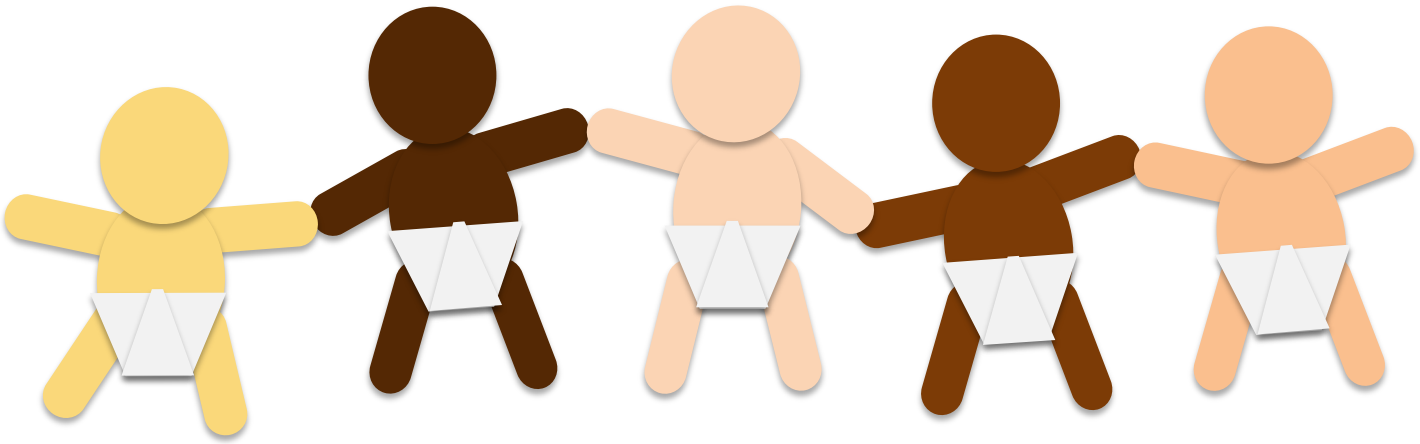
ImPACTS ED 2022

Simulation Guide



Emergency Department

Contents
with links to pages

ImPACTS

IMPROVING PEDIATRIC ACUTE CARE THROUGH SIMULATION

To ensure a successful simulation day for everyone here are some simple steps to complete **PRIOR** to simulation day:

- ❑ Pre-simulation virtual or in person meeting with PECC and ImPACTS one week prior to simulations to ensure learner attendance, supplies, logistics, meeting time day of simulation. Approximately 30 minutes.
- ❑ Confirm with PECC that learners have access AND complete the Pre-Survey prior to simulation day. Learner Survey
- ❑ Remind the PECC to review the simulation guide and complete the PECC survey. All resources and survey for the PECC can be found: ImPACTS Website (Password: ImPACTSsim)
- ❑ Confirm with ImPACTS project manager (white20@iu.edu) that learner pre-surveys had been completed prior to simulation day

PECC Survey

Learner Survey

IMPROVING PEDIATRIC ACUTE CARE THROUGH SIMULATION

Please use the below e-mail template to share with all leaners signed up for simulation day. Please send 24-48 hours prior to sim day.

Thank you for signing up for pediatric simulations tomorrow, **DATE/TIME** in the **SPOKE SITE ED**.
We are excited that content experts from the **HUB SITE** team will join us to conduct these three simulations in our ED.

In advance of the session can please complete the attached survey. This should take approximately 10 minutes.
https://iu.co1.qualtrics.com/jfe/form/SV_5jXdF2XKViyBvro

The topics of the curriculum will be status epilepticus and newborn resuscitation. This simulation is the first part of a 12-week asynchronous peds-curriculum that has been created to support community EDs. After tomorrow's simulation you will receive weekly links to BRIEF learning activities (podcasts, videos, choose your own adventures- attached PDF). At the end of 12 weeks, we will come back together to apply what you have learned from tomorrows sim + these resources in another simulation session!

Please bring whatever resources you typically have on shift (stethoscope, phone, etc…).

Preparation

- ❑ Review this entire guide and become familiar with scenarios.
- ❑ Utilize the Prebriefing / Debriefing Scripts, Prompts and Resources.
- ❑ Review the Checklists prior to simulations
- ❑ Remain in constant communication with PECC to ensure attendance, equipment/supplies, and space to run simulations. Confirm 24 hours prior and morning of simulations with PECC that space is available and minimum learners will be attendance
- ❑ Communicate with PECC "no go" criteria (i.e. ED census surge)
- ❑ Confirm with PECC that all learners have complete the learner surveys **PRIOR** to initial simulation.

Equipment and Supplies

- ❑ Plan to arrive early (typically 1 hour before simulations begin) to set up
- ❑ Ensure that all simulators are functioning.
- ❑ Collaborate with PECC to ensure equipment and supplies are available for use. List of equipment and medication needed for each scenario ****insert link to supply page of each scenario******
- ❑ Encourage PECC to communicate if unable to obtain certain equipment and supplies so they Hub site can supply if needed

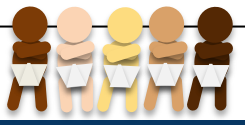
Schedule

Introductions/Overview (0-15 minutes)
Who we are: Hub team member introductions
Who you are: names/experience for leaners

We will start with an orientation to the environment and simulation mannequins. Next, we will conduct the simulations. During the simulation, your team will use available equipment, guidelines, and resources to simulate caring for a critically ill child in the ED. Each simulation will be followed by a debriefing discussion facilitated by our team. We will end with a feedback survey about the experience and simulations. Please see the pre-brief script on the next page for more details.

Simulation
Simulation Anaphylaxis (15 min – 40 min)
Simulation Status Epilepticus (40-70 min)
Simulation Neonatal Delivery (70-100 min)

Group wrap-up
Answer any questions or concerns about the overall experience
Reiterate completing asynchronous weekly education that will be sent out via email



ImPACTS

IMPROVING PEDIATRIC ACUTE CARE THROUGH SIMULATION

Learner Pre-Survey

IMPROVING PEDIATRIC ACUTE CARE THROUGH SIMULATION

Site Name:	Date	Team 1 2

Name	E-mail	Role (MD, RN, RT, etc)	Years in Role

Best practices for establishing psychological safety in simulation.

Basic Assumption: "We believe that everyone participating in our activities is intelligent, capable, cares about doing their best and wants to improve."
Center for Medical Simulation, Boston MA

Prebrief

Welcome your team, make introductions:
"This simulated resuscitation is to practice our team's response to an emergency. We will spend about 15 minutes in simulation, then we will debrief for 20 to discuss what went well and what could be improved with input from the team. Even though it is not real, and the manikin can't be harmed, everyone will get the most out of this scenario if we take it as seriously as possible."

Describe

Describe simulator capabilities, equipment and how to participate:

"Act as you would within your role. You will not get monitor feedback unless your equipment is attached to the patient. Airway equipment should be attached to oxygen, etc. Try to make tasks realistic and timely using your equipment. Please ask for clarifications."

Demo

DEMO: Closed loop communication.
Know your role and task designation. Use closed loop communication to verify and complete.

