

Stroke Information Booklet



A guide prepared for you by specially trained stroke physicians and nurses at New Hanover Regional Medical Center (NHRMC) to help you and your loved ones understand stroke and the effect it can have on your life

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What is a stroke?

Stroke is a condition where part of the brain dies because it goes without blood for too long. Strokes can happen when the blood supply to a part of the brain is cut off, because either:

- An artery in the brain is blocked (ischemic)
- An artery in the brain starts bleeding (hemorrhagic)

How do strokes affect people?

The effects of stroke depend on many things, including:

- Which part and how much of the brain is affected
- How quickly the stroke is treated

Some people who have a stroke have no lasting effects. Others lose important brain functions. For example, some people become partially paralyzed or unable to speak. Stroke is one of the leading causes of death and disability in the United States.

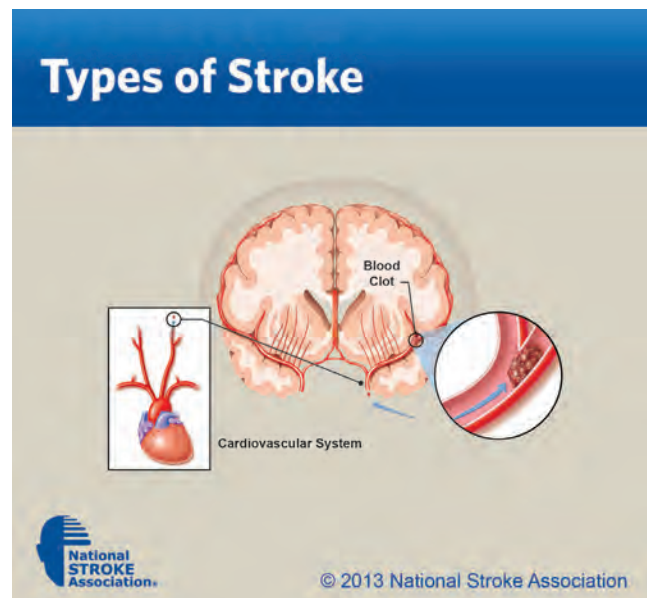
Types of Stroke

Ischemic stroke occurs as a result of an obstruction or blockage within a blood vessel supplying blood to the brain. This may happen because of plaque buildup in the vessels of the brain. It accounts for 87 percent of all stroke cases.

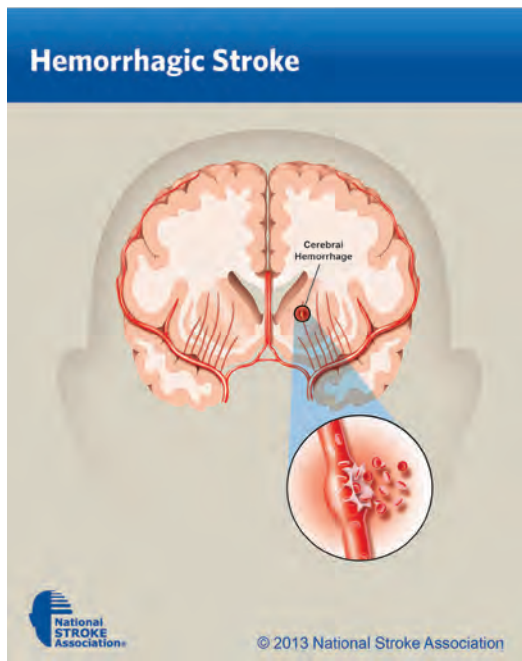
Learning About Stroke

If you or a loved one has had a stroke, it can be a stressful time full of questions and concerns. The specially trained stroke physicians and nurses at New Hanover Regional Medical Center (NHRMC) and other members of NHRMC’s healthcare team will work with you to regain as much function as possible after your stroke.

At every step in your care, we will explain what we are doing and answer any questions you may have. We encourage you to ask questions so that you are participating in the care you or a loved one receives.



Hemorrhagic stroke occurs when a weakened blood vessel ruptures in the brain. Blood spills into the brain, killing tissue and cells.



Transient Ischemic Attack, or TIA, is caused by a temporary clot. Often called a “mini stroke,” these warning strokes should be taken very seriously. Those who experience TIAs are at an increased risk for a stroke in the future.

