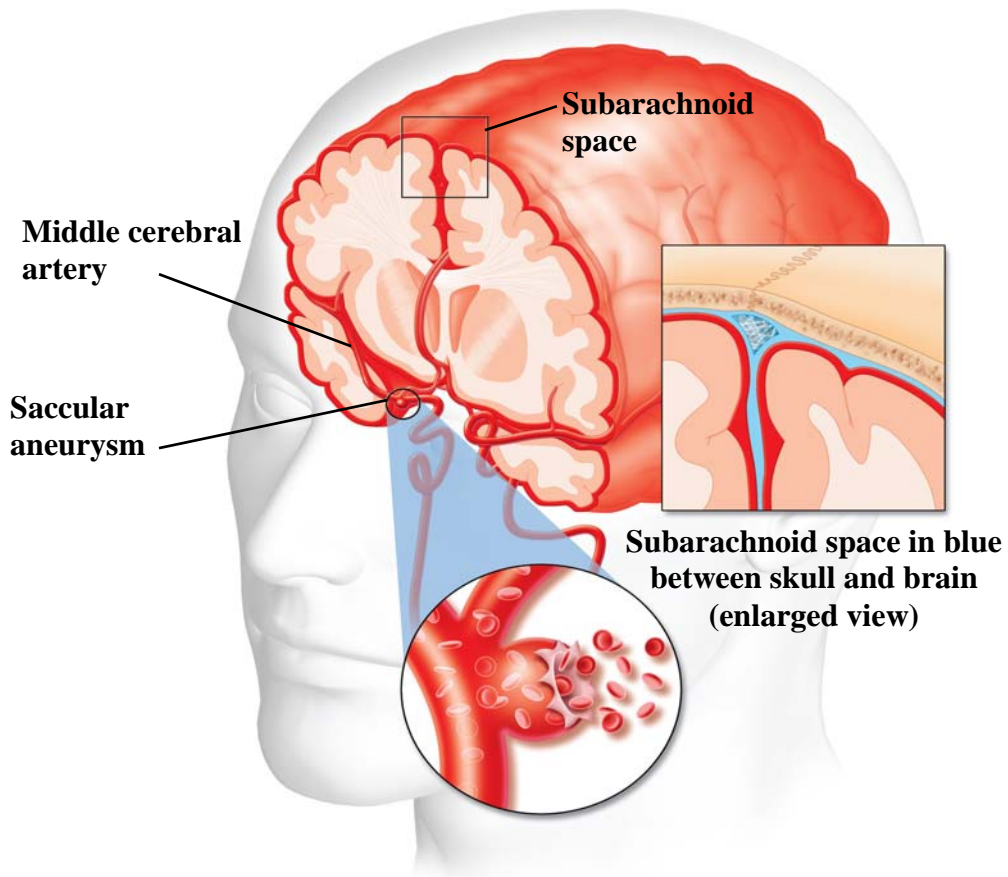


Aneurysm

Ruptured Aneurysm

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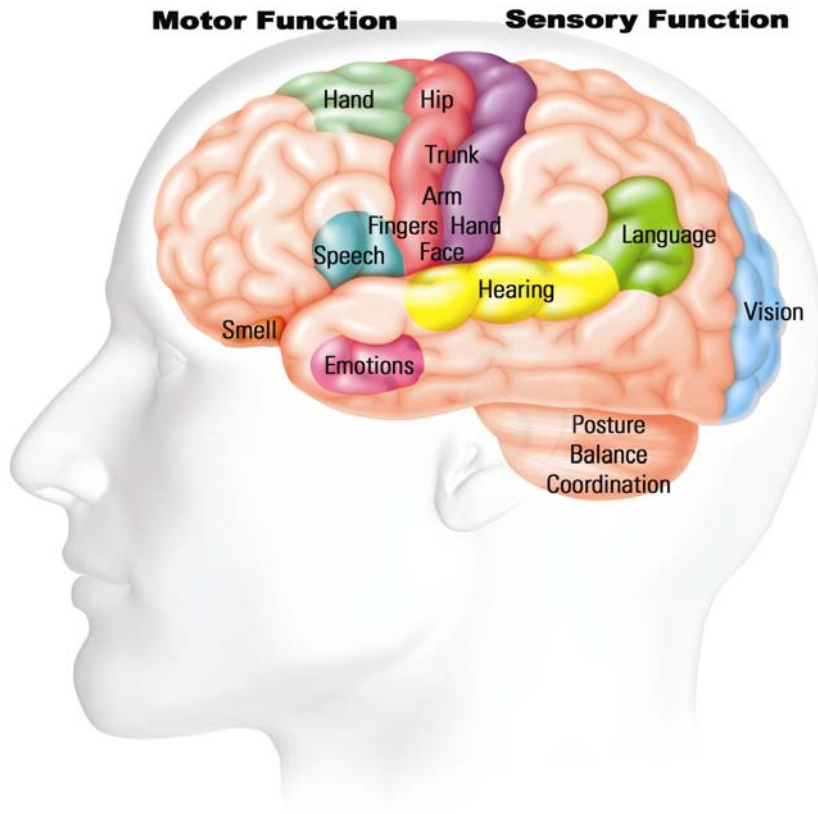
**Subarachnoid hemorrhage** is typically caused by a ruptured aneurysm on the surface of the brain. Blood builds up over the surface of the brain and begins to push on the brain tissue. Treatment may include clipping or coiling of the aneurysm. Clipping includes putting a clip on the outside of the vessel to seal off blood flow. Coiling involves going in through the inside of the vessel with a small catheter and placing small coils inside of the aneurysm to close it off and stop bleeding.



