

The Critically Ill Neonate

For infants 0-28 days. At birth, please refer to NRP guidelines. Not intended for preterm infants.

Recognizing the Critically Ill Neonate:

Pediatric Assessment Triangle:

- **Appearance:** floppy, lethargic or irritable
- **Work of Breathing:** laboured breathing or apnea
- **Circulation:** cyanotic, grey/shocky, cap refill >2 sec

Consider any abnormalities in history:

- Maternal/Perinatal/Resuscitation/Postnatal

Alert Pediatric Referral Centre

Note:

- This guideline applies to neonates beyond the immediate postnatal period
- Follow NRP guidelines if within hours of newborn delivery

Initial Stabilization & Management

1. Place in warm environment (see tips below)

Cardioresp monitor, vital signs + SpO₂ (R hand) + POCT glucose

2. Airway / Breathing:

- Suction nares and ensure patency (5 Fr catheter)
- Apply O₂ as needed to keep sats ≥92%
- If RR <40 assist with CPAP (BVM ventilation if apneic or respiratory effort inconsistent), and insert NG tube (8 Fr), apply low intermittent suction

3. Circulation:

- Secure 2 peripheral IVs if possible (see tips) and send labs if possible:
 - CBC, Blood culture, glucose, blood gas, lactate, lytes, Ca, Mg
 - Obtain portable chest x-ray
- If HR <60 → start CPR (follow PALS bradycardia algorithm)
- If HR >180 → 10 mL/kg NS IV bolus over 10 min
- If HR >220 → consider SVT (see Further Management below)

4. Disability:

- If bedside glucose ≤2.6 mmol/L → give 5 mL/kg D10W push, then start D10W infusion at 4 mL/kg/hr; recheck glucose in 5 min
- Assess tone, pupils, ability to rouse, subtle tonic/clonic or facial movements

5. Always work up and treat for possible sepsis/meningitis:

- Give Ampicillin plus Gentamicin or Tobramycin; add Cefotaxime for suspected meningitis (see Drug Dosing Binder)
- Do not delay transfer to attempt LP

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Further Assessment and Management

Consideration	Features	Immediate Management
Is it the heart?		
Duct-dependent cardiac lesion	- Central cyanosis, SpO ₂ <92% despite O ₂ therapy - Differential SpO ₂ (≥3% diff between R hand-L foot) - Upper ext BP >lower ext BP	• Prostaglandin infusion (see Drug Dosing Binder for details) • Oxygen: aim for 85% SpO ₂ (once PGE started) • Judicious IV fluids: 5-10 mL/kg NS bolus as tolerated • Assess pre/post for signs of CHF: crackles, hepatomegaly:
SVT	- Fixed HR >220, no p-waves	• See PALS algorithm
Is it the lungs?		
Bronchiolitis or Pneumonia	- Laboured respirations - Wheezing/crackles present - SpO ₂ improves with oxygen	• Suction nares and oropharynx, IV fluids • Nebulized epinephrine x 1 (see Drug Dosing Binder for details) • CPAP/ BVM/ Resp support, as required
Pneumothorax (Tension)	- Laboured respirations, low SpO ₂ - Bradycardia, hypotension	• Needle thoracostomy, chest tube (see Drug Dosing Binder for equipment details)
Is it the CNS?		
Bleed/Trauma/Stroke	- Apnea; floppy tone; focal neuro signs	• Support ABCs
Seizures	- Apnea, bradycardia; increased or decreased tone - Facial movements, lip smacking, eye deviation - Subtle tonic-clonic movements	• Lorazepam 0.1 mg/kg IV x 1 over 2 minutes • See Status Epilepticus PedsPac for further details or if no IV access
Is it metabolic?		
Inborn error	- Vomiting, lethargy; alkalosis, acidosis or ↓ glucose	• NPO; D10W @ 6 mL/kg/hr (Need higher rates of dextrose infusion)
Congenital Adrenal Hyperplasia	- Ambiguous genitalia; ↓ glucose, ↓ Na, ↑ K+	• Hydrocortisone 25 mg IV push • Treat hypoglycemia: 5 mL/kg D10W IV, followed by D10W infusion at 4mL/kg/hr
Is this a GI catastrophe?		
Volvulus / GI Obstruction	- Yellow/green emesis; distended abdomen - Shock, acidosis	• Support ABCs • NG low intermittent suction; fluid boluses IV NS 10-20 mL/kg boluses PRN
Diaphragmatic hernia (CDH)	- Laboured respirations - Scaphoid abdomen	• Intubate and ventilate if suspected CDH; call Anesthesia for help, if available

Practical Tips:

Keeping baby warm

- Use overbed warmer with temp sensor, hat, warmed blankets, Bair hugger™
- Warm resuscitation room, closed doors

If difficulty with peripheral IV access

- Consider scalp veins for IV access
- Can insert umbilical vein catheter (UVC) up to 7 days of age
- Obtain intraosseous (IO) access using distal femur, tibia or proximal humerus

Airway/Respiratory Support

- Can provide CPAP/PPV with flow inflating bag (use caution with pressures)
- Ensure NG tube to decompress stomach

Discussion with Pediatric Referral Centre

- Difficult vascular access
- Endotracheal intubation and ventilation
 - Good BVM ventilation is sufficient for most cases
- Diagnostic consideration and management
 - Prostaglandin treatment for suspected duct-dependent cardiac lesion
 - Hydrocortisone treatment for suspected Congenital Adrenal Hyperplasia
 - Acyclovir for suspected HSV infection (focal seizure, skin lesions, CSF pleocytosis, ↑ liver enzymes)

Defer further labs/imaging to referral centre