



# Febrile Seizures in Pediatrics

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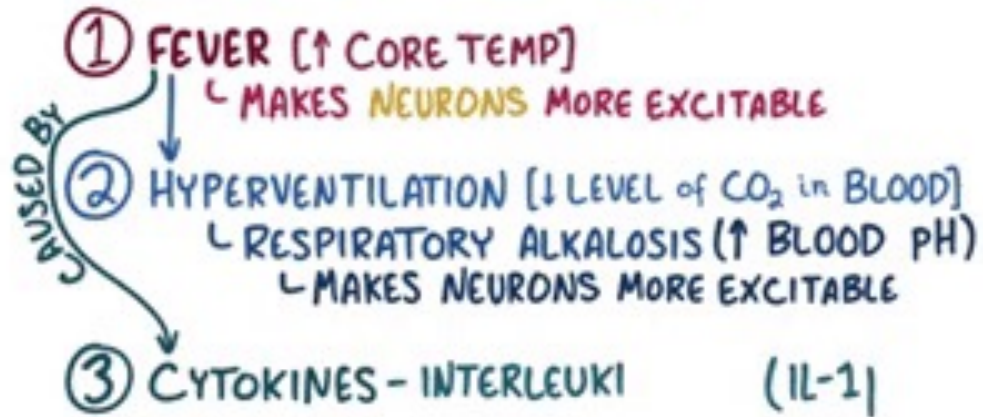


# FEBRILE SEIZURE


↳ TRIGGER = FEVER

↳ LARGE GROUPS OF NEURONS  
ACTIVATE SYNCHRONOUSLY

## POSSIBLE EXPLANATIONS



Why can  
fevers  
cause  
seizures?



# What are the classifications?

## Table 1. Classification of Febrile Seizures

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### **Simple (all of the following)**

Duration of less than 15 minutes

Generalized

No previous neurologic problems

Occur once in 24 hours

### **Complex (any of the following)**

Duration of more than 15 minutes

Focal

Recurr within 24 hours

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*Adapted with permission from Millar JS. Evaluation and treatment of the child with febrile seizure. Am Fam Physician. 2006;73(10):1761, with additional information from reference 1.*

## **Focal**

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Hemiparesis

Hemihypesthesia

Dysphasia

Dysarthria

Hemianopia

Transient monocular blindness

Hemiataxia

Diplopia

Vertigo

## **Nonfocal**

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Decreased consciousness or unconsciousness

Confusion

Amnesia

Unsteadiness

Nonrotatory dizziness

Positive visual phenomena

Paresthesias

Bilateral weakness of arms or legs

Unwell feelings

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**All symptoms should have a sudden onset, rapid clearance and last <24 hours.**

# Common causes and risk factors

The cause of febrile seizures is likely multifactorial

Viral illnesses, certain vaccinations, and genetic predisposition are common risk factors that may affect a vulnerable, developing nervous system under the stress of a fever.

- Viruses most commonly correlated with febrile seizures include human herpesvirus 6, influenza, adenovirus, and parainfluenza

Other risk factors include exposures in utero, such as maternal smoking and maternal stress; being in the neonatal intensive care unit for more than 28 days, developmental delay, having a first-degree relative with a history of febrile seizures, having a second-degree relative with a history of febrile seizures, and day care attendance



# Management for simple febrile seizures

## SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	References
Children with a simple febrile seizure who are well-appearing do not require routine diagnostic testing, such as laboratory tests, neuroimaging, or electroencephalography.	<b>C</b>	1, 31, 32
Continuous or intermittent antiepileptic medications are not recommended after a first febrile seizure because of potential adverse effects.	<b>B</b>	42
Antipyretic agents do not reduce recurrence of simple febrile seizures.	<b>A</b>	42
Risk factors for recurrence of febrile seizure are age younger than 18 months, fever duration of less than one hour before seizure onset, first-degree relative with a history of febrile seizures, and a temperature of less than 104°F (40°C).	<b>B</b>	38

**A** = consistent, good-quality patient-oriented evidence; **B** = inconsistent or limited-quality patient-oriented evidence; **C** = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to <https://www.aafp.org/afpsort>.

## BEST PRACTICES IN NEUROLOGY

### Recommendations from the Choosing Wisely Campaign

Recommendation	Sponsoring organization
Do not routinely order an electroencephalography for neurologically healthy children who have a simple febrile seizure.	American Academy of Nursing
Neuroimaging (computed tomography, magnetic resonance imaging) is not necessary in a child with a simple febrile seizure.	American Academy of Pediatrics

**Source:** For more information on the Choosing Wisely Campaign, see <http://www.choosingwisely.org>. For supporting citations and to search Choosing Wisely recommendations relevant to primary care, see <https://www.aafp.org/afp/recommendations/search.htm>.

# Management for complex febrile seizures

Decisions about diagnostic testing may not be as straightforward in children with a complex febrile seizure, because complex febrile seizures are more heterogeneous.

The neurologic examination is crucial when deciding whether to perform a lumbar puncture.

In a case series of 526 patients with a first complex febrile seizure, only four patients had clinically significant intracranial pathology, and three of those four had obvious findings on physical examination.

Neuroimaging is not necessary for complex febrile seizures unless the child has abnormal or focal findings on neurologic examination.

