ACEP *Tele*SimBox: PEDIATRIC SEIZURE-CHILD
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This session will provide teams of learners the opportunity to engage in the first 5-10 minutes of acute care provided to a seizing pediatric patient in a telesimulated environment. Ideally this session involves two facilitators: a "lead" to serve in the roll of a lead facilitator (also serves as a scripted parent) and an "assistant" (also serves as an embedded nurse).

This one hour session consists of three parts:

1) **Prebrief**: prior to starting, you, as the facilitator will welcome the students, introduce the format, provide expectations and goals (5 minutes)
2) **Simulation**: you will share your desktop and play a video on a browser (includes EMS patch, patient image and vital sign monitor that changes over time independent of learner interventions). The lead will serve in the role of a parent and respond to participants questions/ask questions per the script below. The assistant will be introduced as an experienced nurse who participants can ask to do tasks and/or ask for physical exam findings (15-20 minutes)
3) **Debrief**: at the end of the simulation the facilitator(s) use the debrief script (30-40 minutes)

LEARNING OBJECTIVES

After this session, **med student participants** will be able to:

- Team-centered care
  - Verbally assemble the necessary staff, equipment and resources to care for a seizing pediatric patient in the ED
  - Demonstrate effective teamwork and communication (i.e. designate leader/roles, directed orders, closed-loop communication, sharing mental model)
- 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)
  - Verbalize the first line diagnostic tests of a seizing patient (monitors, dextrose)
  - Verbalize the first line therapeutic interventions of a seizing patient (benzodiazepines)
  - Demonstrate hand off of care at end of case

WHAT'S NEEDED FOR THE TELESIM?

- Internet and secured Zoom platform or other secured telecommunication program
- This booklet of resource documents (A-G)
- Display: preferable for lead facilitator to be on desktop/laptop (consider dual monitor set-up) with a stable internet connection
- Participants and the assistant debriefer can join from desktop/laptop/tablet/phone

BEST WAY TO USE THESE RESOURCES?

BEFORE conducting this session please

1) Review this document
2) Watch the recorded sample telesimulations to get a sense of how one is run: https://www.dropbox.com/s/c28flcv4wbhurdv/zoom_0.mp4?dl=0
3) If you have additional questions/concerns, a one-on-one tutorial can be arranged with the project team (Elizabeth Sanseau: sanseaue@email.chop.edu)

HOW MANY PARTICIPANTS SHOULD BE INVOLVED? -- 2-3 participants is optimal

- The facilitator should assign the participants to the following roles: (1) team leader (2) airway/survey/bedside +/- (3) family liaison
- Have participants rename themselves based on their role in the telecommunication device being used
- If there are more than 3 participants these individuals should be assigned active observation roles +/- provided the checklist
  - Ie: assign each observer the task of noting team-centered care, family-centered care, medical knowledge

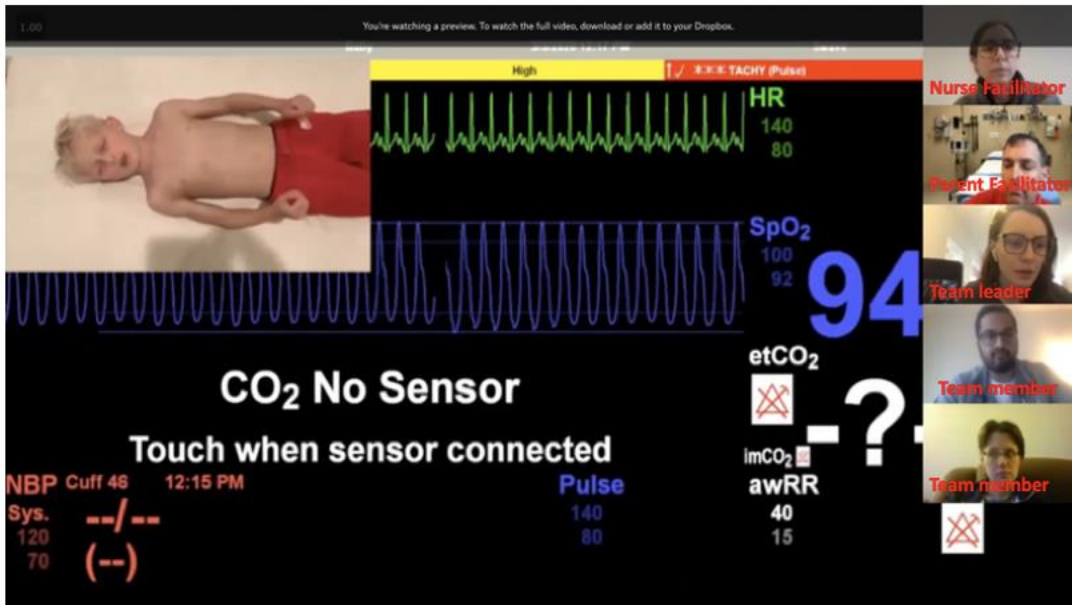
HOW MANY FACILITATORS WILL I NEED? -- 2 co-facilitators is optimal

