1. **Aim/Purpose of this Guideline**
   To provide guidance on the assessment, investigation and management of infants presenting with an ALTE

2. **The Guidance**

   **2.1 DEFINITION AND BACKGROUND**
   The term Apparent Life-Threatening Event (ALTE) applies to infants under 12 months with a history of a sudden event that is frightening to the observer and is characterised by some combination of:
   
   - Apnoea (central or obstructive)
   - Colour change (cyanotic, pallid or plethoric)
   - Change in muscle tone (usually floppy but may be increased tone)
   - Choking or gagging

   Recovery occurs only after stimulation or resuscitation – cases can be mislabelled as ALTE if recovery occurred after simply being picked up. In some cases the observer will fear that the infant will die or has died. All infants with an ALTE need to be evaluated in hospital.

   ALTE is not a diagnosis but a description of an event which has a broad range of possible underlying causes. The terminology should be used with caution in front of parents as it can provoke unnecessary alarm and anxiety. In the majority of cases (>95%), the cause is physiological or a relatively benign condition.

   ALTE occurs with highest frequency in the first 3 months of life but the term encompasses events up to 12 months of age. The term “near-miss SIDS” should be avoided as there is no proven association between ALTE and SIDS (Sudden Infant Death Syndrome).

   Although there is a wide range of potential underlying diagnoses, extensive investigation has a very low yield and is not necessary in most cases. Targeted testing based on history and examination is more appropriate.
2.2 HISTORY

History should ideally be obtained from the person(s) who observed the infant during or immediately after the event.

Description of event:

- What attracted the caregiver's attention?
- Activity at the time of the event (awake/asleep)
- Colour (cyanosis, pallor, plethora) and colour distribution (e.g., whole body vs. perioral)
- Tone – floppy, stiff, normal
- Abnormal movements including eye movements
- Time and duration of event
- Blood/fluid in nose or mouth

Circumstances and environment prior to event:

- Relationship of event to feeding or vomiting
- Sleep position – supine, prone, side
- Environment – nature of sleeping arrangement (cot, car seat, bed etc.), type of bedding, type of clothing

Recent illness and other important points in the history:

- History of coryza or other URTI/LRTI symptoms in infant or family
- Relevant past medical history – prematurity, vaccinations, significant previous illnesses
- Family history of Sudden Unexpected Death in Infancy or later deaths, parental consanguinity
- Social factors – family known to Social Services or on Child Protection Plan, parental smoking, drug and alcohol use, previous ED attendances

Interventions used by caregiver:

- Degree of resuscitation required – gentle or vigorous stimulation, mouth-to-mouth, chest compressions (layperson or medically trained)

2.3 EXAMINATION

A head-to-toe examination should be performed including plotting growth and head circumference. Consider using a body map if there is a suspicion of child abuse (See section on Child Protection considerations)
2.4 HIGH-RISK INFANTS

The following groups are identified as being at risk of having a significant underlying cause or a problematic course following an ALTE:

- Age < 28 days
- Significant prematurity
- Significant prior medical illness
- Clinically unwell looking
- Recurrent events before presentation
- More severe/prolonged ALTE symptoms

2.5 POSSIBLE CAUSES

It is common for no specific cause to be identified after evaluation and observation. An exaggerated physiological airway protection reflex is the most common explanation. In young infants the laryngeal chemoreceptor cough reflex is not well matured and ingress of saliva/feed/refluxed gastric contents into the laryngeal inlet will sometimes trigger apnoea. This reflex appears to be more sensitive during upper respiratory tract infections.

Around 50% of cases of ALTE are idiopathic. Of the group with an identifiable cause the aetiology may be:

- Gastro-oesophageal reflux – most common, around 50%
- Infection – amongst most common group of causes. Includes URTI/LRTI especially RSV, meningitis, septicaemia, UTI.
- Neurological – amongst most common group of causes. Includes head injury, seizures, central hypoventilation syndrome, cerebral malformations, CNS infections.
- Respiratory – infections, congenital malformations, laryngomalacia
- Cardiac – congenital heart disease, arrhythmias, prolonged QT syndrome
- Child abuse (<5% of cases) – shaking, head injury, occlusion of airway, poisoning, Munchausen by proxy.
- Metabolic (<5% of cases) – hypoglycaemia, hypocalcaemia, hypokalaemia, inborn errors of metabolism.

2.6 INVESTIGATIONS

In a previously well term infant with a clear history of symptoms temporally related to feeding or vomiting who has a normal examination it is often not necessary to perform any investigations. The diagnostic yield in this group is likely to be very low.

If the history and examination point to a likely diagnosis then the child should be investigated and managed as clinically indicated.

