CLINICAL GUIDELINE FOR THE EVALUATION OF A CHILD PRESENTING WITH FEVER AND SEIZURE V3.0
1. **Aim/Purpose of this Guideline**

1.1. This guideline applies to all medical and nursing staff caring for a child presenting with fever and seizure. The aim is to provide clear information to provide up to date best clinical practice.

2. **The Guidance**

2.1. A distinction must be made between a child with ‘fever and seizure’ and 'febrile seizure'. In the former the cause may be a Central Nervous System infection. CNS infection must be excluded before a diagnosis of febrile seizure can be made. In older children history and clinical examination will suggest CNS infection in nearly all cases. In the infant and toddler clinical diagnosis of CNS infection is not always obvious so a lower threshold for investigation and treatment is needed. Febrile seizures are common but benign; however they can be very frightening for families. Explanation and advice are an important part of the management of children with febrile seizures. The terms convulsion or fit may be used instead of seizure. The terms are interchangeable.

2.2 **Febrile seizures**

**Definition**

“a seizure occurring in a child aged from six months to five years, precipitated by fever arising from infection outside the nervous system in a child who is otherwise neurologically normal. ”

2.2. Generally seizures associated with fever, in a child who has previously had afebrile seizures, are not described as febrile. Seizures during fever in those who have central nervous system abnormalities are not usually considered to be simple febrile seizures.

2.3. Febrile seizures occur in 2-5 % of children. They are the commonest seizure type in infants and young children, with a peak at 18-24 months. A family history of febrile seizures will be found in 5.4%.

2.4. Most febrile seizures occur at the start of an illness, 50% occur at temperatures less than 40°C.

2.5 **Classification**

2.6. **SIMPLE febrile seizure**
A primary generalised seizure lasting \( \leq 15 \) minutes and not recurring within 24 hours. Seizures may be tonic and or clonic and are non-focal.

88% of febrile seizures are simple.

2.7. **COMPLEX febrile seizure**
Seizure is > 15 minutes in duration or fit is focal or re-occurs within 24 hours of first fit.

2.8. Treatment and evaluation

1. Treatment of seizure
   Treatment of seizure if prolonged is as per status epilepticus protocol.
   Check blood glucose.

2. Treatment of pyrexia
   Antipyretics e.g. paracetamol, ibuprofen. Clothing should be minimal. However, NICE guidance “Fever in children younger than 5 years” states anti pyretics do not prevent febrile convulsions. They should be used if the child appears distressed due to fever.

3. Treatment of cause of pyrexia
   Antibiotics if indicated.

2.9. Evaluation of child with first febrile seizure.

2.10. Most children will have a minor infection; however a seizure may be the first sign of CNS infection. If CNS infection is suspected treatment should be instituted following appropriate investigations. Re-evaluation of continued treatment should be made in the light of cultures or PCR results.

2.11. In 13-16% of children with meningitis, seizures are the presenting sign. Meningeal signs and symptoms may be absent in 30-35%, most of whom are under 18 months. A number of studies have looked at the incidence of meningitis in children presenting with fever plus seizure, cases of meningitis are uncommon, 0-4%.

2.12. Which children presenting with fever and seizure should have a lumbar puncture?

- Any child presenting with symptoms or signs suggesting meningitis. If there are signs of raised intracranial pressure or reduced level of consciousness, lumbar puncture should be deferred and the child should be evaluated by a middle grade or consultant. Cranial imaging may benecessary.

- Serious consideration should be given to performing a lumbar puncture in those aged 18 months and under, unless there are concerns about raised intracranial pressure or reduced level of consciousness, or other contraindications to lumbar puncture.

- In cases where CSF examination has not been done, the rational for this should be written in patients notes.

- The child should regularly be re-assessed and need for lumbar puncture reviewed. If unsure this should be discussed with a more senior doctor.
Clinical guideline for the evaluation of a child presenting with fever and convulsion.

