Stroke Patient Education Handbook









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Inova's Mission Statement

Our mission is to provide world-class healthcare – every time, every touch – to each person in every community we have the privilege to serve.



At Inova, all five of our hospitals are certified stroke centers and have been recognized as experts in stroke and cerebrovascular care by The Joint Commission. We provide exceptional care to our patients through screenings, advanced imaging and treatment, surgical intervention, and rehabilitation. We combine the latest technologies with compassionate and individualized support.

Inova's Stroke Team

We have a multidisciplinary team of stroke and interventional neurologists, neurosurgeons, neuroradiologists, vascular neurologists, neurointensivists, and rehabilitation specialists who provide expert management of all brain blood vessel conditions, as well as stroke support groups for postcare support.

What to Expect During Your Hospital Stay

Once your stroke has been diagnosed through a thorough physical evaluation and brain imaging, your treatment will begin and your team will develop a personalized care plan that meets your needs.

You will be evaluated each day by a member of the stroke team, who will update you and your family on diagnostic results, medications, treatments and rehabilitation needs. You will be cared for by a team of experienced nurses and clinical technicians who have been trained to provide stroke care. A key component of stroke care is to start rehabilitation evaluations by the physical therapist, occupational therapist and speech therapist once you are medically stable. We believe that starting your rehabilitation as early as possible is a critical part of your recovery process. A case manager will also visit you and your family to assist with discharge planning and other social needs.

This stroke education handbook, along with additional resources and materials, will help guide you through your hospital stay and recovery.

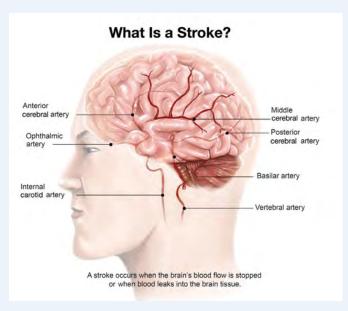


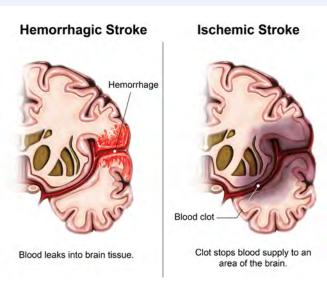
TREATMENT TEAM

Your treatment team may include the following:				
Attending Physician:				
Neurologist:				
Neurosurgeon:				
Physical Therapist:				
Occupational Therapist:				
Speech Therapist:				
Case Manager:				
Other:				
Questions for Your Team				
Notes				

WHAT IS A STROKE?

A stroke happens when the brain's blood flow is stopped or when blood leaks into brain tissue. Arteries are blood vessels that carry blood and oxygen from the heart to the brain, as well as other parts of the body. The brain needs a constant blood supply to function. Without it, the brain tissue those arteries are supplying can die. There are different types of strokes, and identifying what type of stroke a patient had can lead to faster treatment.



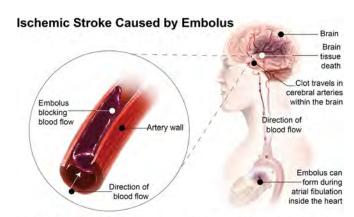




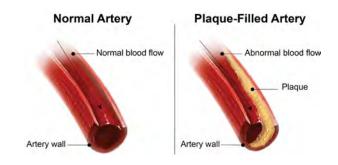
Types of Stroke

An **ischemic stroke** is the most common type of stroke. This happens when a blood vessel in the brain is blocked, stopping blood flow and causing brain tissue death. This blockage may be from a blood clot that formed somewhere in the body and traveled to the brain, or it may be from a blockage that starts in one of the brain's arteries. There are two different types of ischemic strokes:

- An embolic stroke is when plaque (fat deposits) or a blood clot travels from the heart or blood vessels leading to the brain and blocks blood flow to the brain tissue.
- A thrombotic stroke is when plague or a blood clot forms inside the arteries in the brain, blocking blood flow to the brain tissue.



An embolus (blood clot) in the cerebral artery blocks blood flow to part of the brain.

