



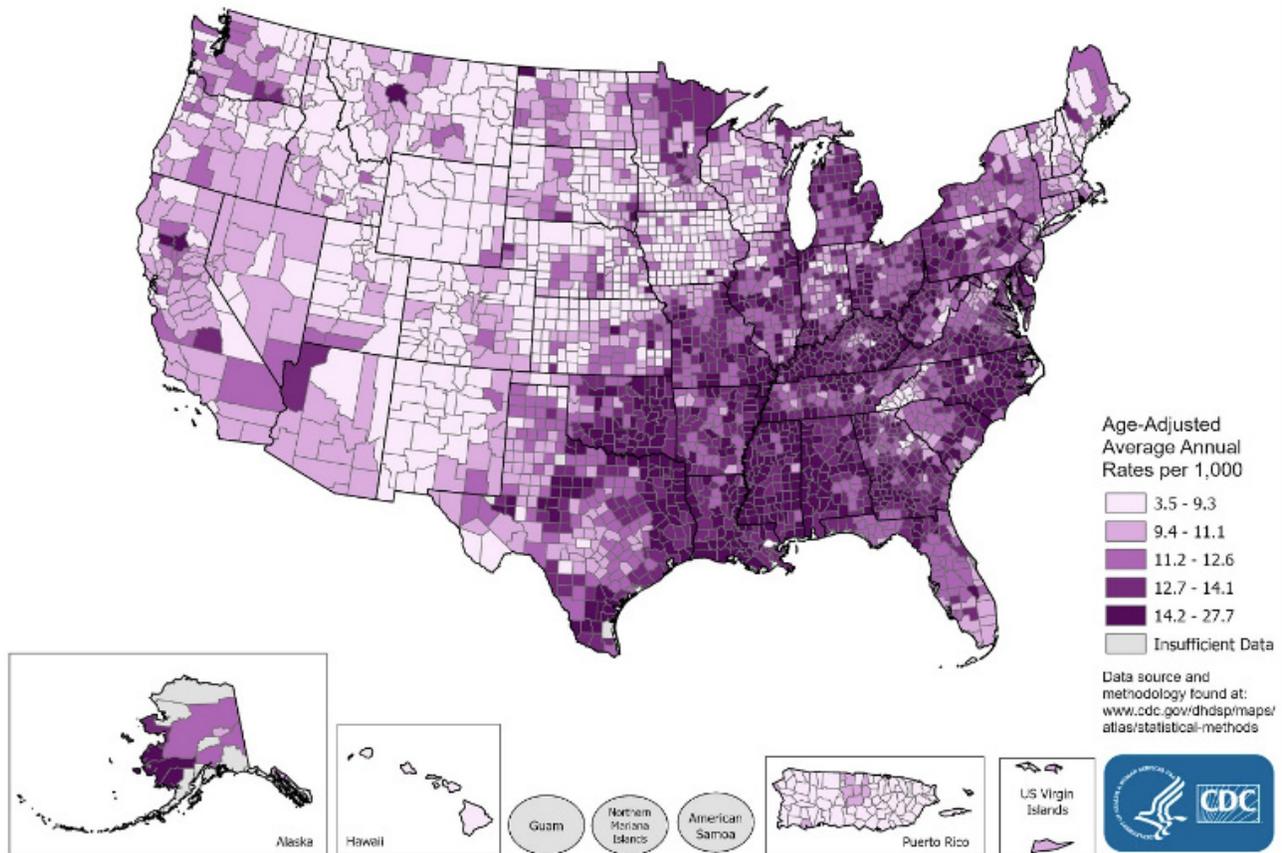


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# Stroke Demographics <sup>1,2</sup>

**Stroke Hospitalization Rates, 2017 - 2019  
All Medicare Beneficiaries, Ages 65+, by County**



- Every 40 seconds, someone in the United States suffers from a stroke.
- Every year, more than 795,000 people in the United States have a stroke. About 610,000 of these are first or new strokes.
- About 185,000 strokes—nearly 1 of 4—are in people who have had a previous stroke.
- Stroke is the fifth leading cause of death, killing nearly 133,000 people a year.
- Stroke is the leading cause of serious, long-term disability.

1 Centers for Disease Control and Prevention. (2021, May 25). Stroke facts. Centers for Disease Control and Prevention. Retrieved February 17, 2022, from <https://www.cdc.gov/stroke/facts.htm>

2 Boehme, A. K., Amelia K. Boehme From the Department of Epidemiology, Esenwa, C., Charles Esenwa From the Department of Epidemiology, Elkind, M. S. V., Mitchell S.V. Elkind From the Department of Epidemiology, Elkind, C. to M. S., & Al., E. (2017, February 3). Stroke risk factors, genetics, and prevention. *Circulation Research*. Retrieved February 17, 2022, from <https://www.ahajournals.org/doi/full/10.1161/CIRCRESAHA.116.308398#d3e918>

## Did You Know?

### You CAN'T Control Some Risk Factors

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- Nearly 75% of strokes occur in people over age 65. The risk of stroke doubles each decade after the age of 55. With that, strokes can and do occur at ANY age, even in children.
- Stroke kills more women than men due to:
  - Pregnancy: Risk highest in 3rd trimester and post-partum
  - Preeclampsia: If experienced during pregnancy, it may double the risk of stroke later in life.
  - Birth control pills: Women should be screened for high blood pressure before being prescribed birth control. Never smoke while taking oral contraceptives.
  - Migraines: Associated with stroke in younger women, especially if they smoke and/or use oral contraceptives.
  - Atrial Fibrillation: Increases the risk among women over age of 75 by 20%.
- Risk of having a first stroke is nearly twice as high for blacks as for whites, and blacks have the highest rate of death.
- Those with a close blood relative that have had a stroke have a higher risk of stroke.
- Approximately 15% of major strokes are preceded by a Transient Ischemic Attack, or TIA.

### You CAN Control Some Risk Factors

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- High blood pressure, high cholesterol, smoking, obesity, and diabetes are leading cause of stroke. 1 in 3 US adults has at least one of these conditions or habits.
  - High blood pressure accounts for 12.7 million strokes worldwide each year.
  - Smoking doubles an individual's risk of stroke.
- Those with Atrial fibrillation, or A-Fib, are 5 times more likely to have a stroke.

1.9 million brain cells can be lost every minute a stroke goes untreated. For every hour a person does not receive treatment, the ischemic brain ages 3.6 years.

The goal is to get to the hospital quickly – call 911 with any signs and symptoms of stroke! When surveyed, 93% of responders recognized sudden numbness on one side as a symptom of stroke. Only 38% were aware of all major symptoms and knew to call 9-1-1. Arriving at the hospital quickly may make the difference between receiving lifesaving treatments, such as a clot busting medications. With stroke, every second counts. Early intervention is the best chance for reversing a stroke.

