Dignity Health®
Dominican Hospital

Stroke education manual

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Introduction

This guidebook will help you understand your diagnosis and treatment plan for your stroke recovery. The information presented here may answer many of your questions, but please speak to any of our staff if you have further questions or concerns. We are here for you.

This guidebook should stay in your room so that the health care team may add materials that are specific to your care. This guidebook is intended to be an introductory resource and to serve as a part of your comprehensive rehabilitation program.

Thank you,

Your Health Care Team

Some information contained within was taken from:

1. The clinical practice of neurological and neurosurgical nursing (7th ed.) Livesay, S.L & Hickey, J.V. (2014). Philadelphia, PA: Lippincott Williams & Wilkins
2. The National Stroke Association
3. American Heart and Stroke Associations
4. Centers for Medicare and Medicaid Services
5. Canadian Heart and Stroke Foundation

This information is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Consult your doctor or health care provider with any specific medical questions.

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Treatment information

Diagnosis

Team member name	Specialty

Date	Procedure	Purpose

Your stroke recovery team

Patient: You are the most important member of the recovery team and will be included in the decision making when appropriate. If you are unable to assist with decision making, then an alternate decision maker will be identified, based on hospital policy, until you are able to make decisions for yourself.

Family/caregiver: With the patient's consent, you will be included in the decision making processes to help with discharge planning. You will be included in family teaching/education, and you should be an advocate for the patient's current and future care.

Below are some of the team members that you may meet during your stay.

Care management/case management*: The nurse case manager is a registered nurse who works together with social work to help with post hospital care planning in cooperation with insurance coverage and community options for patients and families.

Chaplain services: The chaplains provide emotional and spiritual support during your recovery at your request.

Psychologist: Psychologists evaluate thought processing and thought content, psychomotor behavior and emotional regulation. This information is used to inform the patient and their family (if appropriate) about the extent and specifics of the impairment. Furthermore, based upon the evaluation data psychologists educate patients and family members about strategies or techniques to manage thoughts, behaviors and emotions.

** Team members required to meet criteria of IRF (Inpatient Rehabilitation Facility) admission.*

Nursing: Nurses have special education and training to care for patients with stroke. They are responsible for planning your care, helping you understand your medications, watching for side effects of medicines, treating your pain and keeping you as comfortable as possible. Nurses make decisions about your care, watch your vital signs (heart rate, blood pressure, and breathing) and supervise care given to you by other staff such as nurse's aides. The nurses work closely with the doctors and therapists to teach you about your illness, medication and therapies so you can take an active part in your recovery.

Nurse Practitioners (NPs) are registered nurses with graduate education and advanced clinical training. Our NPs work collaboratively with the physicians and other members of the health care team to assist in providing high quality, individualized care.

Occupational therapy (OT)*: Occupational therapy works on returning you to daily life through occupation (an occupation is anything that people do during the course of everyday life). This will include the physical and cognitive skills to engage in activities in your environment and resume your life roles which include self-care, productivity and leisure. They will also address, as needed, your neuromuscular recovery, vision, visual perceptual issues, positioning, splinting, sensation, tone management, adaptive equipment use, range of motion (ROM) and strengthening in attempt to return you to your everyday life.

Physical therapy (PT)*: Physical therapy focuses on functional mobility training, gait/assistive device training, seating/positioning, tone management, therapeutic exercise to enhance strength and ROM, pain management, balance and neuromuscular re-education to assist with restoration of function and prevent disability.

Physicians (MD or DO): The physicians who will work together in managing your care may include specialists in multiple areas including, neurology, neurosurgery, internal medicine, physiatry* and other specialties depending on your specific needs.

Registered dietitians: These professionals ensure that you receive nutrition to promote healing and help with any issues that stem from lack of appetite or difficulty eating.

Rehabilitation technicians/aides: They work alongside the nurses to assist you with basic care that you may be unable to do for yourself. This may include helping you get in and out of bed, going to the bathroom and assisting with your personal daily needs.

Respiratory therapy (RT): Respiratory therapy includes the assessment and treatment of breathing disorders and lung conditions. Respiratory therapists are experts in airway management, including tracheostomy/stoma care for you, if you're having difficulties managing your airway.

Social worker (SW)*: The social worker is a valuable resource for you and your family. With a vast knowledge of benefits and services offered, the social worker's primary focus is helping you smoothly transition out of the hospital to the next level of care and helps you address social problems.

Speech language pathology (SLP or ST)*: Speech Language Pathologists or Speech Therapists assess and treat swallowing, cognitive issues and communication skills, including understanding (receptive) and using (expressive) language skills, swallow assessment and intervention, clarity of speech, and alternate communication methods.

** Team members required to meet criteria of IRF (Inpatient Rehabilitation Facility) admission.*

About stroke

A stroke is an emergency, just like a heart attack, and medical help is needed right away. The brain controls important functions like movement, breathing and sensory perceptions (for example, sight, touch and taste). It also controls higher functions like thinking, learning and emotions. The brain needs an adequate supply of oxygenated blood in order to operate.

Strokes usually give warnings.

Warning signs of a stroke

- **Sudden** numbness and tingling or weakness of the face, arm or leg, usually on one side of the body
- **Sudden** loss of speech, trouble speaking, or understanding
- **Sudden** vision problems
- **Sudden** unexplained dizziness, unsteadiness or sudden falls, especially with any of the other symptoms
- **Sudden** severe headache with no apparent cause, described as the "worst headache" of your life

If you notice one or more of these signs, call 911 and say you are having a stroke. Seek appropriate medical attention immediately at a qualified hospital with a stroke center.

Learn how to detect a stroke B.E. F.A.S.T.

Balance
Loss of balance, headache or dizziness

Eyes
Blurred vision

Face
Ask the person to smile. Has their face fallen to one side?