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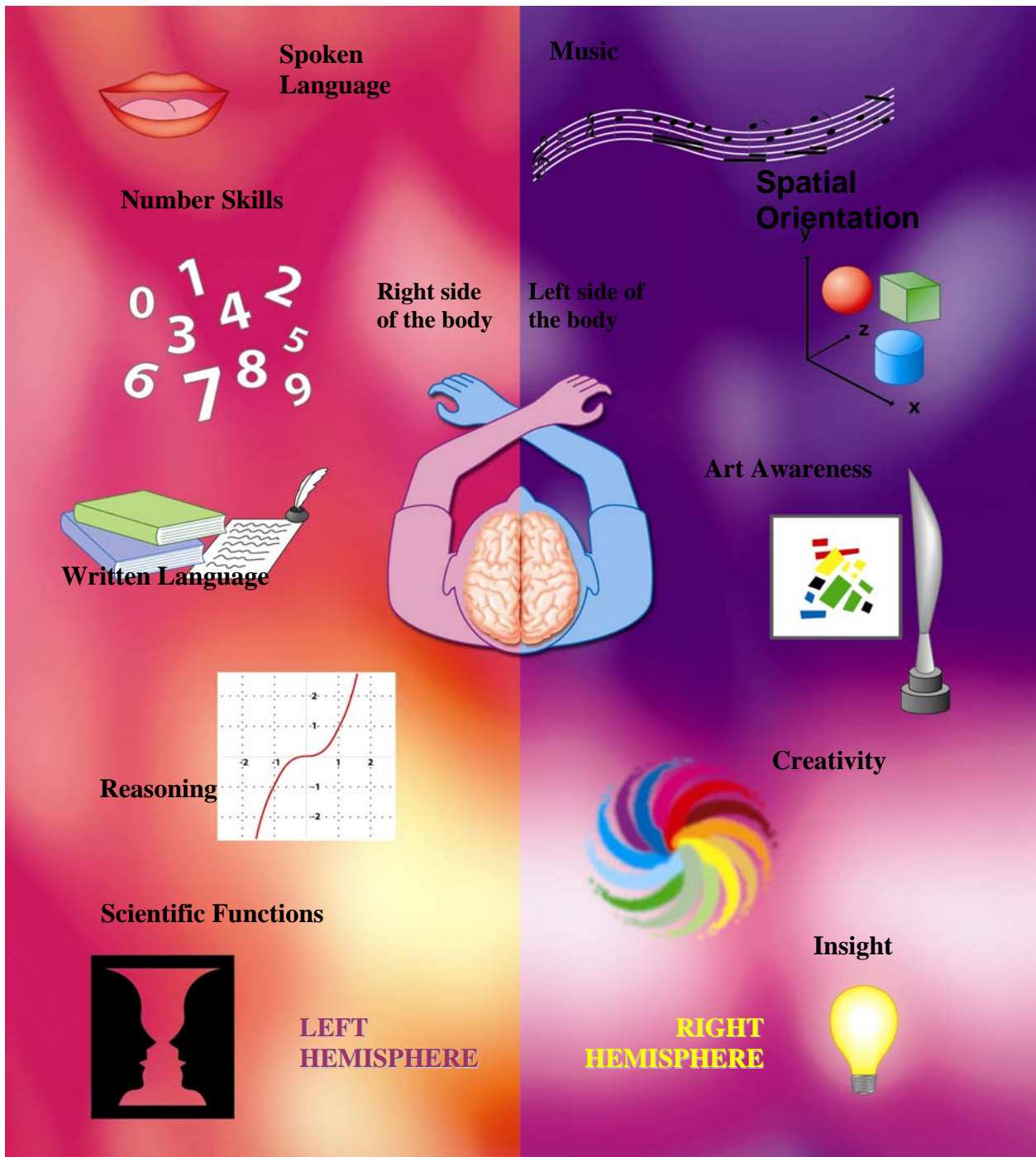
## How does the brain control my body?

