

LRI Emergency Department and Children's Hospital

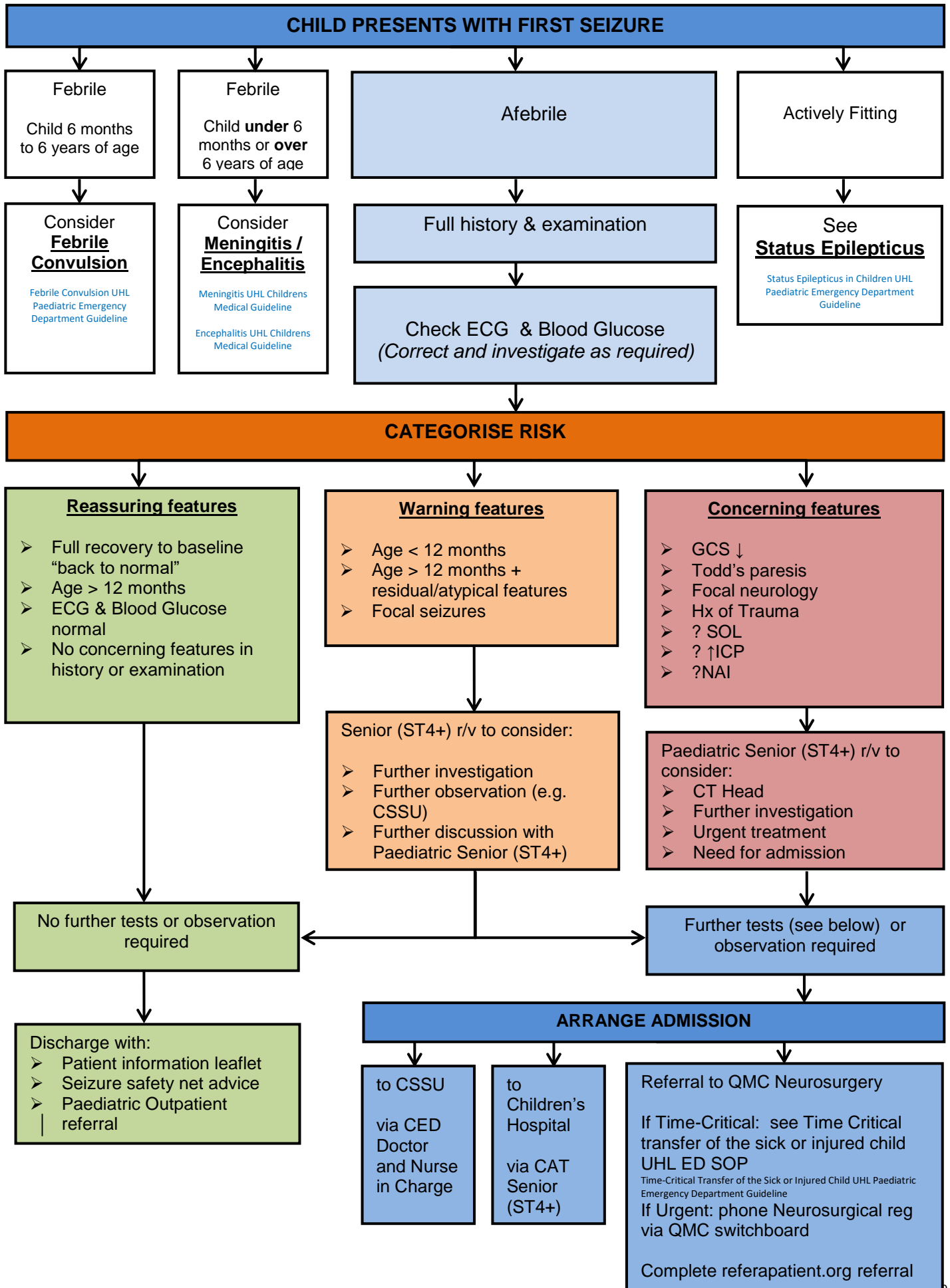
UHL Single Front Door for Children Guideline First Afebrile Seizure management in Children (<16 years)

Staff relevant to:	Children's Hospital and ESM Medical and Nursing Staff
Team approval date:	May 2022
Version:	6
Revision due:	May 2025
Written by:	A Bonfield, J Ward, G Lewis
Reviewed by:	A Bonfield, G Lewis
Trust Ref:	D1/2019

This document **does not** provide immediate guidance on the management of seizures.

