Stroke Education Guidebook

Barrow Neurological Institute | Petznick Stroke Center

Stroke Education Guidebook

Table of Contents

Introduction

This guidebook is intended to be an introductory resource and to serve as a reference tool throughout your recovery. The information and education will include how to identify the symptoms of a stroke, causes, risk factors, treatment options, and goals for recovery.

Each section has an area to help you write things down about your stroke.

The information in this guidebook may not answer all of your questions, but our incredible healthcare team is available to you and your family to answer all questions in real-time.

We are here for you.

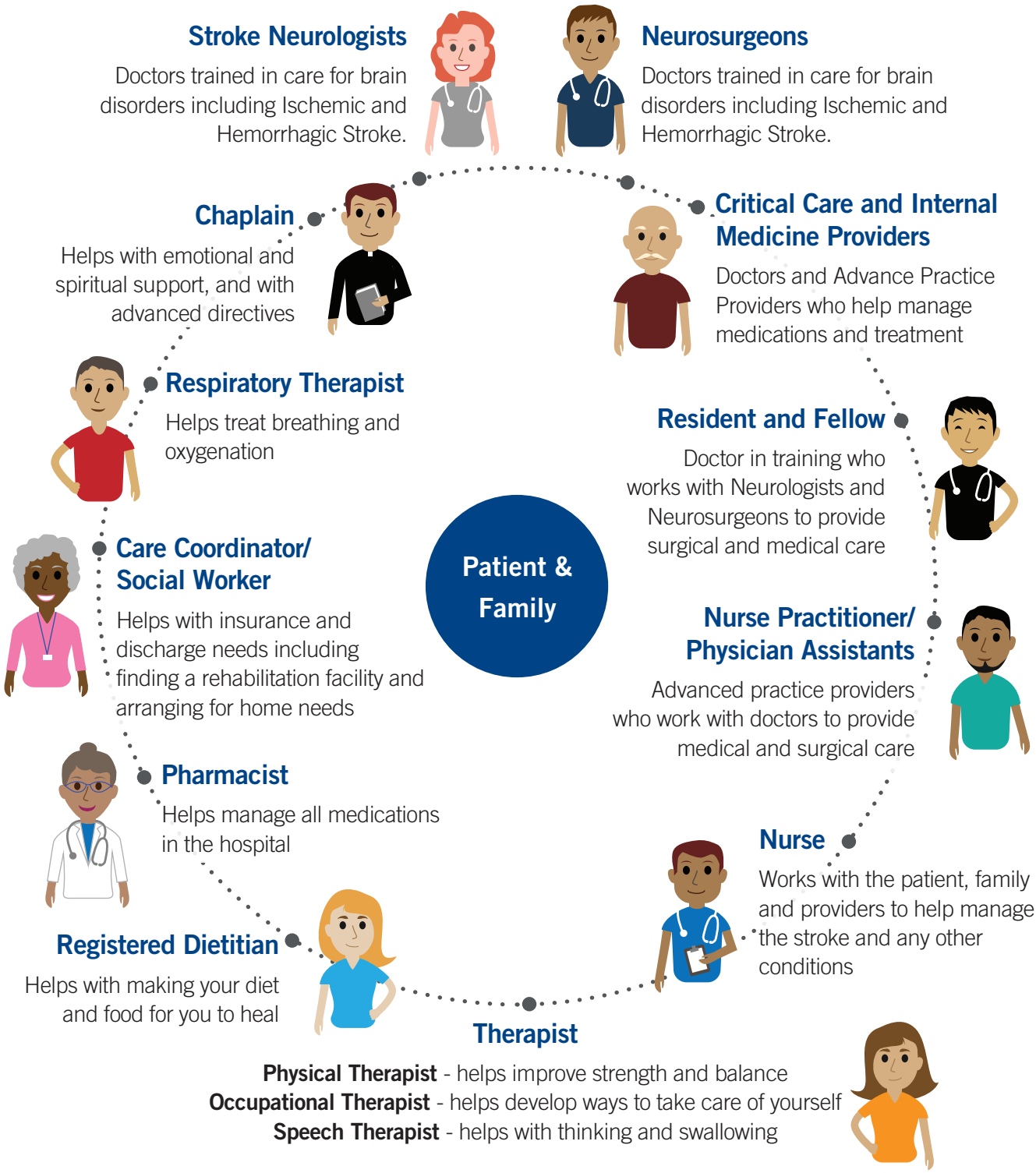
Please keep this guidebook in your hospital room so that your healthcare team may add information specific to you.

Please let us know if we can assist you in any way.

Thank you,
Your Stroke Recovery Healthcare Team

Meet Your Healthcare Team

Provider can include all of the following:



Who are the members of my Healthcare Team?

Team member name:	Specialty:

What is a Stroke?

A stroke is an event that affects the arteries of the brain. Strokes occurs when a blood vessel bringing blood to the brain is blocked or bursts (ruptured). This means that the area of the brain that is blocked or ruptured cannot get the oxygen and nutrients it needs, causing brain cells to be injured.

Your brain controls your ability to move, feel, think and behave. Brain injury from a stroke may affect any of these functions. Different factors affect the ways people experience a stroke.

- The location of the blood vessel that is blocked or ruptured
- The area and size of the brain injury
- The type of stroke
  - o Ischemic Stroke (the most common kind of stroke)
  - o Transient Ischemic Attack (TIA) (also called warning stroke)
  - o Hemorrhagic Stroke (caused by the rupture of a blood vessel in the brain)
    - Intracerebral Hemorrhage
    - Subarachnoid Hemorrhage

About My Stroke

Talk to your health care team to learn where in the brain and what vessels your stroke happened so it can be marked on the images below.

