

Section 1: Case Summary

Scenario Title:	Pediatric Sepsis
Brief Description of case:	5-month-old male (6kg) being transported for septic shock, who requires resuscitation in the referring ED room before transport.

Goals and Objectives	
Scenario Goal:	To review the management of an infant with septic shock before transport from the referring ED per the Surviving Sepsis Campaign International Guidelines for the Management of Septic Shock and Sepsis-Associated Organ Dysfunction in Children 2020 .
Learning Objectives: (Medical and CRM)	<ol style="list-style-type: none"> 1. Verbalize vital signs and symptoms of severe sepsis/septic shock in an infant 2. Apply sepsis guidelines effectively (2020 Surviving Sepsis Campaign) 3. Implement interventions specific to managing a deteriorating patient with septic shock

Learners, Setting, and Personnel			
Target Learners	<input type="checkbox"/> *Transport Team Personnel (based on each center team configuration)		
Location	<input type="checkbox"/> In Situ (Transport vehicle)	<input type="checkbox"/> Simulated vehicle	<input type="checkbox"/> Other:
Simulation personnel	<input type="checkbox"/> **Facilitator(s) / Sim operator <input type="checkbox"/> Embedded Participants: <ul style="list-style-type: none"> ● ED personnel (to give the report in section 3) ● MD for medical control-via phone ● Vehicle operator if utilized by the team 		

Personnel:

*Transport team will include members based on the team or transport center configuration that would typically be used for the ground transport of an infant with this referral indication.

**The simulation team will provide facilitators and the opening vignette, including referral information.

Type of simulator:

Type of Simulator:

Infant – mid to high technology

ImPACTS

IMPROVING PEDIATRIC ACUTE CARE THROUGH SIMULATION

Examples: Baby HAL, SimBaby Laerdal, or SimNewB Laerdal.

Supplies and Fluids	Medications
<p>Infant/Pediatric Transport Cot Transport Bags Defibrillator, pads, electrodes</p> <p><u>Respiratory equipment</u> Nasal cannula Masks / NRB NPA, OPA Bag/mask sets LMA</p> <p><u>Intubation supplies</u> Range of sizes - Endotracheal Tubes - Stylets - Laryngoscopes Colorimetric CO2 detectors Capnography cannula Transport Ventilator Suction supplies and devices</p> <p><u>Fluids and Flushes</u> D5 ½ NS D5NS, NS, LR D10, D25, D50 IV & IO supplies Pull-Push Setup – 3 way stopcock with 20 or 60mL syringe</p>	<p><u>Code Medications</u> Epinephrine 0.1mg/mL (code dose) Based on center supply/concentration Amiodarone 50 mg/mL (undiluted, straight drug) Bicarbonate 0.5 mEq/mL (4.2%) or 1 mEq/mL (8.4%) Calcium (Chloride or Gluconate) 100 mg/mL</p> <p><u>Intubation Medications</u> Lidocaine 10 mg/mL Fentanyl 50 mcg/mL Atropine 0.1 mg/mL Etomidate 2 mg/mL Ketamine 10, 50, 100 mg/mL available NMB: Rocuronium 10 mg/mL, Vecuronium 10 mg/mL (has to be reconstituted with 10 mL NS)</p> <p><u>Hyperosmolar Meds</u> Hypertonic saline (3% HTS) Mannitol 20%, 25%</p> <p><u>Seizure meds</u> Lorazepam 2mg/mL and 4mg/mL Midazolam 1mg/mL and 5mg/mL Diazepam 5mg/mL Phenobarbital 65mg/ml or 130mg/mL Levetiracetam 100 mg/mL – depends, can vary! Valproic Acid 100 mg/mL Fosphenytoin 50mgPE /mL</p> <p><u>Antibiotics</u> generic antibiotics</p>

These supplies and equipment should be available in a fashion that mimics the actual supplies for the transport team.

Section 2: Information to Transport Team upon Deployment

(Transport team will be in the waiting room or any other location that is not the transport vehicle)

Initial Report (Can be via phone or by paging depending on the center)					
Patient's Name: Johnny	Age: 5 months	Gender: Male	Weight: 6 kg		
Presenting complaint: Lethargy					
RR: 60	HR: 180	O ₂ Sat: 88%	BP: 70/30	Temp: 38.9	F _i O ₂ : 100
Blood glucose: 120 mg/dL			GCS: 3		
<p>Narrative: 5-month-old male being transported by pediatric critical care transport team (CCT) from the referring hospital ED to accepting PICU. Parents brought him for two days of fever, decreased energy, and appetite. He was found to be lethargic with tachypnea and saturations in the high 80s. Calculated transport time 20 min.</p>					
Allergies: None					

Past Medical History	Current Medications
Previously healthy infant born full-term after uncomplicated gestation Immunizations up to date	None

Section 3: Information to Transport team upon arrival to referring ED (transport team is at bedside)

