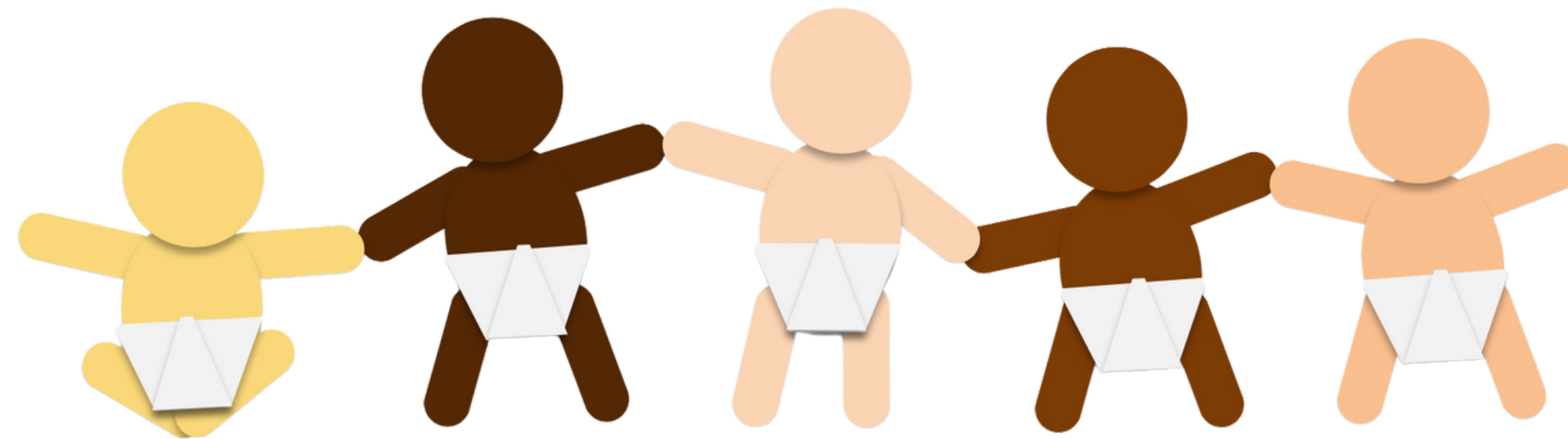
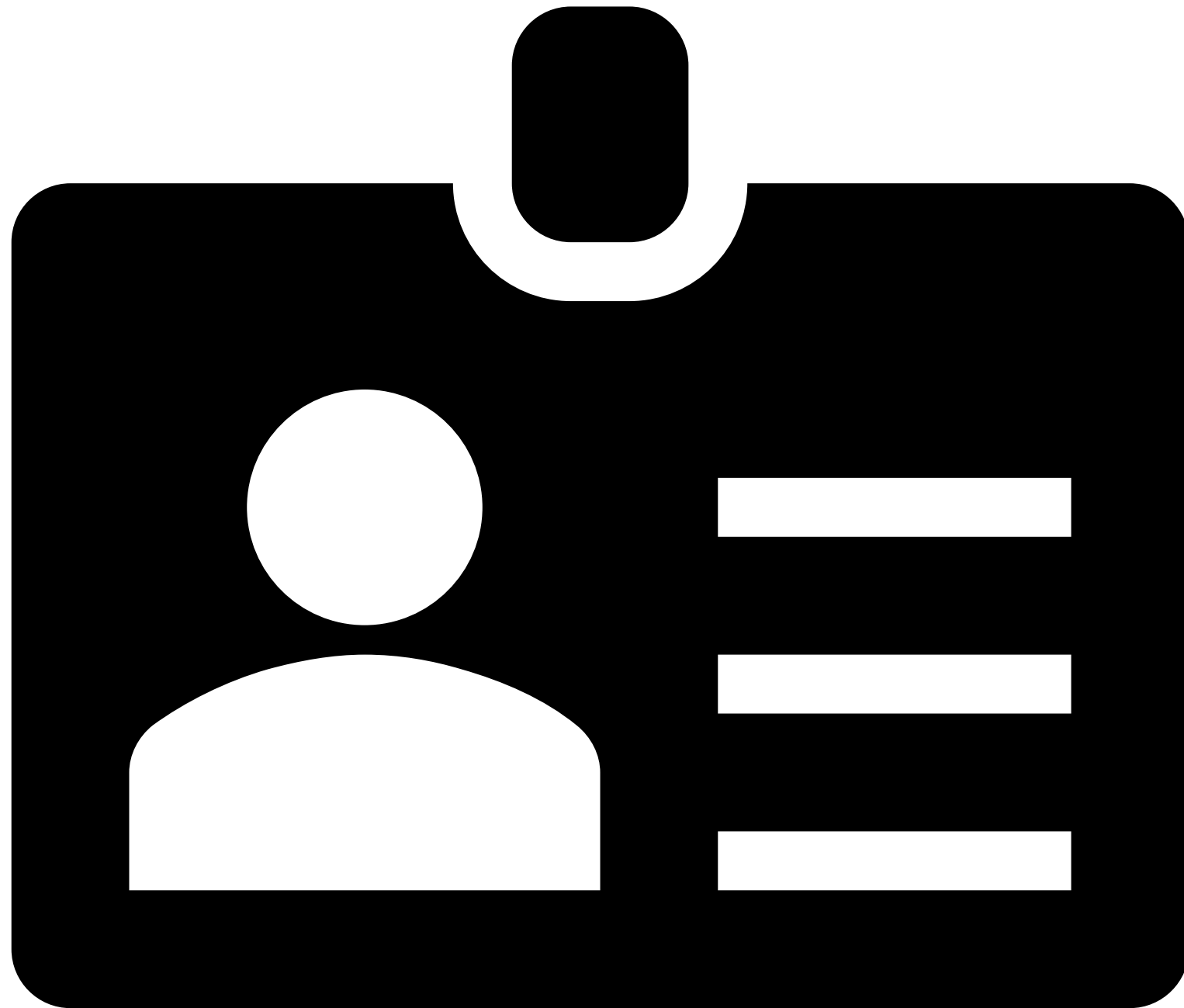