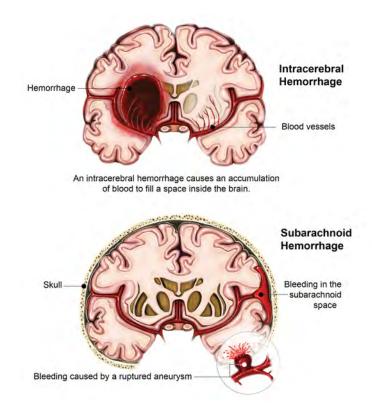


A cryptogenic stroke is a stroke that happened without a known cause. Cryptogenic strokes may account for more than 25 percent of all strokes.

Although a transient ischemic attack (TIA) is not a stroke, it is serious. It happens when blood flow to the brain suddenly stops for a short period of time and is then restored without any tissue death. During this time, the brain cannot function properly. This is often a warning sign that a stroke may happen in the near future.

A hemorrhagic stroke is less common, but more deadly. It happens when a blood vessel in the brain bursts and blood spills into or around the brain. There are two different types of hemorrhagic strokes:

- An intracerebral hemorrhage happens when a weakened blood vessel (also called an aneurysm) leaks or bursts and bleeds into the brain tissue, causing the tissue to die. The most common cause of an intracerebral hemorrhage is high blood pressure.
- A **subarachnoid hemorrhage** happens when an aneurysm leaks or bursts, causing blood to enter the space between the skull and the brain (called the subarachnoid space). This blood can irritate other blood vessels, causing them to spasm and reduce blood flow to the brain, resulting in a stroke.



STROKE WARNING SIGNS

Stroke is a medical emergency. If you or a loved one have any of these symptoms - even if they seem mild call 911 immediately.

- SUDDEN and severe headache
- BALANCE: trouble walking, leaning to one side, dizziness
- EYES: loss of vision, trouble seeing in one or both eyes, double vision
- FACE: facial weakness, drooling, inability to keep food in mouth, tingling or numbness to face
- ARMS: tingling or numbness to arms and/or legs, weakness to arms and/or legs
- SPEECH: trouble speaking, slurred or slowed speech, confusion
- TIME: Call 911 as soon as possible

Do not ignore these warning signs.

Know the Signs of STROKE B.E. F.A.S.T. Balance Is there a sudden loss of balance? Eyes-Is there a sudden loss of vision in one or both eyes? Face-Does the face look uneven? Arms-Is one arm hanging down? Can they can raise both arms? Speech Is speech slurred? Do they have trouble speaking or seem confused? Time-Call 911 now!

STROKE RISK FACTORS

What Is a Risk Factor?

A risk factor is anything that increases your chance of illness, accident or other negative event. There are a number of risk factors that increase the chances of having a stroke: Some you cannot change, but most you can. Up to 80 percent of strokes can be prevented through managing and lowering risk factors.

Risk Factors You Cannot Change

You cannot change or reverse the following risk factors for stroke. It is important that you know how these risk factors apply to you:

- Age As you get older, your risk of having a stroke increases
- Gender Women are at higher risk of having a stroke.
- Ethnicity African Americans have two times more risk of stroke than people of other races do.
- Past stroke If you have already had a stroke, your risk of having another stroke is higher.
- Family history If someone in your family has had a stroke, your risk of having a stroke is higher.

Risk Factors You Can Change

You can lower your risk of stroke when you reduce these risk factors:

- Smoking
- · High blood pressure (hypertension)
- High cholesterol
- Heart disease (carotid artery disease, coronary artery disease, atherosclerosis, etc.)
- Lack of exercise
- Obesity
- High blood sugar (diabetes)
- Irregular heartbeat (atrial fibrillation, also called AFib)
- · Excess alcohol or drug use
- Sleep apnea
- Blood clotting conditions

High Blood Pressure

The number-one risk factor for stroke is high blood pressure. Another name for high blood pressure is hypertension. It is important to understand what your blood pressure is and what it should be.