- Lead (black font in scenario): prebriefs, plays telesim video from shared screen, controls monitor on video (pauses/fast forwards/rewinds), tracks time and stops at 20mins running time, embedded parent, debriefs
- Assistant (red font in scenario guide): embedded experienced nurse who, when prompted, relays the physical exam, responds to intervention requests, provides historical data, and if necessary makes suggestions of what to do next if the team is failing to meet objectives. If team is struggling he/she can provide coaching or advise that they "pause scenario" to huddle/plan next steps

YOUR SCREEN SHOULD RESEMBLE THIS:

active participants and facilitators in gallery view

(Note: specific case may be different)



B	ACEP *Tele*SimBox	Prebrief Guide

Please use this script to introduce your team to the simulation. You may adapt it as it becomes more familiar.

OVERVIEW

The goal of this session is to practice the initial management of a sick pediatric patient as a telesimulated experience.

This is an opportunity for you to practice family-centered care, teamwork and communication and apply your medical knowledge in a supportive environment.

Being telesimulation, you will not have a real patient/mannikin nor have tangible equipment and resources.

TIME COURSE

The session will last about an hour total: 20 minutes for the drill and 40 minutes in a group reflection and discussion, called a debrief.

During the debrief we will discuss opportunities for improvement such as teamwork skills, communication with the family, and medical knowledge.

ORIENT TO ZOOM

You should all be able to hear me ok?

Best to use gallery view to see all participants.

Chat box function can be used for participant who's role it is to communicate with the parent chats with the facilitator, gets historical information, and reports back to the group.

Timeout at any point if you are confused about the technology - we will pause and regroup before restarting the sim.

If you are not an active simulation participant, please mute and hide your video screen. Appreciate hearing observers feedback during debrief (assign one to teamwork/communication, family communication, clinical/medical knowledge).

ORIENT TO SIM

I will provide the prebrief, debrief and control the video.

As the video runs, I will play the role of the parent - if you have any questions for me you must ask.

Co-facilitator is the embedded experienced nurse participant. The nurse will be your eyes and ears - ask for exam, vital signs, weight, temperature, monitors, access, labs, specific airway and any interventions including giving medications.

This goes best if you practice your closed-loop communication skills and continuously re-survey patient.

Consider this a good opportunity to continuously step back and reassess the patient with your team in addition to thinking OUTLOUD.

I will assign the roles prior to starting the video.

When I start the video, you will hear a EMS haste call followed by a 2 minute countdown clock.

Use this time to assemble your team and anticipate equipment, personnel and interventions you want ready.

If you need a TIMEOUT for discussion with your team or with the family member just ask and I will use the pause and restart button to allow for this space.

ESTABLISH SAFE LEARNING SPACE

The "**Basic Assumption***"of simulation is that everyone is here to do their best so we can learn as a team how to take care of sick pediatric patients confidently.

Fiction contract: I/We know that not everyone is comfortable with telesimulation, resuscitation drills, or with care of sick pediatric patients. I/We know it can also be intimidating to be on display in a situation that may be uncomfortable. Here, you are not being graded on your performance; instead we will focus on how to work as a team. Treating it as a real situation will help everyone get the most out of the session. If at ANY TIME you are confused - either with the medical scenario or with a technology glitch - please call a "Timeout" and we will stop and regroup. *(*adapted from the Center for Medical Simulation, Boston)*

