

Let's Talk About...

Stroke in Children

Blood brings nutrients (such as vitamins, minerals, protein, sugar) and oxygen to the brain. The brain needs these all the time. A **stroke** is when a part of the brain does not get enough blood, nutrients, or oxygen. If the supply stops completely, that part of the brain can quickly stop working.

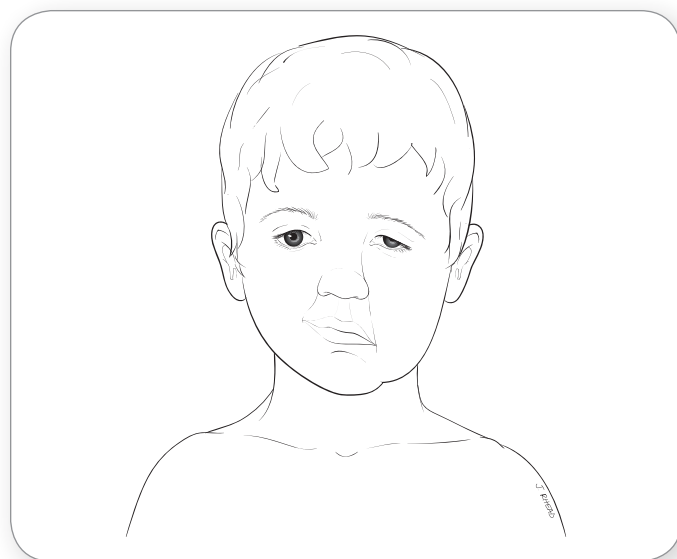
What does a stroke look like?

A stroke can be hard to recognize. But if you know what to watch for, it can be easier to recognize symptoms and seek medical assistance early. Most strokes happen on one side of the brain. This means that only one side of the body or face stops working properly. If you see one half of the face, mouth, or eyelid drooping, arm or leg floppiness, or sudden stumbling or falling to one side, call your doctor right away. Other signs are slurred speech, excessive drooling, or having trouble swallowing. If you are concerned, call your doctor right away!

What causes a stroke?

There are two types of stroke: **ischemic stroke** and **hemorrhagic stroke**.

Ischemic (is-KEE-mick) stroke happens when something blocks blood from going to part of the brain. Usually, blood travels gets where it needs to be by going through thin tubes in the body called blood vessels (also called arteries and veins). There can be a clot (like a scab) inside a blood vessel, or something pinching or squeezing an artery from the outside. This blocks blood, nutrients, and oxygen from going where they need to go. Sometimes a clot forms somewhere else in the body, (for example, in the heart) and a piece breaks off and moves through the blood vessels. It can then travel to the brain, get stuck

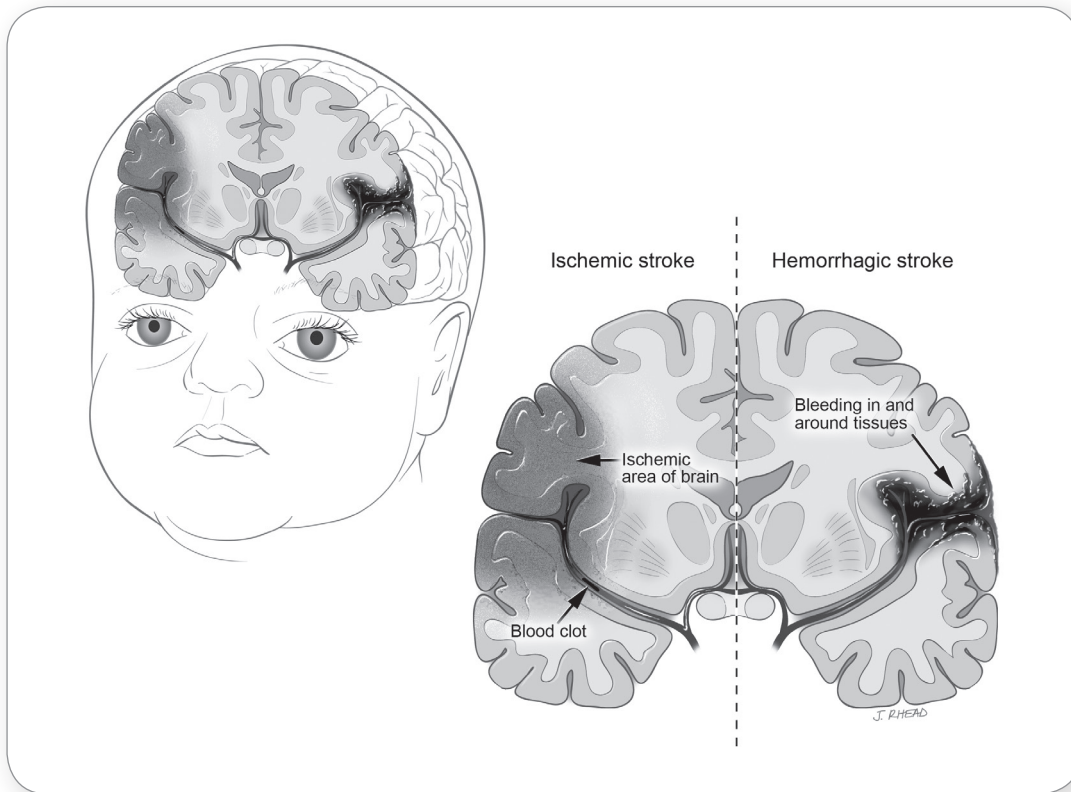


there, and block the blood flow (*see picture on the next page*).

