CONDITION

# Brief resolved unexplained event - BRUE

Learn what a brief resolved unexplained event (BRUE) is, how doctors assess an infant after an episode, and which symptoms need emergency care.

**WHAT IT IS**
Sudden short-lived unexplained event in an infant

**BODY SYSTEM**
Breathing, circulation and nervous system

**MAIN SYMPTOMS**
Blue or gray skin, abnormal breathing, limpness or stiffness, reduced responsiveness

**WHAT CAUSES IT**
Unknown by definition

**HOW IT IS DIAGNOSED**
Caregiver description and clinician assessment

**MAIN TREATMENT**
Observation, caregiver education and follow-up

**CAN IT BE CURED?**
No, no treatment prevents all recurrences

**IS IT AN EMERGENCY?**
Sometimes, if breathing is abnormal or the baby is unresponsive

**LONG-TERM OUTLOOK**
Many lower-risk infants remain healthy

## Overview

A brief resolved unexplained event, or BRUE, is a sudden and short-lived episode in an infant younger than 1 year. During the episode, the baby may change color, breathe differently, become unusually limp or stiff, or respond less than usual. The baby then returns to their usual state.

Doctors use the term BRUE only after taking a careful history and examining the baby. If a medical condition or a clear event such as choking explains what happened, it is not considered a BRUE.

A BRUE is usually brief, often lasting less than a minute. However, even a short episode can be frightening. An infant who is currently blue or gray, is not breathing normally, or cannot be awakened needs emergency help. The term BRUE should not be used by a caregiver to decide

that an active event is harmless.

After an episode has ended, the clinician assesses whether the infant appears to have a lower or higher risk of another event or an underlying medical problem. This classification helps guide testing, observation, and follow-up. It does not predict the outcome with certainty.

BRUE is not the same as sudden infant death syndrome, or SIDS. SIDS refers to the unexplained death of an infant, usually during sleep. A baby with a BRUE recovers from the episode. Home heart or breathing monitors have not been shown to prevent SIDS.

## Symptoms

A BRUE includes one or more of the following changes witnessed by a caregiver:

Redness alone is not the typical color change used to define a BRUE. Normal brief pauses in an infant's breathing also may not represent a BRUE.

The episode must have ended, and the infant must have returned to their usual condition before a clinician can consider the term. Details from the person who saw the event are important because the baby may look well by the time of the examination.

Features such as coughing, gagging, forceful vomiting, fever, persistent breathing difficulty, or ongoing sleepiness may point to another explanation. For example, an infant who coughs and changes color while feeding may have had a choking or swallowing event rather than a BRUE.

Call emergency services if an episode is happening and the baby:

Begin infant CPR if the baby is unresponsive and not breathing normally, if you know how. Follow the emergency dispatcher's instructions. Do not shake the baby.

Even when an episode has completely resolved, contact a healthcare professional promptly for guidance. A first unexplained event should be medically assessed.

- Blue or gray skin, called cyanosis, or unusual paleness
- Absent, reduced, or irregular breathing
- A marked change in muscle tone, such as becoming very limp or unusually stiff
- A reduced or altered response to voices, touch, or the surroundings
- Is not breathing normally
- Remains blue, gray, very pale, limp, or unresponsive
- Has a seizure-like episode that does not stop
- Needs rescue breathing or cardiopulmonary resuscitation, or CPR

- Does not quickly return to their usual behavior

## Causes and risk factors

BRUE describes an event, not a specific disease. By definition, no cause is found after an appropriate history and physical examination.

Sometimes additional information reveals that the episode was caused by another problem. Possible explanations for BRUE-like events include a feeding or swallowing problem, an airway blockage, an infection, a seizure, an abnormal heart rhythm, or an injury. Less common possibilities include metabolic disorders, which affect how the body uses energy, and exposure to a medicine or substance.

Reflux is often considered after an infant spits up, but reflux should not automatically be assumed to explain an unexplained color or breathing change. If there is clear evidence of milk or stomach contents causing coughing or choking, the event may have a feeding or reflux-related explanation and therefore may not meet the BRUE definition.

Clinicians use specific features to identify infants who meet lower-risk criteria. Under American Academy of Pediatrics guidance, these include:

Corrected age accounts for how early a premature baby was born. For example, a baby born several weeks early may have a younger corrected age than their age measured from the date of birth.

An infant who does not meet every lower-risk criterion is considered higher risk for assessment purposes. This does not mean that the infant has a serious condition. It means the evaluation should be tailored more carefully to the child's age, medical history, event details, and examination.

- Age older than 60 days
- Birth at 32 weeks of pregnancy or later and a corrected age of at least 45 weeks
- A first event, rather than repeated or clustered events
- An event lasting less than one minute
- No CPR performed by a trained medical professional
- No concerning findings in the history or physical examination

## Diagnosis

There is no single test that diagnoses a BRUE. Diagnosis depends on the caregiver's description and the clinician's assessment after the episode has resolved.