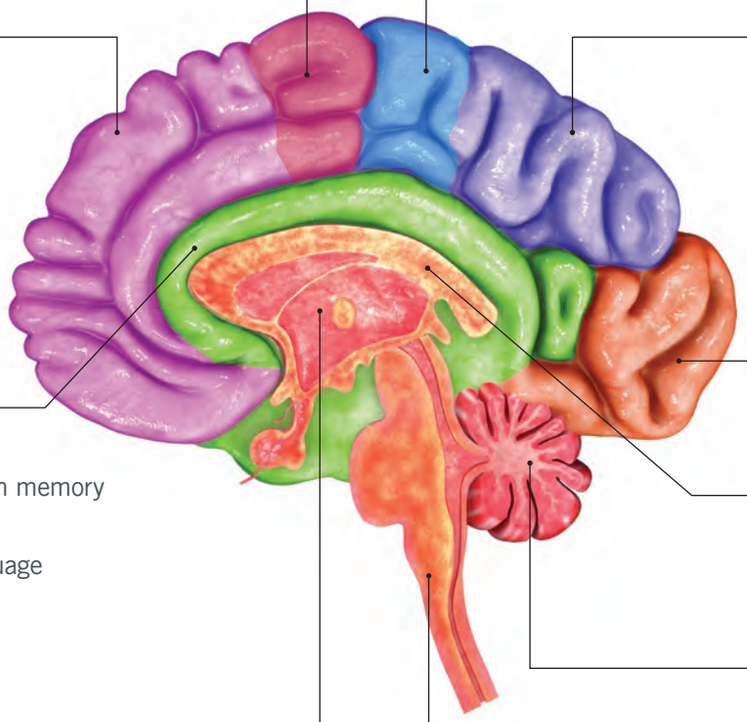
Arms
Can they raise both arms?

Speech
Is their speech slurred?

Time
Call 911 immediately

Anatomy of the brain

The brain controls important functions like movement, breathing and sensory perceptions. It also controls higher functions like thinking, learning and emotions. These functions maybe associated with specific parts of the brain. A stroke causing damage in one of these parts of the brain may affect function associated with the damaged area.



Motor strip

Frontal lobes:
Personality
Social skills
Judgment
Emotion regulation
Movement
Speech
Reasoning
Executive function

Temporal lobes:
Memory
Combine senses with memory
Object recognition
Understanding language
Art/music
Speech
Hearing

Thalamus:
Spatial attention
Depth perception
Relay center for information from the body to brain
Consciousness
Alertness
Sleep

Sensory strip

Parietal lobes:
Depth perception
Spatial orientation
Receives sensory input
Language processing
Spatial attention
Writing/Reading
Calculation

Occipital lobes:
Sight
Processing visual information

Basal Ganglia:
Memory
Emotion
Coordination of muscle movement

Cerebellum:
Balance
Learning
Emotion regulation
Coordinate movement
Attention

Brain stem:
Breathing
Heart rate
Blood flow throughout the body
Motor and sensory pathways cross sides of the body from the brain to spinal chord
Alertness and sleep patterns

Ventricles: A set of four (4) cavities in the brain where cerebral spinal fluid (CSF) is produced, responsible for the production and flow of the CSF from the brain to the spinal cord. If this stops working it can cause fluid buildup, pressure and trapping of CSF and blood which needs to be drained by a device such as an external ventricular drain (EVD) or shunt.

Arteries of the brain

Internal carotid artery (ICA) or external carotid artery (ECA)
Strokes of the ICA and ECA can affect the basal ganglia, thalamus, frontal parietal, temporal, and occipital lobes.

Middle cerebral artery (MCA)
MCA strokes may affect the frontal, temporal, and parietal lobes.

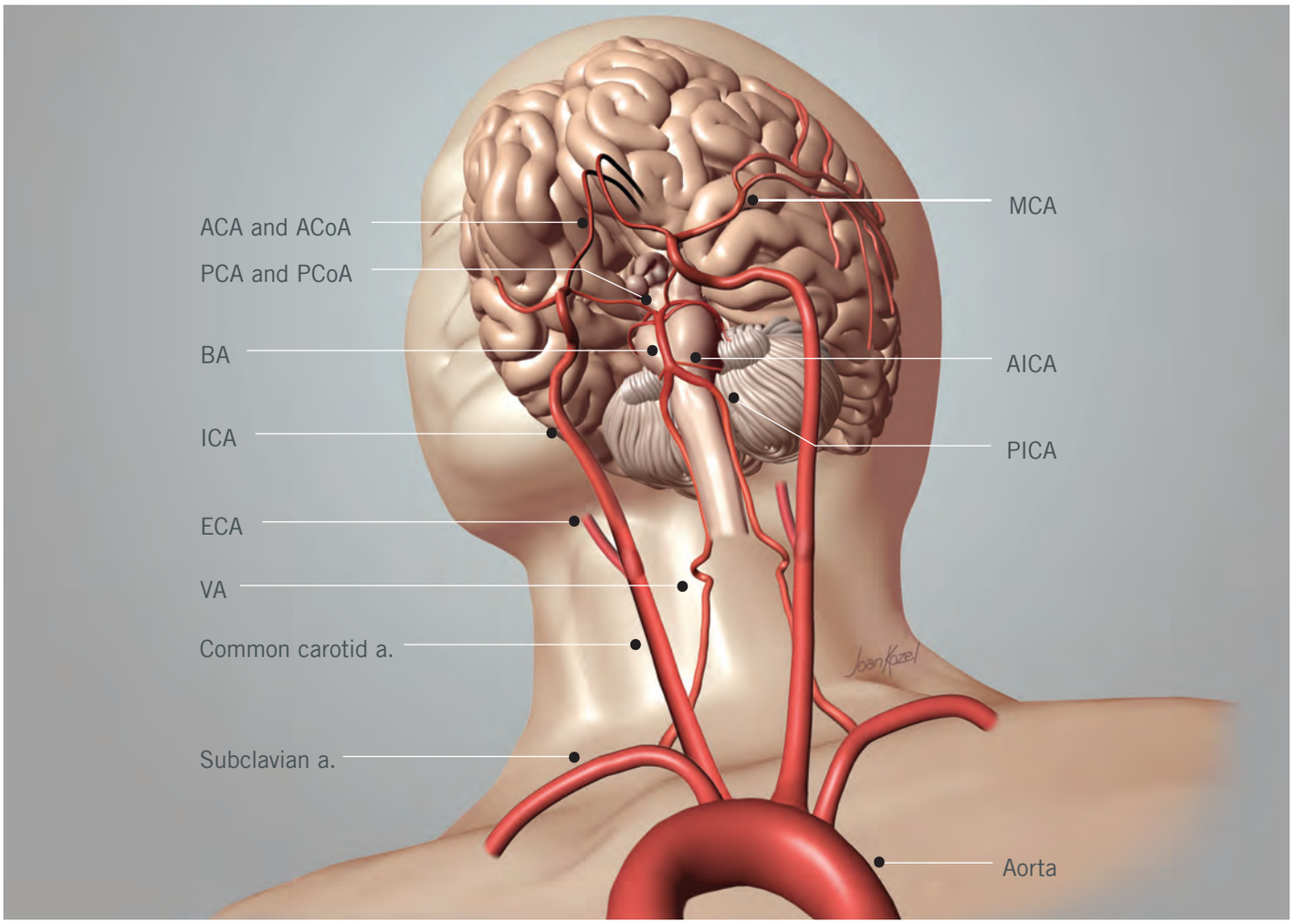
Anterior cerebral artery (ACA) and anterior communicating artery (ACoA)
Strokes of the ACA and ACoA can affect the frontal lobes and possibly the parietal lobes.