SimBox +  
+ Te le Sim Bo x





## **BRIEF INTRODUCTIONS**

Please share your name, organization, and if you have ever done a simulation before.

I will call your name.

# Objectives

By the end of our time together, you will be able to :

- Locate the resources needed to conduct a simulation using Sim Box.
- Describe the steps/ process to conduct a simulation using Sim Box.
- Commit to conducting a Sim Box Simulation in the next month.

# The team



Sofia  
Athanasopoulou  
PEM Fellow  
Yale



Elisabeth Sanseau  
PEM/ Global Health  
Fellow  
CHOP



Marc Auerbach  
PEM Attending  
Yale



Maybelle Kou  
PEM Attending  
Inova

Some SimBox projects have received funding from:





# Why Simulation ?

Simulation is immersive in nature

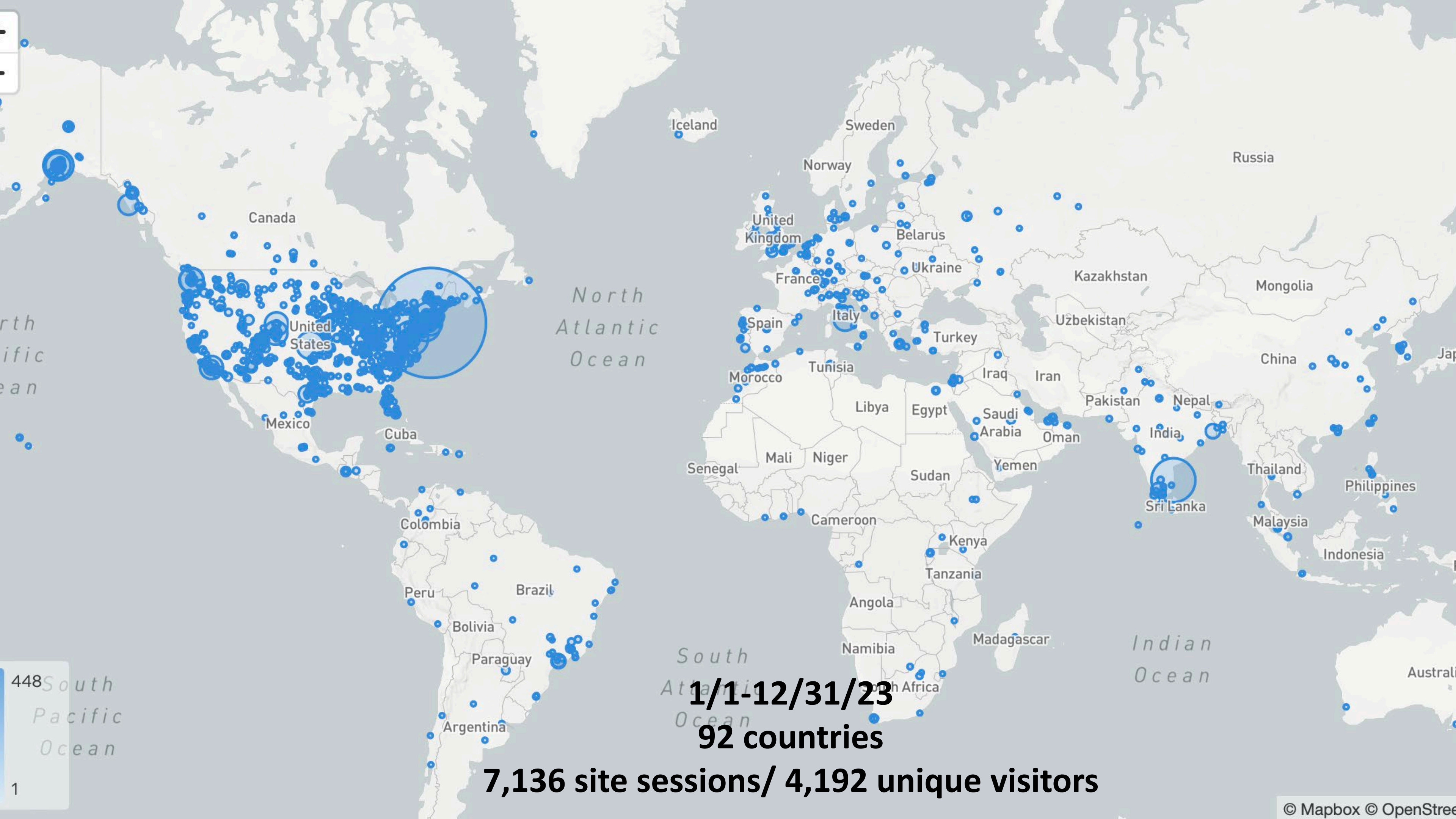
Participants are practicing skills and management in their own practice setting

Opportunities for teams to train together in a realistic setting

Ask team members to “immerse” themselves into the scenario to make it as realistic as possible

Goal is to think, talk, and do with YOUR stuff

Debriefing is reflective to promote participants to learn from the experience

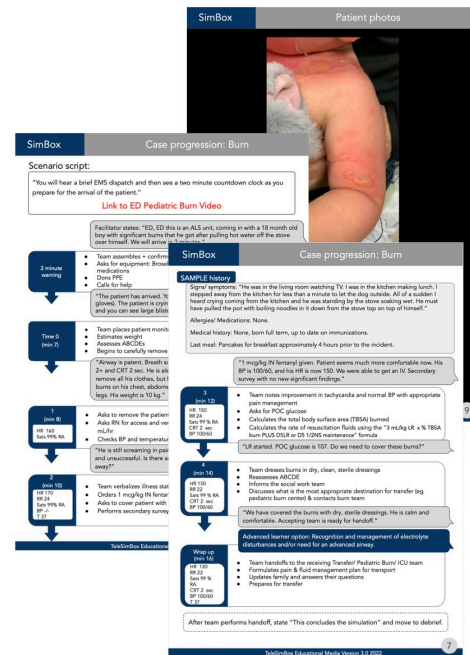
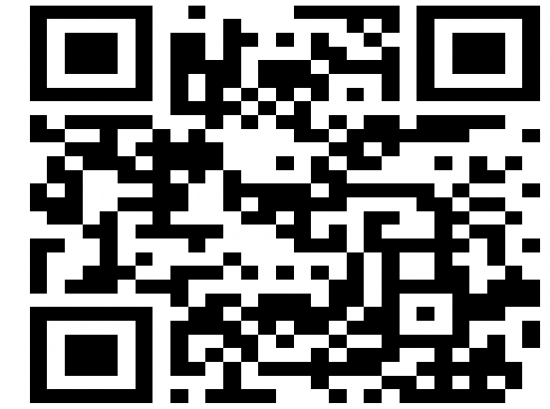
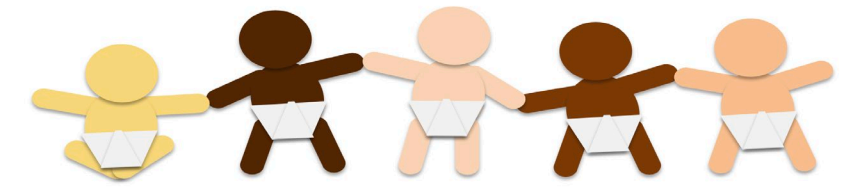


