IAEM Clinical Guideline

# Paediatric Syncope

Version 1.2

September 2024

Author: Laura Heffernan

Guideline lead: Dr Carol Blackburn, in collaboration with the IAEM Clinical Guideline Committee and Our Lady's Children's Hospital Crumlin, Dublin, Ireland.

**To reference this document please reference as:**
Heffernan L. Paediatric Syncope. IAEM Guidelines 2024. https://iaem.ie/professional/clinical-guidelines/ (accessed 2nd September 2024).

## DISCLAIMER

IAEM recognises that patients, their situations, Emergency Departments and staff all vary. These guidelines cannot cover all clinical scenarios. The ultimate responsibility for the interpretation and application of these guidelines, the use of current information and a patient's overall care and wellbeing resides with the treating clinician.

## Revision History

| Date | Version | Section | Summary of changes | Author |
|---|---|---|---|---|
| August 2018 | V1.0 | All | Final Version | L. Heffernan |
| April 2019 | V1.1 | Front cover | Removed guideline number | C. Briant |
| September 2024 | V1.2 | All<br>Front cover<br>Contents | Updated formatting<br>Added guideline referencing information<br>Added table of contents | C. Briant<br>C. Briant<br>C. Briant |

## CONTENTS

GLOSSARY OF TERMS ..... 4
INTRODUCTION ..... 5
PARAMETERS ..... 6
AIMS ..... 6
HISTORY TAKING ..... 7
History of Presenting Complaint ..... 7
Past Medical History ..... 7
Social History ..... 8
Family History ..... 8
EXAMINATION ..... 8
BASELINE INVESTIGATIONS FOR ALL PRESENTATIONS ..... 9
DIFFERENTIAL DIAGNOSIS OF SYNCOPAL DISORDER ..... 9
MANAGEMENT ..... 11
SPECIAL CONSIDERATIONS ..... 12
Indications for Admission ..... 12
Recurrent Events ..... 12
COMPANION DOCUMENTS ..... 13
LINKS TO USEFUL WEBSITES ..... 13

## GLOSSARY OF TERMS

| | |
|---|---|
| BHCG | Beta human chorionic gonadotropin |
| BP | Blood pressure |
| ECG | Electrocardiogram |
| EEG | Electroencephalogram |
| HR | Heart rate |
| LOC | Loss of consciousness |
| LVH | Left ventricular hypertrophy |
| POTS | Postural orthostatic tachycardia syndrome |
| SpO2 | Oxygen saturations |
| Syncope | Loss of consciousness, collapse, faint |

# Paediatric Syncope

## INTRODUCTION

Syncope is a common presentation in all age groups, with 40% of the population experiencing syncope during their lifetime. Up to 35% of children experience at least one episode.

The differential for syncope is broad and it can be a daunting presentation to medically assess. In the paediatric population, the majority of cases are due to benign causes. However rarely, life-threatening conditions may present with syncope and it is crucial to identify these cases when they present to the Emergency Department. Approximately 80% of cases of paediatric syncope are due to autonomic responses (vasovagal, situational & orthostatic) and 20% have neurologic aetiology such as seizure and migrainous headache. Other rare causes of paediatric syncope include arrhythmias, hypoglycaemia and anaphylaxis. Differentiation between the different causes of syncope depends largely on thorough history taking and important features in the history are discussed below.

An algorithm to assist with distinguishing the causes of syncope is provided in the management section. Pertinent areas of examination of the paediatric patient with syncope are outlined, and relevant investigations are suggested in addition to assistance with interpreting results.

Patients, parents and caregivers are often very distressed by syncopal episodes. Detailed history taking, careful examination and appropriate investigations are paramount in alleviating these concerns.

## PARAMETERS

Target audience: This guide is directed at health-care professionals engaged in the care of children with syncope.

Patient population: Patients under the age of sixteen years presenting with possible syncope.

Exclusion criteria: This guideline does not apply to those with significant medical background such as neurological, cardiac, genetic or metabolic disease.

## AIMS

To provide an evidence based guide for the assessment and management of paediatric patients presenting to the Emergency Department with possible syncope.

## HISTORY TAKING

### History of Presenting Complaint

The initial management must include a careful history and examination so as to allow identification of potential aetiology and planning of investigations. Consider the patients' own account and that of a collateral witness. Consider the history in segments; prior to the event, the event itself and after the event.

| Prior to the 'event' | The 'event' itself | After the 'event' |
|---|---|---|
| Activity at the time | Length of event | Level of alertness post event |
| Time of day | Abnormal movements | Length of time to recovery |
| Position | Associated cardiac symptoms – shortness of breath, palpitations, chest pain, incontinence | Reappearance of symptoms on standing up |
| Trigger | Other associated symptoms – nausea, lightheadedness, blurring of vision<br><br>Feelings of pre-syncope (**on this occasion or previously) –** things moving away, falling away | |

### Past Medical History

Previous similar events

Corrected or uncorrected congenital heart disease

Known arrhythmia

Diabetes mellitus and blood sugar control

Menstrual history including sexual activity

### Social History

Access to medications, alcohol or illicit drugs

### Family History

Frequent fainting in first degree relatives

Known cardiac disease in family, specifically cardiomyopathies and cardiac ion channelopathies (Long QT syndrome, Catecholaminergic Polymorphic VT)