Your brain controls many of the actions of your body. The brain is divided into different areas that control how the body moves and feels. The picture below shows the left side of the brain and the areas that may be affected by tissue death.



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The **left side of the brain** controls the movement and feeling on the right side of your body. It controls how you solve problems, understand what you read or hear, and how you reason with others. Survivors of left-sided strokes may have weakness or paralysis of the right side of the body. They may have trouble with talking and/or understanding written or spoken words. This is called aphasia. Survivors may also have a hard time remembering new information.



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The **right side of the brain** is responsible for movement and feeling on the left side of the body. This side of the brain is in charge of creative, artistic skills. A right-sided stroke might cause weakness or paralysis on the left side of the body. Survivors of right-sided strokes may have problems judging distances and space, making them more likely to fall or bump into objects.

There are many **general** symptoms that a stroke survivor may experience. Sometimes survivors will have problems with judgment and uncontrolled behavior. They may not realize that they can no longer safely complete tasks as they did before the stroke. For example, a stroke survivor with paralysis on one side of the body may believe he or she can get up and walk, leading to a fall. A stroke survivor may not realize they have problems with movement, sensation, or vision. It is important that caregivers are aware of the problem areas in order to create a safe environment.

### **Common stroke medications**

Knowing what stroke is and what will increase your chances of a stroke are the first steps in controlling your risk for stroke. Sometimes medicines are needed to help control your risk factors. Work with your doctor to see what medicines are best for you.

**Antihypertensive “blood pressure” medicines** are used to lower your blood pressure when diet and exercise are not enough. There are over 50 types of these medicines on the market. Each medicine works differently to lower blood pressure. Talk with your doctor about which medicine is best for you. Some things to consider in choosing the right medicine for you are cost, convenience, side effects, and interactions with other medicines. **It’s important that you take your blood pressure medicine, even if you feel fine.** Otherwise, the medicine will not work properly.

**Cholesterol-reducing medicines** help to lower the amount of cholesterol in your blood stream. This will help to prevent a stroke. Work with your doctor to see if cholesterol-reducing medicines are right for you.

**Blood clot prevention medicines** help to prevent a stroke by stopping blood clots from forming in the blood stream. There are two types of this drug: anticoagulants and antiplatelets. Work with your doctor to choose the right type of medicine for you.

## Recovery and rehabilitation

Rehabilitation starts in the hospital as soon as possible after the stroke. Depending on the severity of the stroke, rehabilitation may continue after you leave the hospital. Your rehabilitation team may include:

- **Neurologists** are doctors skilled in finding the cause of and treating diseases of the nerves and brain.
- **Nurses** coordinate day-to-day care and help to make rehabilitation a part of the stroke survivor's routine.
- **Physical therapy (PT)** helps restore physical acts and skills like getting in and out of bed, moving from a bed to a chair, balance, and walking.
- **Occupational therapy (OT)** helps relearn the skills you need for everyday living such as eating, going to the bathroom, dressing, and taking care of yourself.

**Speech and language pathology (SLP)** can help stroke survivors who have trouble understanding or speaking written or spoken words (aphasia). A stroke survivor with aphasia can think as well as before the stroke but is not able to get the right words out. Stroke survivors with aphasia can also have difficulty processing words coming in. Speech therapists can teach ways for coping with this challenge.

- **Social workers and case managers** provide counseling and support services for stroke survivors and their families. They help caregivers find the best possible solutions to rehabilitation and recovery needs.

## Life at home for stroke survivors and their caregivers

You may be nervous about being on your own at home after a stroke. Common concerns are:

- A stroke may happen again
- Adjusting to new disabilities
- Ability to go home rather than a nursing home or rehabilitation facility
- The caregiver may not be prepared to care for the stroke survivor
- That friends and family will abandon the stroke survivor

Many communities provide stroke support groups, education, and services that may help with these concerns. Talking about your concerns may be helpful.