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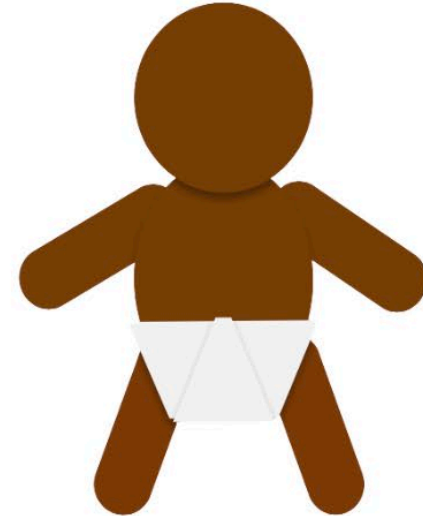
**1/1-12/31/23**  
**92 countries**

**7,136 site sessions/ 4,192 unique visitors**

# What is SimBox?



Booklet



Low or high technology mannequin



Monitor or computer



Your own equipment

# What each case consists of

Booklet

SimBox+  
Tele SimBox

Newborn Resuscitation

Video

SimBox Case progression: Newborn Resuscitation

**SAMPLE history**  
Prenatal history: P1G0001, 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.

4  
HR 130  
RR 40-60  
Sat 85%  
CRT 2 sec

- Team discusses NRP algorithm: SpO2 and HR at goal
- Starts weaning FiO2
- Places ET/CO2 on mask, if not already placed
- Requests stat blood sugar

5  
HR 140  
BP 50/30  
RR 40-60  
Sat 90% on 0.3  
FiO2

- Team notes hypoglycemia
- Attempts IV access
- Orders D10W bolus at 2 mL/kg
- Asks for temperature and blood pressure

Wrap

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

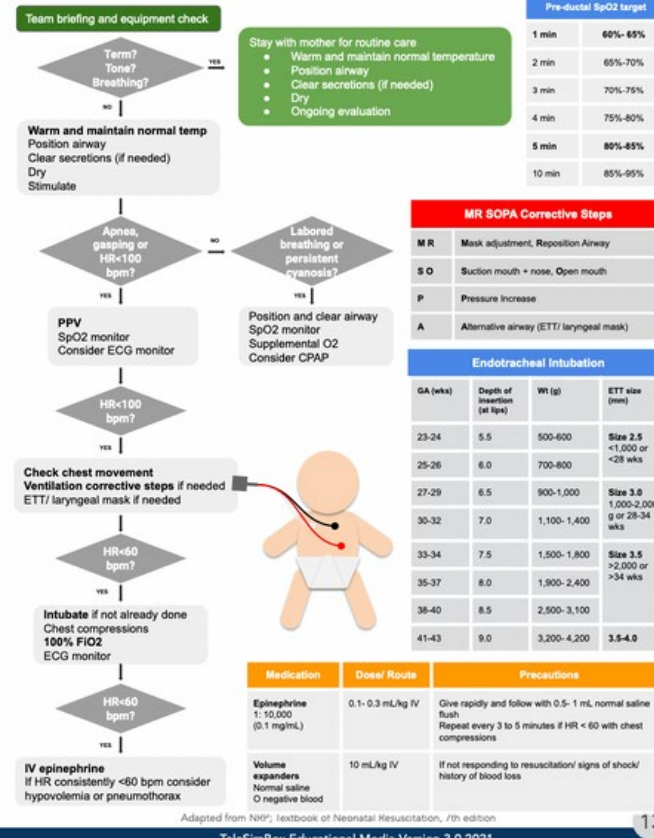
After team performs handoff, state "This concludes the simulation" and debrief.  
[Link to resource page: educational content](#)