If the child is actively fitting, call for help and refer to SOP for **STATUS EPILEPTICUS** in Children

First Afebrile Seizure in Children management flow chart



Contents

First Afebrile Seizure in Children management flow chart	2
Key points	3
Don't Miss	3
1.Scope, Introduction and Background	4
Related documents	4
2. Detailed History and Examination.....	5
Table 1: Typical features of common differential diagnoses for Afebrile seizure-type episodes	6
2.1 Assessment post-seizure	6
2.2 Investigation in Children.....	7
2.3 Disposition and follow-up	7
2.4 Admission	8
Discharge Checklist:	8
3. Education and Training	9
4. Monitoring Compliance	9
5. Supporting References	9
6. Key Words	9

Key points

- 1) 1 in 20 people will have a single seizure in their lifetime
- 2) A blood glucose and an ECG are the only mandatory investigations
- 3) NICE recommend that essential information be given upon discharge to the patient and family
- 4) NICE recommend that all children require follow up

Don't Miss

Did the child definitely have a seizure?

There are many **seizure mimics** (page 6 has common differentials).

A detailed history is **essential**.

1. SCOPE, INTRODUCTION AND BACKGROUND

This guidance is for the assessment, investigation and management of children < 16 years presenting to UHL following a first afebrile seizure. It is for the use of medical and nursing staff working as part of the single front door for children.

A seizure is a short episode of symptoms caused by a burst of abnormal electrical activity in the brain. Typically, a seizure lasts from a few seconds to a few minutes and resolve spontaneously. In a small minority, seizures last for more than 5 minutes requiring treatment. A seizure lasting longer than 20 minutes or recurrent seizures without recovery in between is defined as **status epilepticus**, and is covered in a separate guideline.

Related documents

- [Afebrile Seizure - Recurrent UHL Childrens Medical Guideline C3/2017](#)
- [Status Epilepticus UHL Childrens Hospital Guideline D1/2022](#)
- [Status Epilepticus in Children UHL Paediatric Emergency Department Guideline C33/2016](#)

Types of seizure:

There are many different types of seizures but they can be divided into generalised or focal. These terms relate to whether the burst of electrical activity in the brain is generalised across the entire brain or limited to a focal area.

When a child has a generalised seizure, you may notice that the child:

- becomes very stiff with shaking limbs
- goes floppy and blue around the lips
- starts to roll his/her eyes upwards
- become unconscious

Typically once a seizure has finished, the child is often drowsy and wishes to go to sleep.

A child that has a **focal** seizure can have a variety of presentations depending on which part of the brain is affected. The child may be aware or have impaired awareness. Symptoms range from:

- muscular jerks
- strange sensations in a limb
- sensory hallucinations e.g. hear, feel, smell, taste odd sensations

A **focal impaired awareness seizure** (previously complex partial) can be even more bizarre with loss of consciousness, appearing vacant, smacking lips, fidgeting or other repetitive movements. Note this is not an exhaustive list. Focal seizures usually last for up to a few minutes. They can go on to develop **focal to bilateral tonic-clonic seizures** (previously secondary generalised seizures).

Differential Diagnosis

Did the child definitely have a seizure? There are many **seizure mimics**.

A challenge in managing a child after their first seizure is to clarify whether the child had a seizure in the first place. Other differentials include:

- Syncope/vaso-vagal (most frequently encountered seizure mimic)
- Cardiac arrhythmia
- Hyperventilation/panic attack
- Reflex anoxic seizure
- Breath holding attacks

See [table](#) on page 6 for typical features of common differential diagnoses.

