

Febrile Seizures

Guideline significantly revised by Rebecca Latch, MD, in collaboration with the ANGELS team. Last reviewed by Rebecca Latch, MD, July 22, 2016. Guideline replaced *Evaluation and Treatment of the Child with an Apparent Febrile Seizure* developed in October, 2009 by David McLario, MD.

Preface

Febrile seizures are the most common convulsive event in patients <5 years of age and occur in 2% to 5% of all children. Despite their prevalence, there are few events that can incite more anxiety in parents and healthcare providers alike. This guideline is intended to provide a resource for healthcare providers when caring for a child who has experienced a febrile seizure.

Definition, Evaluation, Assessment, and Prognosis

Definition

- Febrile seizures typically occur in children between 6- and 60-months of age.
- The peak age of onset is between 14- and 18-months of age.
- In order to be labeled a febrile seizure, patients must have a fever with a core temperature of greater than 38°C.
- Children with underlying seizure disorders may have an increased incidence of seizures when they have fever, but these are not, by definition, febrile seizures.
- Febrile seizures can be further categorized as simple febrile seizures or complex febrile seizures based on certain clinical criteria.
 - A simple febrile seizure is one that meets the following criteria:²
 - Generalized clonic-tonic seizure activity without any focality
 - Seizure activity lasting <15 minutes
 - The patient has only 1 seizure in a 24-hour period.
 - A febrile seizure may be described as complex if it has any of the following components:
 - Focal seizure activity
 - Seizure activity lasting >15 minutes
 - More than one seizure in a 24-hour period.

Evaluation

- Initial evaluation of febrile seizures should focus primarily on identifying children who are at higher risk for a serious bacterial infection and treating those children appropriately.
- With the development of the *Streptococcus pneumoniae* and *Haemophilus influenzae* type B vaccines, rates of serious bacterial infections in children have dramatically decreased.
- A literature review shows that the risk of bacterial meningitis in children with their first simple febrile seizure is minimal,³⁻⁵ which has led to recent changes in the American Academy of Pediatrics clinical practice guidelines for the evaluation of a child with their first simple febrile seizure.¹
- Evaluation for acute metabolic abnormalities such as hypoglycemia or hyponatremia may be warranted in children who present actively convulsing, regardless of fever.

Assessment

Simple Febrile Seizure

- Each patient who has experienced a first simple febrile seizure should undergo a thorough physical exam to assess for a source of the fever.
- Any child with signs or symptoms of meningitis such as neck stiffness, Kernig's or Brudzinski's sign, requires a lumbar puncture to effectively rule out meningitis.
- Physical exam findings of meningitis can be minimal in children <18-months of age. Laboratory work-up including blood cultures, urine culture, and a lumbar puncture should be considered in children in that age range who have risk factors shown in the table below.
- Children without these risk factors whose exams are stable and have returned to their baseline neurologic status may not require further evaluation. Any further laboratory testing should be directed to identifying the source of fever.
- Patients who have other risk factors for a seizure disorder, such as an underlying developmental delay or history of a brain abnormality, may need further evaluation of their seizures. After discussion with a neurologist, an outpatient EEG and/or brain MRI may be warranted in these patients.

Table. Risk Factors for Serious Bacterial Infections

Immune deficiencies	Hereditary immune deficiencies Undergoing chemotherapy Sickle cell anemia
Deficient immunization status	Unimmunized children Under-immunized children (who are behind on their immunizations)
Pre-treatment with systemic antibiotics	May mask the symptoms of a serious bacterial infection, necessitating further work-up in these patients.

Complex Febrile Seizure

- Patients who have experienced a complex febrile seizure may be at a higher risk of further seizures and need further evaluation and observation.
- Patients who have physical findings suspicious for serious bacterial infection and those in the high-risk categories above will need further evaluation with blood, urine, and cerebral spinal fluid cultures.
- An outpatient brain MRI and/or EEG may be warranted if there is concern that this seizure

was secondary to an underlying seizure disorder that was unmasked by fever.

Recurrent Febrile Seizures

- Thirty (30%) to 50% of patients who experienced one febrile seizure will experience further febrile seizures.
- The risk is increased by younger age of the patient and by a history of a previous febrile seizure.⁶
- Some of these patients may warrant further workup and consultation with a neurologist if there is concern for an underlying seizure disorder.

Prognosis

- Children who experience a first simple febrile seizure have the same risk of developing epilepsy by age 7 as the rest of the general population, approximately 1%.⁷
- In addition, retrospective studies have shown no difference in cognitive function of young adults who experienced febrile seizures when compared to those who did not.⁷

Discharge Criteria and Instructions

- Patients who have experienced a simple febrile seizure should be observed until they have returned to baseline.
- If there are no signs or symptoms of serious bacterial infection, they may be safely discharged at that point.
- Discharge instructions should include instructions on emergency care for patients experiencing a seizure, including airway management.
- Antipyretics may be used for the patient's comfort; there is no evidence that use of any antipyretic prevents further seizures, even when used in combination with each other.⁸
- Initiation of antiepileptic medications is not warranted in children who have experienced a simple febrile seizure.
- Further discussion with a pediatric neurologist may be warranted in patients who have experienced multiple or complex febrile seizures.⁷

Management

- Initial management of a patient who is actively convulsing is generally the same whether or not the patient has fever.
- Healthcare providers should initially focus on supporting the patient's airway, breathing, and circulation.
- Administration of benzodiazepines and/or antiepileptic medications should be considered if the seizure lasts >5 minutes. See Figure below.⁹

Manage airway and breathing,
supplemental O₂



Consider IV access and labs, including
bedside glucose



Seizure lasting > 5 minutes?



Lorazepam 0.1mg/kg IV (max 4mg)
or Midazolam 0.2mg/kg IM (max 6mg)
or Diazepam 0.5mg/kg PR (max 20mg)



If seizure persists, may repeat dose in 5
minutes, carefully monitoring airway



If seizure persists, can give alternative
medication such as fosphenytoin,
phenobarbital or levetiracetam

Summary

- Previous recommendations from the American Academy of Pediatrics suggested that all patients <18- months of age who have experienced a febrile seizure may need a laboratory evaluation, including lumbar puncture, to assess for serious bacterial infection since physical exam findings of meningitis can be minimal in children that age.³
- As immunizations for *Haemophilus influenzae* type B and *Streptococcus pneumoniae* have reduced the incidence of these infections, recommendations have been revised.
- Only children with an exam concerning for serious bacterial infection and children categorized as high-risk require further evaluation after their first simple febrile seizure.

This guideline was developed to improve health care access in Arkansas and to aid health care providers in making decisions about appropriate patient care. The needs of the individual patient, resources available, and limitations unique to the institution or type of practice may warrant variations.

References

References

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