Norfolk and Norwich University Hospitals NHS Foundation Trust

James Paget University Hospitals NHS Foundation Trust

Joint Trust Guideline for the Management of Brief Resolved Unexplained Events (BRUE)

For Use in:	Jenny Lind Children's Department, Children's Emergency Department
By:	Paediatric medical and nursing staff, Emergency department medical and nursing staff
For:	Infants under 1 year of age presenting with Brief Resolved Unexplained Events
Division responsible for document:	Women and Children
Key words:	Brief resolved unexplained event, BRUE
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Assessed and approved by the:	Clinical Guidelines Assessment Panel (CGAP) If approved by committee or Governance Lead Chair's Action; tick here ☐
Date of approval:	20/01/2022
Ratified by or reported as approved to (if applicable)**:**	Clinical Safety and Effectiveness Sub-board
To be reviewed before:	20/01/2025
To be reviewed by:	Author
Reference and / or Trust Docs ID No:	1349
Version No:	3
Compliance links: *(is there any NICE related to guidance)*	No
If Yes - does the strategy/policy deviate from the recommendations of NICE? If so why?	N/A

Trust Guideline for the Management of: *Condition or Procedure in Adults and / or Children (title needed on every page)*

Version and Document Control:

Version Number	Date of Update	Change Description	Author
2.2	04/03/2020	Extension for 1 year without changes	Archana Soman
3	20/01/2021	Updated to current practice and following an incident, title amended	Dr Catherine Thomas

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Glossary

BRUE	Brief Resolved Unexplained Event
ALTE	Apparent Life Threatening Event
BLS	Basic Life Support

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Objectives

This guideline has been developed to ensure the consistent and safe management of infants presenting to the Emergency Department and Children's Assessment Unit with Brief Resolved Unexplained Events (BRUEs).

It seeks to define a BRUE and stratify the risks associated with these events which will in turn guide management.

It also explains the change in nomenclature for these events and how practice has changed.

Rationale

Brief Resolved Unexplained Events are rare (the exact incidence is unknown, but it is thought to occur in around 0.1% of infants).

This guideline seeks to define what a BRUE is, then stratify these patients into low and high risk groups, to guide further management. It is important to note that only the management of low risk infants lies within this guideline, and that high risk infants should be managed as per their clinical presentation.

BRUEs are almost always distressing for parents and carers and this should be acknowledged during the assessment of these patients.

There has been a change in nomenclature since this guideline was last written. These events were previously known as ALTEs (apparent life threatening events), but since a comprehensive statement by the American Academy of Paediatrics in 2016 they have been known internationally as BRUEs; to better characterise these events and ensure the most appropriate management pathways.

By defining a BRUE and applying evidence based risk stratification we can help to reduce unnecessary anxiety for parents and carers. We can reduce unnecessary and sometimes invasive investigations and hospital admissions.

We also seek to outline when to be suspicious of child abuse and maltreatment in these cases.

Whilst these children may be assessed initially by a junior level clinician, this guideline is written with the understanding that ***all children presenting with a BRUE will be seen by a senior clinician.***

Definition- What is a BRUE?

- **Age:** Less than a year.
- **Brief:** Less than 1 minute.
- **Resolved:** Patient returned to baseline state of health after the event.

- **Event- at least one of:**
  - Cyanosis or pallor.
  - Absent, decreased or irregular breathing.
  - Marked change in tone (hyper- or hypotonia).
  - Altered level of responsiveness.
- **Unexplained:** The clinician is unable to explain the event after appropriate history and examination.

History

Ideally a firsthand history should be obtained from the person who witnessed the event or saw the infant immediately afterwards, and should contain the following information.

Before the Event

- What was the infant doing? Sleeping? Awake? Feeding? Playing?
- How were they? Well? Unwell?
- Where was the infant? Sleeping in cot? Co-sleeping? In high chair? Playing on the floor?
- What position were they in? Prone? Supine? Sitting? Held?
- What was the environment like? Smoking? Cot bumpers? Animals?
- Has the infant recently fed? Milk? Food? Any recent vomits? Foreign bodies?
- What alerted the parent/ carer to the problem?

The Event

- How long did it last?
- Was the infant responsive during the event?
- Was the infant active and moving or quiet and flaccid?
- What was their tone like? Floppy? Stiff? Normal?
- Were there any repetitive movements? Abnormal eye movements?
- What colour was their skin? What colour were their lips? Cyanotic? Pale? Mottled? Plethoric?
- Were they breathing? If not, how long did their breathing stop for? Count seconds with the parents/ carers. Was there increased work of breathing?
- Was there choking or gagging?
- Was the infant distressed?
- Was there any bleeding from their mouth or nose? Any mucous or vomit?