Posterior cerebral artery (PCA) and posterior communicating artery (PCoA)
Strokes of these arteries can affect the parietal lobes, thalamus, brain stem, and nerve controlling eye movements.

Anterior inferior cerebellar artery (AICA) and posterior inferior cerebellar artery (PICA)
AICA and PICA strokes can affect the cerebellum.

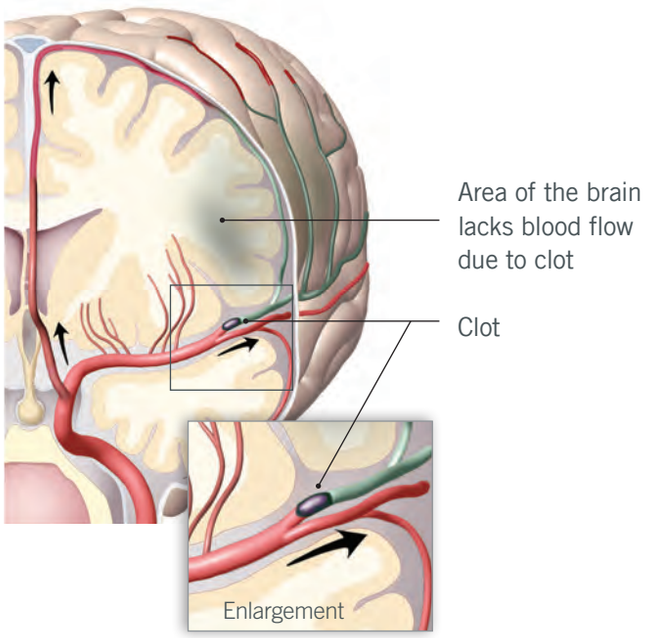
Basilar artery (BA)
BA strokes may affect the brain stem and nerves of the face.

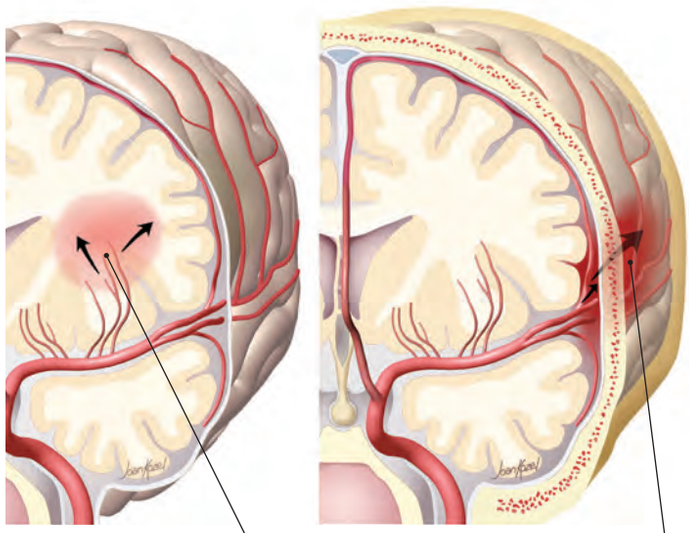
Vertebral artery (VA)
VA strokes can affect the cerebellum, brain stem, and nerves that control the face.



Types of stroke

There are two types of strokes – ischemic and hemorrhagic.





Intraparenchymal hemorrhage (bleeding within the brain tissue)

Subarachnoid hemorrhage (bleeding around the brain tissue)

Ischemic

Ischemic strokes occur when blood flow through an artery in the brain becomes blocked by plaque on the wall of an artery or by a blood clot.

- **Thrombosis** is a blood clot that forms in the artery at the site of the stroke.
- **Embolism** is a blood clot that forms in a different part of the body, usually in the heart, and travels into an artery in the brain.
- **Transient ischemic attacks (TIAs)** are short episodes of ischemia with stroke-like symptoms that resolve in less than 24 hours. TIAs are still emergencies since there is a high risk of experiencing a permanent stroke in the future.
- **Stenosis** occurs when blood vessels become narrow and do not allow enough blood to flow to the brain.
- **Moyamoya** is an inherited condition that causes stenosis in many vessels throughout the brain and neck.
- **Watershed strokes** occur in areas of the brain that receive the furthest supply of blood flow. Any disruption in flow to larger blood vessels or blood flow can cause watershed strokes.
- **Lacunar strokes** happen in deep blood vessels of the brain leaving a small cavity within the brain tissue.

Hemorrhagic

Cerebral hemorrhages occur when a blood vessel in the brain bursts, bleeds, and causes rapidly increasing pressure in the brain. The sudden bleeding causes stroke symptoms like headache, nausea, vomiting, and often rapid loss of consciousness.

- **Intraparenchymal hemorrhage (IPH)** is bleeding that occurs within the brain tissues.
- **Intraventricular hemorrhage (IVH)** is bleeding that occurs within the ventricles, which are fluid filled spaces in the middle of the brain.
- **Subarachnoid hemorrhage (SAH)** occurs when an aneurysm (bulge of the wall of an artery) ruptures over the surface of the brain, creating an explosive burst of blood between the brain and the skull, causing a build-up of pressure that damages the brain.
- **Arteriovenous malformations (AVM)** are tangles of abnormal blood vessels. The direct connection of high pressure arteries to thin-walled veins can cause ruptures. AVMs may occur anywhere in the body, not just the brain.
- **Cavernous malformation (cav mal)** is a group of fragile, thin-walled veins. Since the blood flow is lower, cav mals usually bleed at a slower rate than other types of hemorrhages.