TIME	Facilitator statements and *actions*	Vital Signs/labs	Expected actions by team
START	**STATE:** I will assign you 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 an overview of the case and the EMS patch. ***PLAY VIDEO*:** https://youtu.be/D2UCi8TowXg		
PLAY AUDIO RECORDING BRIEF	The recorded narrator on video will state the following: "Welcome to the ACEP telesimbox intervention. In today's session you will work with others who are present online with you to take care of a simulated pediatric patient. A facilitator is also with you online and will help guide you through this intervention. To start the case you will hear an EMS dispatch call followed by a 2 minute countdown clock. During that 2 minute countdown we asked that you do your best to discuss what you would do like to do to best prepare your resources, team and equipment to care for the patient. Upon arrival of the patient you will have a nurse who will be able to provide you information as well as a monitor with an image of the patient in the upper left hand corner. We ask that you do your best to take care of this patient throughout the case and participate in an active debrief after participating in this simulation. I will now provide the EMS patch. We have a seizing 6 year old male. Was noted to be seizing for approximately 5 minutes by the parents prior to our arrival. No history of trauma or recent illness. No history of seizures. The patient's sats are 88% on 100% NRB, HR 160 and we do not have an IV at this time. We'll be there in 2 minutes.	**MONITOR WITH 120 SECOND COUNT DOWN, THEN PATIENT APPEARS**	○ Team assembles + confirms roles ○ Asks for equipment: monitor, temperature, oxygen, breathing (BVM/CPAP), access (IV/IO), Broselow tape/app, antiepileptic medication ○ Calls for help
2 MINUTE PREP ENDS **+ 4:15 min**	**ASSISTANT STATES:** "Patient has arrived."	**BLANK MONITORS**	○ Team confirms patient is on monitors, pulse oximeter, BP cuff, temp ○ Notes patient is hypoxemic on 100% NRB
+ 4:45 min	**ASSISTANT STATES:** "Patient is seizing, SpO2 is in the 80s on 100% oxygen through NRB." If CPAP vs BVM: state "child is pinking up." If ask for IV: state "cannot get IV, is shaking too much. Is there another way to administer AEDs?	**HR 150s BP 90/50** **RR 20 Sat 80%**	○ Team requests reposition of airway ○ Requests airway/breathing intervention (BVM/CPAP) ○ Asks RN for access (IV/IO)

+ 6 min	**ASSISTANT STATES:** "Patient is seizing and is not responsive, still can't get IV, sats improving with BVM/CPAP and color improving, capillary refill 3 seconds, rectal temp 37deg C. I'll get benzodiazepine as you request - please confirm what medication, dose and route of administration." **LEAD/PARENT STATES HISTORY** (*as prompted*): "*Signs/Symptoms:* Generalized seizure began at home ~5 mins prior to arrival, has never done this before. No recent fevers or infectious symptoms. *Allergies/Medications*: None. *Medical history:* Uneventful birth and past medical history. Vaccines up to date. No known family history of seizures or neurologic, vascular, hematologic, or biliary diseases. Single child, lives with Mom, Dad. No concern for accidental or non-accidental trauma. *Last meal:* usual cereal for breakfast ~2 hrs prior. *Events:* No obvious triggering events."	**HR 150-160s BP 90/50** **RR 20 Sat 90%** **EtCO2 32** **TEMP 37degC**	○ Team verbalizes illness state: afebrile seizing patient in respiratory distress ○ Estimate weight from Broselow ○ Order specific benzo/dose/route of administration
+ 7 min	**ASSISTANT STATES:** "Giving benzodiazepine medication now." *(specific med/dose/route requested by team)*	**HR 160s BP 90/50 (63)** **RR 33 Sat 92%** **EtCO2 32**	○ Team confirms first benzo administered ○ Orders 2nd dose benzo to have at bedside ○ Reassesses ABCs ○ States that if cannot get IV on 3rd attempt will consider IO ○ Orders STAT Glucose, Na, K, Chloride, Bicarb, Ca
+ 8 min	**ASSISTANT STATES:** "Patient's seizing is slowing."	**HR 170s BP 106/62 (76)** **RR 47 Sat 96%** **GLUCOSE 170**	○ Team recognizes that seizure has stopped ○ Stops bagging/CPAP
+ 8:30 min	**LEAD STATES:** "It looks like the child has stopped seizing. Please sign the patient out to the PICU now arriving to help."	**HR 178 BP 106/62 (76)** **RR 53 Sat 97%**	○ Reevaluate ABCDs ○ State differential and further workup plan ○ Hands off patient to PICU team ○ Updates family
END	**STATE: This will end the drill. The patient has been handed off to another team. Thank you for participating. We will now move to the debriefing.**		