Getting Help Right Away

F.A.S.T. is an easy way to remember the sudden signs of stroke. When you recognize these signs, call 911 immediately. This is important because the sooner a stroke patient gets to the hospital, the sooner they’ll get access to treatment. Fast treatment can make a remarkable difference in a patient’s recovery.

F.A.S.T.

Face drooping: Does one side of the face droop or is it numb? Ask the person to smile.

Arm weakness: Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?

Speech difficulty: Is speech slurred, are they unable to speak, or are they hard to understand? Ask the person to repeat a simple sentence, like “the sky is blue.” Is the sentence repeated correctly?





Time to call 911: If the person shows any of these symptoms, even if the symptoms go away, call 911 and get them to the hospital immediately.

What to do if you think someone is having a stroke:

Immediately call 911. Also, check the time, so you know when the first symptoms appeared. In the acute period, ischemic stroke may be treated with a “clot-busting” drug called tissue plasminogen activator, or tPA. Tissue plasminogen activator must be given within three hours of stroke onset. Not all patients, however, will be eligible to receive tPA.

**Remember
You Can Help.
Call 911.**

Every minute counts when someone is having a stroke. The longer blood flow is cut off to the brain, the greater the damage.

	F ACE	Ask the person to smile. Does one side of the face droop?
	A RMS	Ask the person to raise both arms. Does one arm drift downward? Is one arm weak or numb?
	S PEECH	Ask the person to repeat a simple sentence. Is the sentence repeated correctly? Is speech slurred?
	T IME	If the person shows any of these symptoms, call 911 immediately.

Diagnosing Stroke

The first step in caring for someone with stroke symptoms is to determine whether they are actually experiencing a stroke. Two different tests are often used to help diagnose a stroke:

CT (Computerized Tomography)

A CT scanner is a doughnut-shaped, precise imaging machine and is the first test performed to see if the stroke symptoms are caused by bleeding or a clot. Patients lie on a table in the middle of the machine. The machine takes very detailed pictures of a patient's head. It can look at bones, brain, fluid-filled spaces and blood vessels. Sometimes, a stroke caused by a blood clot (ischemic) will not be seen on the CT scan for several hours or even days.

Magnetic Resonance Imaging (MRI) and Magnetic Resonance Angiography (MRA)

- MRI is a type of imaging test that uses strong magnetic and radio waves to take pictures of the inside of your body.
- MRA is an imaging test that uses strong magnetic and radio waves to take pictures of the blood vessels.

Both MRI and MRA show detailed pictures of the brain and help show where damage to the brain might be located. If the patient is unable to have a MRI or MRA performed, a second CT scan may be performed.

Other Useful Tests

Carotid Duplex

A carotid duplex is an ultrasound test that checks the carotid arteries for signs of plaque, or obstructed blood flow. This ultrasound is painless and does not take much time to complete. If a blockage is found, additional testing may be needed.

Echocardiogram (Echo)

An echocardiogram uses sound waves (ultrasound) to produce moving pictures of your heart. It is also known as an echo. An echo looks at how well your heart works. The doctor may look at size of the heart, how the blood flows and how well the heart pumps. In most cases, it is performed by applying an ultrasound probe to the chest. In special cases, it may be done internally by inserting the probe into the esophagus.

One of the most common types of echocardiogram is the transesophageal echocardiogram (TEE). This test is performed from inside the patient's food pipe (esophagus). It uses the same ultrasound waves as a traditional echocardiogram, but a TEE gives a closer and clearer picture of the heart.



Medications Used in Treatment

Depending on the type of stroke, a physician may prescribe the following medications commonly used to treat and prevent future strokes.

Tissue Plasminogen Activator (tPA)

The only medical treatment for acute ischemic stroke is the FDA-approved, clot-busting drug tPA, which must be administered within a 4½ hour window from the onset of stroke symptoms, but only if certain criteria are met. It is administered by IV and breaks up a clot that may be blocking blood flow to the brain. Before it is administered, a CT scan is performed to detect the possibility of a blood clot or any bleeding within the brain. If given promptly, tPA can significantly reduce the effects of stroke and reduce permanent disability. Generally, only three to five percent of patients who suffer a stroke reach the hospital in time to be considered for this treatment. Therefore it is extremely important that anyone experiencing signs and symptoms of stroke call 911 right away.