## Stroke Terminology

**Ambulation:**  
walking

**Aphasia:**  
being unable to understand spoken or written words; being unable to speak

**Apraxia:**  
problems with tasks that you previously learned how to do

**Arrhythmia:**  
irregular heartbeat

**Aspiration:**  
food, medication or fluid being inhaled in the lungs instead of moving down to the esophagus; this increases the risk for pneumonia

**Ataxia:**  
problems with coordination, balance, and movement

**Dysarthria:**  
slurred speech

**Dysphagia:**  
difficulty swallowing

**Hemiparesis:**  
weakness on one side

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

## Dedicated Stroke Care

Stroke recovery begins as soon as you arrive to the hospital, and continues throughout your acute hospital stay, and throughout rehabilitation. Our goal is to maximize each patient's ability to function based on his or her individual type of stroke.

UofL Health offers specialized nursing care for stroke patients. The nursing staff receives stroke- specific education throughout the year to remain aware of the latest research and recommendations in stroke care. Several of our nurses have obtained specialized certifications. Stroke Certified Registered Nurse (SCRN), Certified Neuroscience Registered Nurse (CNRN), or Certified Rehabilitation Registered Nurse (CRRN) are certifications demonstrating their expertise in stroke care. Here at UofL Health, we have three Joint Commission Certified Stroke Centers – UofL Hospital, Jewish Hospital, and Mary and Elizabeth Hospital. All three centers have received recognition awards from the American Heart/American Stroke Association for providing the best evidence- based stroke care in the nation. In addition to the certified stroke centers, UofL Health has a Commission on Accreditation of Rehabilitation Facilities (CARF) accredited Stroke Rehab Program at Frazier Rehabilitation Institute. Our network of stroke care and providers extends beyond hospitalization, to outpatient rehab clinics throughout our region.

The quality of care we provide is a high priority for us. You will be contacted after discharge from the UofL Health Stroke Programs. During and after your stay, we want your honest feedback regarding how we are doing in caring for you. We use information you provide to help us improve the care we provide.



# What is a Stroke?

A stroke is caused by a lack of blood flow to the brain. In most cases, a stroke occurs when an artery bringing oxygen and nutrients to the brain is either blocked or bursts. When the brain doesn't get enough oxygen, the brain cells die. When the brain cells die, the part of the body controlled by the cells will not function properly.

## The Two Major Types of Strokes<sup>3</sup>:

- **Hemorrhagic stroke (13%):**

Caused by the rupture of an artery in the brain.  
Common causes are:

- Uncontrolled high blood pressure, which weakens blood vessels
- Bulges at weak spots in your blood vessel walls (aneurysms)
- Overtreatment with blood thinners (anticoagulants)
- Trauma (such as a car accident)
- Ischemic stroke leading to hemorrhage

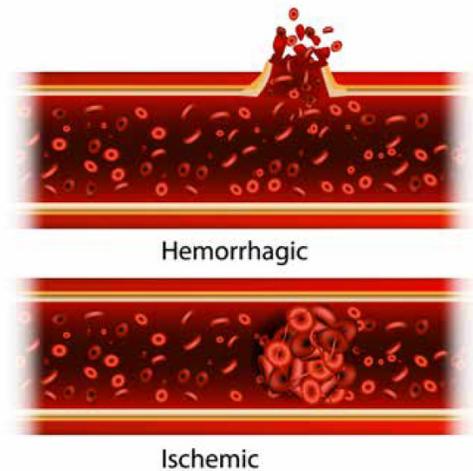
- **Ischemic stroke (87%):**

Blockage of blood flow in the brain.  
Common causes are:

- Atherosclerosis- Buildup of fatty deposits (plaque) in the arteries.
- Heart conditions that lead to blood clots. Example: Atrial Fibrillation, Atrial Flutter
- Blood clotting disorders that promote clotting. Example: Sickle Cell Disease

If there is an unknown reason for the impaired blood flow, this is known as a Cryptogenic Stroke. About one in three ischemic strokes are classified as cryptogenic.<sup>4</sup>

A transient ischemic attack, or TIA, is a warning stroke. A TIA also is caused by a lack of blood flow to the brain, but before the brain cells die, blood flow is restored. When a TIA is over, there is no permanent damage to the brain. However, a TIA is a medical emergency that requires immediate medical attention by calling 911 since a TIA can be a warning sign that a stroke is about to occur.



<sup>3</sup> <https://www.stroke.org/en/about-stroke/types-of-stroke/>

<sup>4</sup> Cryptogenic stroke or stroke of unknown cause. [www.stroke.org](https://www.stroke.org). (n.d.). Retrieved February 17, 2022, from <https://www.stroke.org/en/about-stroke/types-of-stroke/cryptogenic-stroke>

# Stroke is an Emergency

Every moment counts



to recognize the warning signs

**B** **Balance Lost**  
Sudden loss of balance or coordination



**E** **Eyes Blur**  
Sudden trouble seeing or blurred vision in one or both eyes



**F** **Face Drooping**  
One side of the face droops or is numb



**A** **Arm Weakness**  
Sudden weakness or numbness of an arm or leg, especially on one side of the body



**S** **Speech Difficulty**  
Sudden confusion, trouble speaking or understanding speech



**T** **Time**  
Note the time the symptoms started and Call 9-1-1 IMMEDIATELY!



BE FAST was developed by Intermountain Healthcare, as an adaptation of the FAST model implemented by the American Stroke Association. Reproduced with permission from Intermountain Healthcare. © 2011 Intermountain Healthcare. All rights reserved.

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## Brain Functions

Knowing what part of the brain is affected in a stroke, may help you feel more involved in your treatment plan and recovery process. Many people are left brain dominant.

**Left-Brain Dominant:** The left side of the brain controls strength and movement on the right side of the body. Language is also controlled by the left side of the brain. If you have left brain injury, or stroke, you will have decreased strength on the right side of your body and language problems such as reading, writing, speaking, and understanding what is said. Mood and behavior may be affected as well.

**Right-Brain Dominant:** The right side of the brain controls strength and movement on the left side of the body. The right side of the brain also controls emotions, thinking skills, nonverbal communication, and body awareness. If you have a right brain injury, or stroke, you will have decreased strength on the left side of your body have problems with emotions, thinking skills, and communication. Attention, memory, and judgment could be affected as well.

**Frontal lobe:** Initiation of activities, problem-solving, judgment, inhibition of behavior, planning movements of the body, personality/emotions, awareness of abilities/limitations, organization, concentration, expressive language

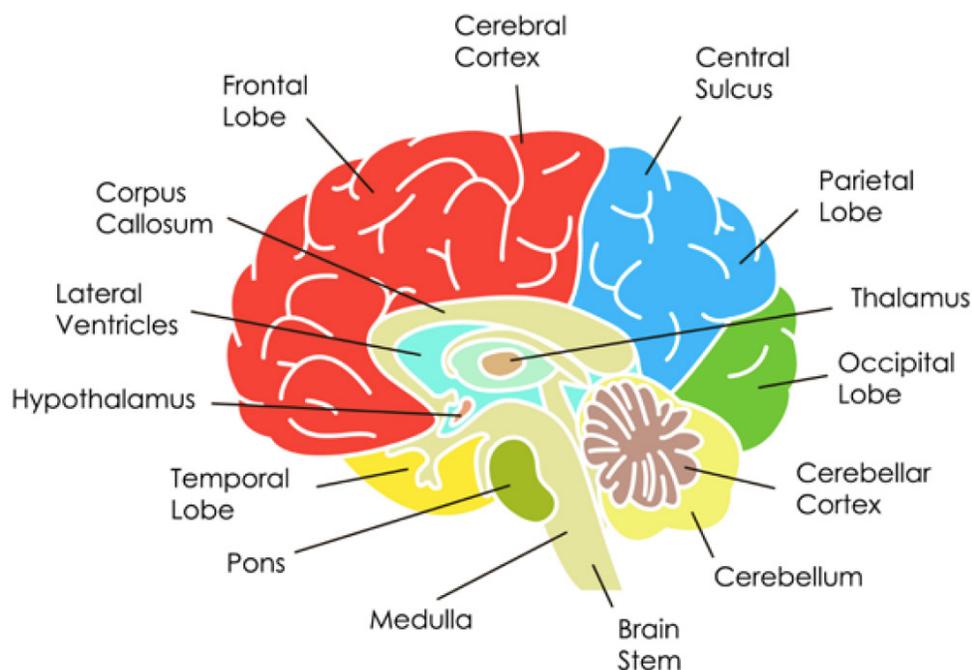
**Temporal lobe:** Memory, hearing, understanding language, organization, and sequencing

