Clinical Guideline

WATCh – MANAGEMENT OF THE COLLAPSED NEONATE

SETTING	Wales and West Acute Transport for Children (WATCh)
FOR STAFF	WATCh Team, South West and Wales District General Hospital medical and nursing teams.
PATIENTS	Neonates (< 28 days of age) presenting to secondary care with acute collapse of unknown aetiology

GUIDANCE

This guidance outlines the immediate clinical management for collapsed neonates presenting into district general hospitals. For the clinical management of children presenting in shock with a known or suspected cardiac cause for their presentation, see the “Management of Children Presenting in Shock Who are Known or Suspected to have Heart Disease”. A summary guideline can be found on page 2 and is available on the WATCh website (www.watch.nhs.uk).

RELATED DOCUMENTS	WATCh Clinical Guideline - Management of Cardiac Collapse BRHC Clinical Guideline - Emergency Management of Undiagnosed Hyperammonaemia
AUTHORISING BODY	WATCh Governance Group
SAFETY	Call the WATCh team for advice and support
QUERIES	0300 0300 789

MANAGEMENT OF THE COLLAPSED NEONATE

IMMEDIATE MANAGEMENT TO RESUSCITATE

Evidence of poor cardiac function (tachycardia, poor/absent pulses, obtunded state)

- **Seek Immediate Senior Support and Anaesthetic/ICU presence**

1. High flow oxygen
2. Intravenous (IV) or Intraosseous (IO) access
   - Bloods (including cultures, glucose and blood gas if possible)
   - Give volume resuscitation – 5-20 mL/kg 0.9% NaCl/PlasmaLyte 148 and assess response; stop if clinical deterioration (bradycardia/decreasing pulse volumes/presence of hepatomegaly)
   - Give broad spectrum antibiotics as per local policy (e.g. Cefotaxime, Amoxicillin and Gentamicin)
3. Prepare to intubate and ventilate
   - Prepare resuscitation doses of Adrenaline (0.1 mL/kg 1:10,000) and dilute Adrenaline (0.1 mL/kg 1:10,000 diluted up to 10ml with 0.9% NaCl)
   - Complete intubation checklist
   - Select cardio-stable induction agents: **Ketamine (up to 1 mg/kg), Rocuronium (1 mg/kg) +/- Fentanyl (1 microgram/kg)**
   - Ensure ECG, oxygen saturation, blood pressure and end tidal CO_2 monitoring are in place during procedure
4. Start inotropic agent to support cardiac function – **Peripheral strength Adrenaline infusion at 0.1 micrograms/kg/min = 10 mL/hr** (see WATCh drug sheet for specific dose / diluent volume)
5. Consider starting Prostaglandin (Dinoprostone) infusion at 20 nanograms/kg/min (if second access available start prior to intubation)

ASSESS RESPONSE – DISCUSS WITH WATCh CONSULTANT FOR FURTHER ADVICE – 0300 0300 789

CONSIDER AND MANAGE POTENTIAL DIFFERENTIAL DIAGNOSES

SEPSIS	Volume resuscitation, blood cultures, full blood count and clotting, septic screen • Broad spectrum antibiotics as above AND Antivirals = Aciclovir 20mg/kg IV 8hrly	
CARDIAC / CONGENITAL HEART DISEASE **Detailed guidance in** **Management of Cardiac Collapse**	**Tachyarrhythmia HR > 220** • 12 lead ECG • Check electrolytes • Chemical cardioversion with Adenosine; capture ECG at time of cardioversion (See WATCh drug sheet for doses) • Synchronised cardioversion **Cardiomyopathy** • Intubation and ventilation as above • Very cautious filling – 5 mL/kg aliquots and reassess for hepatomegaly • Adrenaline infusion as above • Repeat blood gases - monitor lactate **Discuss with WATCh Consultant**	**Suspected Duct Dependent Cardiac Lesion** • 4 limb blood pressure measurements, 12 lead ECG and ECHO if available • Review response to Prostaglandin – increase to 30 – 50 nanograms/kg/min if femoral pulses remain absent / weak (please discuss with WATCh Consultant) • Repeat blood gases - monitor lactate • For suspected cyanotic lesions target saturations: 75% - 85% (adjust FiO_2 accordingly) • Monitor pre and post ductal saturations (right hand for pre ductal, either foot for post ductal) **Discuss with WATCh Consultant**
NON-ACCIDENTAL INJURIES / TRAUMA	• Full top to toe assessment using body map • CT scan if clinical signs present (unequal pupils, bulging fontanelle, seizures) • Treat seizures – Phenobarbitone 20 mg/kg (administered at a rate no faster than 1 mg/kg/minute) • Referral to Paediatric Trauma Team Leader	
METABOLIC DISORDERS	• Send ammonia levels (needs to go on ice), liver function tests, clotting studies, lab glucose and lactates, urine and plasma amino acids / urine organic acids • For hyperammonaemia: **urgent discussion with Metabolic Consultant** and give loading doses of Sodium Benzoate (250mg/kg over 90 minutes), Sodium Phenylbutyrate (250mg/kg over 90 minutes) and L-Arginine 150mg/kg over 90 minutes - dilute in 10% glucose unless otherwise stated • After loading doses start maintenance infusions of Sodium Benzoate, Sodium Phenylbutyrate and L-Arginine as guided by protocol • Maintain adequate glucose intake of 6-8mg/kg/minute	

GENERAL MANANGEMENT

- Ensure nasogastric tube inserted when infant intubated - chest X-ray post procedure to assess endotracheal tube and nasogastric tube position
- **Ventilation Settings**: Start with a Pressure Controlled Mode / Rate: 30-35 bpm / I Time: 0.6 – 0.8 / Positive inspiratory pressure (PIP): 20 / Positive End Expiratory Pressure (PEEP): 6 - adjust based on blood gases
- **Sedation:** Sedate and muscle relax using IV infusions of Morphine and Rocuronium as per WATCh drug sheet – consider loading dose of 50 micrograms/kg of Morphine (if cardiovascularly stable) and 1 mg of Rocuronium when starting infusions
- Establish definitive central and arterial access (consider umbilical access route)
- Urinary catheter - monitor urine output