My stroke was:

- ☐ Right Side of the brain
- ☐ Left Side of the brain
- ☐ Due to blockage in a blood vessel (ischemic)
- ☐ Due to a damaged blood vessel bleeding into brain tissue (intracerebral hemorrhage)
- ☐ Due to a damaged blood vessel bleeding into the area between the brain and its lining (subarachnoid hemorrhage)

The cause of my stroke was:

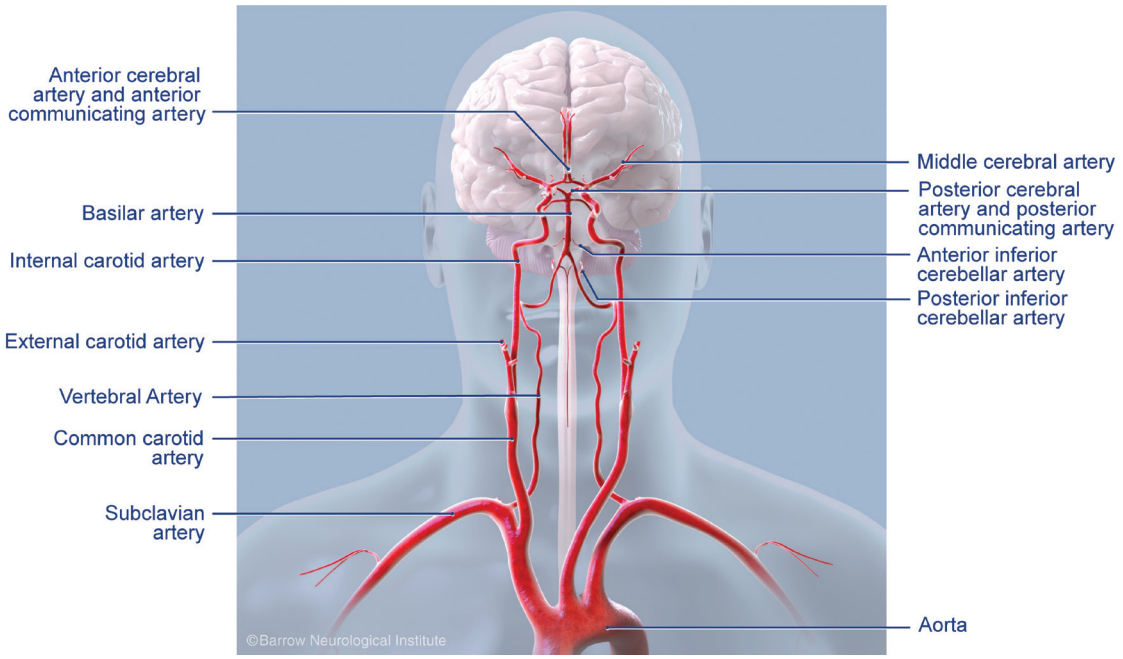
_____

The exact cause of my stroke is not known, but it may have been because of:

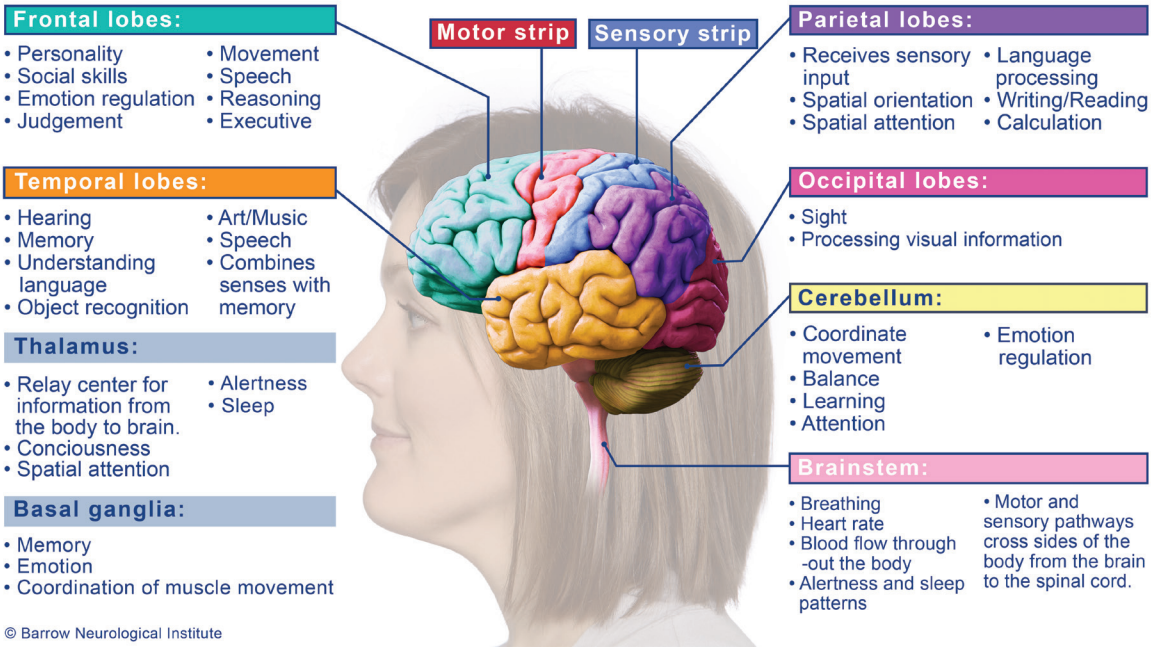
_____

Brain and Neck Vessels

- Vessels are one-way roads.
  - o Arteries take blood with oxygen and nutrients from the heart to brain tissue. Each artery leads to a different part of the brain.



The brain controls functions such as movement, breathing, sensations, thinking, learning, and emotions. These functions come from different parts of the brain.



