

SimBox+ *Tele* SimBox

Fussy Infant



Emergency Department/Hospitalist/Resident



PREPARATION

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FEEDBACK

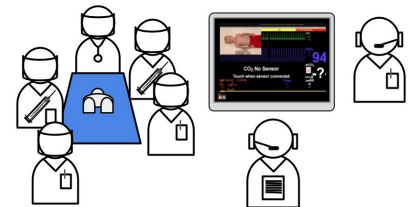
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Thank you for your interest in SimBox low-technology learning tools!

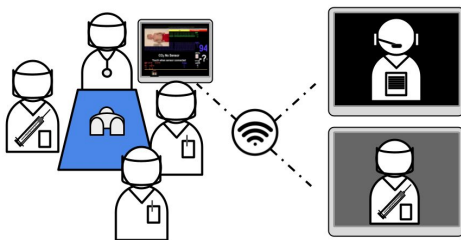
- ❑ Our low-technology simulation series allows your team to engage in the first 10 minutes of an emergency scenario.
- ❑ Use your own equipment and resources in your own clinical environment, or in the convenience of a virtual environment to practice non technical skills.

SimBox Original Version

- ❑ Low-technology manikin.
- ❑ + video.
- ❑ + tablet-based resources (*in situ* or sim lab).



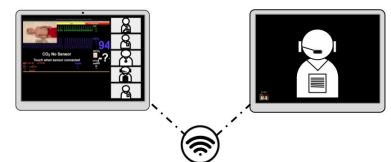
SimBox+ (SimBox Original + tele-facilitator)



- ❑ SimBox Original PLUS.
- ❑ Learners in remote or underserved areas +/- limited access to content or simulation experts.
- ❑ Remote facilitator.

Tele SimBox:

- ❑ Non-technical skills all remote version.
- ❑ Meets post-pandemic demands for virtual learning and continuous education for learners of all levels.



How to use these resources

SimBox or SimBox+

- Review this document + run a session in your ED with a doll/manikin/pillow.

Tele SimBox

- Reference: [Tips / Tricks](#).
- Watch a [sample recording](#) of the telesimulation to see how it is run.

*If using this resource for EM / PEM trainees see Resource page at end of booklet with suggested case augmentation to meet Milestones.

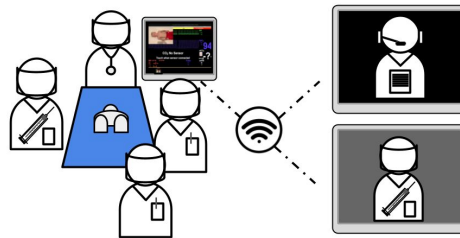
**For additional questions or concerns, arrange a one-on-one tutorial with the project team.

TeleSimBox is a tool meant for you to use as you see fit, based on your own comfort and experience facilitating sims.

The video has a structured, narrated prebrief and debrief and the booklet includes suggested scripts, learning objectives, a prebrief and debrief, case-specific checklists & resources. These can be optional for advanced learners, but are recommended for novice facilitators.

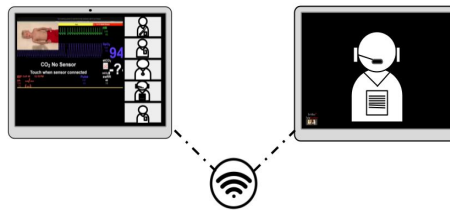
Feel free to run through the video and the facilitator guide prior to the session, and use as many of the resources as you want!

Trial sharing the video prior to the first session.



Use gallery view & ask the participants to name themselves with the assigned role.

If you use the pre-narrated prebrief and debrief, make sure to make statements and comments to complement the video.



Ask observers to mute the audio and turn off the video for the simulation.

Tele-tips

During the simulation, scroll through the monitor video based on the participants' actions.

If the participants quickly stabilize the patient, you can "skip through" to the part of the video where the vital signs have normalized. Conversely, if the necessary interventions have not been performed, you can "scroll back" and spend more time in the part of the video where the vital signs are abnormal.

After this activity, the team will be able to manage pediatric patients with Supraventricular Tachycardia (SVT) with emphasis on the following objectives:

1. Apply Crisis Resource Management and teamwork in the care of a patient with SVT (with attention to role designation, directed orders, sharing mental model and closed loop communication with team and family members).
2. Prioritize treatment of potential etiologies to the guide stabilization or escalation of care for a patient with SVT.
3. Determine the appropriate destination for transfer.

