Ashford and St. Peter's Hospitals
NHS Foundation Trust

Brief Resolved Unexplained Event (BRUE)

Author: Dr Josephine Yeboa-Henaku Consultant Paediatrician

Contact details: josephineyeboa-henaku@nhs.net

Guideline History		
Date	**Comments**	**Approved By**
November 2017	ALTE guideline updated by Dr Erin Dawson	Paediatric guidelines group
December 2019	Guideline reviewed by Dr Fiona MacCarthy	Paediatric guidelines group
July 2025	Guideline updated. Term ALTE replaced with BRUE, risk stratification of babies for earlier discharge	Paediatric guidelines group

Patients first • Personal responsibility • Passion for excellence • Pride in our team

Brief Resolved Unexplained Event

Management in A&E

↓

Airway

Breathing

Circulation

Resuscitation as required

↓

Respiratory Rate

Oxygen Saturations

Heart Rate

Capillary Refill Time

Blood Pressure

↓

History of event and resuscitation required at home

Length of time taken to return to normal

Past Medical History

(Detailed history when clinically stable)

↓

Initial Investigations in CYPED:

Capillary blood gas

ECG

Other investigations as clinically indicated

Consider NAI

ALL HIGH-RISK BABIES PRESENTING WITH BRUE MUST BE ADMITTED

Definition

A sudden, brief (usually less than one minute), and now resolved episode in an infant that includes one or more of the following features:

- Cyanosis or pallor
- Absent, decreased or irregular breathing
- Marked change in tone (hyper or hypotonia)
- Altered level of responsiveness

The term should only be applied when the infant is asymptomatic, and there is no explanation for the episode after a focused history and physical examination.

BRUE was previously known as **ALTE (Apparent life-threatening event).**

ALTE Definition:

"An episode that is frightening to the observer and that is characterised by some combination of apnoea (central or occasionally obstructive), colour change (usually cyanotic or pallid but occasionally erythematous or plethoric), a marked change in muscle tone (usually marked limpness), choking or gagging."

National Institutes of Health Expert Panel 1986

Most parents/carers will believe the child is dead and are likely to attempt appropriate resuscitative measures.

ALL HIGH-RISK BABIES PRESENTING WITH BRUE MUST BE ADMITTED FOR OBSERVATION

Relevant History Details

Event
State – Was the infant asleep, awake, or crying? What was the timing of the BRUE in relationship to feeding or vomiting? If the infant was sleeping, what was the sleep position and location (eg, alone in the crib versus in a bed with the parent)?
Respiratory effort – Were respiratory efforts none, shallow, or increased? Was the infant struggling or choking during the event?
Color – Was the infant cyanotic, pallid, gray, red, or purple?
Color change – Did the color change affect the entire body, extremities, face, perioral area, or lips?
Tone – Was the infant limp, rigid, or tonic/clonic?
Eyes – Were the infant's eyes open, closed, dazed, staring, rolled, or bulging?
Noise – Did the infant make any sound, such as a cough, choking, stridor, cry, or gasp?
Fluid – Did the infant spit up or vomit anything? If so, was it mucus, milk, vomitus, or blood? Did this occur at the beginning of the BRUE or later?
Duration – For how many seconds or minutes did the event last?
Witnesses – Who was present before and during the event? Document the caretaker(s) present, and obtain a description of the event from each.
Intervention
None
Gentle stimulation or "puff of air in the face"?
Vigorous stimulation? If so, did this include vigorous shaking?
Mouth-to-mouth resuscitation?
CPR by trained personnel?
Duration of the intervention?
Past history
Prior events – Have any similar events occurred in the past? If so, describe the event in detail, when and where it occurred, and which caretaker(s) was present.
Medical history – Does the infant have any known medical problems or other symptoms causing concern?
Medications – Was the infant given any medication (prescription, over-the-counter, or herbal) in the day prior to the event? What medications are in the home? Is there any chance that the baby swallowed a medication or poison by accident?
Birth history – Was the baby born "on time," and were there any problems with the delivery or in the nursery?
Family history – Are there any siblings or other children in the household who have had similar events or early deaths or who have other medical problems?
Social history – Do the parents or other household members smoke or use drugs or alcohol? Has the family been reported for possible child maltreatment in the past?

Table Adapted from UpToDate

Examination:

All infants presenting with a BRUE should have a thorough physical examination, paying particular attention to the neurological, respiratory and cardiovascular systems. Ensure the child is fully undressed for the examination.

- Assess general condition
- Measure vital signs, including pulse oximetry.
- Measure height/ length, weight, head circumference and plot on an age-appropriate growth chart.
- Observe for any dysmorphic features which may suggest a genetic or metabolic condition.
- Examine for physical signs suggestive of NAI (for example bruising in non-mobile infant/ unexplained bruising, unexplained injuries, torn frenulum, subconjunctival or retinal haemorrhage, bulging anterior fontanelle etc).
- Complete a neurological examination, including assessment of alertness, tone and developmental reflexes.
- Evaluate for signs of respiratory distress or upper airway obstruction.
- Complete a full cardiovascular examination, including assessment of heart sounds, rhythm, pulses, and for hepatomegaly.
- Assess for any features suggestive of an acute abdomen.
- Developmental assessment.