Diagnosis and Early Treatment

Your healthcare team will gather information and make a diagnosis. They will review events that have occurred and order tests to examine how the brain looks, works, and gets its blood supply.

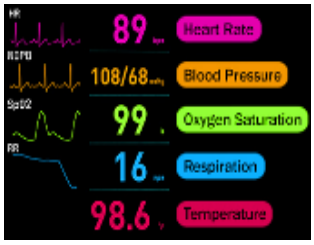
Diagnostic tests you may have are below.

Physical and Neurological Examination

Doctors, nurses, and therapists will ask you questions multiple times during the day and night to monitor how you are healing. They will also ask you to follow instructions to test your thinking, strength, and coordination to determine treatment.

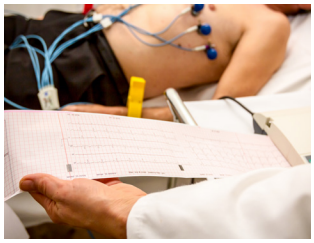
Laboratory Work (Blood Tests)

Blood will be drawn regularly to measure lab values and provide treatment if needed.



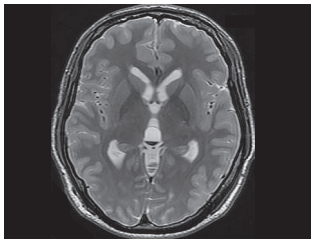
Monitoring

Providers will monitor your heart rate, blood pressure, respirations, oxygen level, and temperature.



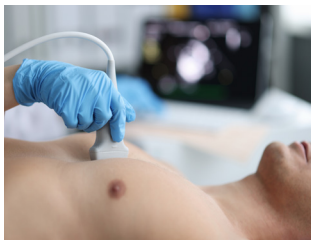
Electrocardiogram (EKG or ECG)

Records the electrical signal from the heart to check for different heart conditions.



Brain and Neck Imaging

A picture to assess brain tissue and blood flow in the brain used to identify cause and healing of tissue

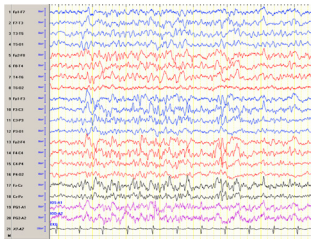


Echocardiogram

Used to assess the walls of the heart and blood flow through the heart.

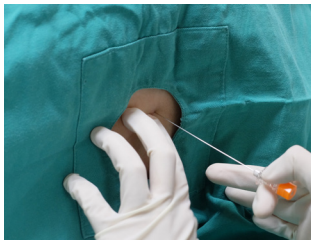
Transcranial Doppler (TCD)

Used to assess blood flow in your brain.



Electroencephalogram (EEG)

Used to find and monitor for seizures



Lumbar puncture

Used to diagnose certain health conditions including bleeding, infection, or inflammation of the brain or spinal cord.

What tests or procedures did I have?

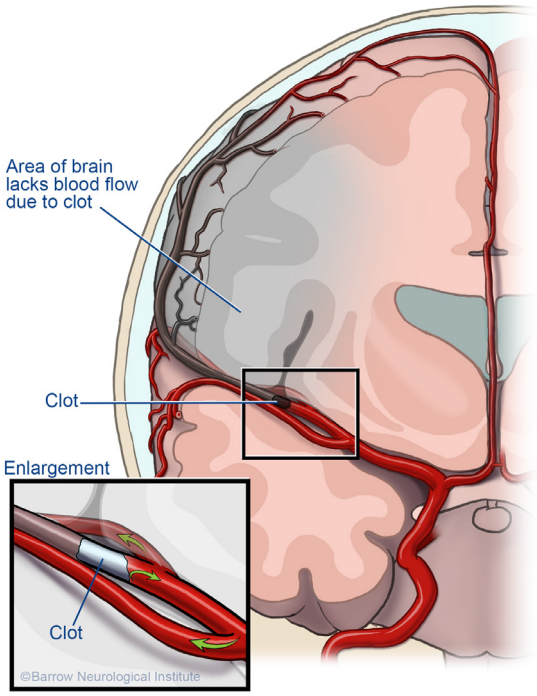
Tests: **Date:**

Types of Stroke

Ischemic Stroke and Transient Ischemic Attack (TIA) - Low Blood Flow or Blockage

Ischemic stroke happens when a blood clot blocks a vessel supplying blood to the brain. It is the most common type of stroke. The treatment goal is to dissolve or remove the clot.

TIA: "Warning strokes". TIAs produce symptoms just like a stroke, but last a shorter amount of time. They are major predictors of future stroke. If you think you have had or are having a TIA, CALL 9-11. Even if the symptoms have gone away.



Ischemic Stroke

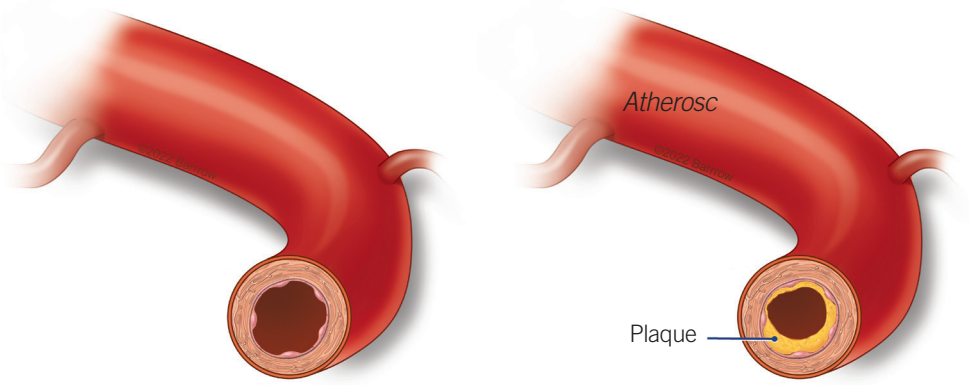
Causes of an Ischemic Stroke

Thrombosis: A blood clot that forms at the site of the stroke.