The End

- How long did it last?
- Was the end abrupt or gradual?
- What interventions did the parents/ carers carry out?
- Did they call 999?
- How long until the infant was completely back to normal?

Past history

- Birth history- especially gestational age.
- Neonatal history and past medical history.
- Feeding issues; vomiting, reflux, recent viral upper respiratory tract infection.
- First episode? Previous similar events?

Family and social history

- Living conditions.
- Smokers at home, smoking in pregnancy.
- Any illness or drug/ alcohol issues affecting the carer.
- Known to social services?
- Family history of note, particularly cardiac and neurological issues.
- History of sudden unexplained death in infancy (SUDI), infant deaths with known cause/ BRUEs in other family members.

Examination

- A full and detailed examination is necessary
- Undress the child fully
- Weight, length and head circumference should be documented and plotted. Ask for “red book”
- Careful systemic examination paying particular attention to the following:
  - Alert level (AVPU/ GCS).
  - Is the infant dysmorphic?
  - Does the infant look unwell?
  - Skin: Colour, mottling, rashes, bruises.
  - Limbs: Evidence of injury.
  - Cardiorespiratory examination.
  - Abdominal examination.
  - Neurological state- tone, pupils, reflexes, symmetry, fontanelle.

- Look for evidence of neglect or injury.

Initial observations should include:

- Oxygen saturations.
- Temperature, pulse rate, respiratory rate, blood pressure.

Risk assessment

Low Risk vs. High Risk

Low Risk= BRUE

- Greater than 8 weeks old.
- Born later than 32/40 AND Corrected Gestational Age is greater than 45 weeks.
- Event lasted less than one minute.
- No CPR by ***trained medical provider.***
- First episode.

Management of Low Risk Infants

- We should: Reassure. Educate patients on the nature of BRUE. Explain low risk does not equal no risk, but on the balance of probability there is a very low likelihood of a serious underlying condition. Provide a 'safety-net'- advise on worrying signs and symptoms and how to seek help if further concerns. Outpatient follow up is ***not*** necessary.
- We may: Perform an ECG, blood gas or blood glucose analysis as it is recognised arrhythmias, acid/base and electrolyte disturbances and hypoglycaemia may not be otherwise evident from initial history, examination and observations.
- We may: Offer a *brief* period (up to 4 hours) of saturation monitoring and observations.
- We may: Offer Basic Life Support (BLS) - if helpful to parents to allay anxiety, but it should not be offered routinely.

High Risk

- Out of scope of guideline.
  - Manage as per clinical presentation.

When to Consider Child Abuse

- Inconsistent history.
- History not consistent with developmental stage.
- Delayed presentation.
- Concurrent unexplained bruising or other injuries.

- Bulging fontanelle.
- History of abnormal movements.
- Abnormal tone/ reflexes.
- Unequal/ non-reactive pupils.
- Conscious level remains reduced on medical assessment.

Differential Diagnoses (Not BRUEs) not an exhaustive list

Physiological	Gagging, laryngospasm, neonatal periodic breathing
Cardiac	Congenital heart disease, arrhythmias, prolonged QT, vascular ring
Respiratory	Inhaled foreign body, airway obstruction including laryngomalacia, congenital malformations
Infection	Pertussis, pneumonia, URTI/LRTI (esp. RSV), meningitis/encephalitis, UTI, septicaemia, gastroenteritis.
CNS	Head injury, seizures, cerebral malformations, central hypoventilation syndrome.
Non-accidental injury	Inflicted injury incl. drug ingestion, induced illness, suffocation.
Gastrointestinal	Gastro-oesophageal reflux
Surgical	Intussuception, testicular torsion
Metabolic/toxins	Hypoglycaemia, hypocalcaemia, hypokalaemia, inborn error(s) of metabolism, intentional and non-intentional drug overdose