Hemorrhagic (hem-oh-RAH-jick) stroke happens when blood vessels in the brain break or tear. Blood leaks out around the brain, and does not get to the part of the brain that needed it. Causes of hemorrhagic stroke include blood vessels that are not normal to begin with (called an AVM or arteriovenous malformation), a blood vessel that pouches out (called an aneurysm: AN-your-iz-um), and very high blood pressure (this cause is rare) (*see picture on the next page*).

Can stroke be prevented?

We do not know a lot about strokes in children. Many people do not know that strokes can happen in kids. The things that cause stroke in adults, such as smoking, high blood pressure, lack of exercise, and high cholesterol, do not apply to children. Sometimes, it is not known what caused the stroke.



How does the doctor know it is a stroke?

Even though many signs of a stroke are easy for doctors to notice, sometimes the signs can be very hard to notice. An expert in children's strokes is needed, and every second counts. Experts such as pediatric neurologists can help figure out whether your child has had a stroke. Special tests such as a CT (computed tomography) or MRI (magnetic resonance imaging) can often help the doctor in diagnosing a stroke. If your child did have a stroke the neurologist can help to figure out what medications or interventions are needed to treat the stroke.

How will the doctor treat the stroke?

The treatment that your child's doctor chooses depends on the cause of the stroke. If stroke is recognized early, doctors can do more. Once damage happens, treatment helps prevent more injury, and helps your child recover.

What will happen in the hospital?

Most often, a child with a stroke needs intensive care for about 24 to 48 hours. Sometimes this lasts for many days, depending on why the stroke happened. Once your child starts to get better, he can move to a regular hospital room. Your child may receive more studies so the doctors

can figure out why the stroke happened. Almost all children who have had a stroke will receive a special test called an "MRI". An MRI is like a camera that takes special pictures inside the brain and helps the doctors see what is happening. Your child may also need a test that looks at blood vessels in the brain, neck, heart, or legs.

Will my child have complications or longer lasting effects from the stroke?

The effects of a stroke are different for every child. The effects can range from mild to severe and can be temporary or permanent. The changes you see will depend on the location of the stroke, how quickly your child received treatment, and whether there were any complications. The effects of a stroke are greatest in the first days and weeks after the stroke occurs. Most children will improve with time. In fact, your child may continue to improve for many months and even years after the stroke.

Some common effects of a stroke may include the following:

- **Weakness and paralysis:** Loss of strength (weakness) and loss of movement (paralysis), usually occurs on one side of the body. Hemiparesis (weakness) or hemiplegia

(paralysis) are terms used to describe one-sided effects following stroke. Sometimes a stroke can cause one-sided neglect, which is when the brain ignores or forgets one side of the body. Trouble swallowing (dysphasia) may also be present.

- **Trouble communicating:** Struggling to express wants and needs is quite common after a stroke. Your child may mix up words or have trouble understanding what others are trying to say. Aphasia is the general term for these kinds of problems. Other effects from the stroke may also interfere with your child's ability to communicate. For example, if the muscles used in talking or swallowing are affected, your child's speech can be slurred, slow, and difficult to understand.
- **Problems thinking and remembering:** Your child may have trouble making decisions or solving problems. They may become forgetful, and it may be harder for them to pay attention.
- **Changes in vision:** Your child's field of vision may be smaller than normal. Some people describe this as a shade being pulled across or over their eyes. It could be hard to coordinate or control eye movements. Your child may have problems with depth perception (judging how close things are to them) or blurred vision.
- **Changes in emotions and behavior:** A stroke can affect your child's behavior including self-control, self-awareness and response to social situations. Sometimes the areas of the brain which control emotions are affected by the stroke. Sometimes following a stroke children have difficulty controlling emotions. Your child's emotions may change rapidly from anxious to sad to angry. It may be difficult to predict emotional reactions such as inappropriate laughing or crying. Your child may also have an overall decreased tolerance for frustration.

What does the future hold?

Your doctors and other caregivers can explain your child's specific condition. They can also tell you a lot about recovery. As with any brain injury, stroke recovery can

take many possible courses and it can be difficult to predict. As you go forward with your child's treatment and recovery, it's important to keep the following in mind:

- The effects of stroke are greatest in the first few days after stroke.
- With time, care and effort, most children do improve.
- Rehabilitation (rehab) activities can play an important role in recovery. Rehab may include physical, occupational, and speech therapies. Rehab helps your child's brain learn new ways of working and can help them regain some of the abilities they lost following their stroke.
- Your medical team will help you decide the level of rehabilitation intensity which will be most beneficial to your child. This may be done in the hospital and then continued in the community with outpatient therapies.

What if I have more questions?

- Ask your child's pediatrician first. The doctors in the Division of Child Neurology at Primary Children's Hospital are stroke experts and they would be happy to talk to you about stroke. You can call them at 801.587.7575, or your pediatrician can call for you.
- Rehabilitation Physicians are brain injury experts and are available to talk with you about the longer lasting effects of a stroke. You can call them at 801-662-4949.
- The World Wide Web can be hard to weed through, and some sources are better than others. The Children's Hemiplegia and Stroke Association website has good information for parents and from children who have had a stroke (<http://www.chasa.org>).
- The American Heart Association and the American Stroke Association have a good webpage (http://www.strokeassociation.org/STROKEORG/AboutStroke/StrokeInChildren/Stroke-In-Children_UCM_308543_SubHomePage.jsp).