Overall Scenario Schema

[Link to Pre-briefing Script for SimBox/SimBox+](#)

2 mins

Play video to team
Assign or Coach them to allocate roles

Team Leader	Resident/ MS	Bedside RN
Respiratory Tx	Medication RN	Technician

6-10 mins

Stem: You are called to a assess a fussy infant.
The team needs to discuss the differential of tachycardia in infants, identify the need for early intervention and then sign out to the appropriate team.

Telesim 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 see a two minute countdown clock as you prepare for the arrival of the patient. You will now hear the EMS dispatch."

[Link to ED Pediatric Fussy Infant Video](#)

Facilitator states: "You are called to assess a 1 month old girl in distress. Her mother states that she has been fussy today and she thinks that her heart is beating very fast."

2 minute warning

- Team assembles + confirms roles
- Asks for equipment: monitor, temperature, oxygen, breathing (BVM/CPAP), access (IV), Broselow tape/app
- Calls for help

AFTER 2 MIN the video states: "Patient has arrived. She is awake and crying."

Time 0

- Team undresses the baby and places the cardiac monitors, pulse oximeter, BP cuff, temperature probe
- Performs ABCDEs
- Uses Broselow tape/ app for weight and/ or asks parents

"Heart rate is 240. The patient has 2+ pulses and less than 2 second cap refill time. She is crying and breathing spontaneously with a Sat of 100% on air. Working on a BP. Weight is 4 kg."

1

HR 240
BP -/-
RR -
Sat 100%

- Team notes tachycardia
- Attempts IV/IO
- Requests EKG and rectal temperature

"Blood pressure is 90/47 and rectal temperature is 36.5. Regular narrow complex tachycardia without visible p waves on the cardiac monitor. No IV access yet."

2

HR 240
BP 90/48
RR 60
Sat 99%

- Team verbalizes illness state: Hemodynamically stable infant with regular narrow complex tachycardia, likely SVT
- Attempts vagal maneuvers
- States that if unable to get access on 3rd attempt, will consider IO
- Asks for POC glucose

"IV successful on 3rd attempt. POC glucose is 110. Vagal maneuvers performed; ice applied on the face for 15 seconds. Baby is unchanged."

SAMPLE history

Signs/Symptoms: Baby was doing well until night prior to presentation when failed to complete feed. This morning has been fussy and drinking no more than a few seconds at a time for the last 4 hours.

Prenatal history: Full prenatal care without complications or infections, GBS negative.

Birth/ Medical history: Term vaginal birth with appropriate post-birth routine care. Breastfed infant with no significant medical history.

Family history: Unremarkable, no cardiac history.

Social history: Mother and Father are only caregivers.

3

HR 240
BP 90/49
RR 60
Sat 99%

- Team orders adenosine 0.1 mg/kg rapid IV bolus
- Asks for a 10 - 20 mL/kg NS bolus
- Applies infant size cardioversion pads to the patient

"Adenosine 0.1 mg/kg administered as rapid IV push via 3-way stop-cock followed with rapid saline flush. HR is still 240 and the monitor shows a regular narrow complex tachycardia without discernible p waves."

4

HR 240
BP 92/50
RR 60
Sat 99%

- Team discusses the differential of tachycardia and considers further evaluation (SVT, sepsis, acute blood loss, thyrotoxicosis, sympathomimetic exposure, electrolyte disturbance, CHF)
- Considers second dose of adenosine, 0.2 mg/kg IV
- Discusses other SVT medications / avoid calcium channel blockers
- Recognizes that patient is now becoming unstable as BP drops

"It looks like the baby is getting worse. Her perfusion is now poor with 4 sec cap refill time and the blood pressure is dropping."

5

HR 240
BP 63/30
RR 60
Sat 100%

- Team verbalizes illness state: Infant with regular narrow tachycardia, now hemodynamically unstable
- Verbalizes need for synchronized cardioversion at 0.5-1 J/kg
- Starts oxygen and places ETCO2
- Considers analgesia for cardioversion (eg, fentanyl)

"After synchronized cardioversion, the HR is 160 and sinus tachycardia is noted on the monitor. Perfusion and BP are improving."