2.13. Document discussion and verbal consent for lumbar puncture with parents and patient.

2.14. Collect CSF for mc&s, protein and glucose and take sample for PCR. Note each request for a specific PCR will require a minimum of 1/2 a ml (universal container)

2.15. Serum may also be taken for PCR. (EDTA 2ml)

2.16. Other Investigations.

- Most children will have a viral aetiology for their fever, most present with respiratory tract symptoms and signs.
- Many children will have recovered from their seizure by the time they are seen. Where the child appears well and alert no investigations may be required.
- For such children re-evaluation is essential to exclude evolving serious bacterial infection.
- The risk of serious bacterial infection in first time febrile seizure is low, 12% in one series.
- Investigations performed in the acute illness should be guided by clinical assessment. Occult bacteraemia is more common in infants.
  - Urine for mc&s should be sent if there is no obvious focus of infection

2.17. EEG and Cranial Imaging.
EEG and cranial imaging are not indicated following a simple febrile seizure (unless other concerns indicate a need for imaging).

2.18. Further management following the diagnosis of a simple febrile seizure.
Unless there is clinical doubt about the child’s developmental or neurological state, the parents should be told that the prognosis is very good. It is important to reassure and explain the nature of febrile seizures to the parents. In addition a patient leaflet (Your Child has had a febrile seizure RCHT048) should be given to parents.

2.19. Recurrence risk

- There is a risk of further simple febrile seizures in one third of children. 15% have more than 1 recurrence, 9% more than 3 febrile seizures.
- 70% of recurrences are within 1 year, 90% within 2 years.
  - The risk of a recurrence is 50% if child was under 1 year when had first episode, risk if first episode in child > 3yrs is 20%.
  - Risk of recurrence is greater if there is neurological impairment or FH of febrile or afebrile seizures.
Clinical guideline for the evaluation of a child presenting with fever and convulsion.

The risk of recurrence increases to 52%, if there is a positive family history in a first degree relative.

If first febrile seizure was prolonged it is likely any further ones will also be prolonged.

2.20. **Risk of subsequent epilepsy**

The risk of subsequent epilepsy is 2-4%, slightly increased compared to the incidence of epilepsy in the paediatric population. The risk is increased if there is a positive family history of afebrile seizures. In children whose neurologic or developmental status was suspect or abnormal prior to seizure and if seizure was complex the risk of developing epilepsy is 18 times higher than children without febrile seizures. There are epilepsy syndromes where fits occur with fever, several kindreds have been described.

2.21. **Prevention of further febrile seizures.**

Daily phenobarbitone or sodium valproate has been shown to reduce recurrent febrile seizures but the potential side effects outweigh this benefit. No medications have been shown to reduce the future onset of afebrile seizures. (evidence I+)

Consideration may be given to the use of diazepam or midazolam at the start of a seizure - in children with recurrent febrile seizures, which have previously been prolonged. Antipyretics do not prevent additional febrile seizures.

2.22. **Immunisations**

There is no contra indication; however there is a risk of febrile seizure in any child after immunisation so parents should be advised about this.

2.23. **Information and Reassurance for parents**

Information given to parents should include:

An explanation of the nature of febrile seizures, including information about the prevalence and prognosis. Instructions about the management of fever, the management of a seizure, and the use of rectal diazepam/midazolam as appropriate. This advice should be given verbally (recorded in notes), and a supplemental leaflet given (RCHT048).

2.24. **Follow Up**

Most children do not require outpatient follow up. For those where there is diagnostic uncertainty about the nature of the seizures (febrile or non-febrile) or if there has been repeated febrile seizures discuss with consultant regarding outpatient follow up.

2.25. **Evidenced based medicine.**

There are several consensus statements on the management of febrile seizures from the RCPCH and American Academy of Paediatrics. Evidence for the incidence of meningitis in children with fever and seizure comes from several large studies. The indications for lumbar puncture in children with no meningeal signs is based on studies showing low incidence of meningitis and consensus statements which
recognise the possible absence of meningeal signs in those under 19 months. The only area where there is grade 1+ evidence is with regard to prophylactic treatment to prevent further febrile seizures. Thus the use of no prophylactic treatment is grade A.
3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>All elements from suggested audit tool in Appendix 4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Audit Lead</td>
</tr>
<tr>
<td>Tool</td>
<td>For suggested audit tool, see Appendix 4.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Annually or per case for review purposes.</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Audit Lead. Child health audit and guidelines meeting.</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Audit Lead. To be reported to Child Health Audit and Guidelines meeting. Recommendations and learning will be passed to relevant medical and nursing management and staff.</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>Required changes to practice will be identified and actioned within three months. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders</td>
</tr>
</tbody>
</table>

