

Title: **'Seizure(s) with Fever' in Children**
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Author: Keshav Kalambella, Specialist Registrar
Contributors: Kiran Damera, Colin Dunkley, Katherine Martin, William Whitehouse, Mal Ratnayaka, Rachael Wheway, Catie Picton, Ann Brown, Kirsten Johnson, Hani Faza
Approval: CEWT (Children's Epilepsy Workstream in Trent)

Scope

Children or young people presenting with 'seizure with fever' to acute paediatric services

Definitions and background

'Fever' : Recorded temperature >37.8 or perceived to have fever by parents/carers around time of seizure

'Febrile Seizures': (Sometimes termed 'Febrile Convulsion')

A convulsive seizure in infancy or childhood between 6 months and 5 years of age (peak age 18-22 months) associated with fever but without evidence of intracranial infection or defined cause of seizure. Population studies report a cumulative incidence of 2–5%¹. The seizure may occur before the fever becomes apparent, and well before the illness causing the fever is manifest.²

Types of febrile seizures:

- Simple Febrile Seizures: A single generalised (no focal features) seizure lasting <10 min (2/3 of all febrile seizures)
- Complex Febrile Seizures: Multiple seizures in same illness or ≥ 10 min or focal features (either during the seizure or afterwards e.g. Todd's palsy). (1/3 of all febrile seizures)

Acute symptomatic seizures with fever:

Other conditions can cause seizure associated with fever. These include

- Intracranial infections (e.g. meningitis/encephalitis/brain abscess)
- Gastroenteritis or sepsis with electrolyte abnormalities or hypoglycaemia

Epilepsy with fever-related seizures:

Seizures can be precipitated by fever in children with a known epilepsy or first presentation of an epilepsy.

Other situations mimicking febrile seizures or epileptic seizures:

- Fever with rigors
- Fever with delirium
- Fever with reflex syncope
- Fever with hypotonic, hyporesponsive episodes

Prognosis

Risk factors predisposing to febrile seizures

- Previous febrile seizure
- Family history (first degree relative)

Risk of future febrile seizures³

Antipyretics can be used but there is no evidence that they reduce risk of febrile seizures. Antiepileptic drugs do not usually have any role in reducing the risk of future febrile seizures. Overall 30% will develop further febrile seizures.

The risk can be individualised:

Risk Factors:

- Early age of onset (<18months)
- Family history of febrile seizures
- Lower temperature (<40°C)
- (Complex features **not** a risk factor)

Number of risk factors	Risk of recurrence
0	15%
1	27%
2	39%
3	65%

Risk of epilepsy⁴

Overall 3% of children with febrile seizures will go on to have some type of epilepsy (recurrent afebrile epileptic seizures) at some point.

The risk can be individualised:

Risk Factors:

- Abnormal 'neurology' prior to first febrile seizure
- Family history of afebrile seizures
- Complex febrile seizure

Number of risk factors	Risk of epilepsy
0	1%
1	2%
≥ 2	10%

References

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5. CEWT Guideline Framework www.cewt.org.uk
6. The management of children and young people with an acute decrease in conscious level, RCPCH guideline, 2015
7. <http://www.nice.org.uk/guidance/CG102>
8. <http://www.nice.org.uk/guidance/CG160>
9. Complex Febrile Seizures: A Practical Guide to Evaluation and Treatment J Child Neurol June 2013 28: 762-767
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11. Kimia A, Ben-Joseph EP, Rudloe T, Capraro A, Sarco D, Hummel D, Johnston P, Harper MB. Yield of lumbar puncture among children who present with their first complex febrile seizure. Pediatrics. 2010 Jul; 126(1):62-9.

Seizure(s) with Fever in Children

Contraindications for Lumbar Puncture⁶

- Signs of raised intracranial pressure** even if GCS is 15
- A GCS of less than or equal to 8
- A deteriorating GCS
- Focal neurological signs
- GCS equal to or less than 12 after a seizure lasting more than 10 minutes
- Clinical evidence of circulatory shock or meningococcal disease
- A CT or MRI scan suggesting CSF pathway obstruction

***Concerning Features:**

- Any prolonged convulsion > 5 mins
- Complex febrile seizures
 - Multiple seizures in same illness
 - Focal features
- Infant < 18 months
- Prior treatment with antibiotics
- Drowsy before the seizure or > 1 hour post seizure
- More than 3 days illness
- GP contact in last 24 hrs
- Meningism (neck stiffness, photophobia, irritability)
- Non-blanching rash (petechiae, purpura)
- **Signs of raised intracranial pressure
 - bulging fontanelle
 - pupillary dilation unilateral/bilateral) or loss/impairment of pupillary reaction to light
 - bradycardia (heart rate < 60/min)
 - hypertension (mean BP >95th centile for age)
 - abnormal breathing pattern or posture)
- Focal neurology

Prolonged Convulsive Seizure Guideline⁵

Reduced Conscious Level Guideline⁶

Meningitis /Meningococcal Sepsis Guidelines

Further Paediatric Assessment

- History and examination
- Paracetamol and/or Ibuprofen prn
- Identify source of fever, investigate & treat (see NICE feverish illness guidelines)
- Routine investigations are not indicated in all children with febrile seizures
- Consider LP if 'concerning features'* (note contra-indications)
- Senior review prior to discharge

Once fit for discharge:

- Discuss risk of future seizures
- Consider home Buccal Midazolam if convulsive seizure >5 minutes, particularly if recurrent. Ensure prescribed with individualised care plan and parental training.
- Febrile seizure and fever advice and written information

Follow up

Most **do not** require follow up. Follow up probably needed for:

- Having recurrent febrile seizures
- Prescribed home Buccal Midazolam
- Children with 'seizure with fever' < 6 months or > 5 years
- Needing follow up for other reasons e.g. neurodevelopment problems etc.

Continuing convulsive seizure > 5 minutes?

Decreased conscious level?

- Before seizure onset
- Or > 1 hour after seizure end
- Or longer than typical post-ictal period for child in question

'Meningism or Meningococcal shock?'

Any concerning feature?*

First Febrile Seizure?
OR
No clear focus of infection?
OR
Parental concern?

Known or suspected epilepsy?

Previous 'febrile seizures'
AND
Focus of infection identified
AND
No significant parental concern

Review epilepsy and management

- Review epilepsy and management
- Inform epilepsy specialist nurse
- Review need for admission or earlier outpatient appointment
- The management of epilepsy is outside scope of this guideline²

Manage according to cause

- Manage according to cause
- Consider discharge
- Discuss risk of future seizures
- Febrile seizure and fever management advice and written information