Aspirin

How does this drug work?

- It stops platelets, the glue of blood clots, from getting sticky and clumping, helping prevent strokes.

How is this drug best taken?

- Non-enteric coated aspirin is recommended over enteric-coated. Talk to your doctor, however, if you have a history of stomach problems or gastrointestinal bleeding.
- To gain the most benefit, do not miss doses.
- Take with or without food. Take with food if it causes an upset stomach.

What are some side effects of this drug?

- You may experience belly pain or heartburn.
- You may have an upset stomach or vomiting. Small meals, good mouth care, sucking on hard, sugar-free candy or chewing sugar-free gum may help.
- Bleeding problems may occur, including bloody or dark stools, easy bruising or bleeding.

- Upset stomach or vomiting. Small meals, good mouth care, sucking on hard, sugar-free candy or chewing sugar-free gum may help.
- Loose stools (diarrhea)

When do I need to call my doctor?

- If you think there was an overdose, call your local poison control center or emergency department right away.

Clopidogrel (Plavix)*How does this drug work?*

- Clopidogrel stops platelets from getting sticky and clumping.

How is this drug best taken?

- To gain the most benefit, do not miss doses.
- Take this drug at the same time of day.
- Take with or without food. Take with food, if it causes an upset stomach.
- There are certain medications to avoid taking with Plavix, as they may make it less effective and/or increase the risk of bleeding. These medications include aspirin, ibuprofen (Motrin), and proton pump inhibitors (Omeprazole). If you take any of these medications, please contact your doctor or pharmacist to be sure it is safe to take with Plavix.

What are some side effects of this drug?

- Itching
- Bleeding
- Bruising
- Nosebleed

Warfarin (Coumadin)*How does this drug work?*

- Warfarin changes the body's clotting system. It thins the blood to stop clots from forming.

How is this drug best taken?

- Use as you have been told, even if you are feeling better.
- Take this drug at the same time of day.
- To gain the most benefit, do not miss doses.
- Keep your use of vitamin K the same from day to day. Talk with your doctor. Do not make changes in your normal diet.
- Take with or without food. Take with food if it causes an upset stomach.

What are some side effects of this drug?

- Bleeding problems
- Headache
- Upset stomach or vomiting. Small meals, good mouth care, sucking on hard, sugar-free candy or chewing sugar-free gum may help.

When do I need to call my doctor?

- If you think there was an overdose, call your local poison control center or emergency department right away.
- A fall or crash when you hit your head. Talk with your doctor, even if you feel fine.
- Swelling, warmth or pain in the leg or arm
- Change in thinking clearly and with logic
- Very bad headache
- Very upset stomach or throwing up
- Very bad back or belly pain
- Black, tarry, or bloody stools
- Blood in the urine
- Coughing or throwing up blood
- Any bruising or bleeding

Aggrenox (Aspirin and Dipyridamole)*How does this drug work?*

- Aspirin and Dipyridamole stop platelets from getting sticky and clumping.

How is this drug best taken?

- Take with or without food. Take with food if it causes an upset stomach.
- Swallow capsule whole. Do not chew, break or crush.

What are some side effects of this drug?

- Headache
- Belly pain or heartburn

Statins

How do these drugs work?

Statins are drugs that decrease LDL or “bad” cholesterol. Statins block the production of cholesterol in your liver and also help remove bad cholesterol from your blood. They can also help stabilize the lining of blood vessels which can help prevent future strokes and even heart attacks.

Several statins are currently on the market. Some examples include: Zocor (simvastatin), Mevacor (lovastatin), Pravachol (pravastatin) and Lipitor (atorvastatin).

How are these drugs best taken?

- Take with or without food. Lovastatin should be taken with food.
- Take in the evening.

What are some side effects of these drugs?

- Stomach upset
- Headache
- Muscle aches

Missed Medication Doses

What do I do if I miss a dose? (Does not apply to patients in hospital.)