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Diversity & Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment
The Initial Equality Impact Assessment Screening Form is at Appendix 2.
**Appendix 1. Governance Information**

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Clinical guideline for the evaluation of a child presenting with fever and seizure V3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>9th Nov 2017</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>9th Nov 2017</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>9th Nov 2020</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Dr. S.Harris, Paediatric Consultant.</td>
</tr>
<tr>
<td>Contact details:</td>
<td>01872 253041</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>Guideline for medical and nursing staff providing clear evidence based best practice for evaluation of a child presenting with fever and seizure. Includes, parental information, suggested audit checklist and flow chart.</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Paediatric, Child Health, Fever, Seizure</td>
</tr>
<tr>
<td>Target Audience</td>
<td>RCHT ✓ PCH CFT KCCG</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>9th Nov 2017</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Clinical guideline for the evaluation of a child presenting with fever and seizure V2.0</td>
</tr>
<tr>
<td>Approval route (names of committees)/consultation:</td>
<td>Child health Audit and guidelines.</td>
</tr>
<tr>
<td>Divisional Manager confirming approval processes</td>
<td>David Smith</td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td>Not Required</td>
</tr>
<tr>
<td>Name and Signature of Divisional/Directorate Governance Lead confirming approval by specialty and divisional management meetings</td>
<td>{Original Copy Signed} Name: Caroline Amukusana</td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy on Policies – Approvals and Ratification):</td>
<td>Internet &amp; Intranet ✓ Intranet Only</td>
</tr>
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</table>
### Related Documents:


Training Need Identified?  
No

Version Control Table

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
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<tbody>
<tr>
<td>Oct 10</td>
<td>V1.0</td>
<td>Initial Issue</td>
<td>Dr. Sian Harris. Paediatric Consultant</td>
</tr>
<tr>
<td>June 2013</td>
<td>V2.0</td>
<td>Reformat and update</td>
<td>Dr. Sian Harris. Paediatric Consultant Tabitha Fergus Deputy ward</td>
</tr>
<tr>
<td>Nov 2017</td>
<td>V3.0</td>
<td>No changes</td>
<td>Sian Harris, Paediatric Consultant</td>
</tr>
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</table>
Appendix 2. Initial Equality Impact Assessment Form

This assessment will need to be completed in stages to allow for adequate consultation with the relevant groups.

<table>
<thead>
<tr>
<th>Name of Name of the strategy / policy / proposal / service function to be assessed</th>
<th>Clinical guideline for the evaluation of a child presenting with fever and seizure V3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directorate and service area:</td>
<td>Is this a new or existing Policy?</td>
</tr>
<tr>
<td>Child Health.</td>
<td>Existing</td>
</tr>
<tr>
<td>Name of individual completing assessment:</td>
<td>Telephone:</td>
</tr>
<tr>
<td>Tabitha Fergus</td>
<td>01872 252800</td>
</tr>
</tbody>
</table>

1. **Policy Aim***
   - *Who is the strategy / policy / proposal / service function aimed at?*
     - Guideline for medical and nursing staff providing clear evidence based best practice for evaluation of a child presenting with fever and seizure. Includes, parental information, suggested audit checklist and flow chart.

2. **Policy Objectives***
   - Clear evidence based best practice for evaluation of a child presenting with fever and seizure.

3. **Policy – intended Outcomes***
   - Evidenced based, standardised practice.