Tests for stroke

Common diagnostic tests

Computed tomography (CT) scan	Special x-ray equipment to make cross-sectional pictures of your body. CT scans quickly identify strokes and hemorrhages.
Magnetic resonance imaging (MRI) scan	A technique that uses a magnetic field and radio waves to look at organs and structures inside your body.
CT angiography (CTA) and MRI angiography (MRA)	Scans that identify the blood vessels in the brain by injecting dye through an IV. These scans help identify aneurysms, AVMs, and narrowed blood vessels.
Angiogram	Dye is injected into the bloodstream and x-rays are taken to visualize the blood vessels.
Electrocardiograms (ECG or EKG)	Records the electrical activity of the heart that is used in diagnosing some heart abnormalities.
Echocardiogram	An ultrasound of the heart that identifies blood clots and assesses blood flow through the heart.
Blood tests	Are assessed in the laboratory to check for high cholesterol, diabetes, abnormal clotting, risk for bleeding, and overall health.

Medical treatments for stroke

The goal of care during hospitalization is to support and maximize recovery. The treatment options depend on the type of stroke. For ischemic strokes, returning blood flow takes priority. For hemorrhagic strokes, stopping the bleeding and stabilizing intracranial pressure (ICP) generally take priority. Then patients are evaluated for any surgical needs.

Ischemic

- **Tissue plasminogen activase (tPA)** is a thrombolytic, a medication that restores blood flow by dissolving blood clots.
- **Medications** such as anticoagulants and antiplatelets are given to prevent strokes from occurring again.
- **Thrombectomy** is mechanically removing the blood clot.
- **Angioplasty** is using a small balloon to open a blood vessel.
- **Stenting** is implanting small mesh tubes into blood vessels to keep the vessel open or divert blood away from an aneurysm.
- **Carotid endarterectomy (CEA)** is the surgical removal of fatty plaque from the carotid arteries.
- **Surgical bypass** of the carotid artery increases blood flow to the brain by connecting the superficial temporal artery (STA) or another vein to a branch of the middle cerebral artery (MCA).

Hemorrhagic

- **External ventricular drain (EVD)**, also known as a ventriculostomy, is a catheter that is surgically placed into the ventricles of the brain to monitor pressure and drain cerebral spinal fluid and blood.
- **Evacuation** of blood clots is to surgically remove a blood clot from a vessel.
- **Clipping** aneurysms the goal is to stop blood flow within the bulging area of the artery by placing small titanium clips around the base of the aneurysm.
- **Coiling or stenting** of an aneurysm during angiogram. Physicians place titanium coils within the aneurysm or use a stent to divert blood flow from the aneurysm.
- **Embolization** of small blood vessels for treatment of AVMs during angiogram.
- **Resection** is surgical removal of AVMs, cav mals to prevent future bleeding.
- **Vasospasm** occurs due to the irritation of the blood on the brain tissue. Physicians use extra fluid to increase blood volumes and blood pressure to keep the vessels open. Severe spasm may require angioplasty.

Effects of stroke

Aphasia: Difficulty with any or all of the following: speaking, reading, writing, and understanding language.

Altered midline: The perception of sitting upright is affected causing you to lean to one side or the other. This can result in a "Pusher" syndrome.

Apraxia: Strokes may impair the ability of a person to carry out movements the way they intend to. This may include initiating movements, coordinating their mouth and tongue properly when talking, completing movements, or using an object correctly.

Balance: The inner ear, somatosensory system, and visual centers contribute to balance. Patients with impairment to one or more of these areas can experience dizziness or vertigo.

Bladder dysfunction: Strokes can affect muscles and sensations that are used in bladder function. Weak muscles can cause urine to leak from the bladder. Strong muscles may not relax and can cause retention. Patients may need to urinate often because they feel the bladder is full.

Bowel dysfunction: Constipation occurs when patients are not aware of their bodily needs or do not eat enough fruits or vegetables, drink enough water or exercise.

Cognitive deficits: Cognition refers to the brain's thinking abilities, such as the ability to learn and remember information, to pay attention, to think quickly and process information, and to solve problems.

Diplopia (double vision): Weak eye muscles, dry or scratched corneas, or impairment of the brain's visual centers can cause double vision.

Dysphagia: Difficulty swallowing food and liquids. This can result in aspiration (entrance of food or liquids into the airway) and lead to pneumonia.

Dysarthria: Weak muscles cause slow or slurred speech. Dysarthria and dysphagia often occur together.

Emotional changes: Emotional changes can occur due to biological changes in the brain itself, adjustment to having a stroke, or both. Some people with stroke experience pseudobulbar affect, such that they experience uncontrollable or rapid shifts in emotions (including tearfulness or laughter) which may or may not be consistent with their internal experience. Changes in emotional expression and perception of others' emotions or body language can occur and may result in miscommunication.

Executive functions deficits: Executive functions include higher-level and complex thinking skills. Injury to the frontal lobe can impact executive function, including cognition and behavior.

1. **Behavioral:** Poor judgment and loss of inhibition can cause patients to act before thinking about the consequences or act in a socially inappropriate manner.
2. **Cognitive:** Patients may be easily distracted, get stuck on one thought, have difficulty understanding abstract ideas, and struggle with using logic to solve a problem.

Foot drop: Inability to lift the foot up which causes you to drag your foot when walking.

Hemiparesis: Weakness of one side of your body.

Hemiplegia: Paralysis of one side of your body.

Hypertonicity: Stiffening of the muscles at rest.

Hypotonicity: Having lower muscle tone which results in muscles being limp.

Insight: Individuals may lack the awareness of changes in cognition or physical limitations following stroke.

Intracranial pressure (ICP): High Intracranial Pressure may be related to one of the following reasons:

1. **Brain edema:** Swelling of the brain, causing it to push against other contents in the skull. This is a major cause of brain injury and can cause death if not treated.
2. **Hydrocephalus:** The enlargement of the cerebral ventricles due to a blockage of cerebral spinal fluid (CSF) flow.

   Extraventricular drain (EVD): A drain that may be placed within the brain to monitor ICP and helps to relieve pressure by draining CSF.

   Ventricular-peritoneal shunt (V-P shunt): a drain that moves the extra fluid from the brain to the peritoneal cavity where it can be absorbed and thus helps relieve pressure by draining the CSF.
3. **Brain herniation:** When some of the structures of the brain are pushed across or through other structures of the skull due to very high ICP. Brain herniation is life threatening and can result in permanent neurological damage and disability.