**Parietal lobe:** Sense of touch, differentiation of size/shape/color, spatial awareness, ability to perceive visual information

**Occipital lobe:** Vision

**Cerebellum:** Balance, coordination, skilled movement activities

**Brain Stem:** Breathing, heart rate, consciousness/arousal, sleep/wake functions, attention/concentration



# Stroke Risk Factors<sup>5</sup>

Knowing your risk factors for stroke is the first step in preventing another stroke. You can change or treat some risk factors, but others you can't. By having regular medical checkups and knowing your risk, you can focus on what you can change and lower your risk of stroke.

## Controllable Risk Factors – Ones You CAN Change

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- **High blood pressure:** This is the single most important risk factor for stroke because it's the leading cause of stroke. Know your blood pressure and have it checked every year. Normal blood pressure is below 120/80. If you have been told that you have high blood pressure, work with your healthcare provider to reduce it
- **Smoking:** Smoking damages blood vessels. This can lead to blockages within those blood vessels, causing a stroke. Don't smoke and avoid second-hand smoke.
- **Diabetes:** Having diabetes more than doubles your risk of stroke. Work with your doctor to manage diabetes.
- **High cholesterol:** High cholesterol increases the risk of blocked arteries. If an artery leading to the brain becomes blocked, a stroke can result.
- **Physical inactivity and obesity:** Being inactive, obese, or both, can increase your risk of heart disease and stroke.
- **Carotid or other artery disease:** The carotid arteries in your neck supply most of the blood to your brain. A carotid artery damaged by a fatty buildup of plaque inside the artery wall may become blocked by a blood clot. This causes a stroke.
- **Transient ischemic attacks (TIAs):** Recognizing and treating TIAs can reduce the risk of a major stroke. TIAs produce stroke-like symptoms but most have no lasting effects. Know the warning signs of a TIA and seek emergency medical treatment immediately.
- **Atrial fibrillation (AFib) or other heart disease:** In AFib the heart's upper chambers quiver (like a bowl of gelatin) rather than beating in an organized, rhythmic way. This can cause the blood to pool and clot, increasing the risk of stroke. AFib increases risk of stroke five times. People with other types of heart disease have a higher risk of stroke, too.
- **Certain blood disorders:** A high red blood cell count makes clots more likely, raising the risk of stroke. Sickle cell anemia increases stroke risk because the "sickled" cells stick to blood vessel walls and may block arteries
- **Excessive alcohol intake:** Drinking an average of more than one drink per day for women or more than two drinks a day for men can raise blood pressure. Binge drinking can lead to stroke.
- **Illegal drug use:** Drugs including cocaine, ecstasy amphetamines, and heroin are associated with an increased risk of stroke.
- **Sleep apnea:** Sleep disordered breathing contributes to risk of stroke. Increasing sleep apnea severity is associated with increasing risk.

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<sup>5</sup> Let's talk about risk factors for stroke. (n.d.). Retrieved February 17, 2022, from [https://www.stroke.org/-/media/stroke-files/lets-talk-about-stroke/risk-factors/lets-talk-about-risk-factors-for-stroke-ucm\\_309713.pdf?la=en](https://www.stroke.org/-/media/stroke-files/lets-talk-about-stroke/risk-factors/lets-talk-about-risk-factors-for-stroke-ucm_309713.pdf?la=en)

## Uncontrollable Risk Factors – Ones You CANNOT Change

- **Increasing age:** Stroke affects people of all ages. But the older you are, the greater your stroke risk.
- **Gender:** Women have a higher lifetime risk of stroke than men do. Use of birth control pills and pregnancy pose special stroke risks for women.
- **Prior stroke:** Someone who has had a stroke is at higher risk of having another one.
- **Heredity and race:** People whose close blood relations have had a stroke have a higher risk of stroke. African Americans have a higher risk of death and disability from stroke than Caucasians. This is because they have high blood pressure more often. Hispanic Americans are also at higher risk of stroke.

### My Stroke Risk Factors

Controllable Risk Factors	
High Blood Pressure	
Smoking	
Diabetes	
High Cholesterol	
Physical Inactivity or Obesity	
Carotid or other artery disease	
Transient Ischemic Attacks (TIAs)	
Atrial Fibrillation (A-Fib)	
Certain Blood Disorders	
Excessive Alcohol intake	
Illegal Drug use	
Sleep Apnea	

Uncontrollable Risk Factors	
Increasing Age	
Gender	
Hereditary and Race	
Previous Stroke	

Total Risk Factors Selected \_\_\_\_\_

### Scorecard Scoring:

<b>High Risk</b>	<b>≥ 3</b>	Ask about stroke prevention right away.
<b>Caution</b>	<b>4-6</b>	Good Start. Working on reducing risk.
<b>Low Risk</b>	<b>6-8</b>	You're doing well at controlling risk!

### Risk Factor Scorecard

Risk Factor	High Risk	Caution	Low Risk
Blood Pressure	>140/90 or unknown	120-139/80-89	<120/80
Atrial Fibrillation (A-fib)	Irregular heartbeat	I don't know	Regular heartbeat
Smoking	Smoker	Trying to quit	Nonsmoker
Cholesterol	>240 or unknown	200-239	<200
Diabetes	Yes	Borderline	No
Exercise	No Exercise	Some Exercise	Regular Exercise
Diet	Overweight	Slightly Overweight	Healthy Weight
Stroke in the Family	Yes	Not Sure	No
Total Score			

# Stroke Prevention

## Mutually Agreed Upon Plan for Stroke Risk Factor Management

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*To reduce my risk for stroke, I agree to:*

- I will keep my follow-up office visit with my Neurologist and other providers.
  - I will talk to my provider about my mutually agreed upon goals.
  - Other risk factor modifications, which I agree to do to help reduce my stroke risk:
- 

### Blood Pressure Management

- I will ask my physician about my blood pressure goal
- I will take my blood pressure daily and record on a log to take to my provider.
- I will obtain a blood pressure machine
- I will take my blood pressure medications regularly
- I will discuss with my physician before making changes to medications

### Reduce Cholesterol/Diet (My LDL level \_\_\_\_\_)

- I am interested in a referral for nutritional education.
- I will take cholesterol reducing medications as prescribed.
- I will attend a nutrition class.
- I will learn about reading labels and understanding my personal fat/cholesterol daily limits.

