

Brief Resolved Unexplained Event (BRUE)

Aliases

Apparent Life-Threatening Event, ALTE

Patient Care Goals

1. Recognize patient characteristics and symptoms consistent with a BRUE.
2. Promptly identify and intervene for patients who require escalation of care.
3. Choose proper destination for patient transport.

Patient Presentation

Inclusion Criteria

1. Suspected BRUE: An event in an infant less than 1 yo reported by a bystander as sudden, brief (less than 1 min), completely resolved upon EMS arrival that includes one or more of the following:
 - a. Absent, decreased, or irregular breathing
 - b. Color change (central cyanosis or pallor)
 - c. Marked change in muscle tone (hyper- or hypotonia)
 - d. Altered level of responsiveness

Exclusion Criteria

1. Any of the following present upon EMS evaluation:
 - a. Abnormal vital signs for age (including fever)
 - b. Vomiting
 - c. Signs of trauma
 - d. Noisy breathing
2. Identifiable cause for the event, which may include:
 - a. Gastric reflux (spitting up)
 - b. Swallowing dysfunction
 - c. Nasal congestion
 - d. Periodic breathing of the newborn
 - e. Breath-holding spell
 - f. Change in tone associated with choking, gagging, crying, feeding
 - g. Seizure (eye deviation, nystagmus, tonic-clonic activity)
3. History or exam concerning for child abuse or neglect
4. Color change that involved only redness (e.g. in the face) or isolated perioral or hand/feet cyanosis

Patient Management

Assessment

1. History
 - a. History of circumstances and symptoms before, during, and after the event, including duration, interventions done, and patient color, tone, breathing, feeding, position, location, activity, level of consciousness
 - b. Other concurrent symptoms (fever, congestion, cough, rhinorrhea, vomiting, diarrhea, rash, labored breathing, fussy, less active, poor sleep, poor feeding)
 - c. Prior history of BRUE
 - d. Past medical history (prematurity, prenatal and/or birth complications, gastric reflux, congenital heart disease, developmental delay, airway abnormalities, breathing problems, prior hospitalizations, surgeries, or injuries)
 - e. Family history of sudden unexplained death or cardiac arrhythmia in other children or young adults
 - f. Social history: who lives at home, recent household stressors, exposure to toxins, drugs, or sick contacts

- g. Considerations for possible child abuse (multiple or changing versions of the story; reported mechanism of injury does not seem plausible, especially for child's developmental stage)
2. Exam
 - a. Full set of vital signs (per Universal Care guideline, includes: T, P, RR, BP, O₂ sat)
 - b. General assessment:
 - i. Signs of respiratory distress (grunting, nasal flaring, retracting)
 - ii. Color (pallor, cyanosis, normal)
 - iii. Mental status (alert, tired, lethargic, unresponsive, irritability)
 - c. Head to toe exam, including:
 - i. Physical exam for signs of trauma or neglect.
 - ii. Pupillary response and anterior fontanelle.

Treatment and Interventions

1. Monitoring
 - a. ECG cardiac monitor
 - b. Continuous pulse oximetry
 - c. Blood glucose check
 - d. Serial observations during transport for change in condition
2. Airway
 - a. Administer oxygen as appropriate for dyspnea or distress with a target of achieving greater than 93% saturation for most acutely ill patients. Escalate from a nasal cannula to a simple face mask to a non- rebreather mask as needed [see [Airway Management guideline](#)].
 - b. Suction the nose and/or mouth (via bulb, suction catheter) if excessive secretions are present.
3. Utility of IV placement and fluids
 - a. Routine IVs should not be placed on all BRUE patients.
 - b. IVs should only be placed in children for clinical concerns of shock, or when administering IV medications *[AEMT]*.

Patient Safety Considerations

1. Regardless of patient appearance, all patients with a history of signs or symptoms of BRUE should be transported for further evaluation.
 - a. By definition, infants who are not completely well-appearing at EMS evaluation do not meet the definition of possible BRUE and should be treated and transported according to local guidelines
2. Destination considerations
 - a. Consider transport to a facility with pediatric critical care capability for patients with high risk criteria present:
 - i. Less than 2 months of age
 - ii. History of prematurity (less than or equal to 32 weeks gestation or corrected gestational age less than or equal to 45 weeks)
 - iii. More than 1 BRUE, now or in the past
 - iv. Event duration greater than 1 minute
 - v. CPR or resuscitation by caregivers or trained rescuers
 - b. All patients should be transported to facilities with baseline readiness to care for children.

Notes and Educational Pearls Key Considerations

- BRUE is a group of symptoms, not a disease process.
- If the infant is not completely well upon EMS arrival, this excludes possible BRUE event:
 - Treat and transport according to local guidelines
- Avoid using “BRUE”, “ALTE”, “SIDS” (sudden infant death syndrome), or “near-miss SIDS” terminology with parent/guardian.

- EMS clinicians play a unique and important role in obtaining an accurate history soon after the event and in observing, documenting, and reporting environmental, scene and social indicators that may point to an alternate diagnosis.
- High-risk patients with a possible BRUE have worse outcomes and may require emergency department (ED) or inpatient testing, intervention, and/or follow-up.
- The determination of a BRUE is made only after hospital evaluation, not in the field:
 - A few of these infants will die even after hospital evaluation and treatment.
- All patients should be transported to an ED.
- Contact medical direction if parent/guardian is refusing medical care and/or transport, especially if any high-risk criteria are present

Quality Improvement

- **Associated NEMESIS Protocol(s) (eProtocol.01)**
9914197—Medical- Apparent Life Threatening Event (ALTE)

Key Documentation Elements

- Document key aspect of history
 - Color change
 - Apnea
 - Change in muscle tone
 - Caregiver resuscitation efforts
 - History of prematurity
 - Prior BRUE events
 - Past medical history
- Document key aspects of the exam to assess for a change after each intervention:
 - Full set of vital signs (T, RR, BP, P, O₂ sat)
 - Respiratory effort
 - Mental status
 - Color
 - Presence of signs of trauma or neglect

Performance Measures

- Complete set of vital signs recorded
- Appropriate transport destination relative to risk criteria

References

Key Reference

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Supplemental References

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