Differential diagnosis of BRUE

1. Gastrointestinal (33%)

- GORD (often co-existent)
- Gastroenteritis
- Oesophageal dysfunction
- Colic
- Surgical abdomen
- Dysphagia

2. Neurological (15%)

- Seizure
- Central apnoea/ hypoventilation syndromes
- Head injury (IVH, SAH)
- Meningitis/encephalitis
- Hydrocephalus
- Brain tumour

- Neuromuscular disorders
- Vasovagal episode
- Congenital malformation of the brainstem

3. Respiratory (11%)

- RSV
- Pertussis
- Aspiration pneumonia
- Reactive airway disease
- Foreign body

4. Otolaryngologic (4%)

- Laryngomalacia
- Subglottic and/or laryngeal stenosis
- Obstructive sleep apnoea

5. Cardiovascular (1%)

- Congenital heart disease
- Cardiomyopathy
- Cardiac arrhythmia/prolonged QTc
- Myocarditis

6. Metabolic/endocrine

- Electrolyte disturbance
- Hypoglycaemia
- Inborn error of metabolism

7. Other infections

- Sepsis
- UTI

8. NAI

- Abusive Head Trauma (AHT)
- Intentional suffocation
- Fabricated induced illness FII (previously known as Munchausen by proxy)

9. Other diagnoses

- Physiological event (periodic breathing, acrocyanosis)
- Idiopathic/ apnoea of infancy

- Breath-holding spell
- Choking episode
- Drug or toxin reaction
- Unintentional smothering
- Anaemia
- Hypothermia

Management

All high-risk babies presenting with BRUE should be admitted. Low-risk babies can be discharged from CYPED after a period of monitoring and observation of between 1 to 4 hours. The risk of a further BRUE is highest in the next 24 hours, but this is an uncommon occurrence (<10%) in low-risk babies.

Low-risk (should meet ALL the following criteria):

- Age >60 days
- If premature, born at gestational age ≥32 weeks and current postconceptional age is ≥45 weeks
- Occurrence of only 1 BRUE (no prior BRUE, and BRUE did not occur in clusters)
- Duration of BRUE <1 minute
- No cardiopulmonary resuscitation (CPR) by a trained medical provider was required
- No concerning historical features
- No concerning physical examination findings

High-risk (ANY of the following are present):

- Age <60 days
- Born at gestational age <32 weeks and current postconceptional age is <45 weeks
- Prior BRUE or BRUE occurred in clusters
- Duration of BRUE >1 minute
- Cardiopulmonary resuscitation (CPR) by a trained medical provider was required
- Concerning historical features
- Concerning physical examination findings

Higher risk of recurrence of BRUE:

- Prematurity (Born at gestational age ≤32 weeks and postconceptional age <43 weeks)
- History of multiple events preceding the hospital admission
- Event duration >1 minute
- Viral respiratory tract infection/ upper respiratory tract symptoms

Admission provides parental reassurance and allows full assessment of the infant.

Initial investigations:

All babies presenting with a BRUE should have:

- Observations: O2 saturations, HR, RR, temperature
- Capillary blood gas
- ECG

Further investigations:

High risk babies may need further investigations if clinically indicated by the history and examination findings.

During admission

- Continuous pulse oximetry for all admitted babies. Discontinue at least 12 hours prior to discharge.
- Observe for any breathing or feeding difficulties.
- Further investigations as clinically indicated.

Advice to parents/ carers

- Do not smoke in pregnancy or around your baby. Smoking exposes your baby to harmful chemicals even if done outside, as they are carried on your clothes.
- Place babies on their 'Back to sleep'.
- 'Feet to foot' keeps babies heads uncovered and prevents them from wriggling down under the covers.
- The safest place for babies to sleep is in their own separate sleep space such as a cot or Moses basket, free from toys, blankets and pillows. Babies should sleep in the same room as parents for at least the first 6 months of life.

- If you decide to bed share, then you must follow the safe co-sleeping rules in the leaflet provided (Safer-sleep-guide-for-parents.pdf)
- Do not share a bed with your baby if you are a smoker, have a premature or underweight baby, or have consumed any drugs or alcohol as this increases the risk of SUDI (Sudden Unexpected Death in Infancy).
- Do not fall asleep with your baby in a sofa or armchair. This increases the risk of SIDS and accidental death as your baby may get trapped and be unable to breathe.
- Do not let your baby get too hot or too cold.
- If your baby is unwell, seek prompt advice.
- Ensure your baby is fully immunised.

Discharge

- Appropriate training is needed so parents can respond if their baby is not breathing.
- Medical/ Nursing staff should provide infant CPR training using the video below prior to discharge:
  How to Give Baby CPR - First Aid Training - St John Ambulance

References:

www.nottinghamchild health.org.uk/Guidelines/Emergency/1.7%20ALTE.doc

Apparent Life-Threatening Event: A Review. Pediatric Clinics of North America 52 (2005) 1127-1146

Yield of Diagnostic Testing in Infants Who Have Had an Apparent Life-Threatening Event. Pediatrics 2005;115;885-893

UpToDate: Acute events in infancy including brief resolved unexplained event (BRUE).

https://www.uptodate.com/contents/acute-events-in-infancy-including-brief-resolved-unexplained-event-brue

BRUE - PAEDIATRIC INNOVATION, EDUCATION & RESEARCH NETWORK

Co-sleeping | The Lullaby Trust

Safer-sleep-guide-for-parents.pdf

How to Give Baby CPR - First Aid Training - St John Ambulance