Leader: Tech, we need an EKG.
Tech: OK going to get the machine.
Tech: OK, I've got the EKG machine here.

Disclose

If a safety concern arises during the simulation, I will state:
"Let's take a safety pause."
If a real event happens that is not part of the simulation, I will state:
"This is not a simulation."
Disclose if video recording, privacy and permission.

Anaphylaxis

After this activity, the team will be able to manage an infant with anaphylactic shock presenting in the ED with emphasis on the following objectives:

1. Verbalize vital signs and symptoms of anaphylactic shock in an infant
2. Implement interventions specific to managing a deteriorating patient with anaphylaxis

Overall Scenario Schema

Link to Pre-briefing Script

2 mins

Assign or Coach them to allocate roles

Team Leader	Pharmacy	Bedside RN
Respiratory Tx	Medication RN	Technician

6-10 mins

Stem: 10-month-old female (9 Kg) being presents with anaphylaxis, who requires resuscitation in the referring ED room.

Co-facilitator prompts are indicated in these boxes

15 mins

Link to Debriefing Script

10 mins

Option: re-run scenario

Scenario script:

"I will assign each of you roles, including team lead, bedside survey and airway provider and parent liaison. You will hear a brief EMS patch and then will have two minutes to prepare for the arrival of the patient. You will now hear the EMS dispatch."

Facilitator states: "We are 1 minute out with a 10-month-old female with wheezing, vomiting and coughing. No meds given."

2 minute warning

- Team assembles + confirms roles
- Calls for help & prepares equipment

General equipment:

- Monitoring supplies
- PIV start equipment

Respiration equipment:

- Nasal cannula
- Masks/NRB
- NPA, OPA
- Bag/mask sets
- LMA
- Capnography cannula
- Suction supplies and devices

Medications:

- Epinephrine 1:10,000
- Epinephrine 1:1,000
- Diphenhydramine
- Methylprednisolone
- Albuterol

Fluids and flushes:

- D5NS, NS, LR
- D10, D25, D50

Case progression: Anaphylaxis

"Mom was cooking in the kitchen while her child was playing on the floor, when mom noticed that the child had problems breathing and called 911 "

Time 0

- Prepare room and staff for patient arrival

IF asked facilitator states:
"The child is crying, coughing, wheezing and vomiting.
There are hives on face, neck and shoulders.
She looks in distress and has difficulty breathing."

1

Sinus tach
HR 170/min
BP 75/40
RR 60/min
O_2 Sat 95% on RA
T 36.7 °C

- Verbalize abnormal vital signs
- Verbalize possible anaphylaxis
- Assess airway
- Assess physical exam findings

(wheezing should be noted on exam)

- If correct dose of IM epi not administered proceed to next phase

- If correct dose of IM epi administered proceed directly to recovery phase

"Airway is completely obstructed, patient is in respiratory depression and anaphylactic shock"

2

HR 210
BP 50/35
O_2 Sat 88%
RR 60/min
T 36.7 °C

- Administer IM Epi
- Establish IV access
- Administer 20 mL/Kg rapid NS bolus

-If correct dose of IM epi administered proceed directly to recovery phase

"The child is starting to breathe well. Vitals are returning to normal"

3

HR 190
BP 120/80
O_2 Sat 95%
RR 60/min
T 36.7 °C

- Simulation ends here

Wrap

- Team leader hands off to receiving NICU/ PICU/ Floor team
- Updates family

After team performs handoff, state "This concludes the simulation" and move to debrief.

Link to resource page: educational content

Patient Rash Photo

Parent Script Instructions

Throughout case make sure to ask for updates every 1-2 minutes if not provided by team. Expect people to inform you of what is going on, you can ask for updates. You will be confused and frustrated.

1. Upon arrival, state: *"I was cooking in the kitchen, Sarah was on the floor playing. Then suddenly she had trouble breathing and I called 911 immediately because I got worried"*

2.**If asked**, give this information:

- Signs/symptoms: she is crying, coughing and vomiting.
- Allergies: None
- Meds: None
- Past medical history: She was born term, at 39 weeks. She is healthy, sees doctor regularly (last visit 3 weeks ago), vaccinated, breastfed, normal growth and development.
- Last meal: breastmilk and breakfast cereal this morning
- Events proceeding: Nothing unusual. She hasn't been sick. She was playing on the floor while mom was cooking in the kitchen.

*** Note everything else that they may ask is normal or you don't know.

3. **If asked about choking hazards: "***I don't have any small toys because I know they can be dangerous. I am wondering if some of the peanuts I was cooking with got on the floor…"*

4. In 5 minutes the child will stop crying because of complete obstruction. Ask: *"Why has she stopped crying? Is she better now? What is happening?"*

5. If/when they give her oxygen, ask: *"Why is that needed, does she have trouble breathing?"*

6. If they start talking about intubation or bring intubation equipment, ask: *"Why does she need to be intubated? I don't understand? Won't that hurt her?"*

7. If after 10 minutes the child is still not getting better (should start crying, breathing better, etc.) ask: *"What is happening? Why is she still not getting better?"*

Data Collection Form: Anaphylaxis

Date: _____ Location: _____

□ Team 1 □ Team 2 Case start time: _____ Case end time: _____

#	Metrics	Yes	No
1	6 kg (4.8-7.2) Wt used: _____ kg		
2	**Airway assessed**  Looked in mouth in the first 3 minutes		
3	**Wheezing verbalized in the first 3 minutes** 		
4	**Anaphylaxis verbalized** ("allergic reaction" not acceptable)		
5	**Administered epinephrine IM** □ Correct dose (0.04-0.1mg for 6kg) □ 1:1000 □ 1:10,000 □ EpiPen Jr (0.15 mg) _____ml _____mg		
6	**Started inhalation with** □ Albuterol □ Recemic epinephrine		
7	**Placed IV**		
8	**Administered rapid fluid bolus** 20 cc/kg		
9	**Family presence** The parent was allowed to stay		
10	**Family-centered care** Team interacted with parent throughout the case		
11	**Disposition** □ Admit □ Observe in the ED (4-6 hours)		
12	**Cognitive aids used (mark all that apply):** □ Broselow □ Smartphone/Online reference □ Other _____ □ None		
13	**Medications given (mark all that apply and write the dose):** □ Dexamethasone _____ □ Diphenhydramine _____ □ Other _____ □ Other _____		

Notes:

Status Epilepticus

After this activity, the team will be able to manage an infant with status epilepticus presenting in the ED with emphasis on the following objectives:

1. Team-centered care: verbally assemble necessary staff, equipment and resources to care for a seizing pediatric patient. Demonstrate effective teamwork
2. Family-centered care: obtain appropriate history from family member (SAMPLE), address family concerns, update on care.
3. Medical knowledge:
   - Verbalize abnormal vital signs and definition of status epilepticus in an infant
   - Apply status evidence-based guidelines effectively (2020 EIIC Guidelines)
   - Implement interventions specific to managing a deteriorating patient in status epilepticus

Overall Scenario Schema

Link to Pre-briefing Script

2 mins

Assign or Coach them to allocate roles

Team Leader	Pharmacy	Bedside RN
Respiratory Tx	Medication RN	Technician

6-10 mins

Stem: EMS is bringing in a 10 m.o girl, with active generalized tonic-clonic seizure that started about 20 minutes ago. Mom gave one dose of rectal diastat (5mg) at home. Seizure stopped for a minute and then continued again, after which mom called 911. They will be here in 2 minutes.