Blood Pressure Categories

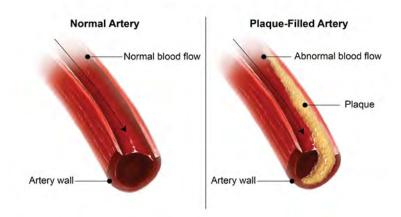


Blood Pressure Category	Systolic mm Hg (upper number)		Diastolic mm Hg (lower number)
Normal	less than 120	and	less than 80
Elevated	120 – 129	and	less than 80
High Blood Pressure (Hypertension) Stage 1	130 – 139	or	80 – 89
High Blood Pressure (Hypertension) Stage 2	140 or higher	or	90 or higher
HYPERTENSIVE CRISIS (consult your doctor immediately)	Higher than 180	and/or	Higher than 120

High Cholesterol

An unhealthy cholesterol level can lead to plaque in your arteries. This plaque buildup (also known as atherosclerosis) narrows the arteries and can lead to stroke. It is important to learn what your cholesterol levels are and what they should be.

Atherosclerosis



HOW TO REDUCE YOUR RISK

Here are some basic lifestyle changes you can make to reduce your risk of having another stroke.

✓ Place a check mark next to the lifestyle changes you wish to focus on to lower your stroke

risk. Then, write what you will do to help achieve these goals. Stop smoking and avoid secondhand smoke _______ Manage AFib _____ Manage diabetes _____ Lower your cholesterol (have it checked regularly)______ Lower your blood pressure (have it checked regularly)_____ ☐ Manage heart disease _____ ☐ Increase physical activity _____ ☐ Maintain a healthy weight_____ Follow a healthy diet _____ Manage sleep apnea _____ Other _____

COMMON MEDICATIONS FOR STROKE PREVENTION

If you have had a stroke, you are at a higher risk of having another one. Many medications can help prevent another stroke. Some of the more common types of medications that your doctor may prescribe are listed below.

Antiplatelet medications help prevent blood clots from forming. Some common examples include aspirin and Plavix.

Anticoagulation medications help prevent blood clots and are often prescribed for patients who have an abnormal heart rhythm or AFib.

Blood pressure medications help to keep your blood pressure within recommended limits. Ask your doctor about recommended blood pressure levels after stroke.

Cholesterol-lowering medications help to lower cholesterol levels in the blood by decreasing the likelihood of plaque formation within your blood vessels, which reduces your chance of having a stroke.

Diabetes medications help to manage blood sugar levels and prevent problems that could increase your risk of having a stroke.

Please discuss your individualized medicines with your doctor.

Medication Tips

- Know your medications: It is important to know the medications you take. Place an updated list of the medications you take in your wallet, so it is available when you need it. Keep this list updated and make changes whenever your doctor prescribes a new medication.
- Keep a routine: Take your medications at the same time every day. Use a pill organizer to help store scheduled medications.
- Take your pills as prescribed: Most stroke prevention medicines should be taken every day to be effective.
- Order refills on time: Use a calendar reminder to order refills before you run out of your medication. Many pharmacies offer an automatic refill option to ensure your medicines are ready when you need them. If you cannot afford your medications, talk to your doctor or case manager about your options.
- Do not stop or change your dosage: Always talk
 with your doctor before making any changes to your
 medications. If you miss a dose, call your doctor for
 instructions on what to do. Never take more or fewer pills
 than prescribed without talking to your doctor first.
- Watch out for side effects: Don't let side effects stop you
 from taking your medications. Tell your doctor if you have
 any side effects from the medicines you are taking.



COMMON TESTS AND PROCEDURES

Below are common tests and procedures that your provider may order while you are in the hospital or after discharge.

A neurological check (neuro check) is a head-to-toe assessment performed by a member of your care team to see how your brain is working. This will alert them to any changes in how your brain is working.

A swallow screen is done to evaluate your ability to swallow. Stroke can sometimes cause difficulty with chewing and swallowing food, liquids or medications (called dysphagia). If food or liquid enters the lungs, it's called aspiration, and it may lead to pneumonia or other health problems. A nurse will do an initial check of your swallowing abilities. If swallowing problems are suspected, a speech-language pathologist may complete a more detailed examination of your swallowing ability and put together a treatment plan for you.

Sequential compression devices (SCDs) are used to help prevent deep vein thrombosis (DVT). A DVT is a clot in the deep veins of your leg that can occur from not being mobile. It can cause swelling, pain and tenderness in your leg. SCDs are worn on your legs while in bed or a chair to help prevent blood clots by encouraging blood flow.