Any history of early cardiac death or Sudden Adult Death Syndrome (unexpected sudden death under 40 years of age) – including accidental drowning, single vehicle unexplained road traffic accidents

Sudden Infant Death Syndrome (very rarely related)

## EXAMINATION

Full cardiac examination

Full neurology examination

All vitals including $Sp0_2$

Single seated BP and HR is usually sufficient

If POTS is suspected, perform lying HR and standing at three minute HR. BP is not necessary. (HR difference >40bpm after three minutes standing or HR >115 is suggestive of POTS)

## BASELINE INVESTIGATIONS FOR ALL PRESENTATIONS

12 lead ECG - Calculate QTc manually in lead II or V5

Glucose level - Finger prick testing is adequate unless abnormal

BHCG - Post menstrual girls only

## DIFFERENTIAL DIAGNOSIS OF SYNCOPAL DISORDER

**Vasovagal syncope:** Commonest cause of syncope. Triggers include intercurrent illness, hot weather, missed meals, inadequate fluid intake and prolonged standing. Prodrome of awareness of feeling cold/hot, clammy and unwell, sounds becoming distant or vision greying out. If event not terminated in prodromal phase and child slumps or stiffens and falls to ground then may be associated with brief tonic or clonic movements or urinary incontinence.

**Epileptic seizure:** Careful history taking should help differentiate this from vasovagal syncope with brief tonic /clonic movements.

**Anoxic-epileptic seizures:** Status epilepticus induced by hypoxia of syncope. Uncommon presentation.

**Cardiac disease:** Syncope on exertion with associated concomitant palpitations immediately prior to syncope. Also linked with unprovoked syncope (little or no prodrome).

**Reflex anoxic seizures/ reflex asystolic syncope:** Noxious stimulus e.g. sudden unexpected shock or pain or sight of blood or needles. May have limb stiffening or jerking. Refer severely affected children to Cardiology/ General Paediatric OPD.

**Blue (cyanotic) breath-holding attacks:** Hypoxic in origin due to disordered

respiration. Toddler who becomes angry or frustrated and cries followed by prolonged end expiratory apnoea. Becomes blue, limp and may lose consciousness. May have limb jerking.

**Self-induced reflex syncope:** Occasionally seen in patients with severe learning difficulties performing a Valsalva manoeuver.

**Postural Orthostatic Tachycardia Syndrome:** Orthostatic tachycardia which may be accompanied by symptoms of cerebral hypoperfusion (light-headedness and dizziness) with sympathetic hyperactivity (palpitations and tremulousness) and relieved by recumbancy.

**Non-epileptic attack disorder:** More commonly seen in girls. Can have explosive onset. May be briefer and less stereotyped than true epileptic seizures. Lack of post-ictal drowsiness. Confirm with video telemetry EEG.

**Narcolepsy and cataplexy:** Cataplexy is sudden loss of muscle tone precipitated by laughter or startle with retention of awareness.

**Alternating hemiplegia of childhood**: Attacks can be associated with severe apnoea

**Anoxic seizures due to suffocation:** Rarely seen in Munchausen syndrome by proxy

| **Cardiac Pointers *RED FLAGS*** | **Vasovagal Pointers** |
|---|---|
| Event triggers – fright, auditory stimulus, extreme emotional stress **without** identifiable prodrome | More likely in morning |
| Syncope during exertion, including swimming (Long QT) | Prolonged standing at any time |
| Palpitations or chest pain associated with Syncope | Sight of blood/needles |
| No nausea | Nausea |
| Family history of early cardiac death, known arrhythmia or familial cardiomyopathy | History of same in parents |
| History of congenital heart disease | Clear typical prodrome preceding event which persists until recovery |
| On waking from sleep or coming on in lying position ( Long QT) | Frequency of syncope or near syncope several times a week |
| New unexplained nocturnal enuresis (due to seizure from arrhythmia overnight) | Associated postural symptoms on other occasions |

**In the presence of cardiac red flags, consideration of referral to outpatient clinic should be considered, regardless of examination or ECG findings. Centres without paediatric cardiology should discuss with the general paediatric team.**

## MANAGEMENT

See Paediatric Syncope Algorithm

## SPECIAL CONSIDERATIONS

### Indications for Admission

- Signs of cardiovascular disease on examination such as non-innocent murmur, heaves or heart failure
- Abnormal ECG including delta waves (WPW), prolonged QTc (>440 msec is borderline prolonged, with >470 msec being very concerning for development of Torsades de Pointes), T wave inversion (not appropriate for age) or LVH.
- Chest pain with syncope
- Syncope with cyanosis
- Apnoea or bradycardia requiring stimulation
- Abnormal neurologic findings
- Orthostatic hypotension that does not resolve with fluid therapy

### Recurrent Events

Potentially vasovagal or psychogenic but rarely cardiogenic.

Consider referral to a general paediatrician for overall review. Recurrent syncopal events can be problematic, for example potential injury from falls and associated psychological issues such as social isolation and self-esteem.

## COMPANION DOCUMENTS

Link to Parent Information Leaflet

Link to References and Evidentiary Table

## LINKS TO USEFUL WEBSITES

https://lifeinthefastlane.com/ecg-library/basics/qt_interval/

https://lifeinthefastlane.com/ecg-library/paediatric-ecg-interpretation/

http://www.rch.org.au/clinicalguide/guideline_index/Syncope/

http://www.uptodate.com/contents/emergent-evaluation-of-syncope-in-children-and-adolescents