Neglect/inattention: Hemispatial neglect is the lack of awareness of one side of your body or a lack of response to stimuli on one side. Hemispatial inattention is a difficulty with attention to stimuli on one side of the body. This may occur with or without visual field cut.

Pressure sores: Damage to the skin and underlying tissues, due to decreased blood flow, resulting from prolonged pressure. Other factors that may contribute to this are friction, poor nutrition and moisture. This pressure commonly occurs in areas where bones are close to the skin.

Sensory changes: Altered sensation of touch, deep pressure, pain, temperature, vibration, hearing, awareness of body in space, and/or sensitivity to light. People can be more sensitive to overstimulation (too much noise, too much light) after stroke.

Sleep issues: Feeling tired after stroke is normal. Recovery from stroke requires a lot of effort and frequent rest periods or naps may be required.

Spasticity: Involuntary stiffening of the muscles related to movement.

Visual field cut: This is a type of partial blindness resulting in a loss of vision in one or both eyes. A typical type of visual field loss in stroke patients is homonymous hemianopsia where the person loses half of the field of view on the same side in both eyes.

Stroke recovery

Stroke recovery is a lifelong process. This begins with the medical personnel providing the best care after you suffer a stroke. When you are medically cleared, rehabilitation will start and assist you with improving physical, mental and emotional functions and restore quality of life and functional independence as much as possible. Each survivor's functional outcomes may be different, even if they had a stroke in the same area of the brain. It is important to continue to learn as much as you can about stroke and the recovery process. The goal of stroke rehabilitation is to relearn and resume the skills that you lost. Use the resources available to you to optimize your understanding of what stroke is, managing post stroke effects, advocating for the stroke survivor's and caregiver's needs and prevention of another stroke.

Examples of national resources include the *National Stroke Association* and the *American Stroke Association,* but these are not the only resources available to you. See page 19 for further resources.

Left and right hemispheres – right brain vs. left brain

Effects of left hemisphere strokes:

- Weakness or paralysis on the right side of your body
- Difficulties with understanding or expressing written language or spoken language (aphasia)
- Trouble learning or remembering new verbal information such as conversations
- Difficulty understanding where objects are in relation to your body
- Sensory changes on the right side of your body, such as numbness or hypersensitivity
- May have difficulty seeing or noticing objects on the right side

Effects of right hemisphere strokes:

- Weakness or paralysis on the left side of your body
- Sensory changes on the left side of your body, such as numbness or hypersensitivity
- May have difficulty seeing or noticing objects on the left side
- Difficulty understanding where objects are in relation to your body
- Difficulty with visual memory such as path-finding
- Difficulty organizing visual information accurately
- Difficulty expressing emotions effectively
- Issues with forgetting or ignoring objects or people on your left side – also known as neglect
- Can be apathetic or amotivated
- May act impulsively
- Poor decision making or lack of insight into your own limitations leading to safety concerns
- Problems with short-term memory, judgment

Stroke management and prevention of secondary 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. Non-modifiable include age, gender, race/ethnicity, and family history.

Modifiable risk factors

Heart disease Atrial fibrillation (a-fib) is an abnormal heart rhythm that may cause blood clots to form in the heart. Blood clots can travel to the brain, causing a stroke. Heart valve disease is damage to or a defect in one of the four heart valves which may cause blood clots to form in the heart. Blood clots can travel to the brain, causing a stroke.	**To lower your risk:** Take heart medications prescribed by your health care provider and have your blood tested on a regular basis.
Hypertension (high blood pressure) • Prehypertension: 120-139/80-89 • Hypertension: Higher than 140/90 **Why is this a problem:** High blood pressure hardens and weakens blood vessels, and causes the heart to work harder leading to cardiac disease.	**To lower your risk:** Have your blood pressure checked regularly. Take the medications as prescribed by your health care provider.
Atherosclerosis / Artery disease Arteries in the heart, head, and neck are narrowed by cholesterol or hardened by high blood pressure. **Why is this a problem:** Plaque forms in artery walls and blocks blood flow.	**To lower your risk:** Have your cholesterol levels and blood pressure checked regularly. Take medications as prescribed by your health care provider.
High blood cholesterol levels • Total cholesterol over 200mg/dL • LDL over 100mg/dL • HDL under 40mg/dL **Why is this a problem:** Cholesterol is deposited in the walls of arteries where it reduces blood flow leading to stroke.	**To lower your risk:** Eat a low cholesterol diet and exercise regularly. Take the medications prescribed by your health care provider.
History of stroke or TIA (TIA sometimes called a mini-stroke) Previous stroke or TIA, especially in the recent past. **Why is this a problem:** A person who has had a TIA is more likely to have a stroke within 90 days. Those who have had a stroke are 20 percent more likely to have another stroke within the next five years.	**To lower your risk:** Tell your health care provider.

Diabetes Fasting blood sugar over 126mg/dL on two separate days. HgbA1c over 7 **Why is this a problem:** Diabetes contributes to atherosclerosis and heart disease, and increases the risk of stroke.	**To lower your risk:** Keep your diabetes under control by proper diet, medication as ordered and exercise.
Excessive weight Being more than 20 pounds over ideal weight. **Why is this a problem:** More likely to develop diabetes, high blood pressure and stroke than those who are not overweight.	**To lower your risk:** Work together with your health care provider to develop a diet and exercise plan that meets your needs.
Diet Eating a diet high in sodium and saturated fat. These types of foods can increase blood pressure and create plaques in arteries, increasing the risk of stroke.	**To lower your risk:** • Eat a diet low in sodium • Eat plenty of fruits and vegetables with meals • Choose heart healthy fats like olive oil, fish, avocado, flaxseed and nuts. Keep the total amount of fat to less than 25-35% of calories from food and drink • Opt for whole grains instead of processed foods • Get 20-30 grams of fiber per day
Tobacco use Smoking cigarettes or cigars, use of chewing tobacco, use of e-cigarettes. **Why is this a problem:** Smoking increases the risk for blood clots and is a strong risk factor for carotid and coronary arteries disease.	**To lower your risk:** Stop smoking. Talk to your health care provider about resources for quitting smoking.
Alcohol consumption More than two drinks a day for men and more than one drink a day for women. One drink equals: • 12 ounces of beer • 1 glass (5 ounces) of wine • 1¼ to 1½ ounces of liquor **Why is this a problem:** Clots are more likely to form and arteries become narrowed.	**To lower your risk:** Abstain or limit alcohol consumption.