Common blood work may include hemoglobin A1C (diabetes), or lipid panel (cholesterol).

Computed tomography (CT) is a scan that uses X-rays to take a picture of your brain.

• Computed tomography angiography (CTA) is similar to a CT scan but also looks at the blood vessels in the brain using contrast.

Cerebral angiography is an X-ray study of the blood vessels that supply your brain. During the procedure, the doctor puts a thin, flexible tube called a catheter into a blood vessel in your groin, arm or neck through a small cut and looks for a clot or abnormal blood vessel. If the doctor finds a blood clot, the doctor may remove it.

Magnetic resonance imaging (MRI) is a scan that uses a magnet, instead of X-rays, to take a comprehensive image of your brain.

An implantable loop recorder is a type of heart-monitoring device that records your heart rhythm continuously.

An echocardiogram (echo) is a test that checks how well your heart is working. It uses sound waves (ultrasound) to produce a picture of your heart.

- A transthoracic echocardiogram (TTE) is an echo that is done by passing a probe (transducer) over your chest. This shows patterns of blood flow, how well the heart pumps and whether the heart is enlarged.
- A transesophageal echocardiogram (TEE) is similar to a TTE, but it's done by passing a probe into the throat to give a clearer picture of the heart. Sedation is used for a TEE.

An **electroencephalogram (EEG)** is a test that measures the brain's electrical activity. It is used to assess for seizures, which are potential complications of stroke. Small, round discs with wires (electrodes) are placed on the scalp during the test and are not harmful.

A **carotid Doppler** is an ultrasound that uses sound waves to evaluate and create pictures of blood flow inside the blood vessels in your neck (carotid arteries). Narrowing of the carotid arteries can reduce or block blood flow to the brain.

A lumbar puncture, also called a spinal tap, is a procedure done to collect cerebrospinal fluid to help diagnose possible disease or infection in your brain or spinal cord.



SURGERY AND TREATMENTS FOR STROKE

Emergency treatment for stroke depends on what type of stroke you have.

Ischemic Stroke

To treat an ischemic stroke, your treatment team must quickly act to restore blood flow to your brain. Two possible treatments are giving a clot-busting medication or physically removing the clot from your brain to restore blood flow. Not every stroke will be eligible for these treatment options.

Thrombolytic therapy (alteplase or tenecteplase):

Thromolytic therapy is an IV medication that can dissolve blood clots that cause a stroke. If you have any strokelike symptoms, it is important to seek immediate medical attention because this medication can only be given within a few hours of when the symptoms started. Giving this medication quickly may increase your chances of survival and reduce long-term disability after a stroke.

Endovascular thrombectomy: If your stroke is caused by a clot in a large blood vessel in the brain, a doctor may perform this procedure to physically remove the clot. The doctor will insert a catheter through an artery in your groin and thread it to your brain to remove the clot that is blocking blood flow to your brain. This procedure must also be performed as soon as possible. Endovascular therapy has been shown to significantly reduce brain damage and long-term disability after a stroke.

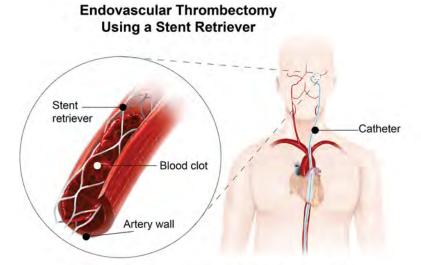
Hemorrhagic Stroke

Treatment of hemorrhagic stroke focuses on controlling the bleeding and reducing pressure in your brain. Treatment options include emergency medication and surgery. Not every stroke will be eligible for these treatment options.

Emergency medication: If you take blood-thinning medications to prevent blood clots, you may be given medication or blood products to reverse the blood thinners' effects. You may also be given medicine to lower the pressure in your brain (intracranial pressure), lower your blood pressure, prevent spasms of your blood vessels or prevent seizures.

Surgery: If the area of bleeding is large, your doctor may perform surgery to remove the blood and relieve the pressure on your brain. Surgery may also be used to repair blood vessel problems associated with hemorrhagic strokes. The time that surgery is performed varies based on the stroke's severity and your condition.