Embolism: A blood clot that forms somewhere is the body and travels to the site of the stroke.

Hypercoagulability: When blood clots faster than it should.

Stenosis and Atherosclerosis: Blood vessels do not allow enough blood to flow to the brain because they become stiff and narrow from fatty plaque build-up (cholesterol).



Normal Artery *Atherosclerosis*

Cryptogenic: Unknown cause

Other: Blood clots can come from cancer, infection, or a tear of an artery in the head or neck.

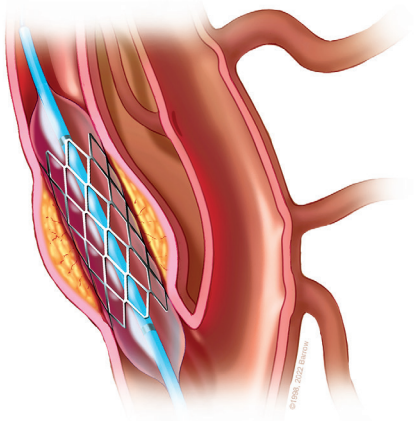
Early Treatment of Ischemic Stroke

Thrombolytic: A clot busting medication given through an IV that dissolves blood clots to restore blood flow to the brain. *(Scan code for more information.)* This medication is more effective the sooner it is started. For most people, it is started within 3-4 hours after stroke symptoms begin.

Mechanical Thrombectomy: Doctors use a wire to remove the blood clot from the brain. This procedure is more effective the sooner it is started. For most people, it is started within 24 hours after stroke symptoms begin.

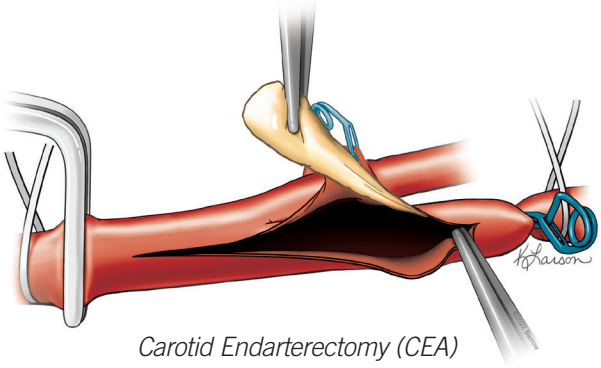
Angioplasty: Using a small balloon to open a blood vessel.

Carotid Stenting: Placing a small mesh tube into blood vessels in the neck to keep the vessel open and to reduce the narrowing of the artery.



Carotid Stenting

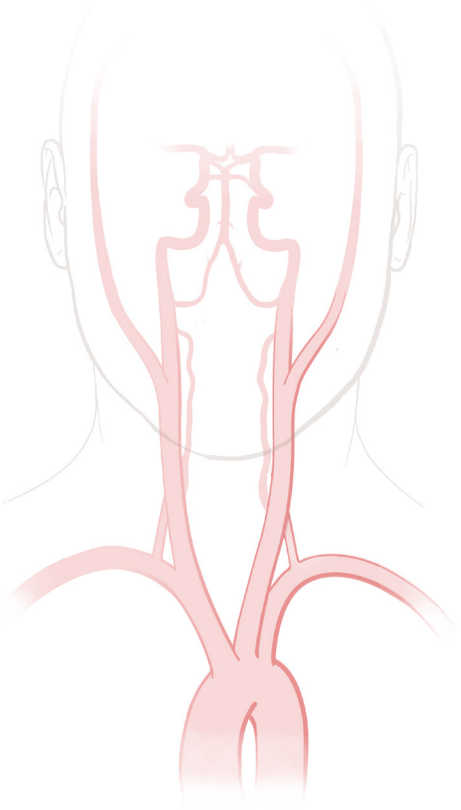
Carotid Endarterectomy (CEA): The surgical removal of fatty plaque (cholesterol) from the carotid arteries.



Carotid Endarterectomy (CEA)

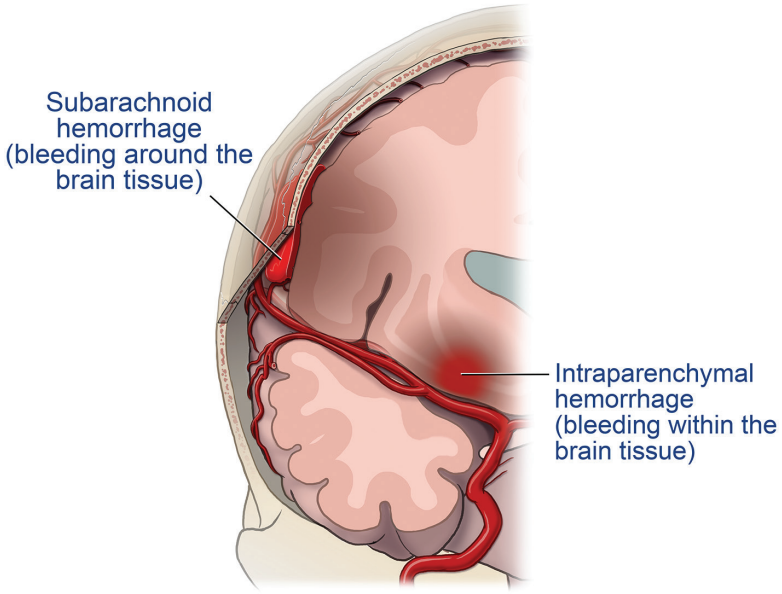
Surgical Carotid Bypass: Surgical bypass of the carotid artery to increase blood flow to the brain.