Here are some steps to help make the move home easier and safer.

- Ask your doctor about ordering a home therapy visit with physical and occupational therapists.
- Make your home wheelchair or walker friendly by moving furniture and adjusting doors.
- Change lighting in your home to decrease glare and help you see better.
- Keep your phones within easy reach.

Staying safe and connected:

- Write down emergency numbers in large print on index cards and keep them handy.
- Arrange for people to check in with you regularly.
- Accept help with household chores.
- Allow family members and friends to drive you places.
- Keep active with your family and friends.

How to stop a fall:

- Move furniture out of your path. Place extra furniture next to a wall or in a less used room.
- Clear paths to the bathroom, kitchen, exits, and bedroom.
- Move electrical cords out of the way.
- Wear non-skid shoes.
- Remove loose carpets in hallways and stairwells.
- Install handrails in stairways.

### Using the bathroom:

- Install handrails.
- Use grab bars in the tub and shower.
- Put non-slip flooring strips inside and outside the tub.
- Use bathtub benches and toilet chairs.
- Use easy-to-use water faucets.
- Use adjustable or handheld showerhead.
- Place bath supplies where they are easy to reach and use.

### Bedroom safety:

- Keep a phone close in case you need help.
- Have a light switch near your bed.
- Use a nightlight and have a clear path to the toilet at night.

### Getting dressed:

- Wear loose fitting clothes.
- Wear clothes that fasten in the front.
- Replace buttons, zippers, and laces with Velcro fasteners.
- Talk with other stroke survivors for ideas and resources.
- Check these websites for adaptable clothing:  
<http://www.makoa.org/clothing.htm> and <http://www.professionalfit.com>

### Staying safe in the kitchen:

- Consider having the temperature control buttons to your stove on the front of the stove, instead of the back.
- Install automatic shut-off controls.
- Keep a fire extinguisher handy.
- Put a mirror over the stove to help you see the stovetop if you are seated while cooking.
- Keep a clear space near the stove where you can place a hot pot quickly.
- Keep oven mitts handy.

### Returning to work and driving:

- Ability to return to work or to drive is something that is specific to each stroke survivor.
- Talk with your doctor about when it will be safe for you to return to these activities.

## **Coping with emotions**

Many stroke survivors are affected by emotional and mood changes. You may experience sudden laughing or crying spells that may or may not have an explanation. Some stroke survivors are helped by anti-depressant medications.

Some things that may help you cope with emotional fluctuations:

- Be open about it. Let people know that you cannot always control your emotions. Explain that the emotions you show on the outside may not reflect how you feel on the inside.
- Distract yourself. If you feel an outburst coming on think of something else. Count backwards or count objects in the room.
- Relaxation techniques may be helpful. Some ideas include: deep breathing, changing your posture, or relaxing your muscles.

## **Depression**

Many people go through depression after a stroke. This can be overwhelming, affecting the spirit of everyone involved. A depressed person may refuse to take medicines, may not want to perform exercises, or may be irritable with others. The depression may dampen a caregiver's enthusiasm for helping with recovery or drive away others who want to help. This may limit the social interactions that the stroke survivor needs to overcome the depression. The stroke survivor's depression may improve over time.

Some things you can do to help cope with depression:

- Stay in contact with other people.
- Continue to enjoy some of your past leisure activities.
- Stay active in spiritual activities.

You may need medical help if the depression continues. Your doctor may recommend counseling, group therapy or medicines.

## Memory loss

Some changes, such as memory loss, can be so subtle that you may not notice them at first. There are several different types of memory loss after a stroke. The most common type is vascular dementia. This is a decline in intellectual abilities because of a stroke. Brain tissue is damaged because of reduced blood flow to the brain. The brain cells will have difficulty working together to process information. Some symptoms of *vascular dementia* are:

- Memory loss
- Confusion
- Mood swings and personality changes
- Language problems
- Difficulty paying attention or following a conversation
- Impaired motor skills
- Difficulty planning and organizing tasks
- Trouble seeing
- Difficulty with calculations, making decisions, solving problems
- Unexplained worry or feelings of sadness

Your doctor can diagnose vascular dementia by examination and testing. Any type of memory loss needs to be evaluated by a doctor.