Co-facilitator prompts are indicated in these boxes

20 mins

Link to Debriefing Script

10 mins

Option: re-run scenario

Scenario script:

"I will assign each of you roles, including team lead, bedside survey and airway provider and parent liaison. You will hear a brief EMS patch and then will have two minutes to prepare for the arrival of the patient. You will now hear the EMS dispatch."

Facilitator states: "We are 2 minutes out with a 10-month-old female who is actively seizing, we have no IV access and have not administered medications.

2 minute warning

- Team assembles + confirms roles
- Calls for help & prepares equipment

Monitor
BP cuff
Defibrillator, pads, electrodes
PIV start supplies
IO supplies
Atomizer

Respiratory equipment
Nasal cannula
Masks / NRB
NPA, OPA
Bag/mask sets
LMA

Intubation supplies
Range of sizes
- Endotracheal Tubes (3.0-4.5)
- Stylets
- Laryngoscopes

Colorimetric CO2 detectors
Capnography cannula
Suction supplies and devices

Fluids and Flushes
D5NS, NS, LR
D10, D25, D50
Pull-Push Setup – 3 way stopcock with 20 or 60mL syringe

Intubation Medications
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)

Seizure meds
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

Antibiotics generic antibiotics

Case progression: Status Epilepticus

Time 0

- Prepare room and staff for patient arrival

Facilitator states: "Patient has arrived. They are actively seizing – GTC, unresponsive to painful stimuli."

1

Rhythm: sinus tach
HR: 190/min
BP: 92/45
RR: 35/min
O_2 Sat: 90% on RA
T: 36.7 ◦C

- Verbalize abnormal vital signs
- Reposition airway, suction & apply oxygen
- Obtain bedside glucose
- Administer IM, IN, or IV benzodiazepine
- Assess physical exam findings (pupils, cap refill, lung sounds)

Modifiers & Triggers to move to next phase

- Patient continues to seize
- If no airway reposition or oxygen sats decrease to 85%
- If only oxygen applied sats remain 90-92%
- If reposition and oxygen applied sats increase to 95%

Facilitator states: "Patient is still seizing"

2

Rhythm: sinus tach
HR: 140/min
BP: 92/50
RR: 25/min
O_2 Sat: 98%
T: 36.7 ◦C

- Administer non-benzo, non-sedating antiepileptic agent
- Obtain additional labs (BMP)
- Verbalize other seizure causes (trauma, tox, infection)

Modifiers & Triggers to move to next phase

- Seizure stops after administration of non-benzo, non-sedating antiepileptic agent
- If additional benzo given OR phenobarbital OR propofol administered pt becomes bradypneic (RR 12) and desats (85%)

Facilitator states: "Patient has stopped seizing and is postictal with improving mental status"

3

HR: 120/min
BP: 95/52
RR: 25/min
O_2 Sat: 98%
T: 36.7 ◦C

- Repeat neuro assessment
- Repeat airway assessment
- Disposition-admit and monitor
- Team leader hands off to receiving NICU/ PICU/ Floor team
- Updates family

Wrap

After team performs handoff, state "This concludes the simulation" and move to debrief.

Link to resource page: educational content

Parent Script Instructions

Throughout case make sure to ask for updates every 1-2 minutes if not provided by team. Expect people to inform you of what is going on, you can ask for updates. You will be confused and frustrated.

1. Upon arrival, state: "Lizzie has been having seizures since birth. We have been on medication since then; I give her 50 mg Topamax daily and diastat (5mg) if she has a seizure. I did the same this time, but she re-started the seizure again. And then I called 911"

2. If asked, give this information:

Signs/symptoms: Shaking upper and lower extremities for the past 20 minutes.

Allergies: None

Meds: Topamax daily (50mg)

Past medical history: She was born prematurely, at 28 weeks. She was immediately put in NICU and stayed there for a few weeks. She had seizures since then and we have been seeing our doctor regularly. He prescribed Topamax daily and diastat as needed. I vaccinate her per her pediatrician's recommendations. She is my only child.

Last meal: breastmilk and breakfast cereal this morning Events proceeding: Nothing unusual. She hasn't been sick. Frequency of seizures: usually once a week, sometimes more, sometimes less. It usually goes away with one does of diastat (5mg). *** Note everything else that they may ask is normal or you don't know.

3. If after 5 minutes the seizure still hasn't stopped, ask with frustration: "why is she still seizing, please give her appropriate medication! Will this cause permanent brain damage? Please do something!"

4. When they give her oxygen, ask: "Why is that needed, does she have trouble breathing?"

5. If they start talking about intubation or bring intubation equipment, ask: "Why does she need to be intubated? I don't understand? Won't that hurt her?"

6. If after 10 minutes the seizure still hasn't stopped, ask: "What is happening? Why is she still seizing? Can't we move her to a better hospital? This cannot be good for her brain!"

Laboratory Values

VBG pH 7.25 pCO2 55 pO2 35 HCO3 19 BE -3

ABG pH 7.30 pCO2 50 pO2 65 HCO3 19 BE -3

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

BMP/chemistry: Na 135 mEq/L, K 4.2 mEq/L, Cl 105 mmol/L, CO2 19 mmol/L, BUN 25 mg/dL

Glucose: 90

Data Collection Form: Status Epilepticus

Date: _____ Location: _____

□ Team 1 □ Team 2 Case start time: _____ Case end time: _____

#	Metrics	Yes	No	Latent Safety Threats
1	6 kg (4.8-7.2) Wt used: _____ kg			
2	**Respiratory depression verbalized** in the first 3 minutes			
3	**Began oxygen non-rebreather OR heated humidified high flow** in the first 3 minutes		□ Nasal cannula □ Simple mask □ None	
4	**Airway positioned in the first 3 minutes** □ Nasal trumpet placed OR □ Jaw thrust, chin lift			
5	**Placed IV in the first 3 minutes**			
6	**Checked bedside glucose** in the first 3 minutes			
8	**First Dose of Medication Given** □ Midazolam □ Keppra □ Fosphenytoin □ Phenytoin □ Propofol □ Phenobarbital □ Other_____	**Route:** □ IV/IO □ Rectal □ Nasal □ IM	**Dose Given:**	
9	**Second dose of Medication given** □ Midazolam □ Keppra □ Fosphenytoin □ Phenytoin □ Propofol □ Phenobarbital □ Other_____	**Route** □ IV/IO □ Rectal □ Nasal □ IM	**Dose Given:**	
9	**Third Dose of Medication given** □ Midazolam □ Keppra □ Fosphenytoin □ Phenytoin □ Propofol □ Phenobarbital □ Other_____	□ IV/IO □ Rectal □ Nasal □ IM		
10	**Family presence** The parent was allowed to stay			
11	**Family-centered care** Team interacted with parent			
12	**Disposition** Verbalized plan to admit/transfer			
13	**Cognitive aids used (mark all that apply):** □ Broselow □ Smartphone/Online reference □ Other _____ □ None			
14	**Medications given (mark all that apply and write the dose):** RSI Meds: □ Rocuronium _____ □ Succinylcholine _____ □ Etomidate _____ □ Lidocaine _____ □ Other _____			
15	**Did the team intubate?** □ Yes □ No			

Notes:

Newborn Resuscitation

After this activity, the team will be able to resuscitate a newborn baby with emphasis on the following objectives:

1. Demonstrate how to adequately locate and use NRP equipment in the Emergency Dept
2. Prioritize treatment of potential etiologies to guide stabilization or escalation of care for a newborn baby.
3. Demonstrate how to adequately perform initial basic steps of newborn resuscitation (warm, dry, stimulate, position and clear airway, ventilate).
4. Demonstrate the element of MRSOPA for corrective ventilation steps.
5. Demonstrate when and how to provide effective ventilation for a neonate.