Surgical clipping and coiling: Your doctor may recommend one of these procedures after a stroke if an aneurysm, arteriovenous malformation (AVM) or other type of blood vessel problem caused your hemorrhagic stroke. These procedures block blood flow into the area that is causing the hemorrhagic stroke by placing a clamp at the base of the aneurysm (clipping) or inserting a tiny detachable coil into the aneurysm to fill it (coiling).



The blood clot is caught in the stent retriever and removed.

THE ROAD TO RECOVERY



Recovery from stroke begins in the hospital and looks different for every person. It may take a few weeks, months or even years to recover. Some people enjoy a full recovery, while others may have long-term or lifelong disabilities.

Long-term effects of stroke can include:

- Paralysis (an inability to move) or weakness on one side of the body
- Problems using or understanding language
- Changes in vision
- Numbness or tingling sensations
- Trouble with chewing or swallowing foods or liquids
- Problems controlling emotions
- Depression
- Difficulty with thinking, including attention, memory and problem solving

Fortunately, research shows that recovery never stops. Stroke recovery is hard work. Even if your improvement may seem to slow down at times, the effort you put into your recovery will result in a better quality of life. Some stroke survivors will continue to see improvement years after their event.

COMMON EMOTIONAL AND PERSONALITY CHANGES AFTER STROKE

After a stroke, you may experience emotional and behavioral changes. This is because the brain controls your behavior and emotions. A stroke may make you forgetful, careless, annoyed or confused. You may also feel anxiety, anger or depression. Your behavior depends on which part of the brain is affected and how much damage to the brain the stroke has caused.

Depression

Depression is common after a stroke. The symptoms can be mild or severe, often starting in the early stages of stroke recovery. You should be evaluated for depression and treated when it occurs. It's important to identify and treat poststroke depression (PSD) as soon as possible. Untreated, it can lead to a longer hospital stay and can limit your recovery.

The symptoms of PSD may vary and change over time, but patients and families should watch for:

- · Sad, anxious or "empty" mood
- Depressed mood
- · Loss of interest or pleasure in activities
- · Sleeping problems
- Decreased motivation
- · Responding with little or no emotion
- Feelings of hopelessness, worthlessness or guilt (feeling like a burden)
- · Decreased energy, fatigue, feeling "slowed down"
- Difficulty focusing, remembering, making decisions
- Appetite changes
- · Thoughts of death or suicide

Treatment for PSD

It's very important for you to remember that your depressed feelings are an expected part of your recovery and are not a sign of weakness. It's also important to get professional help as soon as possible. You and your family should work with a psychiatrist or your primary care doctor to identify how to best treat your PSD.

For some, antidepressant medicines may help, although it may take a few weeks to feel better. You can also benefit from different forms of therapy. Counseling and talk therapy can be helpful in addressing painful and self-defeating thoughts. Another treatment option is to attend stroke support group meetings, where you and your family or caregiver share practical experience and lessons learned.

Other Recommendations for Stroke Survivors

- · Be as physically active as possible each day.
- Schedule daily routine activities for structure and purpose.
- Set goals and find ways to measure accomplishments even small ones count.
- Get out and enjoy regular social activity to stimulate and improve your physical and mental recovery.

Anxiety

Changes related to stroke can lead to worry and anxiety. Anxiety can be caused by many different things including mobility and balance problems, communication and speech issues, and financial concerns. Sometimes anxiety and depression are both in play. Counseling can be helpful for anxiety. If you are feeling anxious, talk to your healthcare team about potential treatment options.

Pseudobulbar Affect (PBA)

When parts of the brain that control emotions are injured, PBA (also called emotional lability or reflex crying) occurs. Most often, people cry easily. Some may laugh uncontrollably or have sudden mood swings. These are physical effects of the stroke and often lessen over time. Telling individuals with PBA not to cry won't help. Instead, ask them how they want to be treated during an episode. Many people prefer that it be treated as a reflex, such as hiccups, and that conversation continue. If PBA is a problem for you, ask your healthcare team about available treatments.

