Stroke / Cerebrovascular Accident (CVA)

Education For Our Community
Definition
Stroke is a brain injury. It occurs when the blood supply to the brain is interrupted. Without oxygen and nutrients from blood, brain tissue dies in less than 10 minutes. The tissue death causes a sudden loss in function.

Causes
A stroke occurs when there is a loss of blood flow. It may happen because of a blockage in blood flow, called ischemic stroke, or because of bleeding in the brain, called hemorrhagic stroke.

A sudden decrease in the flow of blood may be caused by:

- A clot that breaks off from another part of the body (such as the heart or neck) and lodges in blood vessel of neck or brain—there are certain conditions which increase a person's risk to form blood clots, such as:
  - Cancer
  - Pregnancy
  - Atrial fibrillation
  - Certain autoimmune diseases
- A blood clot that forms in neck or brain
- Atherosclerosis—a build-up of fatty substances along the inner lining of the artery that gradually decrease the area the blood can flow through
Inflammatory conditions in the blood vessels (vasculitis)

A hemorrhagic stroke occurs when blood vessels break and bleed into or around the brain. This can happen after an injury or spontaneously.

**Hemorrhagic vs. Ischemic Stroke**

- Hemorrhage/blood leaks into brain tissue
- Clot stops blood supply to an area of the brain

**Risk Factors**

The following factors can increase your risk of stroke but the risk can be modified with lifestyle changes and proper medical care:

- High blood pressure (the number one risk factor for ischemic stroke)
- High blood homocysteine level
- Drug abuse (heroin, cocaine, amphetamines)
- Narrowing of arteries supplying the brain due to atherosclerosis
- High cholesterol levels (specifically, high-LDL [low-density lipoprotein] "bad" cholesterol)
- Smoking
- Diabetes mellitus or impaired glucose tolerance
- Atrial fibrillation (abnormality of heart rhythm)
- Use of birth control pills, if you are over 35 years old and smoke
- Long-term use of hormone replacement therapy

Other factors that can increase your risk of stroke but cannot be modified include:

- Prior stroke or pre-existing cardiovascular disease, such as heart attack
- Prior transient ischemic attack (TIA) — this a "warning stroke" with symptoms that resolve in short period of time
- Age: 60 or older
- Family members who have had a stroke
- Gender: males are at greater risk
• Race: Black, Asian, Hispanic are at higher risk for strokes
• Blood disorders which increase clotting such as sickle cell disease and polycythemia
• Valvular heart disease, such as mitral valve stenosis

**Symptoms**
Symptoms occur suddenly. They differ depending on the part of the brain affected. Also, multiple symptoms can happen at the same time. If you notice any of the symptoms below, call emergency help right away. Getting help immediately is important, because brain tissue dies quickly when deprived of oxygen.

• Sudden weakness or numbness of face, arm, or leg, especially on one side of the body
• Sudden confusion
• Sudden trouble speaking or understanding
• Sudden trouble seeing in one or both eyes
• Sudden dizziness, trouble walking, loss of balance, or coordination
• Sudden severe headache with no known cause
Diagnosis

Having a stroke is an emergency. Tests may include:

- Neurological exams
- Electrocardiogram (ECG, EKG) — a test that records the heart's activity by measuring electrical currents through the heart muscle
- Brain and blood vessel imaging by:
  - Computed tomography (CT) scan — a type of x-ray that uses a computer to make pictures of the brain, helps doctors identify hemorrhagic versus ischemic stroke
  - Magnetic resonance imaging (MRI) scan — a test that uses magnetic waves to make pictures of the brain
  - Ultrasonography — a test that uses sound waves to examine the blood vessels feeding the brain
- Blood tests, including cholesterol, homocysteine, prothrombin time, and other coagulation tests

Other tests may include:

- Arteriography (angiography) — a catheter is placed in a blood vessel in the groin and
threaded up to the brain, shows arteries in the brain
- Magnetic resonance angiography (MRA) — shows brain blood vessels by mapping blood flow
- CT angiogram (CTA)—this test uses a CT scanner, gives images of the blood vessels inside the brain after a dye is injected into the veins
- Functional MRI—shows brain activity by picking up signals from oxygenated blood
- Doppler ultrasound —shows narrowing of the arteries (carotid and vertebral) supplying the brain, evaluates flow of blood in brain
- Echocardiography —a test that uses high-frequency sound waves (ultrasound) to examine the size, shape, and motion of the heart, shows if the clot comes from one of the heart's chambers

**Treatment**
Immediate treatment is needed to:

- Dissolve a clot causing an ischemic stroke
- Stop the bleeding during a hemorrhagic stroke
Treatment after immediate care will aim to:

- Reduce the chance of later strokes
- Improve functioning
- Overcome disabilities

Supportive care may also include:

- Adequate oxygen
- Precautions to prevent choking

**Medications**

Medications may include:

- Clot-dissolving drugs—(Tissue plasminogen activator (TPA) breaks up clots in arteries and blood vessels.
  - Given shortly after the start of symptoms—typically given within 4½ hours by IV, or intra-arterially (IA) within six hours
  - Used in carefully selected patients
- Antiplatelet drugs—decreases the body's ability to make clots
  - Aspirin
  - Clopidogrel (Plavix)
  - dipyridamole/aspirin (Aggrenox)
• Anticoagulant drugs – thins the blood and stabilizes existing blood clots
  o Warfarin – tablet
  o Xarelto – tablet
  o Pradaxa – tablet
  o Lovenox – subcutaneous injection
  o Heparin – intravenous or subcutaneous injection

Other drugs may be given to help:

• Control severely elevated blood pressure (labetalol or nicardipine, the first-line drug, or sodium nitroprusside) – although blood pressure is allowed to run high initially (called permissive hypertension)
• Decrease cholesterol – statins
• ACE Inhibitors – reduce risk of recurrent stroke

**Surgery**

A surgery may be done to prevent damage or allow blood flow back into the affected area. Surgical options after a stroke include:

• Extracranial/intracranial bypass – blood supply is rerouted around a blocked artery using a healthy scalp artery
- Craniotomy—done to relieve pressure build-up in the brain caused by swelling
- Embolectomy—a catheter is threaded through blood vessels to the clot; a special device will either mechanically remove the clot or deliver clot-dissolving medicine directly to the area

Other surgeries may be performed following a stroke or TIA to prevent a recurrence. These surgical options include:

- Carotid endarterectomy (CEA) —fatty deposits are removed from a carotid artery (major arteries in the neck that lead to the brain)
- Carotid angioplasty and stenting —less invasive procedure, carotid artery is widened and a mesh tube is placed into the artery to keep it open

**Rehabilitation**

Rehabilitation can be an important part of your recovery. Rehabilitation may include:

- Physical therapy—to regain as much movement as possible
- Occupational therapy—to assist in everyday tasks and self care
• Speech therapy—to improve swallowing and speech challenges
• Psychological therapy—to improve mood and decrease depression

**Prevention**
Lifestyle changes that can help reduce your chance of getting a stroke include:

• Exercise regularly.
• Eat more fruits, vegetables, and whole grains. Limit dietary salt and fat.
• Stop smoking.
• Increase your consumption of fish.
• Drink alcohol only in moderation (1-2 drinks per day).
• Maintain a healthy weight.
• Check blood pressure frequently. Follow your doctor's recommendations for keeping it in a safe range.
• Take a low dose of aspirin (50-325 milligrams per day) if your doctor says it is safe.
• Keep chronic medical conditions under control. This includes high cholesterol and diabetes.
• Talk to your doctor about the use of a statins. These types of drugs may help prevent certain kinds of strokes in some people.
• Seek medical care if you have symptoms of a stroke, even if symptoms stop.
• Stop the use of recreational drugs (cocaine, heroin, marijuana, amphetamines).
• Take all medications as prescribe by your doctor.