Overall Scenario Schema

Link to Pre-briefing Script

2 mins

Assign or Coach them to allocate roles

Team Leader	Pharmacy	Bedside RN
Respiratory Tx	Medication RN	Technician

6-10 mins

Stem: A newborn has just been delivered in the ED parking lot. He is limp, cyanotic, and apneic.

Co-facilitator prompts are indicated in these boxes

20 mins

Link to Debriefing Script

10 mins

Option: re-run scenario

Scenario script:

"I will assign each of you roles, including team lead, bedside survey and airway provider and parent liaison. You will hear a brief update on the patient and then have 2 minutes to prepare."

Facilitator states: "You are working in the ED when you are told that staff is wheeling in a woman who has just delivered an infant in a car in the ED parking lot."

2 minute warning

- Team assembles + confirms roles
- Calls for help & prepares equipment

Warm:
- Newborn warmer bed set to 100% heat with scale and timer
- Warm blankets, hat, temperature sensor

Clear airway:
- Bulb suction
- 10F or 12F suction catheter attached to wall suction, set at 80- 100 mmHg

Auscultate:
- Stethoscope, cardiac leads & monitor

Ventilate/ Oxygenate:
- Pulse oximeter
- Flowmeter set to 10L/min
- Oxygen blender set to 21% (21-30% if <35 weeks' gestation)
- Term and preterm sized masks
- Positive pressure ventilation (PPV) device (eg T piece resuscitator (ie: Neopuff group), self inflating bag or flow inflating bag with neonatal mask)

Intubate:
- Laryngoscope with size 0 and 1 straight blades
- Stylet
- Endotracheal tubes (sizes 2.5, 3.0 & 3.5)
- Carbon dioxide (CO_2) detector
- Measuring tape and/ or ETT insertion depth table
- Waterproof tape or tube securing device, scissors
- Laryngeal mask (size 1) and 5 mL syringe

Access:
- Heel stick sampling kit
- PIV needle, tapes and saline flush

Medications:
- Normal saline for volume expansion: 10 mL/kg
- Epinephrine 0.1-0.3mL/kg of the 1 mg/10 mL (0.1 mg/mL)

Case progression: Newborn Resuscitation

"The woman is reported to be at 39 weeks gestation with a previous history of a precipitous delivery. This was an uncomplicated pregnancy with no reported issues. The umbilical cord has been clamped and cut. The infant has been brought in by hospital staff and is on the bed. The infant appears limp without any respiratory effort. "

Time 0

HR 70
BP N/A
Rhythm Sinus
Sat 50% RA
RR 0
Time to stay at vitals: 3 min

Patient State: cyanotic, limp

- Team starts APGAR timer
- Place infant on warmer bed, dry and stimulate and suction
- Assess HR and respirations
- Place pulse oximeter on right upper extremity and place cardiac leads

Modifiers & Triggers to move to next phase
- After 3 minutes have elapsed

IF Facilitator is asked:
Term? Yes
Tone? Floppy
Crying: No

1

HR 80
BP 45/30
Rhythm Sinus
Sat 60%
RR 10
Time to stay at vitals: 3 min of ventilation

Patient State: cyanotic, limp

- Begin bag mask ventilation
- Auscultates HR and assesses for chest rise

Modifiers & Triggers to move to next phase
- After 3 minutes of PPV administered

Facilitator states: No chest rise is visualized, HR remains below 100

2

HR 80
BP 50/35
Sat 75%
RR 10
Time to stay at vitals: 5 min

Patient State: cyanotic, limp

- Recognize need to adjust PPV
- Discuss MR SOPA
- Mask adjustment and Reposition
- Suction, Open mouth, increase Pressure, Alternative airway

Modifiers & Triggers to move to next phase
- Moving through MR SOPA algorithm AND after 3 min of adequate PPV

Facilitator states: "I can see symmetric chest rise, tone is improving and baby is moving, color is improving"

3

Transition time: 2 min
HR 160
BP 70/50
Sat 95%

Mannequin State: pink, crying

- Hand off to NICU team or Transport
- Updates family

After team performs handoff, state "This concludes the simulation" and move to debrief.

Link to resource page: educational content

Patient Picture

Maternal history

Prenatal history: P2G1001, no maternal medical problems, unknown gestational age, but mother thinks close to term. No prenatal care since 2nd trimester since mother lost her job and insurance. Precipitous delivery. No maternal peripartum fevers or bleeding.

Family history: No known family history of congenital cardiac disease.

Social history: Denies substance use.

Laboratory Values

Glucose:110

Data Collection Form: Newborn

Date: _____ Location: _____

□ Team 1 □ Team 2 Case start time: _____ Case end time: _____

#	Metrics	Yes	No	Latent Safety Threats
1	Wt used: _____ kg			
2	Infant warmer utilized			
3	**Warm, dry, stimulate, clear airway (if necessary)** < 30 seconds			
4	**Positive pressure ventilation initiated AFTER warm/dry/stim** in the first 1 minute			
5	**Place pulse ox on right upper extremity AND place ECG leads**			
6	**Take ventilation corrected steps MR SOPA verbalized □Mask (adjust) □ Reposition head □Suction □Open mouth □Pressure (increase) □Alternative airway**			
7	**Verbalize re-evaluate ventilation for response** □ Increased HR □ Improved oxygen saturations			
8	**Checked bedside glucose**			
9	**Disposition** Verbalized plan to admit/transfer			
10	**Cognitive aids used (mark all that apply):** □ Broselow □ Newborn Algorithm □ Smartphone/Online reference □ Other _____ □ None			
11	**Medications given (mark all that apply and write the dose):** □ Rocuronium _____ □ Succinylcholine _____ □ Etomidate _____ □ Ketamine_____ □ Epinepherine_____ Other meds: _____			
12	**Did the team intubate?** □ Yes □ No			
13	**Did the team initiate chest compressions?** □ Yes □ No			
Notes:				

Components of a Debrief (Based on 3Ds + PEARLS)

"The purpose of this debrief is to discuss areas of great performance and discover areas for improvement. It is not a blame session- everyone is here to do their best."

Defuse
1-2 min

Solicit emotions and reactions:
"How does everyone feel?"; "Let's take a moment to gather our thoughts."

Discover
7-8 min

Clarify facts:
"Can a teammate share a short summary of the case?"
"Were there other thoughts?"

