

NHS CATS
Children's Acute Transport Service



Clinical Guidelines

Neonatal Collapse

Document Control Information

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Introduction

Children less than 44 weeks of completed gestational age are neonates. This group of children present with nonspecific symptoms and have potential differential diagnoses that require prompt treatment.

Assessment

Attain history and examination considering the following features:

Diagnostic Group	History	Examination	Specific Treatment
Sepsis	PROM, maternal GBS, fever in labour, HSV or HSV contact, fever in child	Fever or hypothermia, tachycardia, long CRT, hypotension, rash, hyperlactataemia. HSV (seizures, low GCS, raised LFT's or coagulopathy)	Antibiotics - cefotaxime, amoxicillin to cover listeria, vancomycin if line or MRSA possible. Consider acyclovir Local guidance may also be followed
Cardiac diagnosis - Congenital Heart disease - Arrhythmia - Myopathy	Cyanosis, breathlessness, tachypnoea, poor feed tolerance	Hepatomegaly, murmur, gallop rhythm, poor pulse volume, cardiomegaly, systolic BP gradient >20mmHg, pre/post ductal SpO ₂ difference, HR >220, hyperlactataemia	Prostaglandin (be aware of apnoeas, hypoglycaemia, hypotension, hyperthermia) Cautious fluid resuscitation. Discuss with cardiology
Metabolic Disorder	Consanguinity, deterioration after feeds, seizures	Hyperventilation, hypertonia, seizures, metabolic acidosis, hypocapnic alkalosis, hyperlactataemia, low GCS, long CRT	Check ammonia Treat hyperammonaemia (see metabolic guideline). Treat possible sepsis Discuss with metabolic team
Neurology, NAI and trauma	Drowsiness, hypotonia, poor feeding, injury, safeguarding concerns	Fontanelle, pupil changes, hypo or hypertonia, bruising (head, abdomen, body), anaemia	Treat any raised intracranial pressure Consider CT head and/or abdomen Discuss with neuro or general surgeon/consider need for blood

Initial management of neonatal collapse

- Ensure airway patent.
- Deliver oxygen.
- Assess for shock and consider signs of cardiac failure.
- Establish IV/IO access, send bloods including blood gas, glucose, ammonia, clotting, group and save and cultures
- Administer 10ml/kg fluid bolus (consider 5ml/kg if suspicion of cardiac disease) of balanced isotonic crystalloid (or 0.9% sodium chloride if not available), assess for cardiac failure, if none present this may need to be repeated.
- Antibiotics
- If signs of cardiac disease start prostaglandin, perform CXR, ECG, 4 limb BP, pre- and post-ductal saturations and refer to CATS congenital heart disease guideline.
- Chase urgent ammonia (*particularly if apnoeas are part of history*), if metabolic disorder likely, prepare metabolic infusions and refer to CATS metabolic guideline.
- Check for signs of trauma and intracranial haemorrhage; consider CT imaging. Check gas for haemoglobin and consider blood transfusion, treat any signs of raised intracranial pressure (hypertension, bradycardia), see CATS neurosurgical guideline and complete body map.
- If likely sepsis, further fluid boluses of 10ml/kg crystalloid should be administered up to 40ml/kg. Reassess after each bolus for fluid responsiveness, and signs of fluid overload (e.g. hepatomegaly, bilateral basal lung crepitations).
- Consider the need to start vasoactive drugs and consider early vasoactives in fluid-refractory shock. *Adrenaline or noradrenaline may be started peripherally* (see CATS drug calculator) until central/umbilical or intraosseous access has been obtained. If there is a high vasoactive drugs requirement with low glucose, consider hydrocortisone. Refer to CATS sepsis guideline.

Management following intubation

- This depends on the likely underlying pathology specific treatments as listed above.
- Capnography should be used to confirm tube placement and for ongoing monitoring of end-tidal CO₂.
- Confirm ETT position on CXR.
- Target saturations according to pathology.
- Monitor BP regularly and administer fluid and vasoactive drugs to support this, monitoring for signs of heart failure/fluid overload.
- Ensure antibiotics have been administered.

- Review ammonia
- Consider requirement for imaging.
- Consider requirement for more venous or arterial access.
- If a child is likely to have a cardiac or metabolic condition this must be clearly communicated to the CATS team, so an appropriate PICU bed is arranged.

Transport considerations

- **Cardiac** - target saturations according to pathology. Prostaglandin may cause apnoeas. If high dose prostaglandin is required children should be intubated and ventilated. Prostaglandin can also cause hypotension, hypoglycaemia, hyperthermia, which require monitoring.
- **Metabolic** - apnoeas can occur. Glucose should be checked and monitored. These children may develop seizures; therefore, prepare doses of anti-seizure medication for transport (lorazepam).
- **Sepsis**: children should be intubated and ventilated if they have an ongoing fluid requirement after 60ml/kg or increasing vasoactive requirement. Have more fluid boluses prepared for transport. Have an escalation plan for vasoactive support. Check and monitor glucose. Consider if the child requires blood, FFP, cryoprecipitate or platelets before transport.
- Confirm with the CATS Consultant the suspected cause of neonatal collapse and that the child has a bed in the appropriate PICU.