- Take a missed dose as soon as you think about it.
- If it is close to the time for your next dose, skip the missed dose and proceed with your regularly scheduled dosage time.
- Do not take two doses at the same time or extra doses.

Knowing and Managing Stroke Risk Factors

Multiple factors increase the risk of stroke, including genetics, age, gender and ethnicity. Risk factors you can control through lifestyle modification include high blood pressure, diabetes, high cholesterol, heart disease, obesity, smoking and alcohol use. Unfortunately, factors like age, gender, ethnicity and family history can't be changed. Studies show that up to 80 percent of strokes can be prevented. Knowing and managing your controllable risk factors is your best protection against stroke.

High Blood Pressure (Hypertension)

High blood pressure is diagnosed when three consecutive blood pressure readings are greater than 140/90. People with diabetes or kidney disease should aim for blood pressure readings less than 130/80. High blood pressure is the

number one risk factor for stroke due to injury of blood vessel walls. Plaque may form within the blood vessels of the brain, which can lead to stroke.

If you have high blood pressure:

- Always take your blood pressure medications as prescribed by your doctor.
- Keep all blood pressure check ups and remember the goal of 130/80.
- Remember that weight loss, regular exercise and quitting smoking all help manage blood pressure and prevent stroke.

Diabetes

People with diabetes are two to four times more likely to experience stroke than those without diabetes. Diabetes affects the body's entire circulatory system.

If you have diabetes:

- Keep all appointments with your doctor and know what your blood sugar value goals are.
- Always take your diabetes medications as prescribed by your doctor.
- Include your family in your care and comply with any dietary recommendations.
- Ask questions and seek out opportunities to learn more about your condition.

Resources:

- American Diabetes Association, 800.232.3472, www.diabetes.org
- We can also arrange for the diabetes educator to speak with patients while they are at the hospital.

Tobacco Use and Smoking

Quitting smoking is the most important lifestyle change you can make. Tobacco products increase blood pressure, heart rate and cholesterol, all of which can lead to plaque buildup within blood vessels. All of these factors increase the risk of stroke.

It is never too late to quit smoking. You will notice changes and benefits to your health soon after you stop smoking. Here are some steps you can take to help you quit smoking:

- Set a date to quit smoking.
- Pay attention to when and why you smoke. Some people find it helpful to write down each time they smoke. Record the time and what you are doing. This will help you consider what to do next time in place of smoking.
- Slowly reduce your smoking until your quit date.



- Remove other tobacco products from your home, car and workplace.
- Avoid places and situations where you are more likely to smoke. If people close to you smoke, ask them to quit with you.
- Reward or treat yourself every time you do not smoke. Do not use food as a reward. One option: Place the cost of the cigarettes you did not smoke into a collection jar and put towards a special occasion or reward.

Resources:

- American Lung Association, 800.784.8669
- American Cancer Society Quit Line, 614.227.2345
- Quit Line NC, 800.784.8669

High Cholesterol

Once you have had a stroke, you are at increased risk to have another. In addition to lifestyle modifications, you will likely be started on a cholesterol lowering medication, known as a statin. Your doctor will provide you with more information on what is best for you.

Heart Disease

If you have been diagnosed with heart disease or had a heart attack, you are at increased risk for stroke. Because plaque has built up in the vessels of your heart, the vessels in the brain may also have plaque buildup. Be sure to see your doctor regularly for close monitoring.

Stroke risk is also increased if you have:

- Atrial fibrillation (A-fib)
- Previous valve repair or replacement
- Congestive Heart Failure (CHF)

Prior Stroke or Transient Ischemic Attack (TIA)

If you have already had a TIA (mini-stroke), it is a warning sign that you may be at high risk for stroke. If you have already had a stroke in the past, it also increases your risk to have another. Be sure to see your doctor regularly for close monitoring and instructions.

Obesity

Obese persons are at increased risk to develop high blood pressure, high cholesterol, heart disease and diabetes – all of which can lead to stroke.

If you are overweight:

- Talk with your doctor about an appropriate diet and exercise plan to lose weight.
- Set measurable goals and record your progress.
- Find a support system to hold you accountable, including working out with a friend or workout partner.