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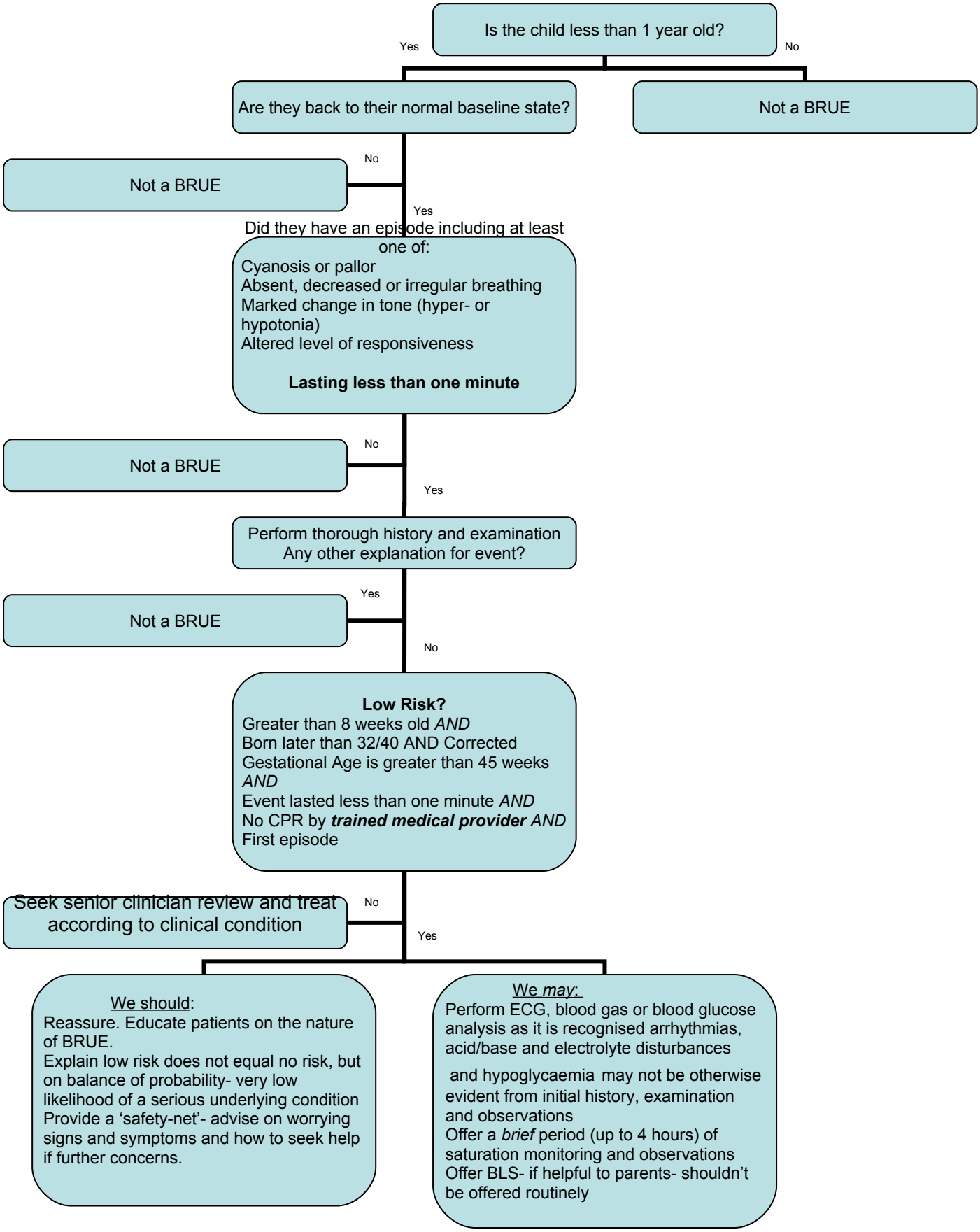
Management Flow Chart



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Clinical audit standards

We will perform a retrospective audit of notes of patients presenting with BRUEs, to determine if this guideline has been followed on at least an annual basis.

The results will be presented at the Paediatric Clinical Governance and Emergency Department Clinical Governance meetings to review the results and make recommendations on further action.

Summary of development and consultation process undertaken before registration and dissemination

The authors listed above drafted this document on behalf of the paediatric directorate who have agreed the final content. During its development it has been circulated for comment to all paediatric and paediatric emergency department consultants. It was then discussed at the paediatric clinical governance meeting and time was provided for further comment.

References

1. American Academy of Pediatrics; Brief resolved unexplained events (formerly Apparent life-threatening events) and evaluation of lower risk infants. *Pediatrics 2016*, 137(5): e20160590.
2. NHS Greater Glasgow and Clyde; Paediatric Guidelines for Health Professionals; Brief Resolved Unexplained Events; Brief Resolved Unexplained Event or BRUE (ALTE guideline update) (scot.nhs.uk)