D	ACEP *Tele*SimBox			Scenario Checklist
TASK		**Done correctly**	**Not done correctly**	**Not done**
Team-centered care	Verbally assemble the necessary staff, equipment and resources to care for a seizing pediatric patient in the ED			
	Demonstrate effective teamwork and communication (i.e. designate leader/roles, directed orders, closed-loop communication, sharing mental model)			
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)			
	Verbalize the first line diagnostic tests of a seizing patient (monitors, dextrose)			
	Verbalize the first line therapeutic interventions of a seizing patient (benzodiazepines)			
	Demonstrate hand off of care at end of case			

E	ACEP *Tele*SimBox	Debrief Guide

A debrief is used by teams to celebrate areas of great performance and discover opportunities for improvement. If you are not familiar with how to run a debrief session, the following is a recommended framework to help you run one effectively. The purpose is to encourage team members to share their knowledge of the events, and help create understanding toward improvement. This should not be a blame session: follow the basic assumption that "*everyone present is here to do their best*". There are many ways to lead a debrief session and you are welcome to adapt this format.

With 2 facilitators, consider breaking up the debrief between the facilitator lead and the assistant as you see fit.

- Consider having the facilitator lead set expectations, elicit reactions, then close out with summary & application at the end.
- Consider having the facilitator assistant lead the debrief discussion on the description and analysis aspects of the case, as they bring a unique perspective as the embedded nurse participant in the telesim scenario.

If observers were present, elicit their feedback on team-centered care, family-centered care, and medical knowledge during the debrief analysis.

Setting expectations **FACILITATOR LEAD**	Create a safe context for learning. Explain the goal of debrief: *"Let's spend 15-20 minutes to debrief the scenario. The goal is to discuss lessons learned from the case so we can improve how we work together and care for sick pediatric patient in the ED. This is not a blaming session. Everyone's participation is welcome. There are four parts to the discussion."*
1) Reactions (1-2 minutes) **FACILITATOR LEAD**	Solicit reactions and emotions: this should allow participants to blow off steam but not launch into the medicine right away: *"First, how did that feel?"*
2) Description (1-2 minutes) **FACILITATOR LEAD**	Clarify facts and medicine: develop shared understanding of what happened: *"Next, can someone share a short summary of the case?"* Ask if everyone agrees or if there are any other perspectives.
3a) Analysis (7 minutes) **ASSISTANT**	Explore performance domains: • Solicit feedback for improvement from the group • Concentrate on learner experiences of the scenario • Use open-ended questions to start the discussion • DO highlight strengths of the team and individuals • ***Ask observers (if present) for their feedback*** *"Now let's talk about specific areas that went well and opportunities for improvement.".*
3b) Reinforce learning (2 minutes) **ASSISTANT**	Provide focused feedback and observations. State how you thought the team did • Identifying priorities in the care of this patient? • Managing the care of this patient?
ELICIT ANY OUTSTANDING ISSUES/CONCERNS FROM THE GROUP	
3) Summary & Application (2 minutes) **FACILITATOR LEAD**	Identify take home points & WRAP UP: *"That was a useful discussion. Please share a take away from our discussion that you hope to apply when you care for a seizing pediatric patient in the ED."* End by thanking the group for their participation.

F	ACEP *Tele*SimBox	Debriefing Prompts & Resources

This page provides possible questions to elicit teaching points during the debrief for each objective. Use the questions on this one-page guide or feel free to use the accompanying pamphlet of "Peripheral Brain Cards." These questions are not meant to replace the discussion that you have with your team, but can help to steer the debriefing session.

Goal: Demonstrate a team-based approach to care for 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	***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: s**igns/**s**ymptoms, **a**llergies, **m**edications, **l**ast meal, **e**vents preceding
Skill: Prioritize treatment	***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
Skill: Manage medication side effects that lead to cardio-pulmonary deterioration	***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 common seizure activity in pediatric patients	***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.
Knowledge: Describe at least three causes of seizure	***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
Attitudes: Utilize team communication skills	***How is a shared mental model helpful to the team?*** ***Was there closed-loop communication between team members?***
Attitudes: Discuss the importance of 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. This does not lead to increased malpractice. A social worker or other provider should be assigned to stay with the family through this difficult time.