Discharge Instructions for Stroke

Home Care

• Be patient. Recovering from a stroke can take time. You will also need support from others.
• Talk to your family and friends. Let them know what support you may need while you regain your strength.
• Try to stay as active as possible. Follow your doctor’s recommendations.
• Participate in your cognitive, physical, and occupational therapy exercises.
• Consider ways to prevent stroke from happening again. Understand your risks for having another stroke. Risk factors include:
  • High blood pressure
  • Smoking
  • Drug abuse
  • High cholesterol
  • Diabetes
○ Heart disease
○ Family history of stroke.

Depression is common after stroke. It may be due to the damage caused by the stroke, rather than just a reaction to disability. Working with a therapist and taking medicines can help treat depression both in the short-term and the long-term. If you have any depression symptoms, talk to your family and your doctor.

**Diet**

Eat a healthy diet. It should be rich in fruits and vegetables and low in meat and dairy. Your doctor may refer you to a dietitian to help you with your diet. A good diet will improve your overall health and help manage other conditions.

**Physical Activity**

Staying physically fit and active will keep you healthy, improve your circulation and increase your strength. Talk with your doctor about the right exercise routine for you.

- Ask your doctor when you will be able to return to work.
- Do not drive unless your doctor has given you permission to do so.
**Medications**

Your doctor may prescribe one or a combination of medicines to:

- Prevent clotting (antiplatelet drugs)
- Thin the blood (anticoagulants)
- Lower blood pressure
- Reduce brain swelling
- Correct irregular heart rhythm (such as atrial fibrillation)
- Ease depression
- Lower cholesterol
- Lower glucose if you have elevated blood sugar

Commonly prescribed drugs include:

- Antiplatelet drugs—reduce your body's ability to form blood clots
  - Aspirin—Certain painkillers (eg, ibuprofen), when taken together with aspirin, may put you at high risk for gastrointestinal bleeding and also diminish the effectiveness of aspirin.
  - Clopidogrel (Plavix)—Avoid omeprazole (Prilosec) or esomeprazole (Nexium) if you take clopidogrel. They may cause clopidogrel to not work. Ask your doctor for other drug choices.
  - Dipyridamole/aspirin (Aggrenox)
• Blood-thinning drugs (anticoagulants)
  ○ Heparin
  ○ Warfarin (Coumadin)
  ○ Enoxaparin (Lovenox) or other related medicines
  ○ Dabigatran (Pradaxa)
  ○ Rivaroxaban (Xarelto)

**Side Effects of Commonly Prescribed Drugs**

**Aspirin:**
Side effects that you should report to your doctor or health care professional as soon as possible:
- Allergic reactions like skin rash, itching or hives, swelling of the face, lips, or tongue
- Black, tarry stools
- Bloody, coffee ground-like vomit
- Breathing problems
- Changes in hearing, ringing in the ears
- Confusion
- General ill feeling or flu-like symptoms
- Pain on swallowing
- Redness, blistering, peeling or loosening of the skin, including inside the mouth or nose
- Trouble passing urine or change in the amount of urine
- Unusual bleeding or bruising
- Unusually weak or tired
- Yellowing of the eyes or skin
Side effects that do not usually require medical attention, report to your doctor or health care professional if they continue or are bothersome:

- Diarrhea or constipation
- Nausea, vomiting
- Stomach gas, heartburn

**Plavix (clopidogrel)**

Side effects that you should report to your doctor or health care professional as soon as possible:

- Allergic reactions like skin rash, itching or hives, swelling of the face, lips, or tongue
- Black, tarry stools
- Blood in urine or vomit
- Breathing problems
- Changes in vision
- Fever
- Sudden weakness
- Unusual bleeding or bruising

Side effects that do not usually require medical attention, report to your doctor or health care professional if they continue or are bothersome:

- Constipation or diarrhea
- Headache
- Pain in back or joints
- Stomach upset
Aggrenox (aspirin/extended-release dipyridamole)
Side effects that you should report to your doctor or health care professional as soon as possible:

- Allergic reactions like skin rash, itching or hives, swelling of the face, lips, or tongue
- Breathing problems
- Black, tarry stools
- Chest pain
- Confusion
- Fast, irregular heartbeat
- Pain on swallowing
- Redness, blistering, peeling or loosening of the skin, including inside the mouth or nose
- Ringing in the ears
- Seizure
- Stomach pain
- Unusual bleeding or bruising
- Unusually weak or tired
- Bloody, coffee ground-like vomit

