Clinical Guidance

Paediatric Critical Care: Neonatal Collapse

Summary

This guideline is for staff to use when treating the collapsed neonate - a neonate who is shocked or requiring respiratory support. It discusses assessment, resuscitation, investigations and advice when managing sepsis, cardiac, metabolic and neonates involved in trauma.

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**Initial Evaluation & Resuscitation**

Tachycardia/ poor perfusion & pulses/ hypotension/ obtunded = SHOCK

Also: apnoea, hypoglycaemia, hypothermia, irritability

**Initial resuscitation:**

- High flow oxygen & consider early intubation/ ventilation
- IV access: IO if >2 attempts
- Push 10mL/kg IV 0.9% sodium chloride or balanced crystalloid
- If fluid responsive, but still shock – repeat fluid bolus up to 40mL/kg
- If still shocked after 40mL/kg fluid boluses, consider inotropes

**Cautious fluid resuscitation if any signs of heart failure (see right)**

- Antibiotics: cefotaxime. amoxicillin. consider aciclovir

**Immediate investigations**

- Arterial/ venous gas, blood glucose, FBC, coagulation, U&Es, LFTs
- Ammonia, lactate, glucose – baseline metabolic tests
- Blood culture
- Ideally urine culture & CSF culture (unless contra-indications to LP)
- Chest x-ray
- ECG (if HR >220bpm, consider SVT – (STRS Arrhythmias link)

**Fluid refractory shock = hypotension despite 40mL/kg fluid**

- Continue fluid boluses if beneficial response with improving HR (monitor liver edge/ signs of cardiac failure)

**Start adrenaline at 0.1micrograms/kg/minute initially**

- if peripheral cannula-check working well & monitor: insert IO if concern

**Re-assess heart rate, blood pressure, pulses:**

- Poor pulses, cold, high lactate = cold shock → increase adrenaline
- Vasodilated, bounding pulses, wide pulse pressure = warm shock → add noradrenaline
- If adrenaline or noradrenaline >0.5micrograms/kg/minute or possible Addisonian crisis (low glucose, [Na]+, [K]+), consider IV hydrocortisone

**Ventilation for shock:**

- Positive pressure supports the left ventricle
- PEEP via facemask also allows continuous assessment for apnoea
- Proceed to early intubation/ventilation
- Anticipate decompensation with induction- use ketamine, fentanyl, rocuronium (avoid propofol)

**Glucose in neonates - neonates are susceptible to hypoglycaemia**

- Monitor regularly & aim blood glucose 4-8 mmol/L
- Start 0.9% sodium chloride & 10% glucose 2mL/kg/h
- Calculate **glucose delivery (mg/kg/minute) = glucose% x mLs/h weight x 6**

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**INTERVENTIONS**

1. Presume sepsis → Early antibiotics
2. CVS & respiratory collapse → Early ventilatory support
3. Think cardiac lesion → Early “prostin” (dinoprostone)
4. Don’t ever forget glucose

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**DO NOT DELAY TRANSFER**

**Intubate and ventilate if:**

- Preductal sats < 70%
- Grunting / acidosis / poor pulses/ apnoea
- Transferring on “prostin” >15nanaoagms/kg/minute

**Cardiac differential diagnoses**

**Coarctation Aorta**

- Systolic arm >-/- leg gradient >20mmHg, absent femoral pulses
- May need high dose “prostin” to open duct

**Hypoplastic Left Heart Syndrome**

- Poor pulses, may be pink (pulmonary overcirculation)
- Target sats 75-85%- titrate O2-discuss with STRS

**Transposition of the Great Arteries (TGA)**

- Pre-ductal R (arm) saturations < post-ductal saturations
- +/- emergency atrial septostomy

**TAPVD (obstructed)**

- Shocked & cyanosed, plethoric CXR
- Echo & surgery, may deteriorate on “prostin”

**SVT**

- HR >220, unresponsive to fluid, narrow QRS
- See cardiac arrhythmia guideline

**Myocarditis**

- Cardiac failure, tachycardia, small QRS
- Ventilation/ inotropes, consider IVIG, send viral PCRs

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**Other differential diagnoses (non-cardiac)**

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<th>Sepsis</th>
<th>Group B strep, E.coli</th>
<th>PROM, maternal GBS, fever in labour</th>
<th>IV cefotaxime &amp; amoxicillin</th>
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<tbody>
<tr>
<td>Herpes Simplex</td>
<td>↓GCS, coagulopathy, ↑ALT, herpes contact</td>
<td>Add IV aciclovir – low threshold to treat. History often absent.</td>
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<tr>
<td>Pertussis</td>
<td>Apnoea, cough, or contact. ↑WCC (lymphocytosis)</td>
<td>See pertussis guideline. Add macrolide. 6 hourly FBC – may need exchange Tx</td>
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<tr>
<td>Urea cycle defect</td>
<td>↓GCS, seizures, ↑ammonia, alkalosis</td>
<td>Ammonia &gt;150mmol/L. Repeat to confirm. Metabolic opinion.</td>
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<tr>
<td>Organic acidemia</td>
<td>Profound metabolic acidosis, ketone positive</td>
<td>Supportive (inotropes, ventilation). May co-present with sepsis</td>
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<tr>
<td>Mitochondrial</td>
<td>↑lactate, seizures, cardiomyopathy</td>
<td>Supportive (inotropes, ventilation). May co-present with sepsis</td>
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<tr>
<td>Trauma</td>
<td>Focal neuro signs, ↑fontanelle, retinal bleeds</td>
<td>Head CT - ?Neurosurgical problem/ NAI? Vit K Deficient Bleeding (send extended coag screen)</td>
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<td>Intrabdominal bleed</td>
<td>Unexplained anaemia, abdominal bruising/ distention, urethral meatus</td>
<td>Abdominal/ head CT - ?NAI? Vit K Deficient Bleeding (send extended coag screen)</td>
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**Reference:**