

Neonatal Collapse (sepsis vs cardiac disease)

- 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. Initial evaluation & resuscitation

- Tachycardia/ poor pulses/ obtunded/ low BP = SHOCK
- High flow oxygen
- Get intravenous access: use intraosseous if difficult
- 20 mls/kg 0.9% saline push, repeat if heart rate > 160
- Antibiotics: Ben Penicillin 50mg/kg IV, Gentamycin 8mg/kg IV

Consider duct dependent cardiac lesion

Immediate investigations

- U+E's Blood glucose, ABG (not capillary), LFTs, FBC & clotting
- Blood culture, consider LP if no contra-indications
- CXR, ECG if tachycardia (heart rate > 200)

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

- Continue fluid boluses if response (heart rate responds)
- INTUBATE AND VENTILATE IF NOT ALREADY
- Start peripheral dopamine at 5mcg/kg/min (or IO)
- Get central IV access : preference for femoral venous line
- Central dopamine (max 15 mcg/kg/min)
- Reassess heart rate pulses and blood pressure

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

- Add adrenaline(ADR) if poor pulses, low cardiac output
- Add noradrenaline if bounding pulses, vasodilated
- If >1mcg/kg/min either ADR or NorADR, consider bolus hydrocortisone IV 2 mg/kg (increase vasopressor sensitivity)

1. EARLY VENTILATORY SUPPORT
2. ANTIBIOTICS (presume sepsis)
3. EARLY PROSTIN (exclude cardiac lesion)

DUCT DEPENDANT CONGENITAL HEART DISEASE¹

- Cyanosis not responding to oxygen
- Poor or absent femoral pulses
- Heart murmur present, or cardiomegaly

Measure pre and post ductal saturations and BP

- Start prostin (dose depends on clinical state):
- 5.0 ng/kg/min if clinically well
- 20 ng/kg/min if unstable or absent femoral pulses
- 50 ng/kg/min if no response and still shocked
- Apnoea common above 15mcg/kg/min
- NB hypotension occurs with high dose

Lack of response = urgent cardiology review
CONTACT STRS CONSULTANT URGENTLY
DO NOT DELAY TRANSFER

- Intubate and ventilate if
 1. Preductal sats < 70%
 2. Grunting / acidosis / poor pulses/ apnoea
 3. Transferring on prostin > 15ng/kg/min²
- To troubleshoot see list below

Dextrose in neonates

- Monitor regularly & aim 4-8 mmol/l
- Start 0.9% saline/10% dextrose 2mls/kg/hr
- Calculation for infusion required :

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

Sepsis	Group B strep, E Coli	PROM, maternal GBS, fever in labour	→ Benzyl Penicillin 50mg/kg IV + Gentamycin 8mg/kg IVI (peak level NB)
	MRSA	Unresponsive 1 st line antibiotics,+ contact	→ Add Vancomycin 10mg/kg IV
	Herpes simplex	Abnormal clotting,↑AST,family cold sores	→ Add Acyclovir 20 mg/kg IV. High index suspicion, history may be absent
Cardiac	Coarctation aorta	Systolic arm leg gradient > 20 mmHg	→ Urgent prostin (may need high dose) and support (ventilation/inotropes)
	Transposition (TGA)	Preductal sats < post ductal sats	→ Urgent prostin. If no response: urgent septostomy
	Hypoplastic left heart	Poor pulses -can be pink but overcirculating	→ Prostn. Target sats 75% . DO NOT USE OXYGEN (will overcirculate)
	TAPVD (obstructed)	Shocked & cyanosed/CXR plethoric	→ Prostn may make worse. Need echo conformation and surgery
	Myocarditis	Cardiac failure, tachycardia,small QRS	→ Supportive (ventilation, inotropes). Immunoglobulin may be beneficial
	SVT	HR>220 despite fluid, narrow QRS	→ Adenosine (escalating doses). ³ If persists ventilation + DC shock
	Urea cycle defect	Seizures,↑ ammonia, alkalosis	→ Ammonia >150mmol/L. Repeat to confirm. Metabolic opinion NB
Metabolic	Organic acidosis	Profound metabolic acidosis, ketone negative	→ 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, retinal bleeds	→ CT Scan head to exclude neurosurgical problem
	Intrabdominal bleed	Unexplained anaemia, abdominal bruising	→ Abdominal CT is suspect problem

Dose in 50 mls	Dose in 50ml	1ml/hr =	Range
Morphine	1 x weight mg	20 mcg/kg/hr	20 - 40 mcg/kg/hr
Dopamine (peripheral)	3 x weight mg	1.0 mcg/kg/min	5 - 10 mcg/kg/min
Dopamine (central)	30 x weight mg	10 mcg/kg/mi	5 - 10 mcg/kg/min
Adrenaline (central)	0.3 x weight mg	0.1 mcg/kg/mi	0.1-1.0 mcg/kg/min
Noradrenaline (central)	0.3 x weight mg	0.1 mcg/kg/min	0.1-1.0 mcg/kg/min
Milrinone infusion	1.5 x weight mg	0.5 mcg/kg/min	0.3-0.7 mcg/kg/min
Prostin infusion	30 x weight mcg	10 nanog/kg/min	5 -50 ng/kg/min

References

1. Penny DJ ADC 2001; 84: F141-145
2. Carmo KA ADC 2007; 92: F117-119
3. Dixon J ADC 2005; 90: 1190-95

STRS clinical guideline
 www.strs.nhs.uk
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