Resources:

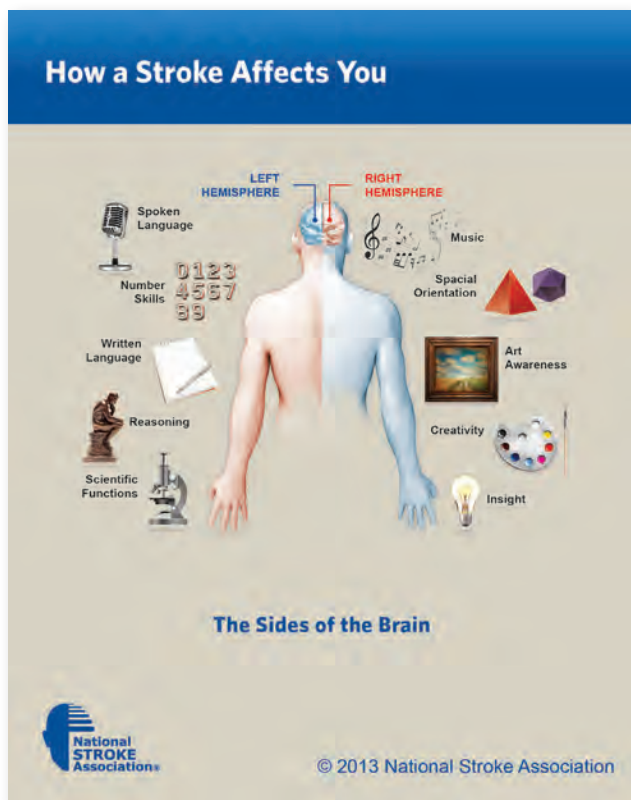
- American Dietetic Association, www.eatright.org
- *Cooking Light*, www.cookinglight.com

Alcohol or Drug Use

Alcohol abuse can increase your risk of stroke. For those who drink alcohol, it's best to limit one's number of drinks to no more than two drinks per day for men and no more than one drink per day for non-pregnant women. If you feel you are unable to limit your alcohol intake, please talk with your doctor, nurse or social worker. A drink consists of:

- 12 ounces of beer
- 5 ounces of wine
- 1½ ounces of liquor

Drugs that are abused, including cocaine, amphetamines and heroin, have been associated with an increased risk of stroke. If you use drugs, please talk with your doctor, nurse or social worker. Help through substance-abuse treatment programs is available.



Understanding Deficits

Brain Regions and Functions

The brain is separated into areas that control specific functions of the body. When an area of the brain is damaged by stroke, functions controlled in that area may be affected.

Right Brain

Generally, the effects of stroke depend on the area of brain tissue affected. One side of the brain controls the opposite side of the body. For example, if the stroke occurs in the brain's right side, the left side of the body will be affected, which could produce the following:

- Paralysis and/or numbness on the left side of the body
- Vision problems
- Speech difficulty

Left Brain

If the stroke occurs in the left side of the brain, the right side of the body will be affected, producing some or all of the following:

- Paralysis and/or numbness on the right side of the body
- Speech/language problems

Deficits That May Occur as a Result of Stroke

Cognitive (thought process) changes may include being unable to:

- Recognize family, friends or familiar places
- Remember how to do daily activities like eating, bathing or dressing
- Remember things like your birthday, the date or where you are
- Follow easy commands

Emotional Changes

After a stroke, people often experience emotional and behavioral changes. This is because stroke affects the brain, which controls our behavior and emotions. Injury from a stroke may make a person forgetful, careless, irritable or confused. Stroke survivors may also feel anxiety, anger or depression.

Motor (Movement) Deficits

After stroke, many movement and coordination problems may occur, including weakness or being unable to move specific parts of the body such as arms, legs and muscles in the face.

Neglect: Neglect involves ignoring the side of the body that has been affected by stroke.

Ataxia: Ataxia involves problems with coordination, movement and balance.