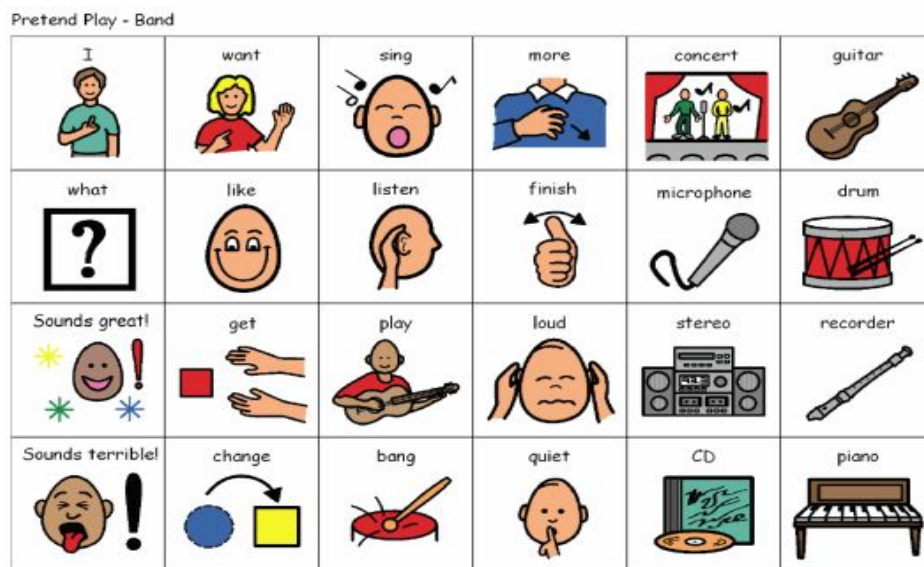
Helpful ideas:

- Get a routine and stick with it as much as possible. Do your activities at the same time every day.
- Break down complex tasks into manageable steps.
- When something needs to be done, do it right away or make yourself a note.
- Have a place you put important items so they are easily found.
- The use of puzzles or “brain teasers” may be helpful to regain your thinking and memory skills. Some examples are crossword, word searching, jigsaw and Sudoku puzzles and concentration games (remembering and matching games). Combine these challenging activities with periods of rest.

## Communication problems

You may have problems with speech or language if a stroke causes damage to the language center of the brain. Language problems can include either understanding or speaking difficulties. Your rehabilitation team will help you with ideas on how to cope with these challenges. Some ideas to help adjust to communication challenges include:

- Speech therapy
- Having the stroke survivor write out or draw what he or she needs
- Slow down and take time to communicate what is needed. Take one idea at a time.
- The use of a word or picture board may be helpful.



Example of a picture board

## Skin

Bedsore can be a serious problem for stroke survivors who spend increased time in bed or in a wheelchair. Sores may be found on the buttocks, heel, back of the head, or side of the ankle. It is important to keep the stroke survivor from staying in one position for too long. Use pillows to support the affected arm or leg. Special mattresses or cushions can reduce pressure and help prevent bedsore.

## **Diet, nutrition and eating**

You should follow a healthy low-fat, low-salt diet to help prevent another stroke and to stay at a healthy weight. A lower activity level may lead to weight gain if you eat the same amount of calories as when you were more active.

Some stroke survivors have less of an appetite. Poor fitting dentures or a reduced sense of taste and smell make food less desirable. The stroke survivor who lives alone may skip meals due to a lower desire to eat and the effort needed to prepare meals. Softer foods with stronger flavors may make eating more pleasant.

Stroke survivors may have trouble swallowing. They may need to use specific swallowing techniques while eating so they do not choke on their food. Stroke survivors may forget to chew or swallow properly. Tougher foods should be cut into small pieces. If you have swallowing difficulties, a speech and language pathologist can assist you.

## **Sexuality**

Part of getting back into a normal routine involves resuming a healthy sex life. The need to love and be loved, and to have the physical and mental release sex provides is important. Concern of having another stroke during sex is common. It is unlikely that a stroke will happen during sexual activity. Talk with your doctor before returning to sexual activity to be sure you are healthy enough.

A stroke can change your body and how you feel. Both can affect sexuality. Stroke survivors report a decrease in sexual desire and how often they have sexual relations. Women report a strong decrease in vaginal lubrication and the ability to have an orgasm. Men often have weak or failed erections and ejaculations.