Explore Performance:
"What went well?"
"What could be improved?"

Use observations of **learner experiences** to highlight strengths of the team and individuals, while asking learners for their thoughts, observations and reflections.

Deepen
1-2 min

Identify patient care priorities and gaps in the overall system of care. Then provide **focused feedback and** specific areas of opportunity for improvement. Elicit any other outstanding issues or concerns.

Summary
1-2 min

Identify take-home points to apply to future practice: Round the room reflections and thanks for participation.

Ref: PEARLS Debrief Framework .+ The 3D model of debriefing. *Semin Perinatol*. 2011;35(2):52-58

This page provides possible questions to elicit teaching points during the debrief. We are tailoring content for each objective. These questions are not meant to replace your team's discussion, but can help to steer the debriefing session.

GOAL: DEMONSTRATE A TEAM BASED APPROACH TO A SEIZING PATIENT

How did your team prepare for the arrival of the anaphylactic patient?
Crisis & Crew Resource Management: Assign roles, designate team leader, share mental model and practice closed loop communication

SKILL: PERFORM A SYSTEMATIC ASSESSMENT/REASSESSMENT OF THE ANAPHYLACTIC PATIENT

1. How does your team perform a systematic assessment of an ill pediatric patient? **PAT** Pediatric Assessment Triangle
Appearance **TICLS**: **t**one, **i**nteractivity, **c**onsolability, **l**ook/gaze, **s**peech/cry
Work of breathing: **Important to undress visualize WOB**
Circulation/capillary refill: **Where and how is this assessed in the pediatric patient?**
Airway Breathing Circulation Caveats: Consider pediatric anatomic differences.
ABC vs **CAB** (in adult patient)
SAMPLE mnemonic: signs/**s**ymptoms, **a**llergies, **m**edications, **l**ast meal, **e**vents preceding

PRIORITIZE TREATMENT

2. How did you prioritize the interventions for this patient?
ABCDs, Monitors, AEDs, Access Always reassess – monitor for stridor, wheezing
Administer IM epinephrine and oxygen followed by albuterol

MANAGEMENT

3. ***What is your first priority in this patient?*** Airway.
When the patient was hypotensive, what was your priority?
Administer IM epinephrine followed by isotonic fluid bolus

KNOWLEDGE: DESCRIBE ANAPHYLAXIS IN CHILDREN

1. How do you recognize anaphylaxis in a pediatric patient?
Acute onset of skin/mucosal findings+respiratory compromise and/or decreased blood pressure.
At least 2 of the following acutely after allergen exposure: skin/mucousal findings, respiratory compromise, decreased blood pressure, gastrointestinal symptoms
Decreased blood pressure after allergen exposure

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GOAL: DEMONSTRATE A TEAM BASED APPROACH TO A SEIZING PATIENT

How did your team prepare for the arrival of the seizing patient?
Crisis & Crew Resource Management: Assign roles, designate team leader, share mental model and practice closed loop communication

SKILL: PERFORM A SYSTEMATIC ASSESSMENT/REASSESSMENT OF THE SEIZING PATIENT

PRIORITZE TREATMENT

MANAGEM MEDICATION SIDE EFFECTS THAT LEAT TO CARDIO PULMONARY DETERIORIATION

1. How does your team perform a systematic assessment of an ill pediatric patient? **PAT** Pediatric Assessment Triangle
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ABC vs **CAB** (in adult patient)
SAMPLE mnemonic: signs/**s**ymptoms, **a**llergies, **m**edications, **l**ast meal, **e**vents preceding

2. ***How did you prioritize the interventions for this seizing patient?***
ABCDs, Monitors, AEDs, Access Always reassess - monitor for apnea side effect (of both seizure and AEDs). Call for help.

3. ***What is your first priority in this patient?*** Airway.
When the breathing slowed/became irregular and the patient was still hypoxic on 100% NRB, what maneuvers worked? Performing BVM (rate 30-50)
What are ways to give benzodiazepine medication without IV/IO access? IN/buccal/IM,PR
How did you get access? PALS recommends 3 PIV attempts in 90 secs prior to getting IO. Proximal tibia is preferred location for IO

KNOWLEDGE: DESCRIBE SEIZURE ACTIVITY IN CHILDREN AND COMMON CAUSES

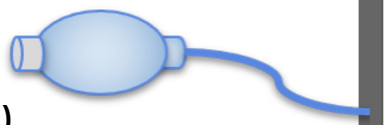
1. How do you recognize a seizure in a pediatric patient?
There are various clinical manifestations including: unresponsiveness, apnea, tremulousness, tonic-clonic activity, fixed eye deviation, etc.
2. What mnemonic is useful in remembering seizure etiologies?
VITAMINS: **V**ascular, **I**nfection, **C**erebral malaria, **T**rauma/**T**oxicology, **A**utoimmune, **M**etabolic, **I**diopathic, **N**eoplasm, **S**yndromes

ABCDE's

- Airway
- Breathing
- Circulation
- Disability/Dextrose
- (Anti)Epileptic drugs

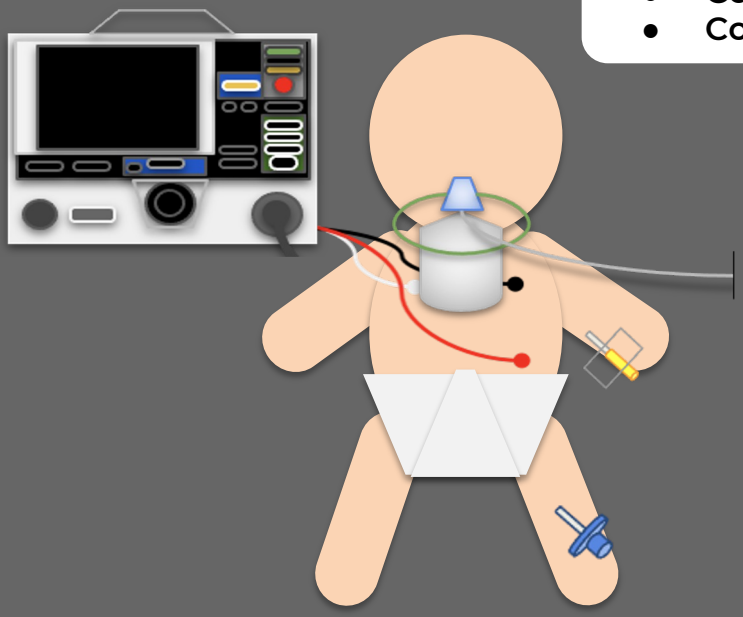
Airway Management

- Jaw thrust, Chin lift, Shoulder roll
- Suction PRN
- Accessories: NP/OP airway



Assist breathing

- Bag mask ventilation (BVM)
- Continuous positive airway pressure(CPAP)
- Consider definitive airway



1. FIRST LINE ANTIEPILEPTIC @ t= 5 MINS
Benzodiazepine (BZ) Q5 min x2

NO IV Access

Buccal:	Midazolam 0.3 mg/kg	max 10 mg
IN/IM:	Midazolam 0.2 mg/kg	max 10 mg
Rectal:	Diazepam 0.5 mg/kg PR	max 0 mg