Medications used to reduce risk factors for the stroke patient

LOWERS BLOOD PRESSURE	EXAMPLES	SIDE EFFECTS
ACE Inhibitors (Angiotensin Converting Enzyme) and ARB (Angiotensin II Receptor Blockers): These prevent the body from narrowing the blood vessels so that the blood vessels remain wide open and blood pressure remains low.	Lisinopril, Valsartan, Losartan	Cough, dizziness, headache, high potassium
Alpha blockers: Lowers blood pressure by relaxing the heart muscles and causing the heart to beat slower.	Doxazosin, Clonidine	Cough, dizziness, headache, fatigue
Beta blockers: Cause the heart to beat in a slower, more regular rhythm. This places less stress on the heart and lowers blood pressure.	Propranolol, Metoprolol, Carvedilol, Atenolol	A heartbeat that is too slow, dizziness, fatigue, cold hands and feet
Calcium channel blockers: Cause the heart to relax by slowing the movement of calcium into the muscles.	Amlodipine, Nifedipine, Diltiazem	Swollen feet, headache, flushing
Diuretics ("water pills"): Removes water and salts from the body by increasing the formation of urine.		
LOWERS CHOLESTEROL	EXAMPLES	SIDE EFFECTS
Statins: Prevent the liver from making more cholesterol.	Atorvastatin, Simvastatin, Rosuvastatin	Joint pain, muscle pain, diarrhea
PREVENTS BLOOD CLOTS	EXAMPLES	SIDE EFFECTS
Anticoagulants/antithrombotics (blood thinners): Prevent blood clots from forming or getting bigger.	Pradaxa, Xarelto, Warfarin, Heparin	Bleeding, bruising, anemia, heartburn
Antiplatelets: These prevent platelets from sticking together. When platelets stick together a blood clot forms.	Plavix, Aggrenox, Ticlid	Bleeding, bruising, anemia, stomach ulcers
LOWERS BLOOD SUGAR	EXAMPLES	SIDE EFFECTS
Insulin: Natural hormone that reduces blood sugar.	Insulin, Lantus, Humalog	Low blood sugar, injection site reactions, weight gain, low potassium
Oral agents: Reduced blood sugar by helping the body tissue absorb sugar from the blood or helping the pancreas make more insulin.	Metformin, Glipizide	Diarrhea, flatulence, nausea, vomiting, dizziness

Discharge planning and disposition

The Case Manager/Social Worker and other team members work together to ensure your health care needs are being met within the covered benefits of your health insurance plan after you are discharged from the hospital. They help you pick the most appropriate setting for your discharge. If you need follow-up inpatient or outpatient services, a summary is provided below.

Settings for stroke care – inpatient services

REHAB PROGRAM	CRITERIA FOR ADMISSION	TYPE OF SETTING	SERVICES PROVIDED	FREQUENCY OF THERAPY
Acute care (inpatient)	• Requires admission to a hospital and order for therapy services. • Needs 24 hour nursing care. • Medical needs requiring daily physician visits.	Hospital-based	24 hour medical care and a full range of therapy services.	Therapy provided according to the needs of the patient and physician orders.
Inpatient rehabilitation facility (IRF)	• Able to tolerate three hours of therapy per day, five days a week. • Needs for at least two of the following therapies (PT, OT, ST). • Needing 24 hour nursing care. • Medical needs requiring rehab physician or physician with specialized rehab training at least three times per week. • Must show practical, measurable improvement in a prescribed period of time.	Free standing or special unit of a hospital with designated rehab beds.	24 hour medical care and a full range of therapy services.	One of the more demanding settings from a therapy perspective. At least three hours per day, five days per week.
Skilled nursing facility (SNF)	• Require skilled therapy services. • Require skilled care nursing. • Frequent on-site evaluation by a physician, nurse practitioner, or physician assistant.	Free standing or special unit of hospital with designated SNF beds for short term nursing care, sub acute.	Provides daily nursing care and a wide range of rehab services.	Less demanding than an IRF, but the program may continue for a longer length of stay.
Long-term care facilities (LTC)	• Requires 24 hour nursing care. • Medically stable. • Physician visits. • Provide the required services from a written order by a physician by qualified personnel.	Free standing facility, nursing home.	Provides long term nursing care and limited rehab services as ordered.	Therapies provided as prescribed by physician.

Settings for stroke care – outpatient services

REHAB PROGRAM	CRITERIA FOR ADMISSION	TYPE OF SETTING	SERVICES PROVIDED	FREQUENCY OF THERAPY
Outpatient facilities	• Order from a following physician including diagnosis, type and frequency of therapy. • A skilled medical need.	Outpatient center, outpatient department of a hospital or doctor's office.	All therapy services. Social worker and neuropsychologist as available.	Therapies usually provided in one hour sessions, two to three days per week as prescribed by physician.
Home health care agencies	• Requires a need for specific rehab services in at least one of the therapy services (PT, OT, ST). • The person must be considered "homebound."	In the persons place of residence.	Nursing and wide range of therapy services.	Therapies usually provided in one hour sessions, two to three days per week as prescribed by physician.
Adult day care	• Able to participate in group activities. • Requires supervision. • Depends on focus of adult day care center.	In the adult day care center.	Nursing is available and group type activities. May have some restorative services.	No skilled therapies provided.
Group home	• Depends on clinical assessment, medical necessity, and inability to live alone in the community. • Fit of the patient to the group home. • Ability to communicate by some means.	In the person's group home or outpatient facility.	Limited nursing, brought in as needed. No therapy provided, must either have home health or go to outpatient for therapy services.	Therapies as prescribed by physician. Home program followed by group home staff as set up by the therapist.
Assisted living	• Those who need help with activities of daily living.	In the person's assisted living facility or outpatient facility.	Limited nursing if any. No therapy provided, must either have home health or go to outpatient for therapy services.	Therapies as prescribed by physician.

Community resources and websites

Stroke and brain injury:

Cabrillo College Stroke and Disability Learning Center
www.strokecenter.com
831.477.3300
Education and support for persons who have experienced functional loss due to stroke or other acquired disability.

Caregiver/community resources:

In-home Supportive Services (IHSS)
www.santacruzhumanservices.org
831.454.4101
Assists low income and disabled adults with Medi-cal, to remain safely in their homes with care providers.