Talk to your health care team to learn what vessels were involved with your stroke so it can be marked on the image below.



Hemorrhagic Stroke – Bleeding in the brain

- Hemorrhagic stroke occurs when a weakened blood vessel ruptures and spills blood into the brain.
- This type of stroke may affect large arteries in the brain or the small blood vessels deep within the brain.
- The treatment goal is to find the cause of the bleeding and stop it from bleeding.
- There are two types of hemorrhagic stroke
  - o Intracerebral Hemorrhage (ICH)
  - o Subarachnoid Hemorrhage (SAH)



Intracerebral Hemorrhage (ICH)

Bleeding from small arteries deep within the brain tissue. Most common cause is damage to arteries due to high blood pressure over many years.

Causes of ICH

Hypertension (HTN): High blood pressure can add extra pressure to the thin walls of arteries, causing them to tear and leak blood into brain tissue.

Cerebral Amyloid Angiopathy (CAA): Deposits of amyloid buildup in blood vessels, making them weaker and more likely to bleed into the brain tissue.

Metastatic Disease: Some metastatic diseases will grow or damage blood vessels, which leads to blood leaking into brain tissue.

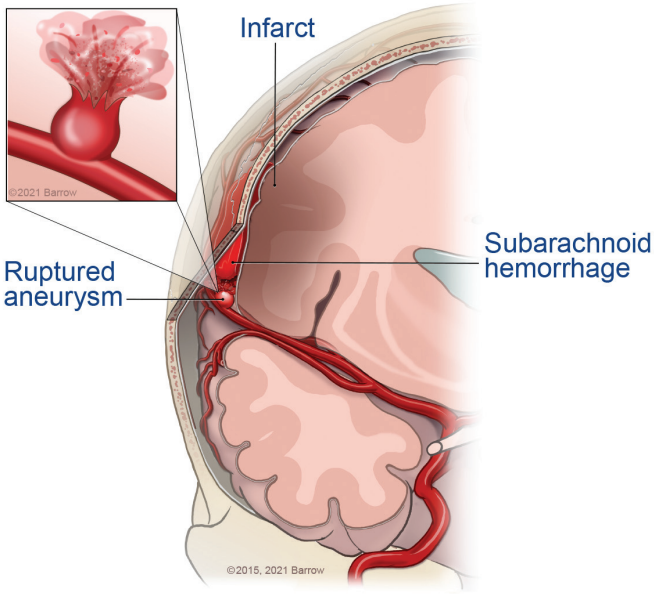
Infections: Some infections can cause swelling or injury to blood vessels, which leads to blood leaking into brain tissue.

Arteriovenous malformations (AVM): Tangles of abnormal blood vessels. The direct connection of high-pressure arteries to thin-walled veins can cause ruptures.

Cavernous malformation (cav mal): A group of fragile, thin-walled veins within the brain.

Subarachnoid Hemorrhage

Blood vessel bursts near the surface of the brain, causing blood to collect between the brain and its protective layers.

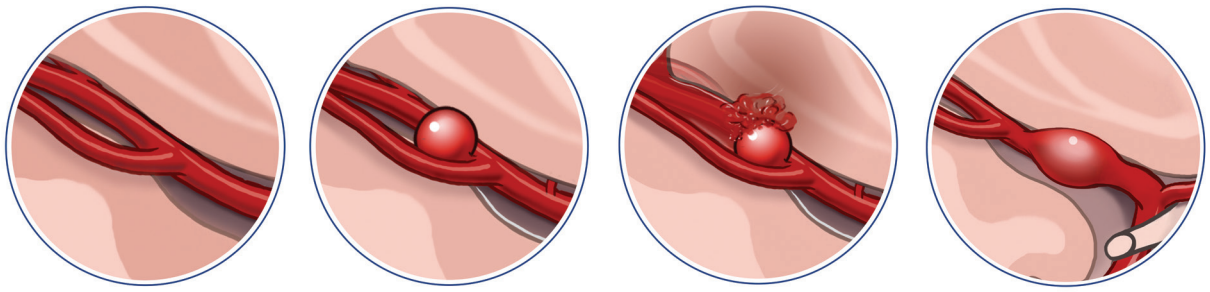


Causes of SAH

Aneurysm: An aneurysm is where the wall of an artery thins and stretches to form a thin balloon of tissue.

The size, shape and location of the aneurysm will help the neurosurgeon to decide what type of aneurysm repair procedure you will have (coiling versus clipping of the aneurysm).

Types of Aneurysms



Healthy Vessel *Saccular aneurysm* *Ruptured aneurysm* *Fusiform aneurysm*

The following have also been associated with increased risk of SAH:

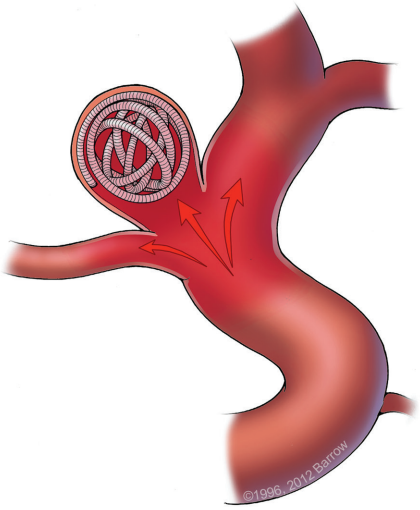
- Ehlers-Danlos syndrome
- Excessive alcohol consumption
- Family history of aneurysms
- Fibromuscular dysplasia (FMD)
- High blood pressure
- Polycystic kidney disease
- Smoking
- Use of blood thinners
- Use of illicit drugs, such as cocaine and methamphetamine

Early Surgical Treatment of Hemorrhagic Stroke

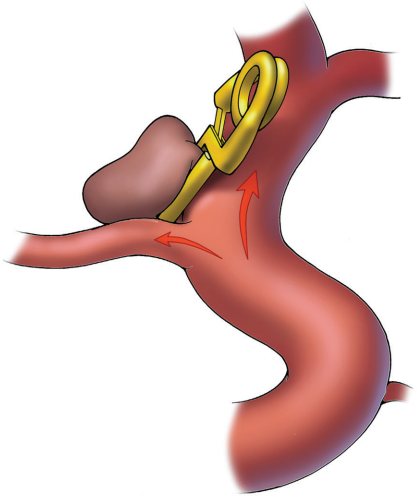
External ventricular drain (EVD) or ventriculostomy: A catheter that is placed into the ventricles of the brain to monitor pressure in the brain.