Midazolam 0.1 mg/kg IV/IO	max 5 mg
Lorazepam 0.1 mg/kg IV/IO	max 4 mg

2. IF SEIZURE ACTIVITY AFTER 2ND BZ DOSE ADMINISTER 2ND LINE ANTIEPILEPTIC @ 15 MIN

LEVETIRACETAM	40-60 MG/KG
FOSPHENYTOIN OR PHENYTOIN	20-25 MG/KG
PHENOBARBITAL (neonate)	20 MG/KG

3. Consider Nonconvulsive status epilepticus NCSE if prolonged "seizure" or postictal period

VITAMINS

Seizure Etiology

V VASCULAR

Stroke, post stroke, AV malformations

I INFECTION

Meningoencephalitis, Lyme disease, TB meningitis, brain abscess, HIV related, cerebral malaria

T TRAUMA / TOXICOLOGY

Non-accidental trauma, brain injury (hemorrhage), toxicologic (prescription and non-prescription, recreational drugs, opioid withdrawal)

A AUTOIMMUNE

SLE, CNS vasculitis

M METABOLIC

Hepatic encephalopathy, uremia, hypoglycemia, low Na, Ca, Mg, porphyria

I IDIOPATHIC

Epilepsy

N NEOPLASM

Primary or secondary brain tumor

S SYNDROMES

Tuberous sclerosis, Down syndrome, Sturge Weber syndrome, Von Hipple Lindau syndrome, other neurodevelopmental syndromes

ELIZABETH SANSEAU MD, MAYBELLE KOU MD, ILENE CLAUDIUS MD

COMMONS.WIKIMEDIA.ORG/WIKI/FILE:VITAMIN_B12_CAPSU

PEDIATRIC SEIZURES

MANAGING CONVULSIVE STATUS EPILEPTICUS

Defined as:

1) Seizure >5 min and/or ongoing seizure upon arrival to ED
2) 2+ seizures without full recovery of consciousness between them

ETIOLOGY

- **V**ascular: stroke, AV malformation
- **I**nfection: meningitis, Lyme, TB, brain abscess, HIV-related
- **T**rauma: hemorrhage, toxicologic
- **A**utoimmune: SLE, CNS vasculitis
- **M**etabolic: hypoglycemia, low Na|Ca|Mg encephalopathy
- **I**diopathic
- **N**eoplasm
- **S**yndromes: Tuberous sclerosis, Rhetts, Sturge Weber, VHL

SYMPTOMS

Convulsions

Incontinence (urine or stool)

Clenched Teeth

Irregular breathing or apnea

Trouble Speaking

Staring or eye rolling

OPTIMIZING THE PEDIATRIC AIRWAY

Airway Differences: Short, anterior airway, large tongue and epiglottis, prominent occiput.
Neonatal seizures are non focal: watch for lipsmacking or blinking

Position Head

Jaw Thrust

Use index/middle fingers to push back of jaw up, thumbs on chin

Shoulder Roll

Use rolled towel under shoulders to achieve neutral neck

Chin LIft

Use two fingers under chin to lift

Suction

Suction secretions from nose and oral cavity

Assist Breathing

1) Airway adjuncts: NP/OP
2) Bag Mask Assist if RR <20
4) Consider supraglottic device or tracheal intubation if apneic and unconscious

Pediatric Status Epilepticus Algorithm

* in children over 1 month of age

Recognition of Status Epilepticus

An unresponsive patient with either one of the following has convulsive status epilepticus:

- Seizure >5 min and/or ongoing seizure on presentation to EMS/ED
- 2 or more seizures without full recovery of consciousness between seizures

Initial Management

- Initiate ABCs, cardiorespiratory and BP monitoring
- O_2 10-15 L/min via non-rebreather mask
- Prioritize giving the first dose of benzodiazepine as early as possible, followed by checking blood glucose
- Monitor for respiratory depression, hypotension, arrhythmias
- Give acetaminophen 15 mg/kg/dose (MAX 650 mg) PR if febrile
- **Consider other investigations:**
  - Electrolytes, blood gas, calcium, CBC, serum glucose
  - Other: anticonvulsant drug levels, LFTs, blood & urine culture

Phase 1 5-15 min

Prehospital

1. Give Midazolam IM/intranasal (IN) (see dosing table).
2. Check blood glucose:
   If blood glucose <3.3 mmol/L (<60 mg/dL):
   Treat with D25W 2 mL/kg/dose IV (MAX 100 mL/dose) OR
   D10W 5 mL/kg/dose IV (MAX 250 mL/dose).
3. If still seizing after 5 minutes, give Midazolam second dose.
   MAX cumulative dose 10 mg in prehospital setting.

Emergency Department (ED)

1. Give benzodiazepine if two doses not already given prior to ED arrival (see dosing table).
2. Check blood glucose if not already done. Treat hypoglycemia as above. Reassess blood glucose in 5 minutes.
3. Give second benzodiazepine dose for ongoing seizures 5 minutes after first dose. When IV/IO access available, switch to IV/IO route.

CAUTION: Do not give more than 2 doses of benzodiazepines.

First Line Agents

No IV/IO	
Midazolam IM or IN	⩽13 kg: 0.2 mg/kg/dose 13-40 kg: 5 mg/dose >40 kg: 10 mg/dose MAX 10 mg/dose
IV/IO	
Lorazepam IV/IO	0.1 mg/kg/dose MAX 4 mg/dose
Midazolam IV/IO	0.1 mg/kg/dose MAX 10 mg/dose

Reassess ABCs, monitor for respiratory depression. If still seizing give one of these second-line agents:

Phase 2 15-20 min

Drug	Dose	Age	Comments/Cautions
Levetiracetam	60 mg/kg/dose IV/IO (MAX 3000 mg/dose) Infuse over 5 minutes	Any age	↓side effects/drug interactions, low risk of psychosis
Fosphenytoin	20 mg phenytoin equivalent (PE)/kg/dose IV/IO/IM (MAX 1000 mg PE/dose) Infuse over 10 minutes	Any age	↓BP, ↓HR, arrhythmia; avoid in toxicologic seizures; choose alternate drug if on phenytoin at home or consider partial loading dose of 10 mg PE/kg/dose
Valproic Acid	40 mg/kg/dose IV/IO (MAX 3000 mg/dose) Infuse over 10 minutes	⩾2 years	In Canada, only available via Health Canada Special Access Program; caution in patients with liver dysfunction, mitochondrial disease, urea disorder, thrombocytopenia or unexpected developmental delay
Phenytoin	20 mg/kg/dose IV/IO (MAX 1000 mg/dose) **Infuse over 20 minutes**	Any age	↓BP, ↓HR, arrhythmia; avoid in toxicologic seizures; choose alternate drug if on phenytoin at home or consider partial loading dose of 10 mg kg/dose; use only if Fosphenytoin not available
Phenobarbital	20 mg/kg/dose IV/IO (MAX 1000 mg/dose) **Infuse over 20 minutes**	**<6 mos**	Respiratory depression, especially in combination with benzodiazepines

Reassess ABCs, monitor for respiratory depression. If still seizing:

Administer alternative second line agent (e.g., if fosphenytoin given, use levetiracetam)