Communication is key. Talking about sex is hard for many people, more so if you are unable to understand or say words, or if you have uncontrollable crying or laughing. It is important to talk openly and honestly with your partner about your sexual needs, desires and concerns.

## Pain

A stroke survivor may have pain for many reasons. Under normal conditions pain is a way for your brain to tell you that your body is being hurt. This is not always the case with the stroke survivor. Sometimes the damage to the brain can cause normal touch to feel painful. Pain may be felt in the joints or muscles due to tightness or weakness in the affected limb.

Pain after a stroke can be:

- Mild, moderate or severe
- Constant or on-and-off
- On part or all of the side of your body affected by the stroke
- Felt in your face, arm, leg or torso
- Aching, burning, sharp, stabbing or itching

### Treating your pain

To find relief, you must first find the cause of your pain. Pay attention to when it happens and in what part of your body. Does it seem to be caused by something or someone touching you? Tell your doctor about your symptoms. Together you can find the best treatment. Here are some solutions you can try at home.

- Avoid things that can cause pain. This could be hot baths, tight or easily bunched clothing, pressure on the side of your body affected by stroke.
- Use heat packs or exercises prescribed by your physical or occupational therapist.
- While sitting or lying down, support your paralyzed arm on an armrest or pillow to relieve shoulder pain.
- Do not let the pain keep you from being active. Not using your muscles may lead to muscle spasm.
- Support your weakened or paralyzed arm with a sling while walking to reduce shoulder pain.
- Check the skin under braces often to be sure that sores are not developing.
- Depression is common if you have chronic pain. See your doctor if you are depressed. Counseling and medicine may help.

## Spasticity after stroke

Spasticity is tightness in the muscles of your arms or legs. This is a common response to the brain injury caused by stroke. The spasticity may get better over time or stay the same. Some symptoms of spasticity are:

- Stiffness in the arms, fingers, or legs
- Painful muscle spasms
- Uncontrolled movements or jerking
- Increased muscle tone
- Abnormal posture

### What treatments are available?

Stretching at least once or twice a day may help. Regular stretching may prevent muscle shortening and reduce muscle spasticity for hours. Weight bearing exercises may also help reduce spasticity. If stretching is not enough, casts or splints may help to improve the range of motion of the affected limb. Applying cold compresses can reduce spastic tone. There are many medicines that can be helpful. Talk with your doctor to see if a medicine would work for you.



## Sleep and fatigue

Most stroke survivors experience a higher level of fatigue. Sleep problems are common in stroke survivors and usually get better with time. A lack of sleep can be frustrating and make you feel tired and irritable. A common cause of sleeping difficulty in stroke survivors is sleep-disordered breathing. This is caused by abnormal breathing patterns. The most common type of sleep disorder is obstructive sleep apnea (OSA). With OSA you may stop breathing for 10 seconds or more many times a night. Some symptoms of sleep-disordered breathing are:

- Loud snoring
- Waking up frequently during the night, gasping for breath
- Increased sweating
- Shortness of breath
- Excessive tiredness during the day
- Memory troubles
- Headaches
- Irritability

Talk with your doctor if you think you may have a sleep disorder.

Treatments for sleep disorder may include:

- Losing weight
- Staying away from alcohol and sleep medicines
- Wearing dental appliances at night to help open your airway
- Sleeping on your side, not on your back
- You may need an assistive breathing machine at night
- Severe cases may need surgery

## Stroke-related webpages

American Occupational Therapy Association (AOTA):

[www.aota.org](http://www.aota.org)

American Physical Therapy Association (APTA):

[www.apta.org](http://www.apta.org)

American Speech-Language-Hearing Association (ASHA):

[www.asha.org](http://www.asha.org)

American Stroke Association (ASA) - A Division of the American Heart Association

[www.strokeassociation.org](http://www.strokeassociation.org)

Bronson Rehabilitation:

<http://www.bronsonhealth.com/MedicalServices/Rehabilitation/page907.html>

Bronson Stroke Care:

<http://www.bronsonhealth.com/MedicalServices/NeuroSciences/page900.html>

National Aphasia Association:

[www.aphasia.org](http://www.aphasia.org)

National Institute of Health Stroke Webpage:

<http://stroke.nih.gov/>

National Stroke Association:

[www.stroke.org](http://www.stroke.org)

Senior Services of Kalamazoo:

<http://seniorservices1.org/index.htm>

The Internet Stroke Center at Washington University:

[www.strokecenter.org](http://www.strokecenter.org)

## Stroke support groups

### **Bronson Methodist Hospital Stroke Survivor Support Group**

Bronson Gilmore Center for Health Education

601 John Street, Kalamazoo

Parking available in the Jasper Street Parking Ramp

(269) 341-7500

The Stroke Survivor Support Group meeting is the third Thursday of the month from 11 a.m. to noon (except for July and August).