Apraxia: This is a problem where you cannot do simple, learned actions or gestures. You want to perform the actions but you cannot do them because the part of the brain that controls action or speech is affected. This may include the following problems:

- You are not able to make sounds or form words the right way
- You are not able to make facial movements like licking of lips, whistling, winking or sticking out your tongue
- You are not able to copy or draw simple figures or shapes

- You are not able to perform movements with your legs, such as shuffling steps or stepping over objects
- You are not able to use tools correctly
- You are not able to do exact movements with hands or fingers
- You are not able to imitate movements or follow an order

Sensory (seeing and feeling) Deficits

Sensory deficits usually appear on one side of the body. This can include:

- Decreased sense of touch
- Numbness
- Tingling
- Inability to feel hot or cold
- Blurred vision or loss of vision in one or both eyes

Dysphagia: This is when there is difficulty with swallowing. This can lead to problems with eating, drinking and taking medication. A “swallow evaluation” may be done during the hospital stay to confirm proper swallowing. If a person is at risk for aspiration, they may not be fed until proper swallowing is confirmed by a Speech Language Pathologist (SLP).

Language Deficits

Language is much more than words. It involves our ability to recognize and use words and sentences. Much of this capability resides in the left hemisphere of the brain. When a person has a stroke or other injury that affects the left side of the brain, it typically disrupts their ability to use language.

Aphasia: A stroke that affects the left side of the brain may lead to aphasia, a language impairment that makes it difficult to use language.

People with aphasia:

- May be disrupted in their ability to use language in ordinary circumstances
- May have difficulty communicating in daily activities
- May have difficulty communicating at home, in social situations or at work
- May feel isolated

Dysarthria: Dysarthria is the term used when a person loses the ability to control his or her mouth and throat to form speech. People who have dysarthria can understand language; they just can’t form words clearly. People with dysarthria might:

- Slur their speech and sound as though they are drunk
- Speak very softly or in a whisper

- Speak too quickly, too slowly or mumble
- Sound hoarse, nasal or breathy when they talk
- Drool or have trouble controlling their saliva
- Have trouble chewing or swallowing
- Find that their face droops to one side

Recovering From a Stroke

Scientists used to think that when a part of the brain was damaged, there was no way to recover what was lost. Recent research suggests, however, that the brain can recover from stroke to some degree. Full recovery from stroke depends on many factors, including:



- Severity of the stroke
- Age
- What part of the brain was damaged
- What other medical problems the person has
- Whether the person was sick before the stroke happened
- How soon the person was treated following the stroke

During recovery, people work to regain some of the abilities they lost. Even though a part of their brain was damaged by 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 and communicate. 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 walking devices.)

Often, recovery involves treatment in a stroke rehabilitation facility, also called “stroke rehab.” In rehab, a variety of medical professionals such as physical therapists, occupational therapists and speech therapists with special stroke training help in the recovery of stroke patients.

NHRMC Rehabilitation Hospital offers comprehensive inpatient rehabilitation to stroke patients in an innovative setting designed to help patients achieve independence and mobility in different environments. Not all patients will be eligible.

Facility

- 66,000-square-foot building
- 3,000-square-foot therapy gym
- Home to Easy Street®, a real-world environment that gives patients an opportunity to practice maneuvering on different surfaces, getting in and out of a car, shopping in a grocery store and managing at home

Scope of Services

- NHRMC Rehabilitation Hospital is an Inpatient Rehabilitation Facility (IRF)
- Physical Medicine and Rehabilitation (PMR) physicians and physician's assistants direct the patient's plan of care on a daily basis
- Skilled Rehabilitation Nursing is provided 24 hours a day
- Physical, Occupational, and Speech Therapy are available seven days a week
- Each patient is assigned a Certified Case Manager who acts as a liaison between patient, family/caregiver, rehabilitation team, physicians, and third party payors
- Other rehabilitation services that are available to the patient include Recreation Therapy, Social Work, and Psychology
- Patients have access to medical services provided at NHRMC including but not limited to Diagnostic Imaging, Laboratory, Pharmacy, Spiritual Care, Nutrition, and Respiratory Therapy
- Consulting physician services for medical management are provided by Hospitalists or other specialists as needed

NHRMC Rehabilitation Hospital is accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF) and has received specialty credentials for stroke, brain injury and amputee rehabilitation – making it the only facility in North Carolina with all three of these specialties. NHRMC Rehab Hospital is also accredited by The Joint Commission.