Pediatric Referral Centre Discussion:

- Need for intubation vs. bag-mask ventilation; hypercapnia is common and resolves with seizure cessation and non-invasive respiratory support
- Additional work up including full septic work up, use of antibiotics/antivirals, brain imaging
- Persistent altered LOC possibly related to non-convulsive status epilepticus or severe underlying brain disorder
- Third line agent: infusion of midazolam, pentobarbital, propofol OR ketamine

EIIC EMSC Innovation and Improvement Center

trekk Translating Emergency Knowledge for Kids

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DESCRIBE SIGNS/ SYMPTOMS OF SHOCK IN A NEONATE

- Learners should approach a sick neonate in a standardized fashion.
- Airway, breathing, and circulation should be assessed immediately.
- Interventions such as airway repositioning/ adjuncts, BMV and CPR should be started concurrently, if required.
- After A, B, C have been addressed, the patient should be evaluated for disability and exposed for a thorough head to toe exam and a blood sugar level should be obtained.
- Labs/imaging should be ordered and antibiotics and fluids administered in a timely fashion.
- Learners should consider the different types of shock and how to treat each condition.

CONSTRUCT A DIFFERENTIAL DIAGNOSIS FOR PERSISTENT HYPOXEMIA IN THE NEWBORN

The differential diagnosis of a persistently cyanotic and hypoxic neonate despite appropriate NRP is broad and includes, but is not limited to:

- **Neurologic:** hypoxic-ischemic encephalopathy (HIE), intraventricular hemorrhage (IVH), seizures, stroke.
- **Respiratory:** respiratory distress syndrome, meconium aspiration syndrome (MAS), pneumonia, pneumothorax, pleural effusion, persistent pulmonary hypertension of the newborn (PPHN), pulmonary hypoplasia secondary to a variety of other causes.
- **Congenital anomalies:** congenital diaphragmatic hernia, congenital cystic adenomatoid malformation (CCAM), tracheoesophageal fistula (TEF).
- **Infectious:** sepsis - consider in setting of chorioamnionitis, Group B Strep, TORCH infections (toxoplasmosis, syphilis, varicella-zoster, parvovirus B19, rubella, cytomegalovirus, herpes infection).
- **Electrolyte disturbance or metabolic abnormality, hypoglycemia in infant of diabetic mother.**
- **Toxic exposures:** maternal narcotic (consider giving naloxone), alcohol or anesthetics.
- **Hematologic:** fetomaternal hemorrhage (order blood products).
- **Congenital heart disease (CHD):** cyanotic CHD or ductal-dependent CHD (critical right heart obstructive lesions, critical left heart lesions, and parallel circulations such as transposition of the great arteries TGA). Obtain pre- and post- ductal saturations and consider giving prostaglandin E_1 (PGE) in consultation with a pediatric cardiology and NICU team.

Knowledge: NRP guidelines

Learners should approach a newborn delivery in a standardized fashion with emphasis on airway and breathing

Team briefing and equipment check

Term? Tone? Breathing?

YES → Stay with mother for routine care
- Warm and maintain normal temperature
- Position airway
- Clear secretions (if needed)
- Dry
- Ongoing evaluation

NO

Warm and maintain normal temp
Position airway
Clear secretions (if needed)
Dry
Stimulate

Apnea, gasping or HR<100 bpm?

NO → **Labored breathing or persistent cyanosis?**

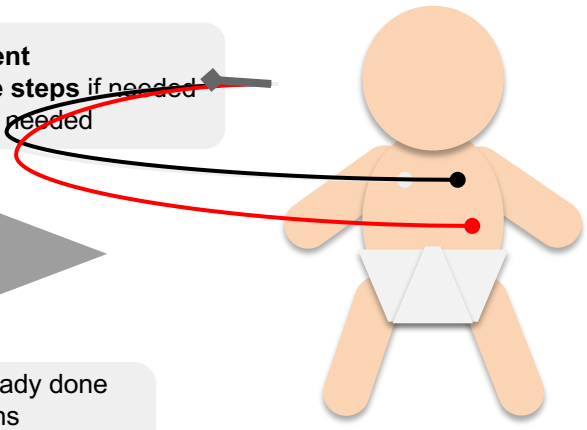
YES → **PPV**
SpO2 monitor
Consider ECG monitor

YES → Position and clear airway
SpO2 monitor
Supplemental O2
Consider CPAP

HR<100 bpm?

YES

Check chest movement
Ventilation corrective steps if needed
ETT/ laryngeal mask if needed



HR<60 bpm?

YES

Intubate if not already done
Chest compressions
100% FiO2
ECG monitor

HR<60 bpm?

YES

IV epinephrine
If HR consistently <60 bpm consider hypovolemia or pneumothorax

Pre-ductal SpO2 target	
1 min	**60%- 65%**
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	**80%-85%**
10 min	85%-95%

MR SOPA Corrective Steps	
M R	**M**ask adjustment, **R**eposition Airway
S O	**S**uction mouth + nose, **O**pen mouth
P	**P**ressure Increase
A	**A**lternative airway (ETT/ laryngeal mask)

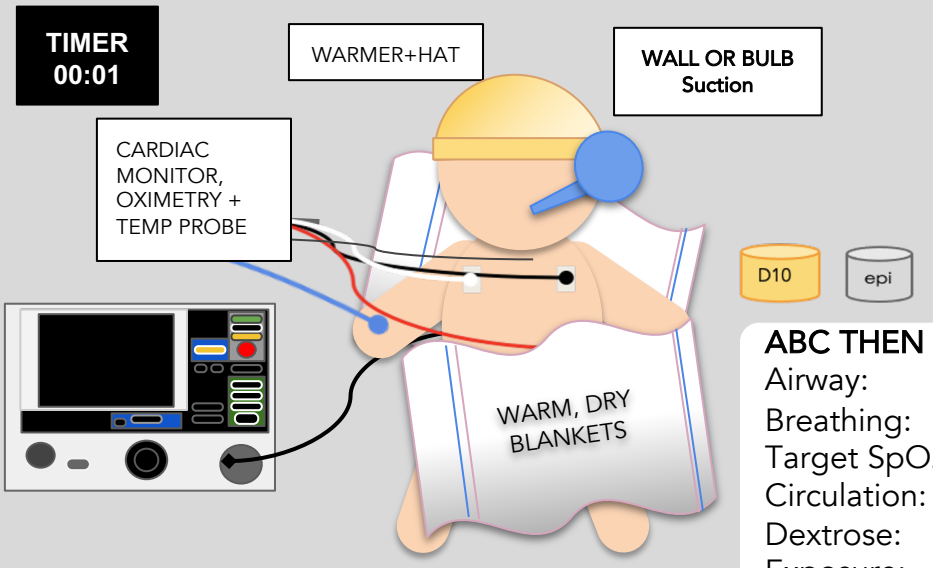
Endotracheal Intubation

GA (wks)	Depth of insertion (at lips)	Wt (g)	ETT size (mm)
23-24	5.5	500-600	**Size 2.5** <1,000 or <28 wks
25-26	6.0	700-800	
27-29	6.5	900-1,000	**Size 3.0** 1,000-2,000 g or 28-34 wks
30-32	7.0	1,100- 1,400	
33-34	7.5	1,500- 1,800	**Size 3.5** >2,000 or >34 wks
35-37	8.0	1,900- 2,400	
38-40	8.5	2,500- 3,100	
41-43	9.0	3,200- 4,200	**3.5-4.0**