Wrap

- Team discusses with receiving PICU/ Cardiology/ Floor team
- Updates family

Video guide

- 7 min: patient appears
- 9 min: HR 240, BP ok
- 15 min: HR 240, BP low
- 16 min: Sinus rhythm

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

[Link to resource page: educational content](#)

TASK		NOT DONE	NOT DONE CORRECTLY	DONE CORRECTLY
Team-centered care	Verbally assemble the necessary staff, equipment and resources to care for an infant with SVT in the ED.			
	Demonstrate effective teamwork and communication (i.e. designate leader/roles, directed orders, closed-loop communication, sharing mental model).			
	Demonstrate appropriate PPE.			
Family-centered care	Obtain an appropriate history from the family member (SAMPLE).			
	Address family concerns, update on care (translate medical aspects of care in plain language).			
Medical knowledge	Verbalize the initial management of an acutely ill pediatric patient (airway, breathing, circulation).			
	Recognize presentation of SVT in infants, both early (fussiness, poor feeding) and late (respiratory distress, poor perfusion, cardiovascular collapse).			
	Identify stable vs unstable SVT: <ul style="list-style-type: none"> • Stable: Normal blood pressure, normal perfusion (capillary refill <3 seconds), normal mental status. • Unstable: Hypotension, signs of poor perfusion (capillary refill ≥3 seconds), abnormal mental status. 			
	Describe initial treatment of SVT in stable patient: Vagal maneuvers (ice to face, knees to chest) Adenosine 0.1 mg/kg rapid IV bolus then flush using 3-way stopcock with simultaneous EKG.			
	Describe the treatment of SVT in unstable patients: Cardioversion 0.5-1 J/kg.			

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.

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.
"Reactions?"; "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. 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.

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.

DEMONSTRATE A TEAM-BASED APPROACH TO CARE FOR A PATIENT WITH TACHYCARDIA

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

PRIORITIZE EARLY ADMINISTRATION OF APPROPRIATE MANEUVERS AND MEDICATIONS IF STABLE



How did you prioritize the interventions for this tachycardic neonate?
Stable versus unstable.

What is your first priority in this patient?

As airway and oxygen saturation were unremarkable, perfusion was important in determining stability, and an important treatment priority.

What maneuvers/ medications do you use?

- Vagal maneuvers: ice pack slurry to the face for 15 seconds.
- First line medicine is adenosine is 0.1 mg/kg IV/IO (max 6 mg), dose can be doubled. Given via 3-way stop cock fast followed by flush <https://www.youtube.com/watch?v=T9pBm-bjfmU>.
- Other possible medications include amiodarone or procainamide.
- Calcium channel blockers can be dangerous in infants <2 years of age (can cause irreversible hypotension).

How did you get access?

PALS recommends 3 PIV attempts in 90 secs prior to getting IO.

GENERATE DIFFERENTIAL DIAGNOSIS FOR NARROW COMPLEX TACHYCARDIA IN NEONATE

Name the 2 most common types of narrow complex tachycardia in neonates and infants?

Sinus tachycardia and supraventricular tachycardia.

What are common causes of sinus tachycardia in neonates and infants?

- Pain, distress/anxiety, fever, and dehydration are common.
- Sepsis, DKA, and thyrotoxicosis are less common but dangerous causes.

DEMONSTRATE FAMILY CENTERED CARE INTERACTIONS

How does the team manage the reactions of family members while you are caring for a seriously ill child?

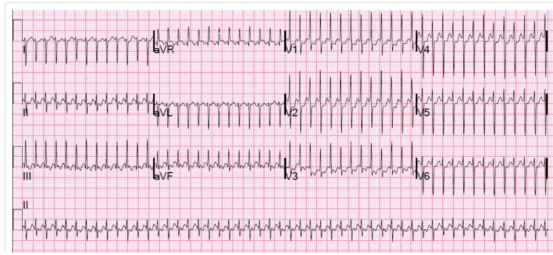
- A large body of literature supports family presence during resuscitation. This does not lead to increased malpractice.
- A social worker or other provider should be assigned to stay with the family through the difficult time.

Early vs Late Presentation

Early: fussiness, poor feeding, sweating or pallor while feeding
 Late: respiratory distress, poor perfusion, cardiovascular collapse

Stable

Normal BP
 Normal Perfusion
 (Capillary refill <3 sec)
 Normal Mental Status



Tap ECG for link to DFTB.com

Unstable

Hypotension
 Poor Perfusion
 (Capillary refill >3 sec)
 Abnormal Mental Status

Initial Management

A B C D E

- Unstable PER PALS: 90 sec or 3 IV attempts then place IO
- Obtain 12 lead electrocardiogram:
 SVT: Regular NARROW COMPLEX tachycardia ≥ 220 bpm

MANAGEMENT OF STABLE SVT

PERFORM VAGAL MANEUVERS

- If unsuccessful: establish IV

First line pharmacologic therapy:

- Adenosine 0.1 mg/kg IV (max 6 mg) rapid IV/IO push via 3-way stop-cock followed with a saline flush

Redose 0.2 mg/kg (max 12mg)x1 if ineffective

HOW TO PERFORM VAGAL MANEUVERS

Elicit "Diving reflex"

- Place bag of ice slurry over eyes for 15-30 seconds

OR attempt modified Valsalva maneuver

- Place infant in knee-chest position for 15-30 seconds OR
- Gently hold infant "upside down" for 30 seconds ([Bronzetti et al 2018](#))

MANAGEMENT OF UNSTABLE SVT

IF PATIENT IS NOT IN EXTREMIS:

- Adenosine 0.1 mg/kg IV/IO (max 6mg) rapid IV push via 3-way stop-cock followed with rapid saline flush

Redose 0.2 mg/kg (max 12 mg) if pt stable

- Consider DEFIB pad placement:
 Infant pads <15 kg, place front/back

IF PATIENT IS IN EXTREMIS OR STILL IN SVT FOLLOWING ADENOSINE:

- Prepare for cardioversion, place DEFIB (Infant pads <15 kg) pads front/back
- CALL Cardiology and or Electrophysiology
- Prepare code cart, anticipate airway and resuscitation epinephrine
- PERFORM Synchronized Cardioversion at 0.5-1 J/kg

IMPORTANT CAVEATS

Check i-stat and body temperature early: Infants may be hypoglycemic and hypothermic from poor feeding or +/- beta blocker therapy.

- After prolonged episodes of SVT patients may decompensate following cardioversion. If available consider POCUS echo to screen wall motility.
- Consider admission for all infants < 6 months after first episode SVT

link to **LITFL**

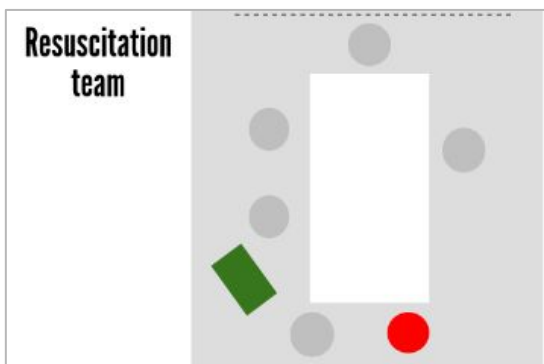
WHEN POSSIBLE: Run a 12-lead during chemical cardioversion. With limited "real estate" make sure the defib pads are not adhered OVER other leads.

COMPONENTS OF EFFECTIVE TEAMS: TEAMSTEPS IN A NUTSHELL

<https://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/modules/implement/teamworknotes.html>

COMMUNICATION	LEADERSHIP	SITUATION MONITORING	MUTUAL SUPPORT
SBAR Situation Background Assessment Recommendation	BRIEF Planning, setting the tone	STEP Status of pt Team Members Environment Progress toward goal	TASK ASSISTANCE Awareness of team work load
CALL OUT Sharing critical information with the team	HUDDLE Ad-hoc planning or updates	"I'M SAFE" <i>Tool for self evaluation</i> Illness Medication	FEEDBACK Providing information for purpose of team improvement
CHECK BACK Loop Closure**	DEBRIEF Exchange of information to inform team of performance and effectiveness	Stress Alcohol/Drugs Fatigue Eating + Elimination	ADVOCACY & ASSERTION Advocating for patient in case of a disagreement with decision maker
HANDOFF I PASS the BATON Introduction Patient Assessment Situation Safety Concern Background Actions Timing Ownership Next Cognitive Aid @DrM_Kou			2 CHALLENGE RULE Information conflict regarding patient safety
			DESC Script <i>Tool for personal conflict*</i> Describe situation Express your concern Suggest an alternative Consensus statement
			CUS STATEMENT I'm concerned I'm uncomfortable This is a safety issue
			COLLABORATION Working toward a common mission

CRISIS RESOURCE MANAGEMENT: CRM and the Shared Mental Model:



CRM (established by the airline industry) is based upon team leadership and defining clear roles for team members. Closed loop communication when used by all team members reduces errors and improves safety through:

- Addressing team members by name when assigning tasks.
- Giving confirmation when tasks are acknowledged or completed.

A shared mental model allows a team to anticipate the plan for patient care and what equipment or medications might be needed.