The clinician may ask:

The physical examination usually includes temperature, oxygen level, heart and breathing assessment, alertness, muscle tone, and signs of infection or injury. Feeding may be observed if the history suggests coughing, choking, or difficulty coordinating sucking and swallowing.

For a well-appearing infant who meets all lower-risk criteria, extensive testing is generally not helpful. Depending on the circumstances, the clinician may briefly monitor breathing and oxygen levels. An electrocardiogram, or ECG, may be considered to look at the heart's electrical rhythm. Testing for pertussis, also called whooping cough, may be considered if exposure or symptoms suggest it.

Routine blood tests, chest imaging, brain imaging, seizure testing, sleep studies, reflux testing, and hospital admission are generally not recommended solely for a lower-risk BRUE. Tests may still be appropriate when the history or examination points to a specific concern.

Higher-risk infants need an individualized evaluation. Testing should focus on likely explanations rather than using the same broad set of tests for every baby.

- What was the baby doing immediately before the event?
- Was the baby sleeping, feeding, crying, coughing, or vomiting?
- What color change occurred, and where was it seen?
- Did the chest move, and were there breathing sounds?
- Did the baby become limp, stiff, or less responsive?
- How long did the episode last?
- What did the caregiver do, and how did the baby respond?
- Has anything similar happened before?
- Was the baby born prematurely or treated for other medical conditions?
- Has the baby recently had fever, congestion, poor feeding, vomiting, or unusual movements?
- Could there have been an injury or exposure to medicine, drugs, or another substance?

## Treatment and management

A BRUE itself does not have a medicine or procedure that prevents all future episodes.

Management depends on whether a cause is later identified and whether the infant meets lower- or higher-risk criteria.

A lower-risk infant who remains well may need only a period of observation, caregiver education, and arranged follow-up. The healthcare team may review what happened, explain when to seek help, and offer resources for infant CPR training. Admission to the hospital is not routinely required solely for monitoring after a lower-risk BRUE.

Medicines that reduce stomach acid are not routinely used to treat an unexplained BRUE. They may not address the event and can have unwanted effects. Feeding changes, thickened feeds, or swallowing therapy should be based on a documented feeding concern and professional assessment rather than the BRUE label alone.

For a higher-risk infant, management is guided by the findings. This might include monitored observation or targeted evaluation of feeding, breathing, the heart, infection, or the nervous system. If another condition is found, treatment focuses on that condition.

A home heart or breathing monitor is not routinely recommended after a lower-risk BRUE. These monitors can produce false alarms and have not been shown to prevent SIDS. A clinician may recommend monitoring for a separate medical reason, but that decision is individualized.

Safe sleep remains important for every infant. Place the baby on their back for each sleep on a firm, flat sleep surface. Keep soft bedding, pillows, bumper pads, and loose objects out of the sleep area. Room sharing without bed sharing is recommended. Consumer monitors and positioning products do not replace safe-sleep practices.

## Complications

Many infants who have a lower-risk BRUE remain healthy and do not have a serious underlying diagnosis. A brief event that fully resolves generally does not cause injury by itself.

Possible concerns include another episode or the later recognition of an underlying condition. The likelihood and type of concern depend on the baby's age, medical history, event features, and examination. Repeated events, events during feeding, poor growth, abnormal movements, or persistent breathing symptoms deserve further evaluation.

A BRUE can also cause significant stress for parents and caregivers. Some caregivers may become afraid to let the baby sleep or may repeatedly check breathing. Clear emergency instructions, CPR education, and a follow-up plan can help. Caregivers should discuss ongoing anxiety or sleep loss with a healthcare professional.

## Follow up

Before leaving medical care, caregivers should understand why the event was or was not classified as a BRUE, whether the baby meets lower-risk criteria, and what follow-up is planned. The timing of routine follow-up depends on the baby's age and clinical assessment, but prompt contact with the baby's primary care clinician is often appropriate.

At follow-up, the clinician may review feeding, growth, breathing, sleep, development, and whether another event has occurred. Bring a written description of any new episode. If it is safe to do so, noting the start and stop time can be useful. Do not delay emergency care in order to make a recording.

Contact the baby's clinician promptly if there are repeated brief episodes, new feeding difficulty, coughing or choking with feeds, poor intake, unusual sleepiness, or a change from the baby's normal behavior.

Seek urgent or emergency care for:

Caregivers and other regular childcare providers may benefit from an approved infant CPR course. Training can improve confidence and help people respond appropriately if a future emergency occurs.

- Blue or gray color that persists or returns
- Pauses in breathing, struggling to breathe, or abnormal breathing that continues
- Limpness, unresponsiveness, or difficulty waking the baby
- A prolonged or repeated seizure-like event
- A baby who does not return to their usual state
- Any event requiring rescue breathing or CPR
- Fever in a young infant, especially one younger than 3 months

## Sources

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