### **Mary Free Bed Rehabilitation Hospital Stroke Support Group & Mentor Program**

2nd Floor Conference Room

235 Wealthy Avenue SE

Grand Rapids, MI 49503

616.242.0443

The Stroke Support Group meeting is held the first Wednesday of every month, 6:15 pm - 7:30 pm.

### **Lakeland Hospital Head Injury/Stroke Support Group**

St. Joseph, MI 49085

Meets monthly. Call (269) 985-4510 for more information.

### **Senior Services**

918 Jasper Street

Kalamazoo, MI 49001 (just south of Bronson Methodist Hospital)

269-382-0515

Meets: April - December on the 2<sup>nd</sup> and 4<sup>th</sup> Tuesdays from 1:30 - 3:30pm

### **Southwest Regional Rehabilitation Center Stroke Support Group**

393 E. Roosevelt

Battle Creek, MI 49017

Contact the Medical Social Work Department at 269-965-3206

### **Three Rivers Health Stroke Support Group**

701 S. Health Parkway

Three Rivers, MI 49093

Contact Chris Johnson at 269-273-9795 or 269-273-9681.

## Definitions of some common medical terms

**Ambulation:** Walking

**Aneurysm:** A weak spot on the wall of the artery that balloons out from the vessel

**Angiography:** A test with contrast to look at blood vessels in radiology

**Anticoagulants:** Medicines used to keep clots from forming and prevent ischemic stroke

**Antihypertensives:** Medicines used to lower blood pressure

**Antiplatelets:** Medicines used to keep blood clots from forming and prevent ischemic stroke

**Aphasia:** A language deficit where there is difficulty speaking and/or understanding spoken or written words

**Arrhythmia:** An irregular or unpredictable heart beat

**Arteriovenous malformation (AVM):** A group of blood vessels that are not connected normally, causing a tangle of distorted blood vessels of various sizes

**Atherosclerosis:** A build up of plaque or “hardening” of arteries

**Aspiration:** Occurs when food or liquid is breathed into the lungs

**Ataxia:** Uncoordinated movement

**Atrial fibrillation:** An irregular beat of the top of the heart that increases your risk of stroke

**Barthel index:** A tool to look at how well a stroke survivor can complete typical daily activities

**Brain stem:** The part of the brain that controls activities like breathing, blood pressure, and eye movement

**Broca’s aphasia:** An aphasia where the stroke survivors can understand what is said and written but have difficulty expressing themselves

**Carotid artery:** The arteries in the neck that take blood from the heart to the brain

**Carotid endarterectomy:** A surgical procedure where plaque is removed from the carotid artery to let blood flow more freely to the brain

**Carotid stenosis:** A build-up of plaque in the carotid arteries that narrows the vessels

**Cerebellum:** The part of the brain that controls coordination of movement

**Cerebrospinal fluid:** The fluid in the brain and spinal cord

**Cholesterol:** A soft, waxy fat in the bloodstream and cells

**Cognition:** The process of knowing, including awareness, perception, reasoning, remembering, and problem solving

**Contenance:** The ability to control body functions; especially bowel and bladder use

**Contracture:** A condition where muscle become tight and resistant to stretching

**CT or “CAT” scanner:** A special x-ray that lets you see the structures of the brain precisely

**Doppler ultrasound:** A test that looks at blood flow through your arteries and veins

**Dysarthria:** Difficulty speaking due to muscle movement difficulty

**Dysphagia:** Difficulty with swallowing

**Edema:** Swelling of tissue due to build-up of water

**Embolic stroke:** A stroke caused by a blood clot

**Emotional lability:** When emotions change suddenly, for no apparent reason

**Gait:** Your style of walking

**Glasgow coma scale:** A tool used to measure responsiveness in a neurologically impaired person

**Global aphasia:** A type of aphasia where stroke survivors have difficulty understanding others and expressing themselves

