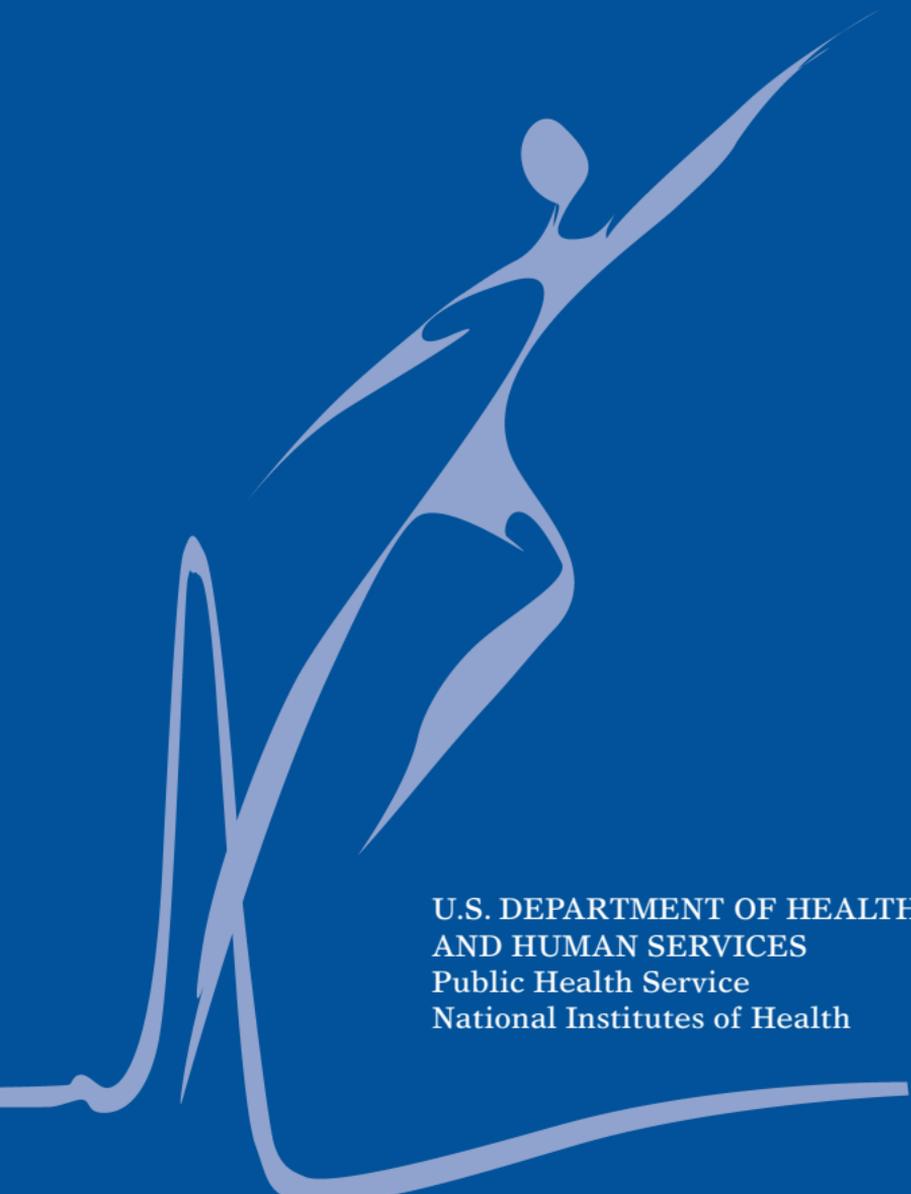


# Febrile Seizures

A stylized graphic in light blue on a dark blue background. It features a white ECG line that starts with a small P wave, followed by a tall, narrow QRS complex, and then a long, flat ST segment. Overlaid on this line is a silhouette of a person with their arms raised in a 'V' shape, suggesting a seizure or a state of intense emotion. The person's head is a simple circle, and their torso and limbs are solid shapes.

