

Management of the Collapsed Neonate/Infant CoMET Guideline

This guideline is for use by healthcare staff, at CoMET undertaking critical care retrieval, transport, and stabilization of children, and young adults.

CoMET is a Paediatric Critical Care Transport service and is hosted by the University Hospitals of Leicester NHS Trust working in partnership with the Nottingham University Hospitals NHS Trust.

The guidance supports decision-making by individual healthcare professionals and to make decisions in the best interest of the individual patient.

This guideline represents the view of CoMET and is produced to be used mainly by healthcare staff working for CoMET, although, professionals, working in similar fields will find it useful for easy reference at the bedside.

We are grateful to the many existing paediatric critical care transport services, whose advice and current guidelines have been referred to for preparing this document. Thank You.

Executive Lead/ Medical Director:	Andrew Furlong (LRI, UHL – andrew.furlong@uhl-tr.nhs.uk)
Author: Supervising Consultant:	Hesham Shafik – CoMET Registrar Hesham.Shafik@nuh.nhs.uk Shri Alurkar – CoMET Consultant Shrirang.Alurkar@nuh.nhs.uk
Guideline Lead:	Mohammad Zoha – CoMET Consultant Mohammad.zoha@uhl-tr.nhs.uk
Clinical Lead:-	Georgina Harlow – CoMET Clinical Lead Georgina.harlow@nuh.nhs.uk Georgina.harlow@uhl-tr.nhs.uk
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Education and Training

1. Annual Transport team update training days
2. Workshops delivered in Regional Transport Study days/ Outreach

Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Incident reporting	Review related Datix	Abi Hill – Lead Transport Nurse abi.hill@uhl-tr.nhs.uk	Monthly	CoMET Lead Governance Meeting
Documentation Compliance	Documentation Audit	Abi Hill – Lead Transport Nurse abi.hill@uhl-tr.nhs.uk	3 Monthly	CoMET Lead Governance Meeting

Management of the collapsed neonate/infant

Call COMET early for advice (0300 300 0023)
Early transfer to a tertiary center may be needed and time critical.

Presentation

- Often non-specific - **THINK neonatal collapse pathway early**
- Symptoms overlap and causes can co-exist
- **Respiratory** - increased work of breathing, apnea, hypoxia.
- **CVS** - tachycardia, hypotension, poor pulses (signs of shock).
- **Neuro** - seizures, hypoglycemia, encephalopathy
- **Others** - Poor feeding, high or low temperature, mottling

History

- Circumstances surrounding collapse
- Perinatal Hx and risk factors for sepsis
- Family Hx of CHD & unexplained death
- Drugs/medications in the household
- Social Hx + safeguarding red flags
- Feeding Hx

Remember

- Non-specific presentation, multiple potential underlying causes
- Main groups: sepsis, cardiac, metabolic disorder, trauma/NAI
- Sepsis & cardiac disease are the most common causes
- General supportive measures improve outcome

Interventions

- Presume sepsis = **Early antibiotics**
- CVS & resp. collapse = **Early ventilation**
- Think cardiac lesion = **Early Prostin** (high dose)
- Don't ever forget **glucose**

General Management

Call 2222 to gather the team with the skills for advanced resuscitation + Call COMET early)

A/B: Apply O2

C: Urgent IV access (IO if > 2 attempts), send investigations & push 10ml/kg plasmalyte or 0.9% NaCl bolus

D: Measure blood glucose (**Send hypo screen if low**) and treat hypoglycemia, treat seizures if present.

Initial investigations: FBC, U&Es, LFTs, CRP, Ca²⁺, Mg²⁺, clotting, blood gas, ammonia, cultures (blood, urine + respiratory secretions), CXR +/- AXR; consider ECG if tachycardic >200bpm.

Specific Management

(1) Sepsis:

- Treat all cases as presumed sepsis. Give antibiotics early
- Add acyclovir if: contact or rash, seizures, abnormal LFTs, coagulopathy, encephalopathy.
- Reassess after the initial bolus → give more boluses if responded even partially (up to a total of 40ml/kg.)
- Watch for signs of overload (Gallop rhythm/hepatomegaly) → stop the boluses, especially with deterioration
- If still shocked after the boluses → Start inotropes via IO/PVL (Usually adrenaline - COMET advice).
- **Intubation triggers** (Have a low threshold to intubate + seek COMET advice): Respiratory failure, impending CVS collapse, fluid refractory shock, reduced/fluctuating GCS,
- **Suggested induction** (COMET advice): ketamine, fentanyl + Rocuronium.