### Anticoagulant/Anti-Platelet/Medications

- I will learn about all my current medications, the reasons I take them, and their side effects.
- I will keep a current list of all my medications with me and at home on my refrigerator door (or other central location).
- I will not stop taking my medications unless instructed by my provider.
- I will get my INR checked regularly if I am taking warfarin, as instructed by my provider.

### Increase Activity/Exercise/Weight Loss

- I will get a personal plan for a regular exercise program and follow it to the best of my ability.
- I will follow my provider's recommendations on maintaining a healthy weight.
- I will join a gym/go to my gym regularly.
- I will actively participate in the rehabilitation program recommended by my providers.

### No Smoking/Drugs and/or Reduce or Limit Alcohol

- I will make an effort to quit smoking.
- I will contact a stop-smoking resource.
- I will decrease my alcohol consumption.
- I will refrain from illicit drug use.

### Sugar Control for Diabetics/Sleep Apnea

- I will attend a diabetes education class.
- I will test my blood sugar as suggested by my provider and keep a written record of results.
- I will follow the diet plan as directed by my nutrition plan.
- I will take my insulin and/or diabetic medications as prescribed.
- If I have been told I have sleep apnea, I will follow up with my provider.

## Tests and Procedures

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*Tests and Procedures you may have to confirm a stroke, what caused the stroke, or for stroke prevention include:*

- **Computed tomography scan (CT scan):** This is an x-ray used to look at the brain. It is used to look for bleeding strokes. It is important to understand these may not show small or new strokes due to blocked large blood vessels.
- **Computed tomography angiography (CTA):** This is a CT scan that uses contrast dye to give 3-D views of blood vessels and aneurysms.
- **CTP (Computed Tomography Perfusion):** A specialized CT scan using contrast and imaging to evaluate blood flow through the brain and aide in diagnostic accuracy and target treatment identification.
- **Magnetic resonance imaging (MRI):** This noninvasive test uses magnets to take pictures of the brain to show if there is a new stroke, and if so where.
- **Magnetic resonance angiography (MRA):** This noninvasive test uses MRIs with or without contrast to look at the blood vessels of the head and neck.
- **Electrocardiogram (EKG):** This test evaluates the heart's rhythm.
- **Echocardiogram (TTE):** This is an ultrasound "video" of the chambers and valves of the heart in action.
- **Transesophageal echocardiography (TEE):** This is a more invasive ultrasound given after anesthesia to look at the back of the heart.
- **Blood tests:** These rule out clotting disorders, measure levels of enzymes and/ or other metabolic factors and monitor thickness of blood.
- **Video Swallow study (done by a speech-language pathologist and radiologist):** This is a video x-ray procedure which views the inside of the mouth and throat while swallowing liquids and foods.
- **3 Dimensional Transcranial doppler (TCD):** This is an ultrasound procedure that looks at blood flow through cerebral vessels using a small probe against the skull.
- **Carotid Ultrasound:** This test looks to see if there is blockage in the carotid arteries by recording sound waves.
- **Loop Recorder:** A minimally invasive procedure performed by a specialized cardiologist. The device implanted just below the skin and allows for continuous electrocardiogram (ECG) monitoring to facilitate identification of an arrhythmia, like atrial fibrillation (Afib).
- **Cerebral Angiogram:** This invasive procedure allows a direct look at blood vessels in the brain by using a catheter inserted into the artery of the wrist or groin.
- **Mechanical Thrombectomy (MT):** A procedure performed by an Interventional Neurologist or Neurosurgeon to remove a clot in eligible patients with a large vessel occlusion. In this procedure, a catheter is threaded through an artery to the blocked artery in the brain to remove the clot that is preventing adequate blood flow to the brain.

# Stroke Medications

## Inpatient Medications

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**Antithrombotics:** These are anti-platelet medications which keep the platelets in the blood from sticking together. Because these medications can increase the risk of bleeding, seek medical attention if you notice any signs of major bleeding. Be sure physicians are aware that these medications are prescribed prior to any medical procedures. A few antithrombotic medications are:

- Aspirin
- Clopidogrel (Plavix)
- Ticagrelor (Brilinta)
- Prasugrel (Effient)

**Anticoagulants:** These medications are used to prevent strokes by thinning the blood to slow clot formation. Because these medications can increase the risk of bleeding, seek medical attention if you notice any signs of major bleeding. Be sure physicians are aware that these medications are prescribed prior to any medical procedures. Common Anticoagulant medications are:

- Warfarin (Coumadin): While taking this medication, frequent lab work is needed to ensure the correct dose is prescribed and consistent Vitamin K intake is important. Vitamin K is found in foods such as green, leafy vegetables and grapefruit juice.
- Rivaroxaban (Xarelto), apixaban (Eliquis), dabigatran (Pradaxa), edoxaban (Savaysa), enoxaparin (Lovenox), heparin: These medications may also be used to prevent strokes in patients with irregular heart rhythms or who are high risk for developing blood clots.
  - Blood clots in the extremities (arms and/or legs), also called a DVT-deep vein thrombosis, are a risk after a stroke or with impaired mobility. Because nursing staff are aware of this possibility, prevention and treatment approaches are started early in your hospital stay, and can include anticoagulants (blood thinning medications), compression stockings, sequential compression device (SCD), and range of motion exercises.
  - Atrial fibrillation, or A-fib, is a quivering or irregular heartbeat that can lead to blood clots, stroke, heart failure and other heart-related complications. This clot risk is why patients with this condition are put on blood thinners, or anticoagulants. Even though untreated atrial fibrillation doubles the risk of heart-related deaths and is associated with a increased risk for stroke, many patients are unaware that A-fib is a serious condition.<sup>6</sup>

**Statins:** Statins help decrease LDL levels, which is the “bad” cholesterol, by blocking production of cholesterol in the liver. It also reduces inflammation in the body. Stroke survivors will be prescribed this medication even if you don’t have high cholesterol. Statins reduce the risk of another stroke, heart attack, or death. These medications could be:

- atorvastatin (Lipitor)
- simvastatin (Zocor)
- rosuvastatin (Crestor)

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<sup>6</sup> What is atrial fibrillation (AFIB or AF)? www.heart.org. (n.d.). Retrieved February 17, 2022, from <https://www.heart.org/en/health-topics/atrial-fibrillation/what-is-atrial-fibrillation-afib-or-af>

# Stroke Medications

## Emergency Medications

**Thrombolytics:** These medications are given when there is a blood clot that is blocking flow to the brain. It works by dissolving the blood clot that is blocking blood flow, to restore blood flow to the part of the brain being deprived of oxygen. Many people don't arrive at the hospital in time to receive the medication, which can save lives and reduce disability and the long-term effects of stroke. There is a short window to receive this medication if you are eligible, so it is important to be knowledgeable of stroke symptoms and seek emergency medical treatment immediately.



### Hospital Transition

When you transition from the hospital to rehab and beyond, your providers will look at your medications to make sure they are still appropriate. Make sure you ask if you have any questions regarding your medications, potential side effects, or duration of treatment.