Free Online Open Access Medical Education Resources

SEIZURE

OVERVIEW

- https://dontforgetthebubbles.com/first-afebrile-seizure/
- https://dontforgetthebubbles.com/febrile-seizures/

VIDEOS & PODCASTS

- https://www.pedscases.com/seizure-4-year-old-male
- https://www.pedscases.com/seizure-types-and-epilepsy
- https://www.pedscases.com/search?search_api_aggregation_1=seizure&type=All&field_clinical_presentation=All&field_specialty_area=All
- https://ucdavisem.com/2020/02/17/the-state-of-status/
- https://emergencymedicinecases.com/emergency-management-of-pediatric-seizures/
- https://rebelem.com/rebel-core-cast-9-0-pediatric-status-epilepticus/

ALGORITHMS

- https://trekk.ca/search?q=status+epilepticus&events=events&teams=teams&external_resources=external_resources
- https://www.aesnet.org/sites/default/files/file_attach/PressReleases/2016/CSE%20Treatment%20chart-final_rerelease%20%282%29.jpg
- https://www.chop.edu/clinical-pathway/status-epilepticus-clinical-pathway

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

REFERENCE: HTTPS://COMMONS.WIKIMEDIA.ORG/WIKI/FILE:VITAMIN_B12_CAPSULE.JPG

Knowledge

Discuss stepwise approach to seizure management in pediatric patients

ABCDEs

Airway
Breathing
Circulation
Disability/**D**extrose
(Anti)**E**pileptic drugs (AEDs)

How to optimize airway / breathing

Open airway
Jaw thrust
Chin tilt
Shoulder roll
Suction PRN
Accessories: nasopharyngeal

Assist breathing
Bag mask ventilation (BVM)
Continuous positive airway pressures (CPAP)
Intubate/ventilate

Commonly used anti-epileptic drugs

Administer first line AED t = 5 min: Benzodiazepine (BZ) Q 5 min x 2

No IV access		IV/IO access
Midazolam 0.3mg/kg Buccal	max 10 mg	Midazolam 0.1 mg/kg max 5 mg
Midazolam 0.2 mg/kg IN/IM	max 10 mg	OR
Diazepam 0.5 mg/kg PR	max 50 mg	Lorazepam 0.1 mg/kg (max 4 mg)

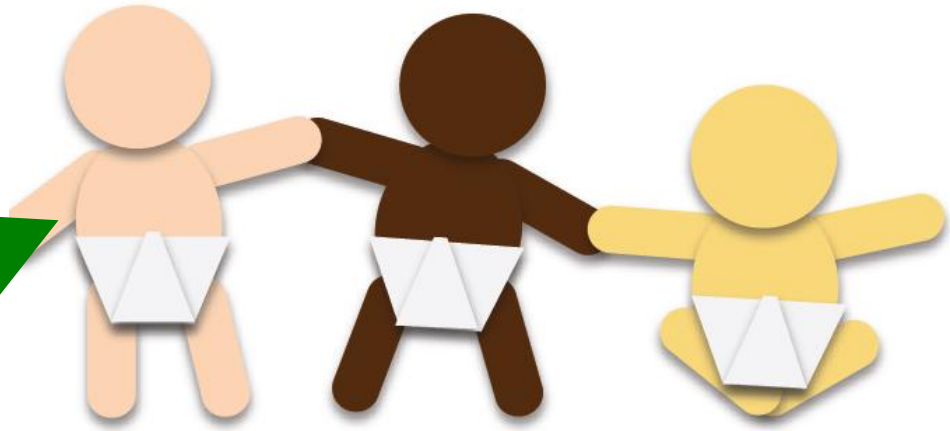
Administer second line AED t+15 min if still has SZ activity after 2nd BZ dose

Leviteracetam 40-60 mg/kg (max 2500 mg) OR
Phenytoin/Fosphenytoin 25 mg/kg OR
Valproic acid 40 mg/kg

G	ACEP *Tele*SimBox	Survey

We want to hear how this went for you and thank you for your feedback.
Please go online and click on either PARTICIPANT or FACILITATOR survey: **https://www.acepsim.com/** *OR*
Use **QR code**: Take out your mobile device, open camera, get QR code in front of camera, a link should pop up, click on that link.

The ACEP TELE SimBox team acknowledges that these materials are not perfect. Please send us feedback on how we can improve. Thank you and - most importantly - happy telesimming!



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