U.S. DEPARTMENT OF HEALTH  
AND HUMAN SERVICES  
Public Health Service  
National Institutes of Health



# Febrile Seizures

## What are febrile seizures?

**F**ebrile seizures are convulsions brought on by a fever in infants or small children. During a febrile seizure, a child often loses consciousness and shakes, moving limbs on both sides of the body. Less commonly, the child becomes rigid or has twitches in only a portion of the body, such as an arm or a leg, or on the right or the left side only. Most febrile seizures last a minute or two, although some can be as brief as a few seconds while others last for more than 15 minutes.

The majority of children with febrile seizures have rectal temperatures greater than 102 degrees F. Most febrile seizures occur during the first day of a child's fever. Children prone to febrile seizures are not considered to have epilepsy, since epilepsy is characterized by recurrent seizures that are not triggered by fever.

## How common are febrile seizures?

**F**ebrile seizures are the most common type of convulsions in infants and young children. Approximately one in every 25 children will have at least one febrile seizure, and more than one-third of these children will have additional febrile seizures before they outgrow the tendency to have them. Febrile seizures usually occur in children between the ages of 6 months and 5 years and are particularly common in toddlers. Children rarely develop their first febrile seizure before the age of 6 months or after 3 years of age. The older a child is when the first febrile seizure occurs, the less likely that child is to have more.

## What makes a child prone to recurrent febrile seizures?

**A** few factors appear to increase a child's risk of having recurrent febrile seizures, including young age (less than 15 months) at the time of the first seizure, frequent fevers, and having immediate family members with a history of febrile seizures. If the seizure occurs soon after a fever has begun or when the temperature is relatively low, the risk of recurrence is higher. A long initial febrile seizure does not substantially boost the risk of recurrent febrile seizures, either brief or long.

## Are febrile seizures harmful?

**A**lthough they can be frightening to parents, the vast majority of febrile seizures are short and harmless. During a seizure, there is a small chance that the child may be injured by falling or may choke from food or saliva in the mouth. Using proper first aid for seizures can help avoid these hazards (see section entitled “What should be done for a child having a febrile seizure?”).

There is no evidence that short febrile seizures cause brain damage. Large studies have found that children with febrile seizures have normal school achievement and perform as well on intellectual tests as their siblings who don't have seizures. Even when the seizures are very long (more than 1 hour), most children recover completely, but prolonged seizures are a risk factor for subsequent epilepsy (seizures without fever).

In other words, between 95 and 98 percent of children who experience febrile seizures do not go on to develop epilepsy. However, although the absolute risk remains small, some groups of children, including those with cerebral palsy, delayed development, or other neurological abnormalities, have an increased risk of developing epilepsy. The type of febrile seizure also matters: children who have prolonged febrile seizures (particularly lasting over an hour), or seizures that affect only part of the body, or that recur within 24 hours, are at somewhat higher risk. Among children who don't have any of these risk factors, only 1 in 100 develops epilepsy after a febrile seizure.

## **What should be done for a child having a febrile seizure?**

**S**eizures are frightening, but it is important that parents and caretakers stay calm and carefully observe the child. To prevent accidental injury, the child should be placed on a protected surface such as the floor or ground. The child should not be held or restrained during a convulsion. To prevent choking, place the child on his or her side or stomach. When possible, gently remove any objects from the child's mouth. Never place anything in the child's mouth during a convulsion—objects placed in the mouth can be broken and obstruct the child's airway. Look at your watch when the seizure starts. If the seizure lasts 10 minutes, the child should be taken immediately to the nearest medical facility for treatment. Once the seizure has ended, the child should be taken to his or her doctor to check for the source of the fever. This is especially urgent if the child shows symptoms of stiff neck, extreme lethargy, or abundant vomiting.