Medication	Dose/ Route	Precautions
Epinephrine 1: 10,000 (0.1 mg/mL)	0.1- 0.3 mL/kg IV	Give rapidly and follow with 0.5- 1 mL normal saline flush Repeat every 3 to 5 minutes if HR < 60 with chest compressions
Volume expanders Normal saline O negative blood	10 mL/kg IV	If not responding to resuscitation/ signs of shock/ history of blood loss

Adapted from NRP; Textbook of Neonatal Resuscitation, 7th edition

NEONATAL RESUSCITATION PROGRAM: **DRY, SUCTION MOUTH, STIMULATE!**



APGAR @ min 1 + 5
- Appearance
- Pulse
- Grimace
- Activity
- Respiration

ABC THEN DE **CPR + IV *access if HR<60***

Airway: Patent? Position?
Breathing: Gasping? Apneic?
Target SpO2?
Circulation: HR >100
Dextrose: Goal >40 mg/dL
Exposure: Goal >36.5 C

AIRWAY

Wait to intubate?

- Can WAIT up to 10 minutes

DO

If HR NOT at goal

Doing chest compressions

*No premedication necessary

DON'T

If things are getting better:
- HR is at goal &
- SpO2 not at goal

BREATHING:

Hand on chest to evaluate breathing.
- Continue to bag-mask baby until you notice spontaneous regular respirations that are not from bagging.
- **Use End tidal CO2 monitor**: rapidly detects sudden changes in ventilation.

CIRCULATION:

Heart rate (HR): **EKG leads work best.**
***Dry skin before applying.**
- **Listen to chest and/or palpate umbilical stump** (umbilical artery).
- If HR <100 or no chest rise: troubleshoot: MR SOPA.

Cord gas
- Obtain up to 1hr from clamped cord.
- BE <- 10 or pH <= 7.15: consider cooling.

Preparedness Tip

Where is your newborn resuscitation equipment cart?
- Keep stocked & locked.

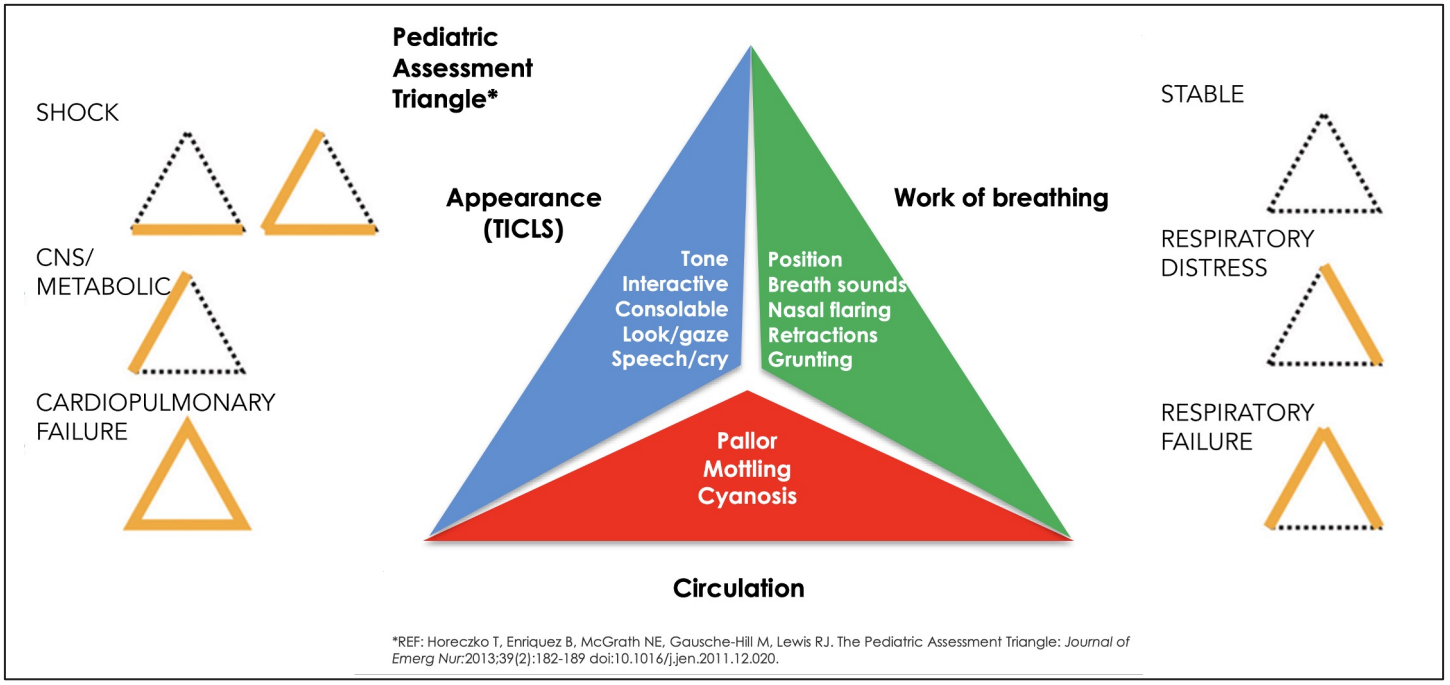
Do you have a warmer?
- Practice finding & turning on now!

Pediatric Vital Signs/Weight by Age

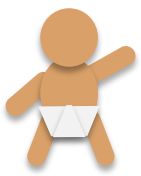
Age	Weight (kg)	Pulse	Resp	Systolic BP*
Newborn	3	100-180	30-60	60-70
6 mos	7	100-160	30-60	70-80
1 yr	10	100-140	24-40	72-107
2	12	80-130	24-40	74-110
3	15	80-130	24-40	76-113
4	16	80-120	22-34	78-115
5	18	80-120	22-34	80-116
6	20	70-110	18-30	82-117
8	25	70-110	18-30	86-120
10	35	60-100	16-24	90-123
12-15+	40-55	60-100	16-24	90-135

*BP in children is a late and unreliable indicator of shock

Using the Pediatric Assessment Triangle (PAT)



*REF: Horeczko T, Enriquez B, McGrath NE, Gausche-Hill M, Lewis RJ. The Pediatric Assessment Triangle: *Journal of Emerg Nur*:2013;39(2):182-189 doi:10.1016/j.jen.2011.12.020.



Pediatric Mental Status Assessment: response to stimuli

A	V	P	U
Alert	Verbal	Pain	Unresponsive

After the simulation day is complete next steps include:

- HUB site to enter data into Qualtrics 48 hours post sim day with link below:

  ImPACTS PRS and Sim Data

- PECC to share link for learners to access virtual education each week

  ImPACTS Weekly Learner Material

  OR

- Participants can use the QR Code below to access the weekly educational content (password: ImPACTSsim)

- PECC to send weekly reminders to learners for weekly educational content

Please contact Erin at white20@iu.edu with any questions regarding data entry.