# Stroke Care Team

Each person on your care team has role and will work with you while you work through the recovery process. Don't be afraid to ask each person for clarification on what they do and how they can help you achieve the highest level of recovery possible!

- **Hospitalist/Intensivist:** This is a primary doctor that will oversee and coordinate your care in the hospital.
- **Neurologist:** A neurologist is a doctor that specializes in brain and brain function and can follow you throughout your stay in the hospital, at rehab, and post discharge.
- **Physiatrist:** A physiatrist is a doctor that specializes in rehabilitation and coordinates your therapy care plans while you are in the hospital.
- **Psychiatrist:** A psychiatrist is a doctor that specializes in mood and behavior treatment plans and medications.
- **Nurse Practitioner:** A nurse practitioner works with your doctor to ensure your medical needs are met. You could see a nurse practitioner working with your primary doctor, neurologist, or other specialist.
- **Nurse (LPN or RN):** A nurse is your main supporter and caregiver while in the hospital, providing your daily care and education. Nurses communicate with others on your stroke care team on any changes or needs.
- **Nursing Aide:** A nursing aide helps the nurse provide your basic daily care such as getting dressed, going to the bathroom, eating, showering, or bathing.
- **Case Manager:** A case manager coordinates your overall care, with a strong focus on discharge planning. The case manager works closely with you and your family, your doctors, nurses, therapists, and insurance company to ensure discharge needs are met.
- **Social Worker:** A social worker can serve many roles in your recovery and provide any resources you may need post discharge.
- **Registered Dietitian:** A registered dietitian ensures you have adequate nutrition plan while in the hospital, rehab, and post discharge.
- **Physical Therapist:** A physical therapist helps strengthen mobility, balance, movement, and positioning through actives or exercises.
- **Occupational Therapist:** An occupational therapist works on helping you perform everyday life skills independently such as bathing, dressing, or eating. They may recommend assistive devices (example: a shower chair) to help you be as independent as possible.
- **Speech and Language Therapist:** A speech and language therapist helps restore speech issues, improve communication and thinking skills, as well as improving any swallowing problems. These therapists suggest different diets or fluids based on your swallowing ability. These diets could be: nectar thick, honey think, puree, or mechanical.
- **Recreational Therapist:** A recreational therapist help you improve skills on things you enjoy doing such as playing games or doing arts and crafts.
- **Psychologist:** The psychologist deals with any mood or behavioral issues that may be affecting the patient's recovery process. The psychologist can help with adjustment to an injury or illness. This person is available to work with the patient, their family, and the therapy staff to help the stroke survivor focus on therapy activities.
- **Neuropsychologist:** A psychologist who specializes in assessment of cognitive, behavioral, social, and emotional problems that result from neurological illness or injury. This is done through a variety of tests that measure thinking, memory, sensory, intellectual, academic, and vocational skills, as well as emotional functioning.

# Health Changes after Stroke

Adjusting to life after a stroke can take time and may require new ways of thinking about and managing health. Because no two strokes are alike and there can be many changes that happen with a stroke, recovery is a long-term process that continues well after the hospital. It is important that you talk to your health care providers if you are concerned about any of these issues, or other issues not listed.

## Physical Activity

Following a stroke, physical therapy helps patients improve physical problems such as balance, walking, coordination, strength, positioning, etc. Patients will usually be encouraged to carefully position their bodies following stroke to promote skin care, reduce swelling, and muscle strength. Patients will also be encouraged to learn new ways to move around safely (eg., from surface to surface), sometimes with the help of another person or with new equipment. Therapy (in or outside the home) is recommended for many patients. However, staying physically active is an important part of recovery for all survivors. Doing physical activity with others, or incorporating interests or hobbies, can be an easy way to stay active. Often, care providers will recommend home activities or exercises to support recovery.

## Bowel/Bladder/UTI

Following a stroke, putting a stroke survivor on a bowel/bladder program is important for recovery. Medications, time voiding, and consistency are needed for success. A common complication that can occur is a UTI or urinary tract infection. Patients and their caregivers are educated on signs and symptoms of a UTI, which may include strong odor, dark color, increased frequency, pain with urination, fever, and confusion. A UTI can be treated with hydration, time voiding, and antibiotics. If not treated, it can lead to sepsis which is life-threatening.

## Skin Care

As the largest organ of the body, the skin helps protect the body and regulate temperature, body fluids, sensation, and more. A primary focus in stroke recovery is preventing skin breakdown or injury, often called "pressure sores/wounds". Your care team will perform skin inspections and encourage healthy activities such as: proper hygiene, shifting weight to prevent pressure spots, re-positioning in bed, hydration, wearing well-fitted clothing and shoes, wearing braces or devices properly.

## Cognition

Cognition is a broad term that refers to different types of processes associated with the way people think, controlled by the brain. Because all strokes impact different areas of the brain, the types of cognitive problems people have following stroke will vary. These problems are often associated with memory, attention, perception, learning, and reasoning. Strategies are usually offered to help improve problems in thinking, and the passage of time often helps with recovery as the brain heals.

## Visual

Depending on the type, extent, and region (e.g., occipital, brain stem) of the stroke, a patient may have problems with vision such as reading problems, poor visual memory, or depth perception and balance issues. Some patients have vision loss on one side of the visual field, which can result in the patient "ignoring" or neglecting that side of their body. Eye movement disorders and dry eyes may also follow a stroke. While these problems may not completely go away, there are many interventions that help improve these problems following a stroke.

# Health Changes after Stroke

## Nutrition

Assessment of nutrition is important for maximal recovery and is a high priority throughout recovery. It can be influenced by the variety physical and emotional changes following stroke. Specifically, changes in senses (e.g., taste, smell), swallowing (ie. dysphagia), or memory can impact a person's appetite and intake. Oral diets may vary by consistency based on a patient's swallow or patients may require tube feeding if unable to swallow or handle food by mouth.

## Hydration

Hydration (fluid intake) is an important aspect of nutrition. For some patients, liquids may require thickening for safety and/or the team may want to monitor intake and output of fluids. Managing hydration is important to the prevention of complications such as infection, constipation, skin issues, confusion. The Frazier Water Protocol is an intervention used in some settings to allow patients who would normally require thickened liquids to drink water between meals (not during meal or for 30 minutes after meal, to prevent risk for aspiration).

## Swallowing Changes

Following a stroke, a person may experience dysphagia, which is a swallowing disorder. Dysphagia may be due to weakness and/or poor coordination of the muscles used for swallowing. A person with swallowing difficulties may be placed on an altered diet or given tube feedings. An altered diet may include a change in the consistencies of solids and or liquids. Patients may also learn different techniques to assist with swallowing, such as tucking the chin or taking small bites. A person with dysphagia is at risk for aspiration pneumonia if food, liquid, or saliva containing bacteria enters the lungs. Following safe swallow recommendations and completing good oral care is essential to prevent aspiration pneumonia. A speech-language pathologist will be involved in creating a plan for managing dysphagia and improving a patient's swallow function.

## Speech

Dysarthria is the term that describes changes with speech production following a stroke, which results from muscle changes in the lips, tongue, and throat. Many people experience this after a stroke, resulting in slurred speech that can't be understood, slowed speech, or very soft speech. Verbal Apraxia also causes impaired speech production but is less common. This involves the inability to plan the movements required to make a certain sound or word.