Referring ER Report					
<p><u>ER nurse at the bedside states:</u></p> <p>This is Johnny: He is a 5-month-old previously healthy infant presenting with two days of fever, lethargy, and decreased appetite. On arrival, he was tachypneic, tachycardic, grunting, with saturations in the high 70s, placed on NRB with improvement in his saturation to the high 80s, but remained tachypneic. Initial CBC/BMP/Blood Cx were done, and CXR was obtained, which showed right-sided infiltrate/pneumonia. Given his work of breathing and hypoxemia, he was sedated with Ketamine 6mg and Rocuronium 6 mg and intubated with 3.5-cuffed ETT before the team’s arrival. He received a dose of ceftriaxone (300 mg) and a 120 mL normal saline bolus IV over 20 min. He has one right antecubital PIV. The patient is on the ventilator at the ED with the current settings: RR 26, TV 7mL/kg, PS 5, PEEP 5, FiO2 50%</p> <p>Most recent VBG post intubation: pH 7.22 pCO2 50 pO2 35 HCO3 8 BE -9</p> <p>COVID negative</p>					
Vital Signs					
HR: 170	RR: 26	SpO ₂ : 94%	Temp: 38.9	BP: 65/33	
Physical Exam					
If a physical exam finding is not specified in the case, it is within normal limits.					
Cardiac: Tachycardia, Cap refill 3 seconds			Neuro: Sedated and paralyzed, Pupils 3mm reactive		
Respiratory: Rales/crackles on the right side only, no wheezing			Head and Neck: normocephalic atraumatic		
Abdomen: Soft, bowel sounds present			MSK/Skin: No rashes, no petechiae		
If asked what labs were done:			Medications		
<p><u>I-stat/VBG/Chemistry:</u> Na 134 K 4.7 Cl 100 CO2 11 BUN 22 Cr 0.6 iCal 1.10 Glucose 120 Lactate 5.0</p> <p><u>Coagulation profile:</u> PT13 PTT 35 INR 1.5</p> <p><u>CBC:</u> Hgb/Hct: 10/30, Plt: 170, WBC 26K</p> <p><u>Blood Cx</u> pending</p>			<p><u>If asked what medications were given for induction:</u></p> <p>Ketamine 6 mg IV and Rocuronium 6 mg IV 20 minutes ago</p>		

Following the initial report and then the ED report to the transport team, the team will be instructed to start the actual care of the patient in the ED room.

Section 4: Scenario Progression-Treatment by Transport Team at referral ED

(This will be the beginning of the actual simulation at the ED. The transport team will do bedside interventions given the unstable hemodynamics. If a team calls medical control, they will prompt the team to stabilize the patient before transport)

Scenario States, Modifiers and Triggers			
Patient State/Vitals	Patient Status	Learner Actions	Modifiers & Triggers to Move to Next State
1. First Phase (Duration 5 min) Rhythm: Sinus tach HR: 185/min BP: 60/25 RR: 26/min O ₂ SAT: 95% on the vent T: 38.9°C	Cool centrally and peripherally, sedated	*Expected Learner Actions <input type="checkbox"/> Verbalize abnormal vital signs <input type="checkbox"/> Obtain a second access IV/IO <input type="checkbox"/> Give a 10-20 mL/kg fluid bolus <input type="checkbox"/> Attach ETCO ₂ <input type="checkbox"/> Assess physical exam findings	- With the bolus, HR comes down to 170 over 3-5 min - If asked about CR, 3-4 seconds, same pulses
2. Second Phase (Duration 5 min) HR: 170 BP: 65/33 O ₂ SAT: 95% RR: 26/min O ₂ SAT: 95% on the vent T: 38.9°C	Cool peripherally, warm centrally, sedated	*Expected Learner Actions <input type="checkbox"/> Give additional 20 mL/kg <input type="checkbox"/> Prepare inotropic agent (crackles/wheezes) <input type="checkbox"/> Consider a second antibiotic <input type="checkbox"/> Re-assess between boluses	- With the additional bolus, HR comes down to 155 over 3 min - If asked about cap refill, 3 seconds, better pulses
3. Third phase (Duration 5 min) HR: 155 BP: 70/40 O ₂ SAT: 95% RR: 26/min O ₂ SAT: 95% on the vent T: 38.9°C	Warm, sedated	*Expected Learner Actions <input type="checkbox"/> An inotropic agent is infusing <input type="checkbox"/> Contact the med control to update <input type="checkbox"/> Re-assess exam after the bolus/inotrope	- BP improves to 70/40 over 2 minutes after starting inotrope - With the inotropic agent hanging and the additional bolus discussion, the case ends

*** Team can contact medical control anytime during the case for recommendations based on their center practice and policies. If medical control contacted:**

“Hi this is Dr. White, can you tell me about this patient, I just took over from night shift”.

IF no suggestions from team to start inotropic support OR administer second antibiotic encourage referring to protocol/policy.

Appendix A: Laboratory Results

ED VBG pH 7.22 pCO₂ 52 pO₂ 35 HCO₃ 8 BE -9

If the transport team obtains VBG, please share results based on what phase in the scenario the ABG is obtained:

Phase 1: pH 7.23 pCO₂ 50 pO₂ 40 HCO₃ 8 BE -14

Phase 2: pH 7.29 pCO₂ 48 pO₂ 40 HCO₃ 12 BE -11

Phase 3: pH 7.30 pCO₂ 48 pO₂ 40 HCO₃ 14 BE -9

CBC: Hgb/Hct: 10/30, Plt: 170, WBC 26K

BMP/chemistry: Na 134 mEq/L, K 4.7mEq/L, Cl 100 mmol/L, CO₂ 11 mmol/L, BUN 22 mg/dL, Cr 0.6 mg/dL, iCa1.10 mmol/L, Glucose 120 mg/dL, Lactate 5.0

Appendix B: X-rays

CXR with unilateral right-sided infiltrate/pneumonia

