

## Summary Sheet: Approach to Brief Resolved Unexplained Events (BRUEs)

### Definition

- BRUE stands for 'brief resolved unexplained event'
- BRUEs were formerly known as apparent life-threatening events (ALTEs)

### Clinical Presentation

- Infant <1 year old
- Sudden, brief, and now resolved episode characterized by at least one of the following:
  - Cyanosis or pallor
  - Absent, decreased, or irregular breathing
  - Change in muscle tone, either hyper or hypotonia, or
  - Altered level of responsiveness<sup>1</sup>
- Note: BRUE is a diagnosis of exclusion

### Etiology

- A wide variety of conditions can manifest as a BRUE, but remember that in the end they are unexplained events

### History

- Details related to the event

Before the Event	During the Event	After the event
<ul style="list-style-type: none"> <li>• What the infant was doing</li> <li>• Where they were</li> <li>• Whether they were behaving normally</li> <li>• Timing in relation to a feed</li> <li>• What made the observer check on the baby</li> </ul>	<ul style="list-style-type: none"> <li>• Level of consciousness</li> <li>• Breathing efforts</li> <li>• Colour</li> <li>• Muscle tone</li> <li>• Limb and eye movement</li> <li>• Where it occurred</li> <li>• How long it lasted</li> </ul>	<ul style="list-style-type: none"> <li>• Whether the infant required intervention</li> <li>• Type of intervention</li> <li>• How long it was performed for</li> <li>• How long the infant took to return to baseline</li> </ul>

- Review of Systems (associated symptoms that could suggest a particular etiology)
- Past medical, family, social histories

Past Medical History	Family History	Social History
<ul style="list-style-type: none"> <li>• Pregnancy and birth histories</li> <li>• Recent illness</li> <li>• Significant health issues</li> <li>• Previous similar events</li> <li>• Feeding difficulties</li> <li>• Failure to thrive</li> <li>• Usual behaviour, sleeping, feeding</li> <li>• Medications</li> </ul>	<ul style="list-style-type: none"> <li>• Similar events</li> <li>• SIDS</li> <li>• Early infant deaths</li> <li>• Genetic, metabolic, cardiac, or neurologic conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Smoking in home</li> <li>• Concerns for non-accidental injury</li> <li>• Recent stressors in home</li> <li>• Supports in home</li> </ul>

### Physical Exam

- General appearance
- Return to baseline (any lingering limpness, colour change, or reduced alertness?)
- Vital signs as well as height, weight, and head circumference
- Cardiac exam
- Respiratory exam
- Neurological exam
- Developmental assessment
- Signs of trauma or maltreatment (observe caregiver's interactions with infant)

## Investigations

- Depends on whether patient is classified as higher or lower risk

Higher Risk Patient	Lower Risk Patient
One of the following: <ul style="list-style-type: none"> <li>• “Concerning features”<sup>2</sup> on history or physical exam               <ul style="list-style-type: none"> <li>○ Signs/symptoms of an underlying condition, or</li> <li>○ Risk factors for a serious condition (i.e. family history)</li> </ul> </li> <li>• BRUE was a recurrent event, lasted &gt;1 min, or required CPR from a medical provider, or</li> <li>• Infant is &lt;60 days old or was born &lt;32 weeks gestation (corrected gestational age &lt;45 weeks)<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• No “concerning features”<sup>2</sup> on history and physical exam,</li> <li>• BRUE was a first event, lasted &lt;1 min, didn’t require CPR, and</li> <li>• Are &gt;60 days old, were born at 32 weeks gestation or later (corrected gestational age of at least 45 weeks)<sup>2</sup></li> </ul>

Investigations	
Higher Risk Patient	Lower Risk Patient
<ul style="list-style-type: none"> <li>• May be more likely to have a serious underlying condition and possibly future events</li> <li>• Needs more thorough investigations for less common causes</li> <li>• Should be worked up based on your degree of clinical suspicion of a concerning underlying etiology</li> </ul>	You <u>SHOULD</u> <ul style="list-style-type: none"> <li>• Make decisions in partnership with the infant’s caregivers</li> </ul> You <u>MAY</u> <ul style="list-style-type: none"> <li>• Order pertussis testing</li> <li>• Order an ECG</li> </ul> You <u>NEED NOT</u> <ul style="list-style-type: none"> <li>• Order viral respiratory testing or a urinalysis</li> <li>• Order blood glucose, serum bicarbonate, or serum lactic acid to check for inborn errors of metabolism</li> <li>• Order neuroimaging</li> </ul> You <u>SHOULD NOT</u> <ul style="list-style-type: none"> <li>• Evaluate for anemia based on lab tests</li> <li>• Obtain bloodwork including CBC, electrolytes, renal function, or tests for inborn errors of metabolism</li> <li>• Sample CSF</li> <li>• Order a chest x-ray, blood gases, echocardiogram, or polysomnograph</li> <li>• Order EEG</li> <li>• Order tests for gastroesophageal reflux</li> </ul>

## Management

- Medical treatment only applicable for higher risk patients
  - Treat the suspected underlying condition
- Hospital admission
  - Typically only for high risk patients
  - Lower risk patients generally don’t need to be admitted just for cardiorespiratory monitoring
    - But if there is a great deal of parental anxiety or timely follow-up not available, it may be reasonable to admit for a clearly defined period of time (i.e. 24-48 hours)
    - Can also consider monitoring for a short period of time (i.e. 1-4 hours) to ensure they remain well
- Provide caregiver education
- Arrange close follow-up and support

## References:

1. Tieder JS, Bonkowsky JL, Etzel RA. Brief resolved unexplained events (formerly apparent life-threatening events) and evaluation of lower-risk infants: Executive summary. *Pediatrics*. 2016; 137(5):e2 0160591.
2. Tieder JS, Bonkowsky JL, Etzel RA, et al. Clinical Practice Guideline: Brief Resolved Unexplained Events (Formerly Apparent Life-Threatening Events) and Evaluation of Lower-Risk Infants. *Pediatrics*. 2016;137(5):e20160590.