## Language

Language problems are most common when the left side of the brain has been impacted by a stroke. Aphasia is the term that describes this difficulty with language and involves partial or total loss of one's ability to use words. Aphasia can affect the ability to speak, write, read, gesture, and understand spoken, written, or gestural language. Fluent aphasia describes speech that is normal in rate, but the words don't make sense. Non-fluent aphasia describes more effortful, hesitant speech that is generally experienced as such by the patient, often resulting in frustration. Language problems can contribute to difficulty with intimacy and social connections and independence.

# Health Changes after Stroke

## Intimacy and Sexuality

While it can be difficult to discuss with providers, sexual health and intimacy are important aspects of recovery. Intimacy, feeling an emotional connection to others, is important even after a stroke. Sexuality can also be impacted after a stroke, as the body may feel or work differently than before. Discussing activities that build self-esteem and a sense of connection or belonging with your family, friends, and providers, can help build intimacy. Discussing positioning and physical changes related to sexual activity may also be important to discuss with providers and partners.

## Lifestyle changes

After a stroke, it is common to experience changes in routines and daily living. These changes may be a result of physical, emotional, or other symptoms. It is important to recognize that some lifestyle changes are temporary and may continue to improve with time (e.g., independence). Patients are encouraged to do as much as is safely possible alone, even if it takes longer or requires some adaptation. Very often, building this sense of independence is an important part of creating a fulfilling lifestyle after stroke. Staying actively involved in the rehabilitation plan, participating in setting goals with your providers, and asking questions that are important to you are other ways to create a healthy daily routine.

## Driving

Driving is often a major concern after stroke, though it can be intimidating to some. It is important to discuss driving goals and safety with the providers involved in your care. Sometimes, modifications are needed for vehicles to make them safe. Some states also require physician release to resume driving.



# Health Changes after Stroke

## Mood

After a stroke, mood changes can be common, especially depression. Depression can look different for everyone and be hard to recognize due to the overlap with some normal physical changes after stroke. It may involve loss of interest or pleasure in activities someone used to enjoy, grief over changes in one's abilities, fatigue and low energy, changes in appetite, tearfulness, and more. New coping skills may be needed to adapt to changes in social activity, hobbies, and leisure due to the stroke. Worry about the future can also be a common experience after stroke. Stroke survivors may also notice they have episodes of uncontrollable laughing or crying. This is known as Pseudobulbar affect. Please see our information on this condition on the next page.

Medication may be prescribed to help with mood changes. Many community agencies and support groups are also available for stroke survivors and families.

## PseudoBulbar Affect (PBA)

*Pronounced: Sue-dough-bulb-R aah-fekt*

PBA episodes can be :

- Sudden
- Frequent
- Uncontrollable
- Mismatched with feelings (expression  $\neq$  emotion)
- Confusing, frustrating or embarrassing

Common in neurological conditions such as:

- Traumatic Brain Injury (TBI)
- Alzheimer's disease / Dementia
- Stroke
- Multiple Sclerosis
- ALS (Lou Gehrig's disease)
- Parkinson's disease

Sometimes mistaken for other conditions such as:

- Depression or Bipolar disorder
- Euphoria
- PTSD
- Pain

It's possible to have these symptoms and conditions while also having PBA, that's why it's important to talk to your Doctor and find out what might be causing YOUR different symptoms.

You might be experiencing PBA if:

- There are times when you feel fine one minute, and then become tearful the next minute over something small or for no reason at all.
- Others have told you that you seem to become amused very easily or seem to become amused about things that really aren't funny.
- You crying very easily.
- Even when you try to control your laughter, you're often unable to do so.
- There are times when you won't be thinking of anything happy or funny at all, but will suddenly become by funny or happy thoughts
- Even when you try to control your crying, you are often unable to do so.
- You are easily overcome by laughter.

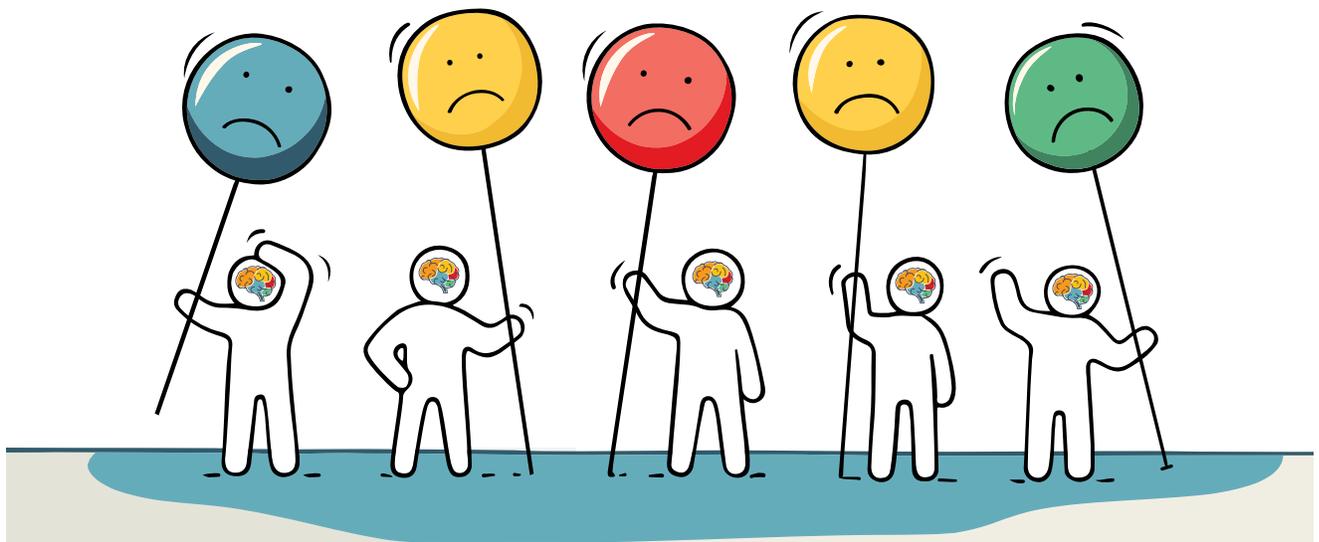
If you have questions or feel you need help with PBA episodes, contact your healthcare provider.

Reference: [www.pbainfo.org](http://www.pbainfo.org)

# Post-Stroke Depression

Many stroke survivors experience feelings of anger, frustration, anxiety, sadness, fear & hopelessness. These emotions are common with post-stroke depression.

**If not treated & managed post-stroke depression can SLOW recovery.**



## IMPORTANT SIGNS:

- Changes in appetite & sleep patterns
- Sadness or unexplained crying spells
- Irritability, anger, agitation
- Worry, anxiety
- Loss of energy
- Feelings of guilt, worthlessness
- Difficulty concentrating
- Loss of pleasure in hobbies or activities
- Use of alcohol or chemical substances
- Thoughts of life is not worth living

<https://www.nlm.nih.gov/health/topics/depression/index.shtml>  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3330166/>  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2924510/>



80% of people treated for depression show improvement in about 4 to 6 weeks of beginning medication, therapy, and/or attending a support group.