Caregivers and Different Types of Therapy

Family members can help a loved one who has had a stroke by providing encouragement, celebrating improvements and letting the survivor do as much as possible independently. Caregivers and other family and friends

can reassure stroke survivors that they are still a valued, important part of the family.

If you can no longer walk very well, a physical therapist can show you ways to improve the way you walk. He or she can also recommend braces, canes and other devices that might make it easier for you to walk.

If you can no longer swallow well, a speech and language therapist can teach you exercises that can improve how you swallow. He or she can also offer tips on how to cope with swallowing problems. For instance, the therapist might suggest you add powders or other ingredients to the liquids you drink, so that they are thick and more easily consumed.

If you can no longer hold your toothbrush, an occupational therapist can show you new ways of holding your brush, so that you can use it.

If you are depressed because you had a stroke, a psychiatrist can prescribe medicines to treat depression. He or she can also talk to you about the way you feel about the stroke.

Planning Your Discharge

Once you are ready to leave the hospital, there are many options. Hospital staff and case managers will help find the right choice for you.

Home

If deficits from your stroke do not significantly impede your daily life, you will be discharged to your home. If you have mild to significant deficits requiring therapy, home therapy may be arranged.

Acute Rehabilitation Facility

Acute rehabilitation is an inpatient program where you stay for a certain period of time to help you get stronger and work on getting back to daily life. You must be able to do three to four hours of therapy per day to be a part of this program. NHRMC is home to a nationally-recognized acute inpatient rehabilitation program.

Extended Care Facilities

If you are not able to participate in the frequent therapy sessions required for rehab, an extended care facility may be more suitable for your needs. These types of facilities are inpatient and can provide therapy as you need it.

Palliative Care

Palliative care is available to promote pain relief and comfort for end-of-life conditions.

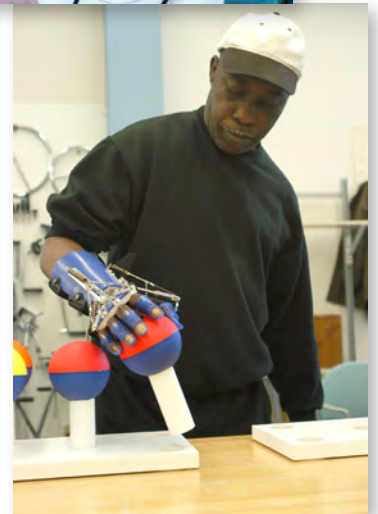
Resources

Listed below are some resources that may be helpful to you and your family.

American Stroke Association
www.strokeassociation.org
 1.888.4.STROKE

National Stroke Association
www.stroke.org
 1.800.STROKES

New Hanover Rehabilitation Support Groups
 910.343.7835



Common Stroke Terms

Activities of Daily Living (ADLs): tasks that are done on a daily basis such as dressing, bathing and eating

Ambulation: walking or gait

Anticoagulants: medicine that thins the blood and prevents the formation of blood clots

Antiplatelets: medicine that prevents platelets from sticking together which prevents the formation of blood clots

Aphasia: the inability to express and/or understand language

Aspiration: when food or fluids are inhaled into the lungs instead going down the esophagus, which increases the risk for infections in the lungs

Ataxia: difficulty with coordination, movement and balance

Atrial Fibrillation (Afib): an irregular heartbeat that increases the risk of forming a clot which can then lead to stroke

Carotid Arteries: the main arteries on each side of the neck that supply the brain with blood, which may become blocked with plaque, increasing the risk for stroke

Carotid Endarterectomy: a surgery that removes the plaque built up in the carotid arteries

Cognition: the ability to think

Deficits: the loss of mental or physical function

Depression: feeling of sadness which may develop in response to a stroke or may be caused by brain damage from the stroke

Dysarthria: a condition characterized by slurred or slow speech, in which a person has difficulty controlling or coordinating the muscles used for speaking, or has a weakness of those muscles

Dysphagia: difficulty swallowing or the inability to swallow

Embolism: a blood clot that forms, breaks off, and travels usually to the brain or lungs

Hemiparesis: weakness of the arm, leg or both on one side of the body

Hemiplegia: paralysis of the arm, leg, or both on one side of the body

Thrombus: a blood clot