If there are no clues from the history or examination then reasonable first line investigations are:
- FBC and differential
- CRP
- UE, LFT, bone profile
- Pre-feed blood glucose
- Blood gas
- Urinalysis
- Chest x-ray
- ECG

Other investigations which may be considered as dictated by clinical suspicion:

- NPA/pernasal swab
- Investigations for non-accidental injury (See section on Child Protection considerations)
- Metabolic investigations – lactate, ammonia, acylcarnitine profile
- EEG
- Neuroimaging
- Urine toxicology/metabolic screen
- Overnight saturations study
- NB – investigations for reflux are often not helpful and should be reserved for more difficult cases

2.7 MANAGEMENT

This may include initial resuscitation and/or management of any underlying aetiology for the presentation (e.g. infection, NAI etc.)

Most children will require admission for close monitoring with apnoea and pulse oximetry monitoring for up to 24 hours. Discharge of a child following an ALTE may be **considered** if:

- The episode is single, short and self-limiting
- It was related to feeding
- A normal feed has been observed
- Advice about appropriate feed volumes has been given
- There is no abnormality detected on examination
- Parental anxiety has been allayed

These patients should have early follow-up with their GPs and in practice most babies are admitted for observation.

Parents should be taught basic paediatric life support prior to discharge.

In most cases it is not appropriate to discharge the child with a home apnoea monitor but this may be appropriate in selected cases after discussion with the consultant on service. Note there is no evidence that apnoea monitors save lives.
Although ALTE is not predictive of Sudden Infant death Syndrome (SIDS), the opportunity should be taken to educate parents about practices that have been shown to lower the incidence of SIDS, namely: avoiding exposure to tobacco smoke, safe infant sleeping practices (on their back, face uncovered, firm mattress, no loose bedding or toys) avoiding bed-sharing.

2.8 CHILD PROTECTION CONSIDERATIONS

2.8.1
Child protection considerations have not always been considered in the collapsed infant. This has led to such infants being investigated for other causes and child abuse not being considered in the differential diagnosis.

Babies presenting with apparent life-threatening events (ALTE) may have suffered an episode of shaking, occlusion of their upper airway or of poisoning. Possible child abuse must also be considered in the differential diagnosis of infants presenting with unexplained collapse, apnoeic episodes or ‘funny turn’. Concern should be heightened if any of the following apply:

- Any history of repeated episodes of unexplained collapse in the presenting child
- Episodes of unexplained collapse or life-threatening events in a sibling or other close relative
- Death of a previous sibling following ‘collapse’ or sudden infant death syndrome
- Inconsistency in history obtained
- Delay in presentation
- Adverse family and/or social history

The acute consultant paediatrician on call should be notified. Contact should also be made with the Community Paediatrician on-call.

2.8.2 Examination and Investigation:

A detailed and careful physical examination of the infant should be made. Special notes should be made of the presence or absence of the following:

- Tension of fontanelle
- Any marks, bruises [particularly finger-mark bruises] or other signs of trauma
- Petechial haemorrhages [look particularly on the face of an infant whose airway may have been occluded]
- Look for evidence of anaemia
- Note baby’s neurological status, particularly persisting irritability, lethargy or poor feeding
- Note occipito-frontal circumference and repeat measurement after 24 hours
- Look for evidence of internal organ injury
- Blood around the mouth or nose should raise concern regarding smothering
- Optic fundi should be attempted to be looked at. The presence of retinal haemorrhage will greatly increase the likelihood of “shaken baby syndrome”.
- Any bruise on a non-mobile infant should be regarded as suspicious. Check upper labial frenulum for tears.

2.8.3 Additional investigations of an infant presenting with ALTE in whom non-accidental injury is suspected:

- Toxicology
- Clotting screen
- If screening for sepsis, discuss with Registrar and/or Consultant whether lumbar puncture indicated:
  - Traumatic lumbar puncture [considered as >10,000 x 10^{-6}/l RBCs in cerebro-spinal fluid] may occur in 6 to 19.6% of lumbar punctures. Nevertheless if a lumbar puncture reveals blood in the CSF, consideration should be given to the possibility that the blood may be due to subdural haemorrhage. Some babies with subdural haemorrhage caused by shaking may make a rapid recovery so the fact that they recover quickly after appearing initially unwell should not deter investigation into the possibility of subdural haemorrhage and abuse.
- Fundoscopy by a Consultant Ophthalmologist after pupillary dilatation
- Skeletal survey after discussion with the (Paediatric) Radiologist
- Cranial CT scan after discussion with the (Paediatric) Radiologist
- Liver Function Tests may alert the clinicians to liver injury
3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Adherence to guideline</th>
</tr>
</thead>
</table>
| Lead                    | Department Operational Lead  
                          | Paediatric consultant      
                          | Community paediatrics     |
| Tool                    | Routine consultant review of casenotes and discharge summaries |
| Frequency               | Continuous/ case by case |
| Reporting arrangements  | Department Operational Lead  
                          | Via Child Heath directorate audit and guidelines meeting 
                          | Clinical effectiveness department |
| Acting on recommendations and Lead(s) | Department Operational Lead  
                                      | Via Child Heath directorate audit and guidelines meeting and appropriate delegation. 
                                      | Clinical effectiveness department |
| Change in practice and lessons to be shared | A lead member of the team will be identified to take changes forward where appropriate. Actions will be taken within 3-6 months. Lessons will be shared with all the relevant stakeholders |

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the ‘Equality, Diversity & Human Rights Policy’ or the Equality and Diversity website.