Coiling or Stenting of an aneurysm. During an angiogram, coils are placed within the aneurysm or use of a stent to divert blood flow from the aneurysm.

Clipping aneurysms: Stops blood flow within the bulging area of the brain artery by placing small clips around the base of the aneurysm.



Coil within an aneurysm



Clipping of an aneurysm

Evacuation: Surgically remove a blood clot from the brain.

Embolization: Stop blood flow in small blood vessels for treatment of AVMs during angiogram.

Resection: Surgical removal of abnormal vessels to prevent future bleeding.

How do I prevent another stroke?

Every stroke survivor has a unique recovery. In order to prevent another stroke, your healthcare team will work with you.

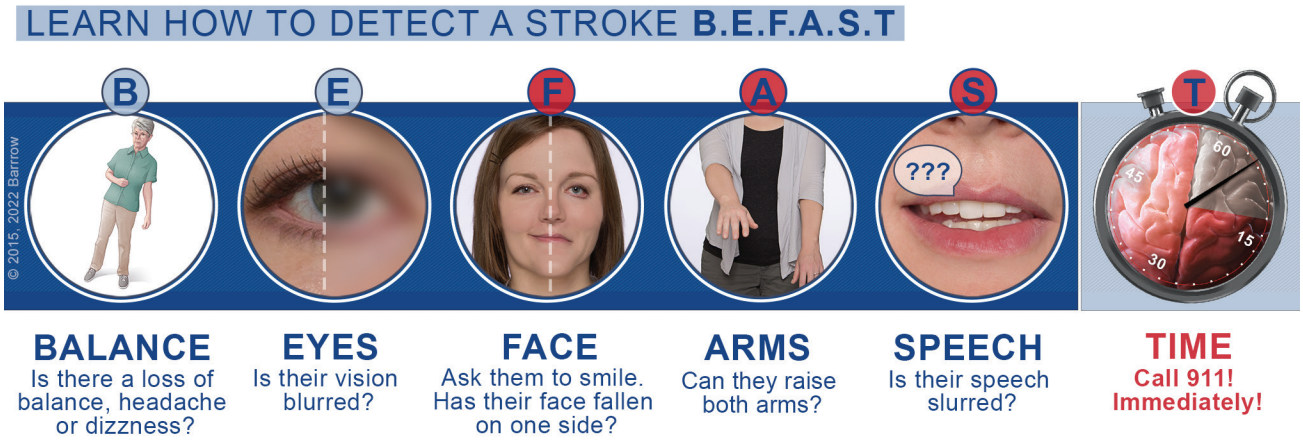
Take steps to understand the signs and symptom of stroke, your risk factors for stroke, medications prescribed to help manage your risk factors and when to see your doctor.

Know the Warning Signs and Symptoms of a Stroke

- **Sudden** loss of balance and dizziness.
- **Sudden** changes in eyesight.
- **Sudden** numbness and tingling or weakness of the face, arm, and leg. Usually on one side of the body.
- **Sudden** loss of being able to talk or understand words.
- **Sudden** severe headache for no reason. People usually describe it as the "worst headache" of their life.

B. E. F. A. S. T. is an easy way to remember the signs of a stroke.

If you notice any of these signs in yourself or with someone else, get medical help immediately. Call 911 and say you are having a stroke.



What are my risk factors of stroke?

You can prevent or reduce damage from a stroke by knowing and reducing your risk factors. There are two kinds of factors: modifiable and non-modifiable.

Modifiable Risks

Modifiable risk factors are physical traits, conditions, or habits which can be modified to reduce the risk of a stroke:

- Heart conditions
- High blood pressure
- High cholesterol
- Diabetes
- Tobacco & alcohol use
- Poor diet
- Obesity & physical inactivity
- History of a stroke or TIA

Non-modifiable Risks

Non-modifiable are risk factors cannot be changed to reduce risk:

- Age
- Gender
- Race/ethnicity
- Family history

My Risk Factors:

- ☐ Heart Conditions
- ☐ High Blood Pressure
- ☐ High Cholesterol
- ☐ Diabetes
- ☐ Obesity/ Physical Inactivity
- ☐ Poor Diet
- ☐ Tobacco Use/ Alcohol Use
- ☐ History of a Stroke or TIA

Scan code for more information about risk factors from the American Heart Association

	My Results	My Goals
Blood Pressure	/	/
Weight		
Total Cholesterol		
HDL (good cholesterol)		
LDL (bad cholesterol)		
Triglycerides		
Glycosylated Hemoglobin (HbA1c: average blood sugar in the past 3 months)		

Medications

Your healthcare team will tailor your medications to your needs and risk factors. It is important to take your medications as ordered by your healthcare team.

The following are some of the common reasons medications are prescribed after stroke.

Preventing Blood Clots

- Anticoagulants and antiplatelets help prevent blood blots from forming.

Managing Irregular Heartbeats

- Irregular heartbeats increases the risk for blood clots to form within the heart.
- Medications may be prescribed to prevent blood clots in the heart or to control the heart rate and rhythm.