2. DETAILED HISTORY AND EXAMINATION

It is **critical** to obtain as detailed a history as possible at the time of presentation, including what happened before, during and after the episode. Was it provoked or unprovoked? The determination that a seizure has occurred is typically based on a detailed history provided by a reliable observer. Video footage is often helpful. Below are some of the points to consider:

<p style="text-align: center;">The Event Itself</p> <p>Preceding Events: Activity at time, relation to food/drink</p> <p>Warning Symptoms: Feeling faint/dizzy, anxious, panic, dry mouth, distortion of vision/hearing, taste/smell</p> <p>Behaviour: mood changes prior to seizure</p> <p>Aura: subjective symptoms</p> <p>LOC: Responsiveness, duration, incontinence of urine</p> <p>Vocal : cry or gasp, slurred/garbled speech</p> <p>Fall/Postural changes: Stiff/floppy, limbs flexed/extended</p> <p>Facial changes: eyes rolling /pupil dilation, drooling, tongue biting, colour change</p> <p>Type of movements: Fine and juddering, single or repeated jerks, wild flailing movements</p> <p>Breathing: Normal, rapid (change in breathing pattern), cessation of breathing</p>	<p style="text-align: center;">Provoking factors</p> <p>Systemic illness</p> <p>Fever</p> <p>Trauma</p> <p>Drugs/medication/poisons</p> <p>Alcohol</p> <p>Photosensitivity</p> <p>Sleep deprivation</p> <p>Stress/migraine</p> <p>Menstruation</p> <p>Problems at home/school</p> <p>Emotional upset</p>													
<p style="text-align: center;">Background</p> <table border="0"> <tr> <td style="vertical-align: top;">PMHx:</td> <td>Previous similar events Prolonged febrile convulsions Hypoglycaemia Head injury Medications Drugs/Poisons</td> <td>Meningitis/Encephalitis Metabolic disorders Structural brain lesions Cardiac problems Complex birth history Developmental delay</td> </tr> <tr> <td style="vertical-align: top;">Family Hx:</td> <td>Seizures or similar events</td> <td>Sudden deaths</td> </tr> </table>	PMHx:	Previous similar events Prolonged febrile convulsions Hypoglycaemia Head injury Medications Drugs/Poisons	Meningitis/Encephalitis Metabolic disorders Structural brain lesions Cardiac problems Complex birth history Developmental delay	Family Hx:	Seizures or similar events	Sudden deaths	<p style="text-align: center;">Differential Diagnoses (see table 1)</p> <p>Idiopathic</p> <p>Febrile convulsion</p> <p>Epilepsy</p> <p>Cardiac Arrhythmia Panic</p> <p>Attack</p> <p>Breath holding attack</p> <p>Reflex anoxic seizures</p> <p>Gastro-oesophageal reflux</p> <p>Self-gratification episodes</p> <p>Non-epileptic episodes</p> <p>Other differentials NICE, pg 4</p>							
PMHx:	Previous similar events Prolonged febrile convulsions Hypoglycaemia Head injury Medications Drugs/Poisons	Meningitis/Encephalitis Metabolic disorders Structural brain lesions Cardiac problems Complex birth history Developmental delay												
Family Hx:	Seizures or similar events	Sudden deaths												
<p style="text-align: center;">Residual Symptoms after attack</p> <table border="0"> <tr> <td>Time taken to return to normal</td> <td>Drowsiness, Amnesia, Confusion</td> <td>Lethargy, headache, muscle ache</td> </tr> <tr> <td>Focal neurological deficit</td> <td>Tongue biting/other injury</td> <td>Nausea, Vomiting</td> </tr> <tr> <td>Incontinence of urine</td> <td></td> <td></td> </tr> </table> <p>Note: Tongue biting and incontinence can happen for any cause of unconsciousness. They are not pathognomonic for epileptic seizure.</p>			Time taken to return to normal	Drowsiness, Amnesia, Confusion	Lethargy, headache, muscle ache	Focal neurological deficit	Tongue biting/other injury	Nausea, Vomiting	Incontinence of urine					
Time taken to return to normal	Drowsiness, Amnesia, Confusion	Lethargy, headache, muscle ache												
Focal neurological deficit	Tongue biting/other injury	Nausea, Vomiting												
Incontinence of urine														
<p style="text-align: center;">Examination</p> <table border="0"> <tr> <td>ABCD - Don't Ever Forget Glucose!</td> <td>GCS</td> <td>CVS examination (Include BP/ECG)</td> </tr> <tr> <td>Focal neurological signs / asymmetry</td> <td>Dysmorphism</td> <td>Developmental delay</td> </tr> <tr> <td>Gait</td> <td>Neurocutaneous lesions</td> <td>Hepatosplenomegaly</td> </tr> <tr> <td>Signs of infection</td> <td>Fundoscopy</td> <td>Weight/Height/Head Circumference</td> </tr> </table>			ABCD - Don't Ever Forget Glucose!	GCS	CVS examination (Include BP/ECG)	Focal neurological signs / asymmetry	Dysmorphism	Developmental delay	Gait	Neurocutaneous lesions	Hepatosplenomegaly	Signs of infection	Fundoscopy	Weight/Height/Head Circumference
ABCD - Don't Ever Forget Glucose!	GCS	CVS examination (Include BP/ECG)												
Focal neurological signs / asymmetry	Dysmorphism	Developmental delay												
Gait	Neurocutaneous lesions	Hepatosplenomegaly												
Signs of infection	Fundoscopy	Weight/Height/Head Circumference												