**Hematoma:** A collection of blood in an organ, tissue or space

**Hemianopia:** A vision loss where half of one visual field is lost in one or both eyes

**Hemiplegia:** Inability to move one side of the body

**Hemorrhage:** Bleeding from a blood vessel in surrounding tissue

**Hypertension:** Elevated blood pressure

**Hypotonia:** A decrease in muscle tone or strength

**Hypoxia:** A lack of oxygen that causes weakness, tremors, and speech difficulties

**Infarct:** An area of tissue death resulting from lack of blood supply

**Intracerebral hemorrhage:** A stroke caused by bleeding in the brain

**Ischemia:** A blockage of blood flow to the brain

**Left hemisphere:** The left half of the brain that controls the right side of the body, speaking, writing, and problem solving skills

**Magnetic Resonance Imaging (MRI):** A test that looks at internal structures with magnetic and radio waves

**Neglect:** A lack of awareness of objects or actions on one side of the body

**Occlusion:** Disruption of blood flow through the blood vessel; usually caused by atherosclerosis or a blood clot

**Penumbra:** An area of the brain around the stroke that is in danger of dying, but is not permanently damaged

**Plaque:** A fatty deposit in the inner lining of the artery

**Platelets:** The part of blood that sticks together to form clots

**Right hemisphere:** The right of half of the brain that controls the left side of the body

**Secondary injury:** Injury to the cells surrounding the dead cells that can occur for hours after the initial injury

**Spasticity:** Abnormally increased tone in a muscle

**Stenosis:** Abnormal narrowing of a blood vessel

**Stroke:** The sudden interruption of blood flow to a part of the brain that leads to cell death

**Subarachnoid hemorrhage:** A stroke caused by bleeding under the membrane surrounding the brain

**Thrombolytic agents:** Medications that work to dissolve stroke-causing clots.

**Thromboembolism:** An clot that originates in one vessel and travels through the bloodstream to be lodged in another vessel

**Thrombosis:** The clotting of blood within a vessel

**Thrombotic stroke:** A stroke caused by a blockage of a blood vessel from the build-up of deposits  
The occlusion is complete when a clot lodges in the narrowed vessel.

**Transient Ischemic Attack (TIA):** A brief interruption of blood flow to the brain causing temporary stroke symptoms, lasting less than 24 hours

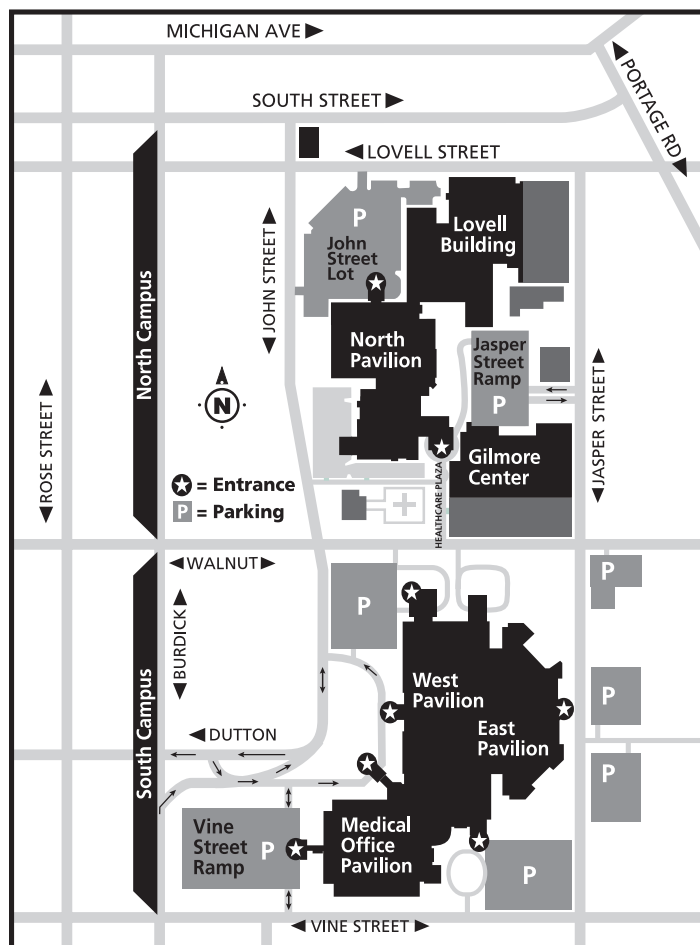
**Unilateral neglect:** A lack of awareness of space on one side of the body

**Vertebrobasilar arteries:** The arteries in the back of the neck that supply blood to the brain stem and cerebellum









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