Reducing Blood Pressure

- Lifestyle modifications and diet can help to reduce blood pressure.
- Ranges for blood pressure include:
  - o Elevated Blood Pressure: Systolic 120-129 and Diastolic <80
  - o Stage 1 Hypertension (HTN): Systolic 130-139 or Diastolic 80-89
  - o Stage 2 Hypertension (HTN): Systolic 140-149 or Diastolic 90-99

Reducing Cholesterol

- Lifestyle modifications and diet can help to reduce cholesterol.
- Ranges for cholesterol include:
  - o Cholesterol: under 200mg/dL
  - o LDL (Bad Cholesterol): under 70 mg/dL
  - o HDL (Good Cholesterol): over 40mg/dL

Managing Diabetes

Having uncontrolled diabetes can increase the risk for stroke.

Medication Log

You can use the chart below to record your medications.

Name of Medication	Dose	Time	Purpose	Special Instructions	Goal
Example: Lipitor	40mg	At Night	Cholesterol	Take without food	LDL less than 70mg/dL

Rehabilitation Settings

After hospital discharge, you may need to go to a rehabilitation center to help with your recovery.

Your Case Manager, Social Worker, and other team member's work together to ensure your health care needs are met within the covered benefits of your health insurance plan after you are discharged from the hospital.

Rehab Program	Criteria
Long-Term Acute Care Hospital	An individual here is stabilized but needs more time with hospital care.
Acute Rehab Facility	An individual here participates in therapies for 3 hours per day. This is typical for a shorter duration of rehab needs.
Skilled Nursing Facility	An individual here participates in therapies for 1 to 2 hours per day. This is typical for a longer duration of rehab needs.
Home with Family and/or Home Health	An individual here will be at home with outpatient therapy.

Follow-Up Care

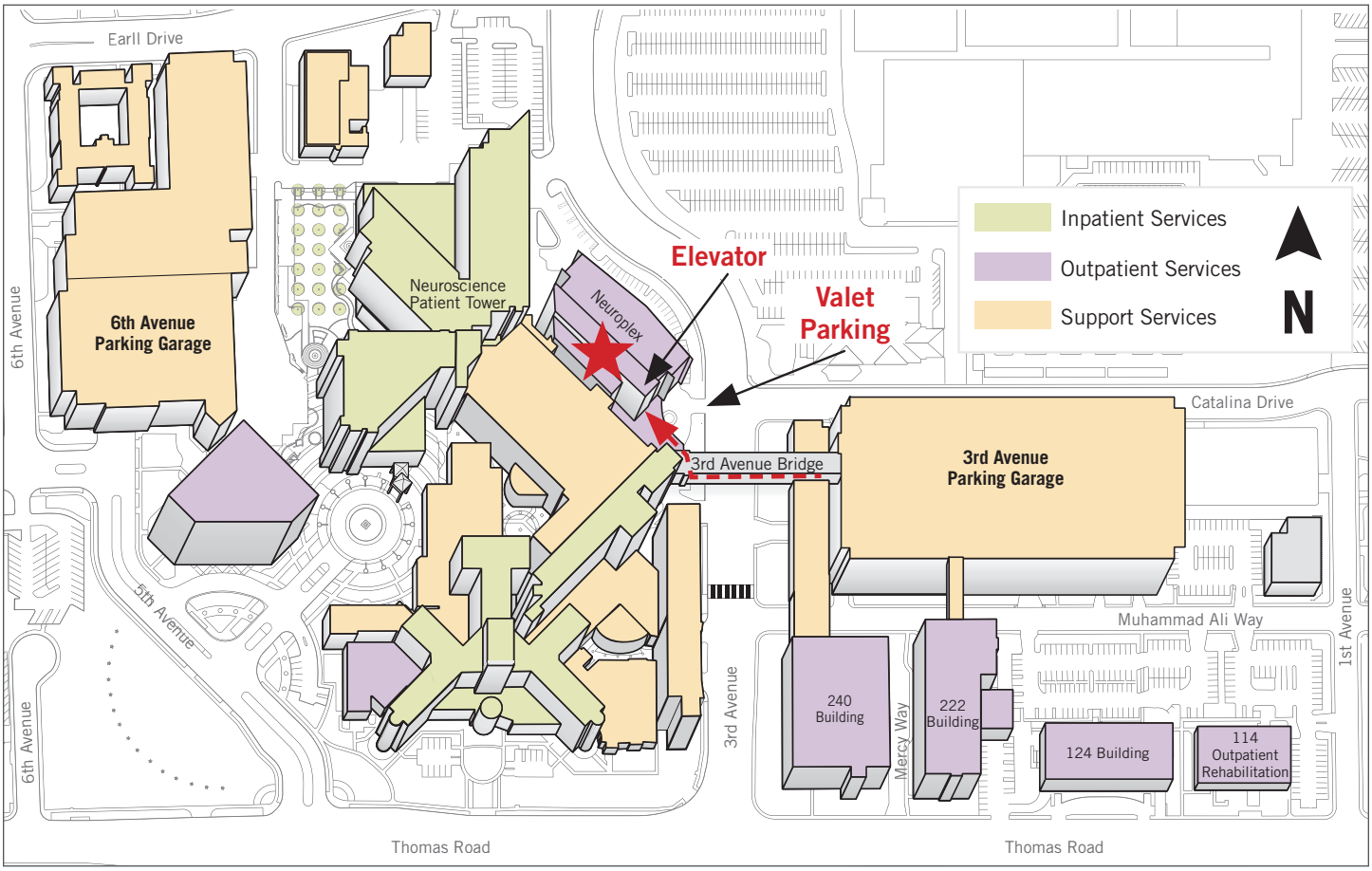
We care about how you are recovering and it is important for your healthcare team to evaluate your progress. It is important to make and attend follow-up appointments.

