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. ”

2.3. 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.

2.4. 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%.

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

2.6. Classification

2.7. SIMPLE febrile seizure

A primary generalised seizure lasting <= 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.

2.8. COMPLEX febrile seizure

Seizure is > 15 minutes in duration or fit is focal or re-occurs within 24 hours of first fit.
2.9. 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.

2.10. Evaluation of child with first febrile seizure.
2.11. 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.

2.12. 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%.

2.13. 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 be necessary.

- 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.
  - Note- Otitis media may coexist with meningitis.
  - Note- CNS infection is more likely if the febrile seizure was complex.


2.15. 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)

2.16. Serum may also be taken for PCR. (EDTA 2ml)
2.17. **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 m,c&s should be sent if there is no obvious focus of infection**

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

2.19. **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.

2.20. **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.
  - 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.

2.21. **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.

2.22. **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.

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

2.24. 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).

2.25. 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.

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 5.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Audit Lead</td>
</tr>
<tr>
<td>Tool</td>
<td>For suggested audit tool, see Appendix 5.</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.

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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>20 September 2013</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>20 September 2013</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>1 September 2016</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>
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<td>Target Audience</td>
<td>RCHT</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>June 2013</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Evaluation of child with fever and a convulsion.</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></td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td></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</td>
</tr>
<tr>
<td>Document Library Folder/Sub Folder</td>
<td>Clinical / Paediatrics.</td>
</tr>
<tr>
<td>Links to key external standards</td>
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15. FU Knudsen, A Paerregaard, R Andersen and J Andresen Long term

<table>
<thead>
<tr>
<th>Training Need Identified?</th>
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### Version Control Table

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<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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<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 manager.</td>
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**All or part of this document can be released under the Freedom of Information Act 2000**

**This document is to be retained for 10 years from the date of expiry.**

**This document is only valid on the day of printing**

**Controlled Document**

This document has been created following the Royal Cornwall Hospitals NHS Trust Policy on Document Production. It should not be altered in any way without the express permission of the author or their Line Manager.
### Appendix 2. Initial Equality Impact Assessment Screening Form

| Name of service, strategy, policy or project (hereafter referred to as *policy*) to be assessed: Clinical guideline for the evaluation of a child presenting with fever and seizure. |
|---|---|
| Directorate and service area: Child Health. | Existing |
| Name of individual completing assessment: Tabitha Fergus | Telephone: 01872 252800 |

1. **Policy Aim***
   - 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.

5. **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. **Is consultation required with the workforce, equality groups, local interest groups etc. around this policy?**
   - no
   
   b. If yes, have these groups been consulted?
   
   c. Please list any groups who have been consulted about this procedure.

*Please see Glossary

### 7. The Impact

Please complete the following table using ticks. You should refer to the EA guidance notes for areas of possible impact and also the Glossary if needed.

- Where you think that the *policy* could have a **positive** impact on any of the equality group(s) like promoting equality and equal opportunities or improving relations within equality groups, tick the ‘Positive impact’ box.
- Where you think that the *policy* could have a **negative** impact on any of the equality group(s) i.e. it could disadvantage them, tick the ‘Negative impact’ box.
Where you think that the policy has no impact on any of the equality group(s) listed below i.e. it has no effect currently on equality groups, tick the 'No impact' box.

<table>
<thead>
<tr>
<th>Equality Group</th>
<th>Positive Impact</th>
<th>Negative Impact</th>
<th>No Impact</th>
<th>Reasons for decision</th>
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<tr>
<td>Age</td>
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<td>Child health guideline.</td>
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<td>Disability</td>
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<td>Religion or belief</td>
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<tr>
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<tr>
<td>Marriage / Civil Partnership</td>
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<td>x</td>
<td></td>
</tr>
</tbody>
</table>

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

- A negative impact and
- No consultation (this excludes any policies which have been identified as not requiring consultation).

8. If there is no evidence that the policy promotes equality, equal opportunities or improved relations - could it be adapted so that it does? How?

Full statement of commitment to policy of equal opportunities is included in the policy

Please sign and date this form.

Keep one copy and send a copy to Matron, Equality, Diversity and Human Rights, c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Chyvean House, Penventinnie Lane, Truro, Cornwall, TR1 3LJ

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

Signed ___________________________ T. Fergus___________________________

Date ____________________________ 25/06/13_____________________________
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?
Appendix 4. Flow Chart.

HAS THE CHILD BEEN FITTING FOR LONGER THAN 5 MINUTES

NO

HISTORY AND EXAMINATION
Is CNS infection suspected?

NO

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

YES

TREAT STATUS EPILEPTICUS CHECK blood sugar

YES

DISCUSS WITH SENIOR DOCTOR
CONSIDER NEUROIMAGING TREAT SUSPECTED INFECTION

NO

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

YES

LOW THRESHOLD FOR LP DISCUSS WITH MIDDLE GRADE DR.

NO

LUMBAR PUNCTURE
CSF for mc&s, biochemistry and PCR

DID CHILD HAVE ANTIBIOTICS PRIOR TO PRESENTATION?

YES

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

NO

EVALUATE FOR OTHER SOURCE OF INFECTION
CONSIDER
Blood cultures, PCR, swabs,
Urine culture, CXR,
FBC, CRP, Viral titles.

ARE THERE UNDERLYING NEUROLOGICAL OR DEVELOPMENTAL CONCERNS?

NO

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

YES

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

EXPLANATION TO CARERS ABOUT FEBRILE CONVULSIONS PLUS WRITTEN INFORMATION

EVALUATE RISK OF FURTHER FEBRILE CONVULSIONS AND ADVICE PARENTS

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