Electroencephalography (EEG) has no role in the acute management of febrile seizures and does not predict recurrence. However, outpatient EEG should be performed in children with multiple risk factors for epilepsy (developmental delay, family history of epilepsy, and more than one defining feature of a complex febrile seizure) because of the risk of subsequent nonfebrile seizures

# Acute management

Prehospital and emergent management should focus on stabilizing the patient (ABCs [airway, breathing, and circulation])

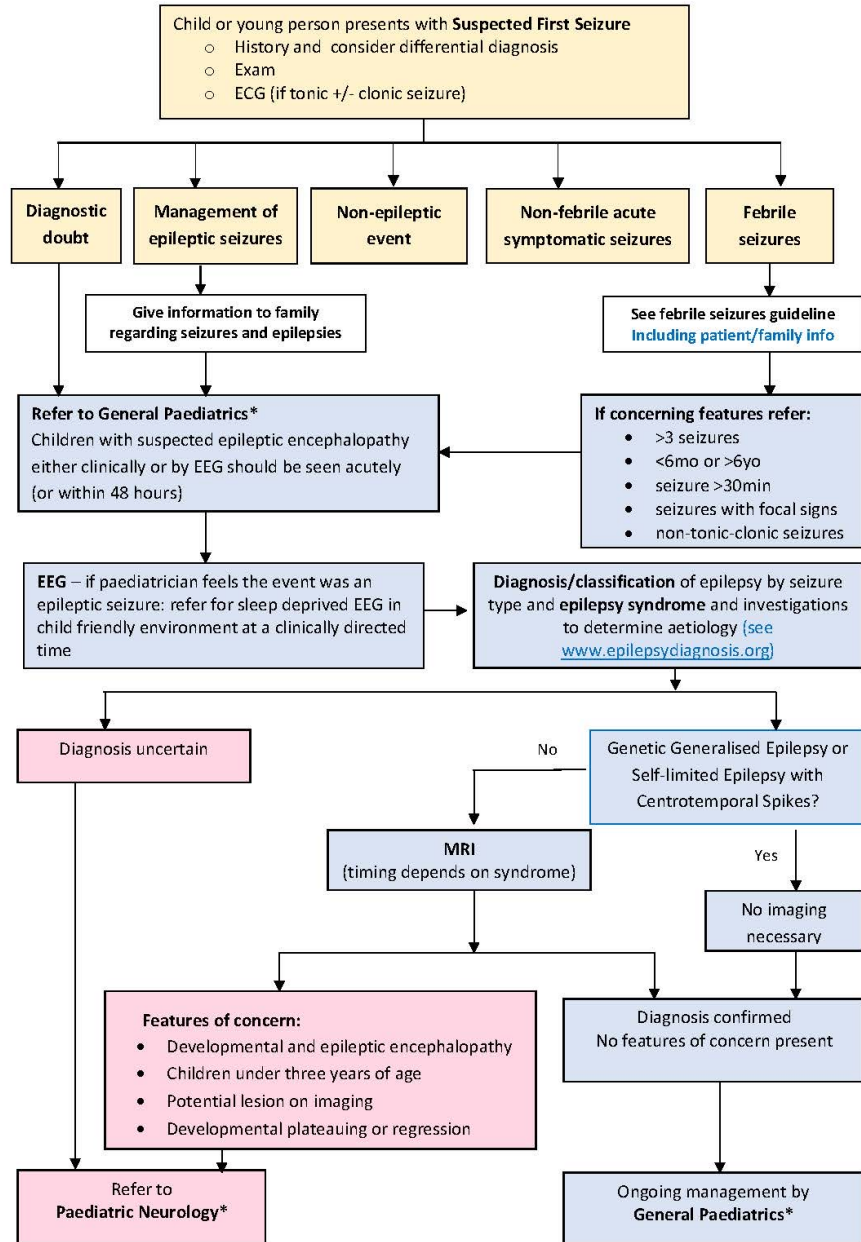
Most febrile seizures are self-limited and end before patients arrive at the hospital. However, seizures lasting longer than five minutes are unlikely to stop on their own, and a benzodiazepine should be administered to break the seizure

A 2018 Cochrane review concluded that intravenous lorazepam (Ativan) and diazepam have similar rates of seizure cessation and respiratory depression

When intravenous access is unavailable, buccal midazolam or rectal diazepam (Diastat) is acceptable.

The Cochrane review concluded that there is insufficient evidence to support the use of intranasal benzodiazepines





# Seizures in children

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\* = referrals at Starship. Follow local processes elsewhere.  
Aim for paediatrician review acutely or within 2 weeks of presentation.

Questions  
parents may  
have:

**Will they have one again? Will they get epilepsy? Will they have brain damage? Was this from a vaccine?**

Epilepsy occurs more frequently in children who have had febrile seizures than in the general population. In a normal child with a simple febrile seizure, the risk is approximately 1 to 2 percent, only slightly above that of the general population. For children with complex febrile seizures, an abnormal developmental history, or a family history of epilepsy, the risk is closer to 5 to 10 percent.

#### RISK FACTORS FOR RECURRENCE

*Recurrence risk: 40%*

- 1<sup>st</sup> febrile seizure < 18 months
- Duration of fever < 24 hours
- Complex febrile seizure
- Family history of febrile seizures
- Temperature < 40°C (104°F)

#### EDUCATION / REASSURANCE OF CAREGIVERS

- Febrile seizures are **common**, occurring in **2-5%** of children **≤ 5** years old.
- **No risk of death, brain damage, learning problems, or decreased IQ.**
- Most patients have 2 or 3 febrile seizures in a lifetime.

# Resources

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1. Smith DK, Sadler KP & Benedum M. *Am Fam Physician*. 2019 Apr 1; 99(7):445-450
2. Jensen KV & Liu N. Peds case notes: febrile seizures. Accessed at <https://www.pedscases.com/febrile-seizures-0>