References for depression and anxiety

stroke.org/-/media/stroke-files/life-after-stroke/life-after-stroke-guide_7819.pdf?la=en integrisok.com/resources/on-your-health/2018/june/how-to-recognize-serious-depression-after-a-stroke

REHABILITATION

Rehabilitation can include inpatient and/or outpatient services to help you relearn skills affected by your stroke. Rehabilitation teaches you new ways to adjust for any disabilities, enabling you to be as independent as possible. Your rehabilitation team may include:

Physiatrist: A physiatrist is a doctor who has received specialized training in physical medicine and rehabilitation, a branch of medicine emphasizing the prevention, diagnosis, treatment and rehabilitation of conditions that cause functional impairment.

Physical therapist: Physical therapists specialize in diagnosing and treating problems with balance, difficulty walking, weakness, decreased sensation and decreased coordination. A physical therapy program may include exercises to strengthen muscles, improve coordination and regain range of motion to maximize functional movements, based on your goals.



Occupational therapist: Occupational therapists address motor, sensory and visual changes to promote increased wellbeing and independence in activities of daily living, such as dressing, bathing, using the toilet and feeding yourself. Occupational therapists can also help with instrumental activities of daily living, such as driving, cooking, and managing your home and health. Occupational therapy will address fine-motor coordination skills and focus on restoring movement and functional use of the affected arm or hand. Your occupational therapist may recommend specialized equipment to help you be as independent as possible.

Speech-language pathologist: Speech-language pathologists assess, diagnose and treat disorders related to speech, language, thinking, swallowing and communication issues related to stroke. The speech-language pathologist provides strategies to support your ability to communicate with your care team and maximize your ability to engage in the rehabilitation process.

Case manager: Case managers are often nurses or social workers who coordinate, monitor and evaluate services and resources to support you after stroke. They facilitate communication between you, your caregiver and healthcare providers, and any community agencies to coordinate your care after you leave the hospital.

It is important to know that rehabilitation takes time. A successful recovery requires patience and a solid support network, including family, friends and therapy professionals. We can help. For a full list of Inova's rehabilitation services and locations, visit inova.org/rehab

ADVICE FOR CAREGIVERS

Being a stroke caregiver is demanding, and you may feel overwhelmed at times. Here are some tips that can help.

Take Care of Yourself

- Share your feelings with friends or other caregivers.
- Take time out to relax with a favorite activity or meditation.
- Enlist the help of family, friends or local resources.
- Take care of your physical health. Eat well-balanced meals and take time for at least 15 minutes of daily exercise.
- Seek spiritual support.
- · Keep a journal to record your thoughts.



Take a Break

- · Respite care is essential.
- Find support services, such as in-home care, adult day care or outpatient programs in your community.

Take Care of Your Mental Health

- It's normal for caregivers to feel frustrated, helpless, afraid or angry. If left unchecked, these feelings may lead to depression.
- If you are struggling with depression or a lack of interest in life, seek help from your doctor or a mental health professional.
- You may also benefit from joining a support group.

Outpatient/Local Resources

Outpatient Rehab Patient Access Team 703.664.7190, option 2

Inova Cares Clinic for Community Bridging 571.623.3390

If you or your loved one needs additional help after discharge from the hospital, reach out to your primary care provider to get referrals to resources.

Resources for Caregivers

Visit **stroke.org** for timely, comprehensive information, or try one of the websites listed below:

American Stroke Association stroke.org/we-can-help/caregivers-and-family

Administration on Aging acl.gov/about-acl/administration-aging

CareGiving.com caregiving.com

Eldercare Locator 1.800.677.1116 eldercare.acl.gov

Medicare 1.800.633.4227 medicare.gov

National Alliance for Caregiving caregiving.org

Caregiver Action Network 1.855.227.3640 caregiveraction.org

STROKE RESOURCES

Inova Stroke and Cerebrovascular Disease Program inova.org/stroke

American Stroke Association/American Heart Association stroke.org

Brain Aneurysm Foundation

bafound.org

Joe Niekro Foundation

The Joe Niekro Foundation™ is committed to supporting patients and families, research, treatment, and awareness of brain aneurysms, AVMs and hemorrhagic strokes. joeniekrofoundation.com

National Aphasia Association

The goal of the National Aphasia Association is to provide access to research, education, rehabilitation, therapeutic and advocacy services to individuals with aphasia and their caregivers.

aphasia.org

ChooseMyPlate

ChooseMyPlate offers ideas and tips to help you create a healthier eating style that meets your individual needs and improves your health.

choosemyplate.gov

Quit Now Virginia

Quit Now Virginia provides free information and coaching by telephone or online to Virginia residents who want to quit smoking or using tobacco.

quitnow.net/virginia

Family Caregiver Alliance

A service for quality information, support and resources for family caregivers of adults with chronic physical or cognitive conditions including but not limited to Alzheimer's disease, stroke and Parkinson's disease.