## **How are febrile seizures diagnosed and treated?**

**B**efore diagnosing febrile seizures in infants and children, doctors sometimes perform tests to be sure that seizures are not caused by something other than simply the fever itself. For example, if a doctor suspects the child has meningitis (an infection of the membranes surrounding the brain), a spinal tap may be needed to check for signs of the infection in the cerebrospinal fluid (fluid that bathes the brain and spinal cord).

If there has been severe diarrhea or vomiting, dehydration could be responsible for seizures. Also, doctors often perform other tests such as examining the blood and urine to pinpoint the cause of the child's fever.

A child who has a febrile seizure usually doesn't need to be hospitalized. If the seizure is prolonged or is accompanied by a serious infection, or if the source of the infection cannot be determined, a doctor may recommend that the child be hospitalized for observation.

### **How are febrile seizures prevented?**

If a child has a fever, most parents will use fever-lowering drugs such as acetaminophen or ibuprofen to make the child more comfortable, although there are no studies proving that this will reduce the risk of a seizure.

Children especially prone to febrile seizures may be treated with the drug diazepam orally or rectally whenever they have a fever. The majority of children with febrile seizures do not need to be treated with medication, but in some cases a doctor may decide that medicine given only while the child has a fever may be the best alternative. This medication may lower the risk of having another febrile seizure. It is usually well tolerated, although it occasionally can cause drowsiness, a lack of coordination, or hyperactivity. Children vary widely in their susceptibility to such side effects.

Prolonged daily use of oral anticonvulsants, such as phenobarbital or valproate, to prevent febrile seizures is usually not recommended because of their potential for side effects and questionable effectiveness for preventing such seizures.

In addition, some children are prone to have very long febrile seizures. When a child has had a long febrile seizure, the subsequent ones might also be long. Because very long febrile convulsions (lasting an hour or more) are associated with increased risk of developing epilepsy, some doctors will suggest that such children be treated with a rectal form of the drug diazepam to stop the seizure. The parents of a child who had a very long febrile seizure may wish to consult their doctor about this possibility.

### **What research is being done on febrile seizures?**

**T**he National Institute of Neurological Disorders and Stroke (NINDS), a part of the National Institutes of Health (NIH), sponsors research on all forms of seizures in medical centers throughout the country. NINDS-supported scientists are exploring the environmental and genetic risk factors that might make children susceptible to febrile seizures. Scientists are also working to pinpoint factors that can help predict which children are likely to have recurrent or long-lasting febrile seizures.

Investigators continue to monitor the long-term impact that febrile seizures might have on intelligence, behavior, school achievement, and the development of epilepsy. For example, scientists conducting studies in animals are assessing the effects of febrile seizures (and especially very long seizures) on measures of intelligence and on the development of epilepsy. Scientists are trying to determine if children experiencing a long febrile seizure are at a higher risk for future development of a particular type of epilepsy called mesial temporal lobe epilepsy (TLE). Mesial TLE is associated with scarring of a brain area called the hippocampus. Mesial TLE usually presents in adolescents or young adults, some of whom have a history of febrile seizures as young children.

Investigators also continue to explore which drugs can effectively treat or prevent febrile seizures and to check for side effects of these medicines.

### **Where can I get more information?**

Information about NINDS research on febrile seizures and other neurological disorders is available from the Institute's Brain Resources and Information Network (BRAIN) at:

#### **BRAIN**

P.O. Box 5801

Bethesda, MD 20824

301-496-5751

800-352-9424

*[www.ninds.nih.gov](http://www.ninds.nih.gov)*

**Epilepsy Foundation**

8301 Professional Place

Landover, MD 20785-7223

301-459-3700

800-332-1000

*www.epilepsyfoundation.org*

**Citizens United for Research in Epilepsy  
(CURE)**

223 W. Erie, Suite 28W

Chicago, IL 60654

312-225-1801

800-765-7118

*www.CUREepilepsy.org*





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Prepared by:  
Office of Communications and Public Liaison  
National Institute of Neurological  
Disorders and Stroke  
National Institutes of Health  
Department of Health and Human Services  
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