4.2. Equality Impact Assessment
The Initial Equality Impact Assessment Screening Form is at Appendix 2.
## Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Clinical Guideline for the management of the infant with an Apparent Life-Threatening Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>March 2014</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>March 2014</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>March 2017</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Dr Rachel Nicholls, Paediatric Registrar</td>
</tr>
<tr>
<td>Contact details:</td>
<td>01872 250000 Bleep 2716</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>Guidance on the assessment, investigation and management of infants presenting with an ALTE</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Apparent life-threatening event, ALTE, cyanosis, pallor, floppy, apnoea, choking</td>
</tr>
<tr>
<td>Target Audience</td>
<td>RCHT, PCH, CFT, KCCG</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Nurse Executive</td>
</tr>
<tr>
<td>Date revised:</td>
<td>March 2014</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Management of the Infant With an Apparent Life-Threatening Event</td>
</tr>
<tr>
<td>Approval route (names of committees)/consultation:</td>
<td>RCHT Paediatric Department Audit and Guidelines meeting Child Death Review – Named doctor for Child death</td>
</tr>
<tr>
<td>Divisional Manager confirming approval processes</td>
<td>Sheena Wallace</td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td>Not Required</td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy on Policies – Approvals and Ratification):</td>
<td>Internet &amp; Intranet ✓ Intranet Only</td>
</tr>
<tr>
<td>Document Library Folder/Sub Folder</td>
<td>Paediatrics</td>
</tr>
<tr>
<td>Links to key external standards</td>
<td>none</td>
</tr>
</tbody>
</table>
Related Documents:

[5] – Up to Date: Use of home cardiorespiratory monitors in infants, version 8.0, last updated April 2013
[7] - Royal College of Paediatrics and Child Health, working party report, 2002: Fabricated or Induced Illness by Carers

Other references:
Up to Date: Apparent Life-threatening event in infants, version 17.0, last updated July 2013
Apparent Life Threatening Event ALTE Guideline, The Royal Children’s’ Hospital Melbourne
Further notes on ALTE, The Royal Children’s’ Hospital Melbourne

Training Need Identified? No

Version Control Table

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2011</td>
<td>V1.0</td>
<td>Initial Issue</td>
<td>Dr. John Lewis community paediatrician</td>
</tr>
<tr>
<td>March 2014</td>
<td>V2.0</td>
<td>Full review and re write of content, re ratification and re format into new trust template</td>
<td>Dr Rachel Nicholls, Paediatric Registrar</td>
</tr>
</tbody>
</table>

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry.

Clinical Guideline for the management of an infant with an ALTE.
## Appendix 2. Initial Equality Impact Assessment Form

<table>
<thead>
<tr>
<th>Name of the strategy / policy / proposal / service function to be assessed (hereafter referred to as policy) (Provide brief description): Clinical Guideline for the management of an infant with an ALTE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Directorate and service area: Child Health</td>
<td>Is this a new or existing Policy? new</td>
</tr>
<tr>
<td>Name of individual completing assessment: T. Fergus</td>
<td>Telephone: 01872252800</td>
</tr>
<tr>
<td>3. Policy – intended Outcomes*</td>
<td>Evidenced based standardised care</td>
</tr>
<tr>
<td>4. *How will you measure the outcome?</td>
<td>Audit and case review</td>
</tr>
<tr>
<td>5. Who is intended to benefit from the policy?</td>
<td>Children and families</td>
</tr>
<tr>
<td>6a) Is consultation required with the workforce, equality groups, local interest groups etc. around this policy?</td>
<td>no</td>
</tr>
<tr>
<td>b) If yes, have these *groups been consulted?</td>
<td></td>
</tr>
<tr>
<td>C). Please list any groups who have been consulted about this procedure.</td>
<td></td>
</tr>
</tbody>
</table>

### 7. The Impact

Please complete the following table.

Are there concerns that the policy could have differential impact on:

<table>
<thead>
<tr>
<th>Equality Strands</th>
<th>Yes</th>
<th>No</th>
<th>Rationale for Assessment / Existing Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (male, female, transgender / gender reassignment)</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race / Ethnic communities /groups</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disability - learning disability, physical disability, sensory impairment and mental health problems</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion / other beliefs</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marriage and civil partnership</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy and maternity</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:
- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation - this excludes any policies which have been identified as not requiring consultation. or
- Major service redesign or development

8. Please indicate if a full equality analysis is recommended.  Yes  No

9. If you are not recommending a Full Impact assessment please explain why.
No areas indicated

Signature of policy developer / lead manager / director t.fergus  Date of completion and submission March 2014

Names and signatures of members carrying out the Screening Assessment 1.  2.

Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead, c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa, Truro, Cornwall, TR1 3HD

A summary of the results will be published on the Trust’s web site.

Signed __T.Fergus_____________
Date ____March 2014__________

Clinical Guideline for the management of an infant with an ALTE.