Senior Resource Directory – Santa Cruz County
www.srnetwork@calcentral.com
831.462.1433

Vista Center for the Blind and Visually Ompaired
www.vistacenter.org
831.458.9766

Fall Prevention Center of Excellence
www.stopfalls.org
Videos, education and information on fall prevention.

Meals on Wheels
www.communitybridges.org
831.464.3180 ext. 100
Home delivery of meals.

Grey Bears
www.greybears.org
831.479.1055
Thrift shop, second hand medical supply.

Restore Orthotics and Prosthetics
www.healthcare4ppl.com
831.920.3659
Prosthetics and orthotics for neck, back, knees and ankles.

Medic Alert
www.medicalert.org/safereturn
800.432.5378

Driving School
info@sterlingdrivingschool.com
831.600.7392

California Public Utilities Commission
www.ddtp.org
800.806.1191
Free specialized phones/communication devices that are easier to hear, dial, and call.

Senior activities, engagement/fitness:

PEP Classes
www.dignityhealth.org/dominican/pep
831.457.7099

Exercise Classes:
- Strength building for people with neurological impairment, senior strength and conditioning
- Steady on your feet: Balance for seniors

Water Exercises:
- Advanced aquatic lymphedema decongestion

Support Groups:
- Lymphedema education and support group
- Heart Connections: A heart health support group

Lifestyle Management Programs:
- Diabetes management (Type1&2)
- Supervised exercise therapy for peripheral artery disease

Elderday Adult Day Health Care Center
www.communitybridges.org
100 Pioneer St., Suite C, Santa Cruz, CA 95060
831.458.3481
A day program for seniors with functional impairments.

Cindy's Celebrations, Inc.
www.cindyscelebration.org
831.479.7509
Recreational luncheons at different restaurants throughout the community for elderly clients.

Shared Adventures
www.sharedadventures.org
831.459.7210
Enjoy arts and social interactions, as well as engage with the natural environment through outdoor recreation.

Watsonville Parks and Community Services Dept.
www.watsonvillerec.com
831.768.3240

Caregivers

Caregivers are essential to the recovery of a person affected by stroke; however, the caregiver must be sure to balance the demands of their role with their personal needs. The needs of the stroke survivor may change over the course of their recovery as will the role and needs of the caregiver. Keep open communication with one another to ensure the ever-changing needs of one another are being addressed.

Rights and responsibilities of a caregiver:

- Take care of yourself.
- Accept help from others.
- Maintain aspects of your life that do not necessarily include the person you care for.
- Know it is okay to get angry and to express other difficult emotions while monitoring for signs of depression.
- Take pride in what you are accomplishing and recognize the courage it takes to meet the needs of another.
- Educate yourself on stroke and deficits specific to your loved one.
- Seek support and guidance from others.
- Monitor for signs of "caregiver burnout."
- Interview the several individuals/facilities to determine how their services align with you and the stroke survivor's needs.
- Include the stroke survivor in the interview and decision making process.
- Research funding for care. Check with your insurance. Determine if your state provides waivers to offset the cost. Options can be found through the federal government's Administration on Aging (www.aoa.gov) and/or your states agency on aging (www.n4a.org) to identify your options.

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.

Rehabilitation services

Choosing the right rehabilitation/facility

Making the choice of where you or your family member will do their rehabilitation is an important decision. Insurance coverage may play a role in this decision but by doing some research and advocating for the patient you can help get the patient to the most appropriate rehabilitation setting. To make the choice best suited to the patient's needs, you may consider asking the following questions:

1. Is the facility accredited by CARF and/or The Joint Commission?
2. Are there doctors on staff who are board certified in rehabilitation medicine?
3. Do the therapists have specialty training/ certification in dealing with specific conditions or diagnosis?

   a. Some of these may include but not limited to NDT, Neuro-IFRAH, PNF, Certified Brain Injury Specialist (CBIS), Certified Stroke Rehabilitation Specialist (CSRS) or specialty certifications from discipline specific licensing boards (i.e. PT has NCS – Neurologic Clinical Specialist, OTs may have board certification in Physical Rehabilitation as examples).
4. Does the nursing staff have a majority of Certified Rehabilitation Registered Nurses (CRRN) on staff?
5. What equipment/technology do they have at their disposal?
6. Do they have aquatic therapy?
7. Do they have appropriate physical space and exercise equipment available?
8. How many days of therapy will the patient receive (they need at least three hours a day, five days a week)?
9. How much one-on-one therapy will the patient get? Do they use groups to meet the three hour rule? If so, how?
10. Will they have a team of therapists/nurses or random therapists/nurses on a daily basis?
11. Can you get a tour of the facility?
12. Do they have dedicated stroke programs and what are their outcomes?
13. Does your insurance cover the place you choose, and if not, what is your out-of-pocket cost?
14. Does the program have options for you to go to for the next level of care (outpatient rehab or day treatment)?
15. Is there medical care available at the facility if you need it?
16. Does the program offer stroke support groups for the survivors and caregivers?
17. Do they have neuropsychologists, rehabilitation psychologists or counseling available?
18. What are the facilities' outcomes?

Hospital based acute care rehabilitation services

The priorities for inpatient acute care are management of stroke deficits to improve recovery, prevention of post-stroke complications that may interfere with their recovery process, and the prevention of stroke recurrence. Early therapeutic intervention is an important component to stroke recovery and, when appropriate, will be ordered by the physician. Occupational, physical and speech therapies will complete their assessments preferably within 24 to 48 hours of receiving an order. Evidence-based practice shows patients admitted with a diagnosis of acute stroke should be mobilized as early as possible. Treatment plans will be set individually by the therapist based on what is necessary and tolerated. Once the assessments are completed, discharge planning will be initiated. Therapies are an important part of the discharge planning process to help identify the most appropriate next level of care. Family, friends and other support systems are also important during this planning as they will help guide interventions, education and plans for assistance that will be required during transition from the hospital.

Inpatient rehabilitation facility (IRF)

Currently to be classified as an Inpatient Rehabilitation Facility by Medicare, that facility must have at least 60 percent of a facility's total inpatient population meet IRF criteria and have one or more of 13 defined conditions (examples are stroke, brain injury, spinal cord injury, neurological disorders, amputation, congenital deformity, major multiple trauma, fracture of the femur, and burns). For those facilities that designate them as "Neurorehabilitation," they will specialize in the care of people with neurological conditions.

What are CARF and The Joint Commission Certification?