(2) Metabolic: **D/W COMET+ seek metabolic advice**

- Symptoms - seizures; encephalopathy; hypoglycemia; metabolic/lactic acidosis; respiratory alkalosis
- History questions: Consanguinity, deterioration after feeds
- Always check ammonia in collapsed neonate - **Hyperammonemia = TIME CRITICAL.**
- Management = Supportive (Treat hypoglycemia, stop feeds, possible sepsis, Intubate and Ventilate)
- May need to start scavengers: Sodium Benzoate, Sodium Phenylbutyrate, L-Arginine and L-Carnitine
- See CoMET Metabolic Emergencies Guideline for drug locations, emergency metabolic drug monograph

(3) Heart disease:

(A) Duct-dependent systemic or pulmonary circulation:

Suspect if:

- Cyanosis not responding to 100% oxygen.
- Poor or absent femoral pulses.
- 4 limb BP or pre/ post ductal Sats differential
- Heart murmur present, or cardiomegaly

Treatment: Low threshold to start Prostin (dinoprostone):

- 5 nanograms/kg/min if clinically well
- 20 nanograms/kg/min if unstable or absent femoral pulses
- 50 -100 nanograms/kg/minute if no response
(With COMET/Cardio advice)

- DON'T DELAY TRANSFER

- Facilitate a local ECHO if available.
- Consider limiting FiO2 + aim lower SpO2 e.g., 75-85%.
- **Remember** with Prostin: It can cause apnea and hypotension especially with doses > 10nanogram/kg/min
- Intubate and ventilate if: Preductal sats < 70%, Grunting / acidosis / poor pulses/ apnoea, or Transferring on prostin >10nanograms/kg/minute.

(B) Non duct dependent Cardiac condition:

- 1- Evidence of arrhythmia on ECG – treat as per APLS
- 2- Evidence of HF (gallop rhythm, hepatomegaly, peripheral edema, FTT) - cautious fluid resus, stop if liver ↑

Cardiac differential diagnoses

- Coarctation Aorta:** Systolic arm >/- leg gradient >20mmHg, absent femoral pulses
Management = May need high dose prostin to open duct
- Hypoplastic Left Heart Syndrome:** Poor pulses, may be pink (pulmonary over-circulation)
Management = Target sats 75-85%- titrate O2
- Transposition of the Great Arteries (TGA):** Pre-ductal (R arm) saturations < post-ductal saturations
Management = +/- emergency atrial septostomy
- TAPVD (obstructed):** Shocked & cyanosed, plethoric CXR
Management = Echo & surgery, may deteriorate on prostin
- SVT:** HR >220, unresponsive to fluid, narrow QRS
Management = As per APLS or cardiac arrhythmia guidelines
- Myocarditis:** Cardiac failure, tachycardia, small QRS
Management = Ventilation/ inotropes, consider IVIG, send viral PCRs

(4) Trauma/NAI

- ** Intracranial bleed: Focal neurological signs, raised fontanelle, retinal bleeds
- Management = Head CT -?neurosurgical problem/ NAI/?Vit K Deficient bleeding (send extended coag)
- ** Intra-abdominal bleed: Unexplained anaemia, abdominal bruising/ distention, urethral meatus
- Management = Abdominal/ head CT- ?NAI, ?Vit K Deficient bleeding (send extended coag screen)
- ** Consider C-Spine imaging in cases of trauma/NAI for floppy infants

References:

1. Penny DJ ADC 2001: 84 F141-145,
2. Cammo KA ADC 2007; 92 F117-119. Lillie, J. Challenging Concepts in Paediatric Critical Care. Oxford 2020.10.1093/med/9780198794592.003.0002.
3. CoMET Metabolic Emergencies Guideline
https://www.eastmidlandskids.nhs.uk/application/files/4016/9204/7894/Paediatric_Metabolic_Emergencies_CoMET_Guideline.pdf