**58%** of caregivers show depressive symptoms.



More than 1/3 of stroke survivors experience post-stroke depression.

**U of L** Health

Comprehensive Stroke Program

**If you have questions or feel you need help with depression, contact your health care provider.**

# Safety After Stroke

Due to the physical impairments following a stroke, stroke survivors are more likely to have a serious fall within the first year of recovery. It is important to remember that certain medications might make you drowsy so using assistive devices can help make daily living activities more manageable and can help prevent falls. Be sure you discuss any concerns you may have with returning home with your care team.

Check any off you think would help you:

## Mobility

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- Use the assistive devices recommended by your therapists instead of relying on furniture to support yourself while walking (such as a cane, walker)
- Keep halls and paths in your home clear
- Secure loose carpets
- Remove throw rugs if possible
- Install good lighting in walkways
- Put items you use often in places that are easy to reach
- Place handrails for support when going up and down stairs
- Ramps instead of steps
- Plastic treads on stairs
- Bedrails

## Dressing

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- Wear flat shoes; avoid flip-flops or shoes with an open back
- Wear nonskid socks or shoes; try to avoid slick surfaces
- Simple clothing with nylon adhesive fasteners to replace buttons and snaps

## Kitchen/Eating

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- Special eating utensils
- Plate guards to scoop up food
- Cups with slip lids to avoid spills
- Long handles on sponges and brushes
- A board over wheelchair arms to use as a table for eating, resting objects or supporting a weak arm

## Bathroom

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- Raised toilet seat
- Shower seat, bench or stool with rubber tipped legs
- Grab bars for toilet, tub, or shower
- Rubber mat in tub or shower
- Electric razor

## Prepare for Emergencies

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- Notify your fire department if you have any trouble escaping a fire
- Place any emergency items such as a phone or flashlight next to your bed
- Post emergency phone numbers by your phone
- Make a fire escape plan for your home. Practice your plan regularly
- Install smoke alarms inside each bedroom, outside each sleeping area, and on every level of your home
- Test your alarms monthly. Replace batteries once a year. Replace alarms every 10 years

# Preparing for Leaving the Hospital

Our goal is to make sure you can manage your health and are able to go home or to another care setting successfully. We invite you to use this list to help you prepare for when you leave our hospital.

## My Health

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- |  |  |
|--|--|
| <input type="checkbox"/> I understand my medical condition(s)                                | <input type="checkbox"/> I understand where I will receive care after I leave the hospital, if applicable (i.e. home health, rehabilitation, long term care, etc.) |
| <input type="checkbox"/> I know what I need to do to stay healthy after I leave the hospital | <input type="checkbox"/> I have participated in planning the next steps in my care   |
| <input type="checkbox"/> I know if/when I can safely resume daily activities                 |  |

## Signs and Symptoms

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- |  |   |
|--|---|
| <input type="checkbox"/> I understand the possible problems or side effects I should watch for | <input type="checkbox"/> I know who to contact if I have certain signs and symptoms |
|--|---|

## Medications

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- |   |  |
|---|--|
| <input type="checkbox"/> I understand the reason for taking each of my prescribed medicines | <input type="checkbox"/> I know the possible side effects of each medication |
| <input type="checkbox"/> I know how to take my medicines                                    |  |

## Appointments

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- |  |   |
|--|---|
| <input type="checkbox"/> I know when my follow-up appointment is     | <input type="checkbox"/> I know where my follow-up appointment is located |
| <input type="checkbox"/> I know who my follow-up appointment is with |   |

*If you have any questions about your discharge, please let a member of your care team know.*

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## STROKE FOLLOW-UP APPOINTMENT INFORMATION

### **Items to bring:**

- List of medications/supplements
- Insurance cards
- Driver's license
- Pharmacy information
- Primary care doctor information
- Specialist doctor information
- Hospital discharge instructions (if needed)
- Recent test results from home or previous appointments
- List of allergies

### **What to tell your providers:**

- How have I been feeling?
- Any new medical issues or symptoms?
- Any issues with pain?
- How have I been sleeping?
- What has improved since last visit/hospitalization?

### **Questions to ask your providers:**

- What is a stroke?
- What caused my stroke?
- What type of stroke did I have?
- What are my risk factors?
- What are the signs/symptoms of stroke?
- What are my medications for?
- What are the side effects from my medications?
- Do I have any physical limitations such as driving or working out?
- What kind of exercise could I be doing?
- What are my lab results? (*Bring BP/blood glucose results*)
- What is the best diet for my stroke?
- Can you share my studies with me and the results?
- Can I get a copy of my test results?
- What should I expect from my recovery?
- What can I do to prevent another stroke?

## Follow Up

You will be contacted after discharge from the UofL Health Stroke Programs. In addition, Frazier does follow up phone calls at 90 days after discharge about satisfaction and health status. After you are discharged from the hospital, it is very important to follow up with your doctor. The discharge instructions that your nurse provides will instruct you on what doctors you should schedule appoints to see. Be sure to review these instructions and call to schedule an appointment with your primary care physician, the neurologist, and any other providers the hospital physicians felt you should see after discharge. When you make these appointments, be sure to let the office staff know you have been in the hospital and the hospital physician wanted you to follow – up with their office.

If you need help finding a primary care provider in the Louisville area, please call:

**502-588-4343**

If you need help finding a primary care provider outside the Louisville area, please contact our Stroke Social Worker for assistance:

**Carrie Crockett, CSW**  
**502-645-5425**

# Patient and Caregiver Resources

## UL Health Support Groups for Stroke Survivors and Support Systems

### UofL Health – Stroke

#### Louisville Stroke Support Group

Virtually online and/or Crescent Hill Library  
2762 Frankfort Avenue  
Louisville, KY 40206  
*Third Friday of the month*  
Hours: 12 – 2 p.m.

**Contact:**

*Carrie Crockett, CSW at 502-645-5425*

### UofL Health – Stroke

#### Campbellsville Stroke Support Group

Virtually online and/or Taylor Co Public Library  
1316 E. Broadway Street  
Campbellsville, KY 42718  
*First Friday of the month*  
Hours: 1 – 3 p.m.

**Contact:** *Carrie Crockett, CSW at 502-645-5425*

### UofL Health – Stroke and Memorial Hospital Stroke Support Group

Virtually online and/or Medical Arts Conference  
Room (*lower level of Medical Arts Building*)  
721 W. 13 Street  
Jasper, IN 47546  
*Fourth Tuesday of the month*  
Hours: 1– 3 p.m.

**Contact:**

*Mary Jo Eaton Calhoun, BSN, RN at 812-996-6364*  
*Carrie Crockett, CSW at 502-645-5425*

### UofL Health – Mary & Elizabeth Hospital Stroke Support Group

First Floor Medical Plaza 1  
4402 Churchman Avenue  
Louisville, KY 40215  
*Second Wednesday of the month*  
Hours: 12 – 2 p.m.

**Contact:**

*Stefanie Metzroth or Jennifer Bucher*  
*at 502-361-6585*

### UofL Health – Stroke

#### Virtual Stroke Support Group

Virtually online via Zoom  
*Fourth Wednesday of the month*  
Hours: 6 – 7 p.m.