1.800.445.8106

caregiver.org

Local Services

Find a Stroke Support Group

stroke.org/en/help-and-support

Brain Injury Services

Providing case management, counseling and support groups to people affected by brain injuries including stroke.

8136 Old Keene Mill Rd., Suite B-102 Springfield, VA 22152 703.451.8881 braininjurysvcs.org

Stroke Comeback Center

Offers programs, classes and social support for survivors of stroke and brain injury.

> Stroke Comeback Center Vienna 145 Park St. S.E. Vienna, VA 22180 703.255.5221 strokecomebackcenter.org

Stroke Survivor Fitness

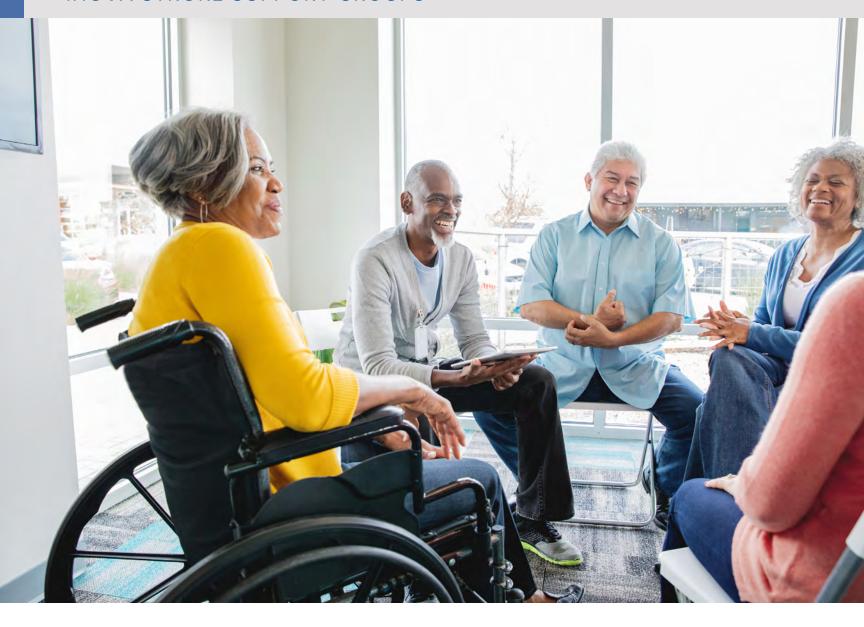
Specializes in designing long-term fitness programs that accommodate a stroke survivor's specific physical, neurological and cognitive challenges. strokesurvivorfitness.com

DPI Adaptive Fitness

A personal training service focused on advancing stroke survivors from current fitness/functional level by working with the rehab team, doctors and family and ensuring a safe and effective routine.

DPI Adaptive Fitness Training Center 3545 Chain Bridge Rd., Suite 101 Fairfax, VA 22030 1.877.264.5836 dpiadaptivefitness.co

INOVA STROKE SUPPORT GROUPS



Inova is pleased to offer numerous free stroke support groups. They are held virtually or in convenient locations throughout Northern Virginia. Please check inova.org/strokesupport for updates about the meeting schedule and locations – and to confirm whether the stroke support group will be meeting virtually and/or operate.

inova.org/strokesupport

For additional information, you can also contact the numbers listed below.

Stroke Survivors and Caregivers – Inova Fairfax Hospital: Email laura.buhler@inova.org

Stroke Survivors and Caregivers – Inova Fair Oaks Hospital: 703.391.3642

Stroke Survivors and Caregivers – Inova Loudoun Hospital: 703.858.8290

Stroke Survivors – Inova Mount Vernon Hospital: 703.664.7190

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