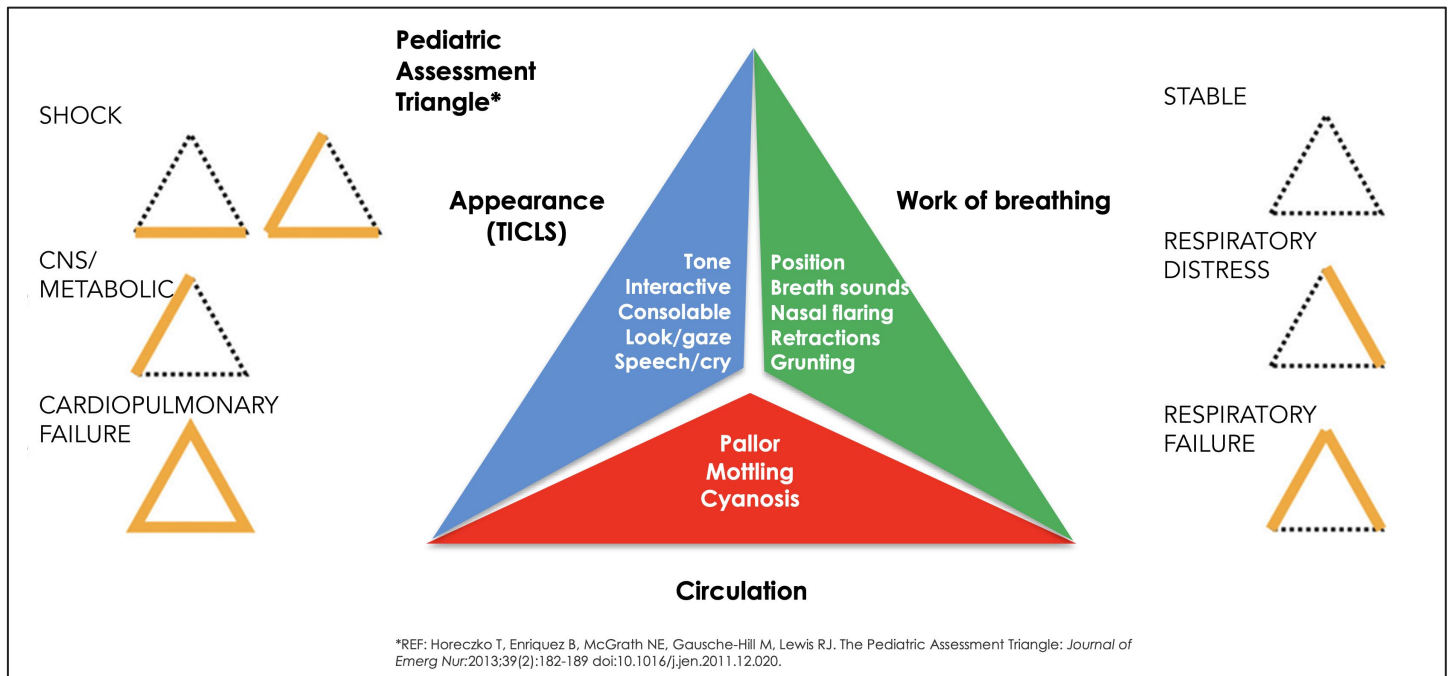
Pediatric Vital Signs/Weight by Age

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)



Pediatric Mental Status Assessment: response to stimuli



Family-centered care:

- Obtain appropriate history from family member (SAMPLE).
- Address family concerns and update on care.
- Manage the expectations of those who receive care in the ED and use communication methods that minimize the potential for stress, conflict, and misunderstanding [Assess via their communication to prep family for intubation and then for transfer, Patient Centered Communication (EM Milestone ICS1) Level 3:].

Medical knowledge:

- Verbalize the initial management of an acutely ill pediatric patient (ABC's).
- Verbalize first line diagnostic tests of a tachycardic patient.
- Verbalize the first line therapeutic interventions of a patient in SVT.
- Demonstrate handoff of care at the end of the case .
- Integrate hospital support services into a management strategy for a problematic stabilization situation [Trainee should request transfer early, Emergency Stabilization (EM milestone PC1) Level 4], Performs rapid sequence intubation in patients using airway adjuncts Employs appropriate methods of mechanical ventilation based on specific patient physiology [Airway Management (EM milestone PC10) Level 3/Pediatric ACGME intubation procedure requirement].

Thank you for participating in the simulation.
Please complete the facilitator and participant surveys by clicking on the links
or scanning the QR codes below:

Facilitator Survey



Participant Survey



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