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Can a newborn have a stroke?

Yes. A *perinatal stroke* is a stroke that happens to a baby between 20 weeks gestation and 28 days after birth (1). Perinatal strokes are especially common during the week after birth. A recent estimate suggests the incidence of perinatal stroke may be about one in 2200 live births (1).

Perinatal Stroke and HIE



Perinatal stroke is the result of an oxygen-depriving event: either a clot forms and results in reduced flow of oxygenated blood (ischemia) or a hemorrhage disrupts normal blood circulation. Similarly, [hypoxic-ischemic encephalopathy \(HIE\)](#) is, at its core, an injury caused by a lack of oxygenated blood flow to the brain. Sometimes babies that are diagnosed with HIE will also suffer a perinatal stroke as a result of the HIE; it is very common for them to co-



occur.

## Types of perinatal stroke

There are many types of perinatal stroke; the main factors for classification based on time are as follows (1):

- Fetal: Occurring before and close to birth.
- Neonatal: Occurring from birth to 28 days of postnatal life.
- Presumed Perinatal Ischemic Stroke: Exact time of onset is unknown, but assumed to be neonatal (birth to 28 days of life).

The clinical types of perinatal stroke are (1):

- Hemorrhagic stroke
- Arterial ischemic stroke
- Cerebral sinovenous thrombosis (CSVT)
- Periventricular venous infarction (PVI)

## Risk factors and causes of perinatal stroke

Babies are born with twice as many red blood cells as adults; this helps them absorb oxygen in the womb, which is a relatively low-oxygen environment. However, it also means that their blood is much thicker than a healthy adult's, and therefore they are at high risk for blood clots and stroke. The following factors can also contribute to perinatal stroke (3):

Trauma to the baby's head during labor or delivery: If there is pressure on the baby's head or parts of the womb (umbilical cord, placenta, or uterus), this can lead to oxygen-depriving blood clots and/or hemorrhage, both of which can cause hypoxic-ischemic brain injury and stroke. Birth trauma sometimes occurs due to misuse of birth-assisting tools such as forceps or vacuum extractors, or failure of medical professionals to respond to conditions that put the pregnancy in a [high-risk](#) category.



**Dehydration:** Dehydration after birth can cause blood to thicken and clot.

**Infections such as sepsis and meningitis:** Sepsis and meningitis after birth can lead to clotting.

**Congenital defects:** Certain abnormalities, such as a hole in the heart, can make it easier for blood clots to pass from other parts of the body up to the brain.

The mother's health can also affect the likelihood of perinatal stroke. Some of the maternal risk factors are diabetes, autoimmune disease, and blood-clotting disorders.

### Signs your baby is having a stroke

Perinatal strokes can be difficult to recognize. The typical symptoms in adults and older children – speech problems, weakness or numbness on one side of the body, etc – do not manifest as clearly because *all* newborns are unable to talk and lacking in strength and coordination. However, fetal stroke often involves the following signs and symptoms (1):

- Seizures (infant seizures are hard to recognize; check out our [FAQ](#) for details)
- Abnormal tone
- Encephalopathy
- Focal weakness
- Hypotonia
- Apnea
- Altered mental status
- Partial weakness of one side of the body
- Respiratory difficulties
- Feeding difficulties
- Jitteriness

As a baby gets older, asymmetrical weakness may become more apparent. They may also begin to favor one hand over the other. Sometimes this is mistaken for right or left “handedness.” However, handedness normally does not develop until a baby is about one year old – earlier, it may be a sign of a stroke.



## Diagnosing perinatal stroke

Because the initial signs and symptoms of a stroke can be very subtle, medical professionals should use additional diagnostic tools if they suspect that a stroke may have occurred. These may include (1):

- Taking images of the brain through an MRI or CT scan. In rare situations, brain imaging can be done in utero through the use of an ultrasound if there are signs of fetal stroke.
- EKG to record heart rhythm
- Blood tests to look for signs of a clotting condition or infection
- Lumbar puncture. This entails taking fluid from the spinal cord. It can reveal signs of [brain bleeds](#) or infection.
- Magnetic resonance arteriogram (MRA) or a magnetic resonance venogram (MRV) to examine blood vessels.
- EEG monitoring should also be done to look for signs of seizure.

## Treatment for perinatal stroke

Once a stroke has occurred, the cause of the stroke should be address and treatments should be used to prevent additional damage. Such treatments include (4,5):

- Blood-thinning medications. Babies who have had one ischemic stroke are often at risk for another one because existing brain injury makes the brain's cells fragile and prone to bleeding. When tissues are prone to bleeding, they are also susceptible to more clotting. Blood thinners decrease the risk of further clots and help stabilize the baby's condition. However, blood thinners should not be used to treat hemorrhagic stroke; that will only make the baby's condition worse.
- IV fluids to hydrate the baby
- Oxygen
- Treatment of any existing heart conditions
- Anticonvulsants for seizures



- Blood transfusions

The only treatment that researchers have identified that can help *repair some of the brain damage* caused by fetal stroke and hypoxic-ischemic encephalopathy is [hypothermia therapy](#), a process wherein the baby's brain is cooled down enough to slow metabolism and help the brain repair itself (6). The effectiveness of the treatment can vary (some children treated with hypothermia therapy show no signs of disability, while others have moderate to severe disability). However, hypothermia therapy has been clinically demonstrated to reduce the level of disability when administered in a timely fashion: within six hours of birth, and the sooner the better.

#### Outcomes of perinatal stroke

Because nerve cells in newborn brains are still forming connections with one another, if one part of the brain is damaged, certain brain functions may be transferred to other parts of the brain. This plasticity in brain wiring makes it possible for some newborns who have suffered a stroke to grow up with fewer disabilities. However, perinatal stroke can result in complications similar to those caused by other hypoxic-ischemic events. These include [seizures](#), [cerebral palsy](#), [intellectual and developmental disabilities](#), [speech delays and language disorders](#), and more (5). Each of these conditions requires its own treatments and therapies, which you can explore further by clicking on the links provided.

*The information presented above is intended only to be a general educational resource. It is not intended to be (and should not be interpreted as) medical advice. If you have questions about perinatal stroke, please consult with a medical professional.*

#### Sources

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