

- Non specific presentation: hypothermia, respiratory distress, poor pulses
- Sepsis and cardiac disease commonest cause (both present as shock)
- General supportive measures will improve outcome

1. EARLY VENTILATORY SUPPORT
2. ANTIBIOTICS (presume sepsis)
3. EARLY PROSTIN (exclude cardiac lesion)
(Prostaglandin E2/Dinoprostone (Prostin))

1. Initial evaluation & resuscitation

- Tachycardia/ poor pulses/ obtunded/ low BP = SHOCK
- High flow oxygen
- Intravenous access: use intraosseous (IO) if difficult
- Push 20 mls/kg 0.9% sodium chloride (caution if signs of heart failure)
(If no signs of heart failure and still signs of shock-repeat fluid bolus)
- Antibiotics: cefotaxime 50mg/kg IV and amoxicillin 100mg/kg IV

Consider duct dependent cardiac lesion

2. Immediate investigations

- Arterial/venous gas, U+E's, blood glucose, LFTs, FBC & clotting
- Blood culture, consider LP if no contra-indications
- CXR /ECG if tachycardia (heart rate > 220 bpm, consider SVT)
- Ammonia if seizures/ encephalopathy

3. Fluid refractory shock = hypotension despite 40 mls/kg fluid

- Continue fluid boluses if response (HR improves and liver not ↑)
- **Start peripheral dopamine at 10micrograms/kg/min**
- **Intubate and ventilate**
- Central IV access or IO.
- Central dopamine 10micrograms/kg/min
- Reassess heart rate pulses and blood pressure

4. Dopamine resistant shock (use 2nd line inotrope)

- Adrenaline(ADR) if poor pulses, cold, low cardiac output
- Noradrenaline (NorADR) if vasodilated-bounding pulse/wide pulse pressure
- If ADR or NorADR >0.5 mcg/kg/min or possible Addisonian crisis (low glucose, ↓Na+, ↑K+), consider hydrocortisone 2 mg/kg IV

DUCT DEPENDENT CONGENITAL HEART DISEASE¹

- Cyanosis not responding to oxygen
- Poor or absent femoral pulses
- Heart murmur present, or cardiomegaly
(see list below regarding diagnosis of individual lesion)

Pre/post ductal saturations, 4 limb BP

Start Dinoprostone-dose depends on clinical state

- Discuss with STRS: dose is in nanograms (ng)
 - 5 ng/kg/min if clinically well
 - 20 ng/kg/min if unstable or absent femoral pulses
 - 50-100 ng/kg/min if no response-consultant approval
- Apnoea common: 1st hour and increase in dose
- Hypotension may occur with high dose

Lack of response = urgent cardiology review

DO NOT DELAY TRANSFER

- Intubate and ventilate if
 1. Preductal sats < 70%
 2. Grunting / acidosis / poor pulses/ apnoea
 3. Transferring on Dinoprostone ≥ 15ng/kg/min²

ASSESSMENT OF HEART FAILURE

- Signs: gallop, cardiomegaly, hepatomegaly
- Potential diagnosis CHD, cardiomyopathy, myocarditis
- Cautious fluid resuscitation- stop if increasing liver size

Glucose in neonates

- Monitor regularly & aim blood sugar 4-8 mmol/l
- Start 0.9% sodium chloride/10% glucose 2mls/kg/hr
- If metabolic/hypoglycaemic- calculate:

$$\text{glucose mg/kg/min} = \frac{\text{glucose}\% \times \text{mls/hr}}{\text{weight} \times 6}$$

Sepsis	Group B strep, E Coli	PROM, maternal GBS, fever in labour	→ Cefotaxime 50mg/kg IV and amoxicillin 100mg/kg IV
	Herpes Simplex	↓GCS, coagulopathy, ↑ALT, herpes contact	→ Add Aciclovir 20 mg/kg IV. High index suspicion, history often absent
	Pertussis	Apnoea, cough-pt. or contact, ↑WCC (lymph)	→ See pertussis guideline. Add macrolide. 6 hourly FBC- may need exchange Tx.
Cardiac	Coarctation aorta	Systolic arm/leg gradient > 20 mmHg	→ Urgent Prostin (may need high dose) and support (ventilation/inotropes)
	Hypoplastic Left heart	Poor pulses –may be pink= pulm. overcirculation	→ Prostin. Avoid oxygen-can cause pulm. overcirculation. Target sats 75%
	Transposition (TGA)	Preductal sats < post ductal sats	→ Urgent Prostin. If no response: urgent septostomy
	TAPVD (obstructed)	Shocked & cyanosed/CXR plethoric	→ Prostin may make worse. Need echo confirmation and surgery
	SVT	HR>220 despite fluid, fixed HR, narrow QRS	→ See arrhythmia guideline. Adenosine, if shocked: ventilate +DC shock
	Myocarditis	Cardiac failure, tachycardia, small QRS	→ Supportive (ventilation, inotropes). Consider immunoglobulin. Viral PCRs.
	Metabolic	Urea cycle defect	↓GCS, Seizures, ↑ammonia, alkalosis
	Organic acidaemia	Profound metabolic acidosis, ketone positive	→ Supportive (inotropes, ventilation). May co-present with sepsis
	Mitochondrial	↑Lactate, seizures, cardiomyopathy	→ Supportive (inotropes, ventilation). May co-present with sepsis
Trauma	Intracranial bleed	Focal neuro signs, fontanelle↑, retinal bleeds	→ Head CT to exclude neurosurgical problem/ ?NAI ?haemorrhagic disease
	Intra-abdominal bleed	Unexplained anaemia, abdominal bruising	→ Abdominal and head CT, ?non-accidental injury (NAI), ?haemorrhagic disease of newborn