4. *How will you measure the outcome?*
   - Audit

5. Who is intended to benefit from the policy?
   - Children and families presenting with fever and seizure.

6a Who did you consult with
   - Workforce
   - Patients
   - Local groups
   - External organisations
   - Other
     - x

6b. Please identify the groups who have been consulted about this procedure.
   - Clinical Guideline Group
   - Paediatric Directorate

What was the outcome of the consultation?
   - Guideline agreed
7. The Impact
Please complete the following table. **If you are unsure/don't know if there is a negative impact you need to repeat the consultation step.**

Are there concerns that the policy **could** have differential impact on:

<table>
<thead>
<tr>
<th>Equality Strands:</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Rationale for Assessment / Existing Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Child health guideline</td>
</tr>
<tr>
<td>Sex (male, female, trans-gender / gender reassignment)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race / Ethnic communities /groups</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disability - Learning disability, physical impairment, sensory impairment, mental health conditions and some long term health conditions.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion / other beliefs</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marriage and Civil partnership</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Pregnancy and maternity</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:

- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation- this **excludes** any policies which have been identified as not requiring consultation. **or**
- Major this relates to service redesign or development

8. Please indicate if a full equality analysis is recommended.  
<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

9. If you are **not** recommending a Full Impact assessment please explain why.

   No areas indicated
Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead
c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa,
Truro, Cornwall, TR1 3HD

This EIA will not be uploaded to the Trust website without the signature of the Human
Rights, Equality & Inclusion Lead.

A summary of the results will be published on the Trust’s web site.

Signed Chris Warren

Date 09/11/17
Appendix 3. Checklist and Recommended Audit Tool.

A useful checklist to aid evaluation of a child presenting with fever and seizure. This list is also recommended for audit.

Do the case notes contain?

- An accurate description of the seizure, including its duration?
- Information about the nature of the episode? (What was child doing/where did it occur/recent meals/recent activity).
- A record about the family history with regard to febrile and non-febrile seizures?
- The age at first seizure?
- The temperature on admission?
- Whether signs of meningitis were present or absent? When they were first noted?
- An assessment of the cause of the fever?
- The child's neurodevelopmental state when recovered (estimated as far as practical)?
  - A neurodevelopmental history should form part of the initial clerking.
- The blood glucose concentration, if the child was seen during a seizure?
- Was the following information recorded as being given to parents? An estimate of the likely prognosis, what to do if further seizures occur, and advice about future immunisation? Parent advice leaflet RCHT-048?
- Discharge summary - Does the discharge summary sent to the general practitioner contain information on the above points?
Clinical guideline for the evaluation of a child presenting with fever and convulsion.

Appendix 4. Flow Chart.

HAS THE CHILD BEEN FITTING FOR LONGER THAN 5 MINUTES

TREAT STATUS EPILEPTICUS CHECK blood sugar

DISCUSS WITH SENIOR DOCTOR CONSIDER NEUROIMAGING TREAT SUSPECTED INFECTION

HISTORY AND EXAMINATION

Is CNS infection suspected?

IS THERE EVIDENCE OF RAISED INTRACRANIAL PRESSURE OR IS THERE REDUCED LEVEL OF CONSCIOUSNESS?

LOW THRESHOLD FOR LP DISCUSS WITH MIDDLE GRADE DR.

LUMBAR PUNCTURE CSF for mc&s, biochemistry and PCR

HAS THE CHILD BEEN FITTING FOR LONGER THAN 5 MINUTES

YES

NO

IS CHILD <18 MONTHS WITH FEVER AND NO OBVIOUS FOCUS?

YES

NO

DID CHILD HAVE ANTIBIOTICS PRIOR TO PRESENTATION?

YES

NO

IN ANOTHERWISE WELL CHILD IT MAY BE THAT NO OTHER SPECIFIC INVESTIGATIONS ARE REQUIRED

EVALUATE FOR OTHER SOURCE OF INFECTION

CONSIDER Blood cultures, PCR, swabs, Urine culture, CXR, FBC, CRP, Viral titres.

ARE THERE UNDERLYING NEUROLOGICAL OR DEVELOPMENTAL CONCERNS?

CHILD NEUROLOGICALLY NORMAL WITH NO CNS INFECTION PRESENTING WITH FEVER AND SEIZURE

EXPLANATION TO CARERS ABOUT FEBRILE SEIZURES PLUS WRITTEN INFORMATION

CONSIDER INVESTIGATIONS FOR EPILEPSY or other CNS disorders e.g. EEG, MRI, bloods.

Clinical guideline for the evaluation of a child presenting with fever and convulsion.

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