Side effects that do not usually require medical attention, report to your doctor or health care professional if they continue or are bothersome:

- Diarrhea
- Flushing, reddening of the skin
- Headache
- Nausea
- Reduced amount of urine passed
Heparin

Side effects that you should report to your doctor or health care professional as soon as possible:

- Allergic reactions like skin rash, itching or hives, swelling of the face, lips, or tongue
- Any sign of bleeding like bruising, pinpoint red spots on the skin, black, tarry stools, blood in urine, bleeding gums, nosebleeds
- Back pain
- Bleeding in the eye
- Burning or itching on the bottoms of the feet
- Cold, blue, or painful hands and feet
- Coughing up blood
- Feeling faint or lightheaded, falls
- Fever, chills
- Heavy menstrual bleeding
- Nausea, vomiting
- Stomach pain
- Unusually low blood pressure

Side effects that do not usually require medical attention, report to your doctor or health care professional if they continue or are bothersome:

- Pain at site where injected
Coumadin (warfarin)

Side effects that you should report to your doctor or health care professional as soon as possible:
- Back or stomach pain
- Chest pain or fast or irregular heartbeat
- Difficulty breathing or talking, wheezing
- Dizziness
- Fever or chills
- Headaches
- Heavy menstrual bleeding or vaginal bleeding
- Nausea, vomiting
- Painful, blue or purple toes
- Painful, prolonged erection
- Signs and symptoms of bleeding such as bloody or black, tarry stools, red or dark-brown urine, spitting up blood or brown material that looks like coffee grounds, red spots on the skin, unusual bruising or bleeding from the eye, gums, or nose
- Skin rash, itching or skin damage
- Unusual swelling or sudden weight gain unusually weak or tired
- Yellowing of skin or eyes

Side effects that do not usually require medical attention, report to your doctor or health care professional if they continue or are bothersome:
- Diarrhea
- Unusual hair loss
**Lovenox (enoxaparin)**

Side effects that you should report to your doctor or health care professional as soon as possible:
- Allergic reactions like skin rash, itching or hives, swelling of the face, lips, or tongue
- Black, tarry stools
- Breathing problems
- Dark urine
- Feeling faint or lightheaded, falls
- Fever
- Heavy menstrual bleeding
- Unusual bruising or bleeding

Side effects that do not usually require medical attention, report to your doctor or health care professional if they continue or are bothersome:
- Pain or irritation at the injection site

**Pradaxa (dabigatran etexilate)**

Side effects that you should report to your doctor or health care professional as soon as possible:
- Allergic reactions like skin rash, itching or hives, swelling of the face, lips, or tongue
- Breathing problems
- Chest pain or chest tightness
- Feeling faint or lightheaded, falls
- Headache
• Signs and symptoms of bleeding such as bloody or black, tarry stool, red or dark-brown urine, spitting up blood or brown material that looks like coffee grounds, red spots on the skin, unusual bruising or bleeding from the eye, gums, or nose

Side effects that do not usually require medical attention, report to your doctor or health care professional if they continue or are bothersome:
• Stomach pain
• Upset stomach

Xarelto (rivaroxaban)
Side effects that you should report to your doctor or health care professional as soon as possible:
• Allergic reactions like skin rash, itching or hives, swelling of the face, lips, or tongue
• Bloody or black, tarry stools
• Changes in vision
• Confusion, trouble speaking or understanding
• Red or dark-brown urine
• Redness, blistering, peeling or loosening of the skin, including inside the mouth
• Severe headaches
• Spitting up blood or brown material that looks like coffee grounds
• Sudden numbness or weakness of the face, arm or leg
• Trouble walking, dizziness, loss of balance or coordination
• Unusual bruising or bleeding form the eye, gums, or nose

Side effects that do not usually require medical attention, report to your doctor or health care professional if they continue or are bothersome:
• Dizziness
• Muscle pain

If you are taking medicines, follow these general guidelines:

• Take your medicine as directed. Do not change the amount or the schedule.
• Do not stop taking them without talking to your doctor.
• Do not share them.
• Know what the results and side effects may be. Report them to your doctor.
• Some drugs can be dangerous when mixed. Talk to a doctor or pharmacist if you are taking more than one drug. This includes over-the-counter medicine and herb or dietary supplements.
• Plan ahead for refills so you do not run out.
Lifestyle Changes

You and your doctor will plan lifestyle changes that will help you recover. There are many lifestyle changes and tools that will help you regain function. They can also help prevent another stroke. Always talk with your doctor if you are having difficulty with any of these changes. The guidelines below will help you get started.

Prevention

The following may help prevent another stroke:

- Exercise regularly.
- Maintain a healthy weight.
- Learn stress management techniques.
- Manage high blood pressure. This can be done with medicine, exercise, and a proper diet.
- Reduce high blood homocysteine levels. This can be done through prescription drugs or by increasing folate, vitamin B12, and vitamin B6.
- Treat atherosclerosis (narrowing of the arteries) through medicines, diet, and exercise.
- Ask your doctor about herbs and supplements that may help reduce your risk of stroke. This may include policosanol, fish oil, or folate.
- Manage high cholesterol levels, particularly low-density lipoprotein (LDL) cholesterol, the "bad cholesterol." This can be done with medicine, diet, and exercise.
• Manage diabetes mellitus through weight management, diet, exercise, and medicines.
• Address atrial fibrillation through medicines.
• Consider stopping the use of birth control pills if you are over 35 years old.
• Quit smoking.
• Get help for drug abuse.
• If you drink alcohol, drink only in moderation (1-2 drinks per day).

Follow-up
This condition needs to be monitored closely. Be sure to keep all appointments. Have exams and blood tests done as directed.

• Follow Up with your Physician
Prompt follow up with your physician(s) is crucial in maintaining your heart health. Recommendations from the American College of Cardiology encourage the patient to follow up with a physician within 7 days of discharge:

✔ Days immediately following discharge are a vulnerable period.
✔ Medications will be reviewed and further explained, if necessary.
✔ Questions regarding your treatment and care can be answered.
Coordination of care is important in preventing readmission

Call Emergency Medical Services Right Away If Any of the Following Occurs
It is important that you and those around you know the warning signs for stroke. Call for medical help right away if you have any of the following which may suggest a new stroke:

- Sudden weakness or numbness of face, arm, or leg, especially on one side of the body
- Sudden confusion
- Sudden trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden dizziness, trouble walking, loss of balance, or coordination
- Sudden severe headache with no known cause

What to do if you think someone is having a stroke

- Immediately call 9-1-1 or the Emergency Medical Services (EMS) number so an ambulance can be sent. Also, check the time so you'll know when the first symptoms appeared. A clot-busting drug called tissue plasminogen activator (tPA) may improve the chances of getting better but only if you get them help right away.
A TIA or transient ischemic attack is a "warning stroke" or "mini-stroke" that produces stroke-like symptoms. TIA symptoms usually only last a few minutes but, if left untreated, people who have TIAs have a high risk of stroke. Recognizing and treating TIAs can reduce the risk of a major stroke.

Is it a stroke? Check these signs **FAST!**

- **Face**: Does the face look uneven? Ask them to smile.
- **Arm**: Does one arm drift down? Ask them to raise both arms.
- **Speech**: Does their speech sound strange? Ask them to repeat a phrase.
- **Time**: Every second, brain cells die. Call 9-1-1 at any sign of stroke!

**Act FAST. Call 9-1-1 at any sign of stroke!**

Massachusetts Department of Public Health
PATIENT AND FAMILY RESOURCES:

1. The “Stroke Education for Our Community” booklet that you received at Morris Hospital can be accessed at:

   Morris Hospital

   http://www.morrishospital.org/patients-visitors/discharge-education/

2. Try this site to organize your medications at home:

   MyMedSchedule.com®

   http://www.mymedschedule.com/

3. Free Stroke information at the following websites:

   www.stroke.org

   www.strokeassociation.org
References