Table 1: Typical features of common differential diagnoses for Afebrile seizure-type episodes

	Epilepsy	Syncope / Vaso-vagal Episode	Cardiac Arrhythmia	Hyperventilation/panic attack	Reflex anoxic seizure	Breath holding attacks
Background	FHx PMHx inc head injury/ meningitis/ encephalitis	Hx previous faints	Congenital/ Acquired heart disease	Recent stress, previous panic attacks	FH of faints	Nil of note
Provoking factors	Sleep deprivation Usually none	Postural changes Prolonged standing Dehydration Vaso-vagal events	Exercise	Psycho-social	Head trauma Pain/ discomfort Excitement Fright Cold food	Temper/upset
Warning signs	Usually none	Light headedness Visual symptoms Blurring/ blacking out Buzzing/echoing/ distant sounds	Palpitations	Fear Feeling of unreality Breathlessness	Pallor Fall to floor	Cries, holds breath,
Features of the attack	Stiff phase followed by rhythmical jerking Repeated complex movements/ behaviours Cyanosis	Pallor May have brief jerks or stiffening Can have incontinence	Pallor May have brief jerks or stiffening Sweating	Agitation / fear Rapid breathing Stiffening of hands Shaking Paraesthesiae of hands and feet	Hypoxia may induce brief generalised tonic clonic seizure and short lived asystole (vagal induced)	Goes blue Occasional brief LOC Can lead to Reflex Anoxic Seizure
Residual symptoms	Drowsiness Agitation/ disorientation Headache Bitten tongue Urine incontinence	Rapid recovery. Lethargic but orientated	Rapid recovery	Rapid recovery	Rapid recovery	Rapid recovery

2.1 Assessment post-seizure

Following a seizure the child may have residual symptoms including:

- Drowsiness, Amnesia, confusion
- Lethargy, headache, muscle ache
- Bitten tongue/other injury
- Nausea, Vomiting
- Incontinence of urine
- Focal neurological deficit

It is important that the patient fully return to their baseline level of consciousness and activity, with any failure to fully recover prompting review of the differential diagnosis and consideration of further investigation/management as necessary.

2.2 Investigation in Children

If a child has stopped fitting, has no atypical/concerning features and has fully recovered, no special investigations are required.

A full history of the attack including provoking factors should be ascertained. The child should be fully examined with particular emphasis on focal neurological findings and any signs of acute infection.

A blood glucose and ECG should be done on all children following a suspected seizure.

Further emergency investigations (E.g. full blood count, blood urea and electrolytes, calcium or magnesium, imaging) are not routinely indicated unless history or examination suggests warning or concerning features.

Outpatient EEG is **NOT** routinely indicated after the first simple afebrile seizure.

2.3 Disposition and follow-up

Children who have had a first seizure do not necessarily need to be admitted to hospital provided they have returned to normal and are given appropriate safety advice. NICE guidelines recommend **all children who have had their first seizure should be seen by an appropriate paediatrician in an outpatient setting**. Outpatient follow up should be arranged as per local arrangements.