- Notify with Primary Care Provider (PCP) and tell them you have been in the hospital. Plan a follow-up appointment if indicated.
- If you have been discharged home from the hospital, someone from our Stroke Team may call you within 1 week and 90 days of hospital discharge.
- Please be sure to provide your nurse with a phone number where we can reach you.

Hospital and Clinic Contact Information and Appointment Tracker

Clinic Name	Address	Phone Number	Appointment Date & Time
St. Joseph's Hospital and Medical Center	350 West Thomas Road Phoenix, AZ 85013	(602) 406-3000	
Petznik Stroke Center Clinic	350 West Thomas Road Phoenix, AZ 85013	(855) 977-9496	
Transition Clinic	350 West Thomas Road Phoenix, AZ 85013	(602) 406-1140	.
Barrow Brain and Spine Clinic	350 West Thomas Road Phoenix, AZ 85013	(602) 406-3181	

Petznick Stroke Center



Petznick Stroke Center

2910 N. 3rd Ave. just north of Thomas Rd., Phoenix

If you are coming from the 3rd Avenue Garage and are at the 2nd floor Information Desk then proceed to cross the 3rd Avenue Bridge and take your first right into the Barrow Neuroplex where you will take the elevator to the 4th floor.

If you are coming from the Valet go into the Barrow Neuroplex entrance on the first floor. Take the elevator to the 4th floor where you will find the clinic location.
Valet parking is complimentary.

Resources

Here are just a few of the many resources available for stroke patients, their families and caregivers.

BNI Resources	
Petznick Stroke Center (844) 359-3978 BarrowNeuro.org/centers-programs/stroke	**Barrow Therapeutic Recreation and Adventures Program** BarrowNeuro.org/DOTL
Community Resources	
American Stroke Association Stroke.org	**Arizona Bridge to Independent Living (ABIL)** ABIL.org
National Aphasia Association Aphasia.org	**Arizona Technology Access Program (AzTAP)** AzTAP.org
Brain Injury Association of America (BIAA) (800) 444-6443 biausa.org	**City of Phoenix Adaptive Recreation** Phoenix.gov/parks/adaptive-recreation
Brain Injury Alliance of Arizona BIAAZ.org	**Ability360 Sports & Fitness Center** (602) 386-4566 Ability360.org/sports
Joe Niekro Foundation JoeNiekroFoundation.com	**Valley Metro Mobility Center** ValleyMetro.org/accessibility
Petznick Stroke Center (844) 359-3978 BarrowNeuro.org/centers-programs/stroke	**Arizona Disabled Sports** ArizonaDisabledSports.com
National Institute of Neurologic Disorders and Stroke (NINDS) NINDS.nih.gov	**National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR)** acl.gov/about-acl/about-national-institute-disability-independent-living-and-rehabilitation-research

Support Groups	
Barrow Stroke Survivor & Caregiver's Support Group at Outpatient Rehab (602) 406-6688 BarrowNeuro.org/centers-programs/stroke/support-programs/stroke-support-group/	**Joe Niekro Foundation** JoeNiekroFoundation.com/patient-caregiver-support/ support-groups
Barrow Grief Support Group (602) 406-3275	**Family Caregiver Alliance (FCA)** (800) 445-8106 Caregiver.org
American Stroke Association Stroke.org/en/stroke-support-group-finder	**Caregiver Action Network (CAN)** (202) 454-3970 CaregiverAction.org
Prescription Resources	
Good Rx goodrx.com - multiple pharmacy discounts	**Walmart Pharmacy** walmart.com (offer many $4 prescriptions)
Family Wize familywize.org - offers pharmacy discounts including Brilinta and Eliquis coupon savings	**Eliquis** eliquis.bmscustomerconnect.com for Eliquis 30 day free coupon
Brilinta brilinta.com for Brilinta coupons	

Resources for Caregivers

Caregivers are essential to the recovery of a person affected by stroke.

The needs of the stroke survivor may change over the course of their recovery, as will the role and needs of the caregiver. It is important to have open communication with one another to ensure the ever-changing needs of one another are being met.

Types of Assistance for Caregivers:

- **Respite Care:** short-term, temporary relief to those who are caring for family members who might require permanent placement in a facility outside the home. Caregivers providing unpaid care are eligible for respite care under the 2006 Federal Lifespan and Respite Care Act.
- **Adult Day Care:** professional supervision of adults in a social setting during the day.
- **Home Health Aide:** in-home personal health care assistance.
- Get assistance from family and friends to give you time to do required tasks or engage in leisure pursuits.

References

McPhee, S. & Papadakis, M.A. (2021). *Current medical diagnosis and treatment 2020*, (60th ed.). McGraw-Hill Publishers.

Guidelines for the Early Management of Patients with Acute Ischemic Stroke (2019)

Guidelines for the Management of Aneurysmal Subarachnoid Hemorrhage (2012)

Guidelines for the Management of Spontaneous Intracerebral Hemorrhage (2015)

Questions/Notes

Questions/Notes

What do I need to do before and after going home from the hospital?

Discharge Checklist:

- ☐ Provide my nurse with a phone number where my healthcare team can reach me.
- ☐ Fill my prescriptions as soon as possible
- ☐ Take my medications as prescribed
- ☐ Read through hospital paperwork and this guidebook
- ☐ Call my healthcare team to schedule follow-up appointments and therapy
- ☐ Call my healthcare team for help if I do not understand my discharge instructions or have any questions about my recovery plan.
- ☐ Attend a stroke support group

Add Pocket here

The Joint Commission

American Heart Association

American Stroke Association

CERTIFICATION

Meets standards for

Comprehensive Stroke Center

Barrow Neurological Institute | *Minding What Matters Most™*