Commission on Accreditation of Rehabilitation Facilities (CARF) and The Joint Commission are accredited health care organizations. They are independent, nonprofit organizations focused on meeting a high quality of services and standards of care. They strive to help facilities put in place a system of care that will meet the needs of the patient and family and provide them with the best possible care.

The therapy team

The team will work towards helping you increase functional independence, provide pertinent education to the patient and family, decreasing the burden of care and prepare for discharge to the community. They work in an interdisciplinary team with a patient centered approach, which includes the patient, the caregiver and health care professionals as detailed on "Your Stroke Recovery Team," page 4–5.

The rehabilitation process and the expectations of the patient and family

One of the primary goals of an IRF is to send the patient home with family or a caregiver in the safest and most efficient manner possible. Patients may not achieve complete independence or return to their prior level of function at the time of discharge from the IRF. The team will work to get the patient to the highest functional level in the restraints of time and progress before moving to the next level of care. The patient may need physical assistance, cognitive assistance or both upon returning home. The level of assist will vary depending on the patient and the severity of their deficits. It is recommended that the family/caregiver play an active part in the rehab process.

By agreeing to come to the IRF the family or caregiver has agreed to help or obtain the help necessary to meet patient's needs. The patient, family and/or caregiver(s) should let the team know what their needs and goals are so an individualized plan of care can be established. The amount and timing of family training will be conveyed by the team based on the patient's needs.

Interdisciplinary team meetings occur at least once a week to discuss the resolution to any problems that may affect the patient's plan of care, review the patient's progress towards their rehabilitation goals, and modify the plan of care to meet their needs.

Discharge planning starts as soon as the patient is admitted to help ensure a smooth transition home. On admission, the family should understand that they may need to provide 24 hours a day/7 days a week supervision for the patient on discharge. On some occasions, this may not be necessary at the time of discharge, but it is for the vast majority of the patients especially those discharging from a neurorehabilitation center. It is recommended that you start making plans to have someone to assist the patient once you initiate rehabilitation. Most insurance policies do not cover this type of custodial care, and family members or caregivers at the time of discharge usually have to provide it. The team will assist you in this process by helping you understand your insurance benefits, by providing family teaching for the physical and cognitive limitations of the patient, assist in recommending and obtaining any equipment needed, and help develop the necessary skills needed to go home. It is recommended that you do not wait until the end of the stay at the IRF to start preparing for discharge.

What do the different levels of supervision mean?

The amount of supervision upon discharge will be determined by the rehabilitation team and conveyed to you.

- 24/7 supervision means the patient will require 24 hours a day, 7 days a week supervision. This means that you have to provide constant and direct supervision physically and/or cognitively to assist the patient. When this level of supervision is recommended you cannot leave the patient alone. You need to be aware of the patient's needs and are responsible for the patient at all times.
- Close supervision means that you do not have to have constant direct supervision of the patient, and you can leave them alone for short periods of time (an hour or less) as long as the patient has a way to contact you if a need arises prior to your return.
- Distant/intermittent supervision means you can leave the patient alone for short periods of time and check on them occasionally. These times will be recommended by the therapy team.

What is QI scoring?

We rate the patient by assessing Quality Indicator (QI) scores. QI scores are the accepted method of describing a patient's functional ability in an Inpatient Rehab Facility (IRF). It is a measure of disability not impairment. It is a basic indicator of the patient's current burden of care and a requirement by most insurance payers. For more information please ask your rehab team member.

Outpatient rehabilitation

It is recommended you contact prospective outpatient facilities to ensure you select a facility that has a team of therapists that works with patients who have had a stroke. Your outpatient team may consist of a speech therapist, occupational therapist, physical therapist, social worker, nurse and neuropsychologist. Your plan of care will be established with each therapist, with individualized goals to focus on mobility, self-care, and home management, return to work/school, community/recreational activities and return to driving.

The patient will typically be seen for an hour session with each therapist, two times per week. Discharge from outpatient therapies is based on whether the patient has met the goals, and the insurance plan coverage. The patient may be discharged from outpatient rehab when there is a medical set back as well.

Return to work

Return to work considerations should be discussed with your physician and therapists. Throughout your course of treatment, your physicians and therapists will continue to re-evaluate your status for return to work.

- You may want to explore your options for the Family Medical Leave Act (FMLA) and disability pay options (short-term & long-term disability) with your employer.

  www.dol.gov or call 866.487.2365

- Neuropsychological evaluations, functional capacity evaluations and/or physicals through your employer may be required prior to your return to work.

- You may need some accommodations in your work place and may need to utilize your rights under the Americans with Disabilities Act.

  www.ada.gov or call 800.514.0301

- Although not required by all employers, it is highly recommended that you get cleared by your physiatrist or neurologist before returning to your regular work duties, and consider a gradual return to work.

- If you anticipate that you will be unable to return to work within a 12 month time frame, you may want to apply for Social Security Disability benefits.

  www.ssa.gov or call 800.772.1213

Return to school

An individual with a stroke may have physical and cognitive changes that may affect the return to school. Once the student is cleared by their doctor to return to school, the parent/legal guardian should contact the school to request an evaluation to determine their student's educational needs. A team of individuals at the school will evaluate the student as well as obtain any outside evaluations (such as therapy evaluations, medical records). Once the school evaluation team has all the appropriate information to determine the student's educational needs, a meeting with everyone will be held to discuss the best plan for the student to have a successful return to school. Students who may need special education services may need to be served under the Individuals with Disabilities Education Act (IDEA) for services available for return to school.

- Per the 504 section of the Rehabilitation Act of 1973, a student is allowed classroom modifications that may include environmental, curriculum, methodology, organizational, behavioral and presentation strategies (extra test time, typed notes).
- An individualized education plan (IEP) allows a student to have therapy services at school, transportation, one on one aide, and time spent outside of the regular education classroom, in a classroom more specialized for a student with a disability.

Return to driving

Depending on the location and severity of the stroke, the stroke can affect skills that are important for safe driving such as reaction time, ability to multi-task, visual perceptual skills, and judgment. If you would like to return to driving, talk with your physician.

We recommend that before returning to the road you complete a pre-driving screening. An occupational therapist in the Outpatient Therapies department at Dominican Hospital can complete this screening and tell you whether you need further testing and training before you drive. To schedule an Occupational Therapy evaluation and pre-driving screening, you will need a referral from your physician.

Dominican Hospital Outpatient Therapies
831.457.7057

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