You should also provide them with a copy of the RCPCH First Seizure safety-net advice: <https://www.rcpch.ac.uk>



Excepting for rare circumstances and on the advice of a specialist, children should not be started on anti-epileptic medication. A seizure with an obvious trigger (termed a “provoked seizure”) has an estimated 3-10% chance of recurrence; therefore most children will go on to be seizure-free. The incidence of a recurrence of an unprovoked seizure is slightly higher, with 25% risk of a further episode over the next year and 45% risk over the next 3 years. This increases to 70-80% chance of further seizures after a second seizure.

2.4 Admission

Consider admission and specific management for children in the following situations:

- Age Less than 1 year – Consider Paediatric Neurology opinion after Consultant Paediatrician assessment.
- Reduced level of consciousness - Glasgow coma scale (or equivalent) <15/15 (>1 hour post-fit)
- New neurological signs – Consider imaging (MRI/CT as available)
- Suspected ↑ intracranial pressure - (e.g. papilloedema, tense fontanelle, high BP with low HR)
- Generally unwell - Irritable, uninterested, vomiting
- Meningism e.g. Kernig's sign positive, photophobia, neck stiffness
- Complex seizure - prolonged (>15 minutes), focal recurrent
Consider imaging (MRI/CT as available)
- Signs of aspiration - e.g. respiratory distress, need for oxygen, chest signs.

Discharge Checklist:

If a child has stopped fitting, has fully neurologically recovered, and has no admission criteria, they may be considered safe for discharge.

Before discharging the child from PED make sure the patient and carers have:

- An RCPCH First seizure advice sheet
- A referral has been made for paediatric outpatient follow up
- Appropriate advice has been given about bathing and sports
- [Indicate on the discharge note that you gave a leaflet/safety advice](#)

3. EDUCATION AND TRAINING

None

4. MONITORING COMPLIANCE

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Appropriate investigations documented : ECG and Blood glucose	Records audit	Gareth Lewis	3 yearly	departmental audit meeting
Outpatient review occurred	Records audit	Gareth Lewis	3 yearly	departmental audit meeting

5. SUPPORTING REFERENCES

An EEG should not be obtained routinely after first unprovoked seizure in childhood. Neurology 2000;54:635

Patient UK. "Epilepsy with tonic-clonic seizures" <http://patient.info/health> Accessed March 2022

Epilepsies: diagnosis and management. NICE guidelines CG137. Jan 2012 (Update 12 May 2021)

F Davies, C. Westrope. "First Fit in Children" Leicester Royal Infirmary Emergency Department. July 2004-2008

An evidence and consensus based guideline for the management of a child after a seizure. Emerg Med J 2003; 20:13-20.

B Pohlmann-Eden, E Beghi, C Camfield, P Camfield. "The first seizure and its management in adults and children" BMJ. 2006 Feb 11;332(7537):339-42.

Garcia Pierce J, Aronoff S, Del Vecchio M. Systematic Review and Meta-analysis of Seizure Recurrence After a First Unprovoked Seizure in 815 Neurologically and Developmentally Normal Children. Journal of child neurology. 2017 Nov;32(13):1035-9.

Incidence of first seizures, epilepsy, and seizure mimics in a geographically defined area Eimer M. Maloney, Elijah Chaila, Éilis J. O'Reilly, Daniel J. Costello Neurology Aug 2020, 95 (5) e576-e590; DOI: 10.1212/WNL.00000000000009980

Epilepsy foundation. <https://www.epilepsy.com/learn/types-seizures> accessed March 2022

<https://n.neurology.org/content/95/5/e576>

6. KEY WORDS

Afebrile, Children, Fit, Fitting, Paediatric, Seizure

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
 As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) Dr G Lewis – Consultant in Paediatric Emergency Medicine Dr A Bonfield – Speciality Registrar Dr R Radcliffe – Consultant Paediatrician Dr D Bhaskaran – Higher Speciality Dr	Executive Lead Chief Nurse
Details of Changes made during review: May 2022 Removed specification of QTc in flow chart ECG investigations Changed terminologies when referring to types of seizures i.e. complex partial now focal awareness impaired and secondary generalised now focal to bilateral tonic-clonic seizures Added note to residual symptoms: Tongue biting and incontinence can happen for any cause of unconsciousness. They are not pathognomonic for epileptic seizure Added Outpatient follow up should be arranged as per local arrangements and You should also provide them with a copy of the RCPCH First Seizure safety-net advice	