Scenario: 10-day old Neonate with Critical Coarctation of the Aorta

Learners	Goals	Objectives	Strategy	Assessment
Emergency	Review and practice	1. Identify cardiogenic	1. High fidelity	1. Critical action
Providers	recognition of:	shock in the neonate	simulation	checklist
	1. Ductal-dependent congenital heart disease	2. Demonstrate prioritization of ABCs with continued reassessment	2. Structured debriefing	2. Global Assessment Scale
		3. Verbalize the differential diagnosis of shock in the newborn period		
		4. Obtain rapid IV/IO or UV access		
		5. Perform RSI in the context of cardiogenic shock in an infant		
		6. Recognize and treat hypoglycemia in the infant in shock		
		7. CCEMTP: Administer PGE to the infant with shock		
		8. CCEMTP: Administer empiric antibiotics to the infant in shock.		

Defined Team Roles:

- Team leader:
- Airway /Breathing:
- Circulation/IV Access/Monitor/Fluids:
- Medications
- Family member (parent):
- Debriefing:
- Simulator:

Scenario Flow

- Medical Setting: Home
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- **EMS Call:** Parents noted that the baby had been feeding poorly for 3-4 days, decreased urination, and today has been "breathing fast" and has become "lethargic." Fire arrives and describes pale, limp infant with cold extremities, tachypnea, and tachycardia. Unable to obtain a BP, unable to obtain IV access. VS: HR 180, RR 40s, Pox not picking up.
- **Preparation:** Roles and expectations verbalized, including potential need for: IV/IO access, RSI Estimates weight at 3 kg, Consider call for additional transport/flight depending on where you are
 - Critical Actions: Anticipates airway equipment, RSI meds, IO, umbilical line equipment
- **Patient eval:** Pale, intermittent grunting with rapid respiratory rate, poor tone.
- **VS**: HR 180, RR 48, BP unable to obtain, POX unable to obtain, if obtains temp = 36°C
- Physical Exam:
 - Critical Actions: Applies high-flow oxygen via non-rebreather, attaches monitors, calls for IV access with 10cc/kg NS bolus. *Closed loop communication*: 10cc/kg = 30cc NS bolus; repeats back. Exposes infant
 - o **Airway**: Patent
 - o **Breathing**: Intermittent grunting, clear BS bilaterally, tachypneic
 - Circulation: Palpable brachial pulses, very weak femoral pulses, unable to appreciate distal pulses in feet.
 - Critical Actions: Limits attempts at PIV to 3 attempts or 90 seconds (CCEMTP Prepares umbilical stump with wet saline), or calls for EZ-IO drill. Recognition of shock. Verbalizes differential diagnosis: "We have a critically ill 10-day old infant in decompensated shock with poor perfusion. This could be overwhelming sepsis or congenital heart disease." Calls for glucose. Places UVC or IO. Administers IVF bolus: 10cc/kg = 30cc.
 - **Disability** (GCS): Eyes closed at rest, grunting,
 - **Head**: Atraumatic, sunken fontanelle. {PERRL: 4mm to 2mm, if checked} Nares patent, dry lips/tongue, normal TMs.
 - **Thorax**: Tachycardic with possible gallop, harsh murmur.
 - **Abdomen**: Non-distended, non-tender, no organomegally

- Critical Actions: IF team is CCEMTP, they can begin empiric antibiotics: Ampicillin 50mg/kg = 150 mg UV/IO and Gentamicin 4mg/kg = 12mg. Requests STAT PGE drip from pharmacy at 0.05mcg/kg/min (0.1mcg/kg/min OK).
- Pelvis / Extremities: Cold extremities, mottled, 10sec capillary refill.
- Includes parent in resuscitation room.
 - Frightened teenage parent reveals uncomplicated pregnancy with no pre-natal care, uncomplicated NSVD, discharged DOL 2, bottle feeding well until 3-days ago. Has not checked temperature, noted "fast breathing" and "hard to wake up to feed."
 - Explains critical condition of infant, need for intubation
- **Reassess VS, ABCs**: HR 185, RR 46, BP unable to obtain, POX unable to obtain. Patent airway, clear BS, occasional grunting, cold extremities with extremely delayed capillary refill.
 - o **Bedside glucose**: 32
 - Critical Actions: Orders D10 bolus: 4cc/kg (2-5 acceptable) = 12cc UV/IO push. Orders second bolus of NS, 10cc/kg = 30cc. RSI medications, prepares for RSI. Closed loop communication. Medications reviewed with ordering physician and nursing staff that prepares medication, tube size and length discussed between team leader and airway physician:
 - Critical Actions: RSI attempted, successful Closed loop communication: ETT confirmed with team by:
 - Checking breath sounds
 - Checking rapid ETCo2 Detector
 - Vitals signs re-assessed including pulse oximetry
 - Critical Actions: NG tube placed
- **Reassess VS, ABC:** HR 190, RR 46, Unable to obtain BP or POX
 - **Critical Actions:** Requests repeat bedside glucose. Administers empiric antibiotics. Orders PGE infusion 0.05mcg/kg/minute.
- Summary
- "We have a 10-day old male infant in de-compensated shock. Given the difference between upper and lower extremity pulses and the infant's age, this is likely to represent cardiogenic shock from a ductal-dependent lesion, but we cannot rule out sepsis. We have established a definitive airway with a 3.5 uncuffed ETT at 10cm at the lip, and placed an NG tube. We have established IO (or UVC) access, given two boluses, and empiric antibiotics.

We have also given dextrose for hypoglycemia, we have started a PGE drip."

Debriefing

- Team Leader:
 - O How did that feel?
 - o What do you think went well?
 - O What could have gone better?
 - o I noticed that you didn't ----- {Discuss missed action items}
 - o I was concerned based on -----{Discuss specific items}
- Other team members:
 - o How did that feel?
 - o What do you think went well?
 - O What could have gone better?
 - o I noticed that you didn't ----- {Discuss missed action items}
 - o I was concerned based on -----{Discuss specific items}
- Does anyone else in the room have any questions or comments?