**Contact:**

*Carrie Crockett, CSW at 502-645-5425*

### UofL Health – Brain Injury Survivor Support Group

4912 US Highway 42, Suite 104  
Louisville, KY 40222  
Virtually Online and/or In person  
*Third Wednesday of the month*  
Hours: 5:30 – 6:30 p.m.

**Contact:**

*Frazier NeuroRehab Program at 502-429-8620*

### UofL Health – Brain Injury Caregiver Support Group

Virtually and/or in person  
4912 US Highway 42, Suite 104  
Louisville, KY 40222  
*Every 3 months, on the second*  
*Tuesday of the month*  
Hours: 4:30 – 6 p.m.

**Contact:**

*Frazier NeuroRehab Program at 502-429-8620*

### Flourishing Together:

#### Eat Well, Move More, Stress Less

10-week virtual session series  
Optional monthly support group following initial  
10-week session

**Contact:**

*Mona Huff at 502-706-0098.*

**Register:**

*[tragerinstitute.org/microclinic-program](http://tragerinstitute.org/microclinic-program)*



**Want to stop using tobacco? Here's some FREE help for you!**

## **STOP SMOKING CLASSES**

### ***Plan to Be Tobacco Free***

A new one-time session lasting up to one hour, offered at no charge by Kentucky Cancer Program Tobacco Treatment Navigators. Developed to help individuals prepare for a quit attempt. Visit [kycancerprogram.org](http://kycancerprogram.org) to learn more.

### ***Cooper Clayton Method to Stop Smoking***

Kentucky Cancer Program, local health departments and community organizations offer classes across the state. Includes 13 one-hour weekly sessions and may provide nicotine replacement. Visit [kycancerprogram.org](http://kycancerprogram.org) or call 1-800-QUIT-NOW for a listing of classes in your area.

### ***UofL Health – Pharmacy Services***

Our outpatient pharmacists are trained to provide tobacco cessation coaching and education. This free program offers individualized care for anyone who wants to quit using tobacco and is age 18 and older. For more information, call 502-562-3571.

### ***Quit Smoking Hotlines:***

- **1-877-44U-QUIT (1-877-448-7848)**  
The National Cancer Institute's trained counselors are available to provide information and help with quitting in English or Spanish, Monday through Friday, 8 a.m. to 8 p.m. Eastern Time.
- **1-800-QUIT-NOW (1-800-784-8669)**  
Calling this toll-free number will connect you directly to your state quit line. All states have quit lines in place with trained coaches who provide information and help with quitting. Specific services and hours of operation vary from state to state.

### ***Computer On-line Help***

- [QuitNowKentucky.org](http://QuitNowKentucky.org)
- [Becomeanex.org](http://Becomeanex.org)
- [Smokefree.gov](http://Smokefree.gov)
- [LiveHelp.cancer.gov](http://LiveHelp.cancer.gov)  
Text chat with a specialist

## Tips for Caregivers

There are many ways you can help your loved one adjust to changes following a stroke. Here are a few tips:

### Physical

- Follow any recommended positioning needs.
- Encourage the use of assistive devices as needed. (Eg. Walker, cane, shower chair, hand/foot splints)
- Encourage sitting up and getting out of bed with appropriate assistance to help prevent muscle weakness.
- Encourage possible movement of the affected side with all activities.
- Encourage full concentration and focus on controlled movements when attempting to use affected side.
- Break movements down into parts with cuing.
- Encourage your loved one do regular exercises that they can do or join them in creating an exercise routine.

### Cognitive

- Provide reorientation to date, time, place, and situation.
- Reduce distractions when communicating or doing other activities.
- Encourage your loved one to re-check his/her work when completing paperwork.
- Encourage writing down important information in a memory device.
- Give extra time to solve problems. Provide hints/ cues to assist with successful completion.
- Point out unsafe behaviors and calmly explain why the behavior is unsafe and what the safe behavior should have been.
- Provide repetition for new learning.





### Speech/Language

- Encourage your loved one to talk slow, open mouth wide and repeat/rephrase as necessary.
- Encourage good posture and deep breaths before speaking.
- Encourage completion of all home speech exercises.
- Use shorter sentences, and reword/rephrase ideas to help with understanding.
- State one idea at a time and when possible ask “yes” or “no” questions.
- Allow time for your loved one to respond and understand.
- Do not attempt to speak louder. Language is the issue, not hearing.
- Respect your loved one and include them in conversations.
- Pay close attention to facial expressions, sounds, or words they may use to convey their message.
- Communication aids such as gestures, whiteboards, paper and pencil can help if your loved one is having trouble understanding you.

### Daily Living/Psychosocial

- Encourage your loved one to attempt precious hobbies and activities.
- Have your loved one assist with ADL's. (bathing, dressing, eating, grooming)
- Include your loved one in conversations or activities involving previous roles.
- Identify available resources/ programs in the community.
- Motivate your loved one to explore modified options and equipments for leisure activities.
- Encourage attendance in support groups for stroke survivors.
- Attend support groups for caregivers.
- Offer support and engagement to help with motivation.
- Don't take changes in mood/ personality personally.
- Keep track and celebrate progress and allow your loved one to be as independent as his or her health allows.
- Give positive feedback, praise, and efforts to support their independence

## Visual

- Encourage them to look towards the affected side.
- Help maintain normal range of motion at the neck.
- Encourage use of an organized search pattern to find objects.
- Remove visual distractions in the environment.
- Read information twice to make sure all details are noticed.
- Encourage use of finger to follow across lines when reading.
- Discuss with with a doctor when a visual consult may be needed.

## Safety

- Help with activities that could be dangerous such as cooking or bathing.
- Keep sharp items in a safe place.
- Help remove any fall hazards from the home- and keep and eye out for new ones.
- Help prepare an emergency plan for your loved one.
- If you don't live with the stroke survivor, arrange calls to check on them daily. (Neighbors may be willing to help!)
- Know and look for warning signs and symptoms of a stroke. See page 8 for signs and symptoms of a stroke.

## Nutrition

- Make sure your loved has enough to eat and drink.
- Talk with your loved one's provider if there is a concern about decreased appetite.
- If your loved one has trouble with swallowing, help prepare foods that are easy to swallow.
- Be alert for choking and know what to do if this happens.
- Encourage your loved one to eat healthy.
- Help plan meals if necessary.

## **Remember you need to take care of yourself too!**

- Get help if you need it from family, friends, support groups, or your church. See page 25 on information about support groups.
- Set aside time for yourself by pursuing a hobby or interest, or by scheduling a weekly night out with friends.
- Acknowledge your feelings. It's okay to be angry, guilty, frustrated, or afraid. Talk about your feelings with a trusted friend or family member and know when to seek help for yourself.

For additional support and/or resources please contact our UofL Health Stroke Social Worker:

**Carrie Crockett, CSW**  
**502-645-5425**



# My Providers

NAME	PHONE
Primary Care Doctor	
Hospitalist	
Neurologist	
Intensivist/Pulmonologist	
Psychiatrist	
Nurse Practitioner	
Emergency Doctor	
Case Manager	
Social Worker	
Physical Therapist	
Occupational Therapist	
Psychologist	
Other	
Other	
Other	
Other	











