



## July 29 Pediatric Resuscitation

# Interprofessional SIM Clinical Debrief

### Case 1- Neonatal Sepsis

- Differential diagnosis for critically ill neonate
  - o Common 3 include
    - Sepsis
    - Ductal dependant heart disease
    - Metabolic disturbance (i.e. CAH)
    -
- Normal vitals in a newborn?
  - o **Heart rate 110-160– LOW is < 95, high is > 180.** Important to consider absence of fever here. Generally, for every 1-degree Celsius temperature elevation = 10 bpm increase
  - o Normal blood pressure systolic 65-90, hypotension is < 60-70 systolic
  - o **Another easy way to remember normal systolic BP is  $70 + 2 \times \text{AGE (years)}$**
  - o RR 40-60
  - o **Practical Point:** consider carrying **TREKK pocket cards re normal vitals**, also consider smartphone app **“PediSTAT”** for fast access to this important information
- **Remember pre and post-ductal saturations!**
  - o Important to consider attaining these numbers from the start of newborn resuscitation, as it can lead you towards or away from cardiac pathologies such as ductal dependent lesions (IE when the ductus arteriosus begins to close, sometimes a few days after birth, infants can present in shock like states)
  - o **Practical point:** this tends to be inaccurate in the critically ill neonate. Consider determining if neonate is ill due to cardiac cause if FiO2 100% and SpO2 not reponding well (shunt)
- What defines shock in a neonate?
  - o **Cold vs warm (explanation below). Cold MORE COMMON**
  - o Cap refill > 2 seconds, tachycardia, altered mental status, cool extremities, poor urine output THEN hypotension (LATE, LATE FINDING).
  - o **Practical Point:** Place hand on infants stomach, if handprint visible for several seconds, this is a sick baby

- Cold vs warm shock
  - **Infants will often present in “cold shock”—poor peripheral perfusion.** Systemic vascular resistance (SVR) is high, resulting in poor cap refill etc. That is, **infants can vasoconstrict better**, causing mottling/cool extremities, and hypothermia. **Shock is from poor inotropy**
  - “Warm shock” is more common in adults—“distributive”, poor SVR
  
- Treatment of neonatal shock
  - Reasonable to **start with fluids—generally 10-20 cc upfront over 10 minutes**, may consider repeating
    - Be cautious with fluids **if suspecting cardiac cause of shock. Start with 5 cc bolus.**
  - Up to 28 days of life, **dopamine** is considered reasonable vasopressor, PARTICULARLY IN COLD SHOCK. Start at 5 mcg/kg/min and titrate up to 10 mcg/kg/min.
    - **5 – 10 mcg/kg/min generally results in inotropy** and increased CO, with little effect on SVR
    - Over 10 mcg/kg/min results in more systemic vascular resistance
  - Can also consider **epinephrine infusion** as well
  - **Practical Point:** Be very cautious when suspecting cardiac cause of shock, as increasing systemic vascular resistance can result in increased afterload and worsened shock. Hence, dopamine or epinephrine are good choices as they have more Beta 1 effect with more inotropy and less effect on SVR. **AVOID LEVOPHED**
  
- ALWAYS check serum glucose in sick neonate, REGARDLESS of cause (sepsis, CAH) as they can be adrenally deplete/adrenal insufficiency
  - **Practical Point:**
    - **Rule of 50**
      - **5 cc/kg of D10W**
      - **2 cc/kg of D25W**
      - **1 cc/kg of D50W** → avoid in infants as this is highly viscous and likely not able to be pushed into tiny veins
  
- Antibiotics in neonatal sepsis
  - Most common bacteria in include
    - GBS, E coli, listeria, Staph aureus
      - Therefore, **gent and ampicillin** suggested at 4 mg/kg and 75 mg/kg respectively. Instead of gent, can use **cefotaxime**
    - If seizure, or signs of meningitis (i.e. seizure) consider adding **acyclovir**
  
- Intubation
  - Cuffed vs uncuffed tube—preference?
    - Size is age/4 + 4 for UNCUFFSED
    - Age/4 + 3.5 for CUFFED
  - Laryngoscope size
    - Use Broselow tape
  - Induction medications
    - Ketamine and rocuronium considered safe
    - Avoid propofol in this case given shock-state

- Post-induction sedation
  - Avoid propofol re propofol infusion syndrome higher in children
  - Fentanyl, midazolam reasonable

## Case 2- Infant SVT

- Vagal maneuvers for SVT can be considered first
  - Ice bag to face—fill bag with ice, fill with water (to allow it to conform to face) place over face for at least 10 seconds. Vagal response/diver's response.
  - Inversion technique—hold baby upside-down for several seconds.
  - In either of these cases, WARN the patient and parents as this can be very distressing to both parties
- Initial adenosine dose is 0.1 mg/kg
  - If this fails, repeat at 0.1 mg/kg
- If unstable, or no response with adenosine, consider SYNCHRONIZED cardioversion
  - 0.5-1 J/kg first
  - 2 J/kg if failed first attempt