Video guide  
7 min: patient appears  
9 min: HR < 100, low sats  
10 min: HR > 100, low sats  
12-17 min: HR > 100, goal sats

TeleSimBox Educational Media Version 3.0 2021

SimBox Resources: Neonatal Resuscitation Program

Knowledge: NRP guidelines  
Learners should approach a newborn delivery in a standardized fashion with emphasis on airway and breathing



&

Click here

Click here

Step 1 HR < 100 Low Sats PPV Step 3 Step 4 Step 5

SimBox+ TeleSimBox

Monitor overlay:  
HR 118  
SpO2 71  
Pleth  
CO2 No Sensor  
Touch when sensor connected  
NBP Manual 05:56 PM 05:56 PM 0/0 (0) Pulse 140 80  
Sys. 120 70  
imCO2  
awRR 40 15

SimBox+  
Tele SimBox

X

Yale SCHOOL OF MEDICINE

Yale  
NewHaven  
Health



# The Booklet: Case Progression

**SimBox** Case progression: Burn

**Scenario script:**

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

[Link to Pediatric Burn Video](#)

Facilitator states: "EMS, please respond to an 18 month old boy who pulled hot water off the stove over himself and has sustained severe burns. You will arrive on scene in 2 minutes."

**2 minute warning**

- Team assembles + confirms roles
- Asks for equipment: Broselow tape/ app, monitors, access, medications
- Dons PPE
- Calls for help

"The arrive at the home and have put on the appropriate PPE (mask and gloves). The scene is safe. You find a toddler who is crying and screaming in pain. His clothes appear wet and you can see large blisters on his exposed skin."

**Time 0 (min 7)**

- Team places patient monitors, pulse oximeter, BP cuff, temp probe
- Estimates weight
- Assesses ABCDEs
- Begins to carefully remove all clothes

"Airway is patent. Breath sounds are equal bilaterally. Femoral pulses are 2+ and CRT 2 sec. He is alert and moving all limbs. You are trying to remove all his clothes, but he is crying inconsolably. He has severe scald burns on his chest, abdomen, and anterior surface of his left arm and both legs. His weight is 15 kg."

**1 (min 8)**

- Team asks to remove the patient's diaper too (if not done)
- Attempts IV access and verbalizes need to start fluid resuscitation with Lactated Ringer's (LR) at 125 mL/hr
- Checks BP and temperature

HR 160  
Sats 99% RA

"He is still screaming in pain, IV placement and BP measurement attempted and unsuccessful. Is there anything we can give him for his pain right away?"

**2 (min 10)**

- Team verbalizes illness state: Patient with extensive scald burns
- Orders 1 mcg/kg IN fentanyl
- Asks to cover patient with dry, clean sheet
- Performs secondary survey

HR 170  
RR 24  
Sats 99% RA  
BP -/-  
T 37

6

TeleSimBox Educational Media Version 3.0 2022

Facilitator prompts

Participants actions

**SimBox** Case progression: Burn

**SAMPLE history**

Signs/ symptoms: "He was in the living room watching TV. I was in the kitchen making lunch. I stepped away from the kitchen for less than a minute to let the dog outside. All of a sudden I heard crying coming from the kitchen and he was standing by the stove soaking wet. He must have pulled the pot with boiling noodles in it down from the stove top on top of himself."

Allergies/ Medications: None.

Medical history: None, born full term, up to date on immunizations.

Last meal: Pancakes for breakfast approximately 4 hours prior to the incident.

"1 mcg/kg IN fentanyl given. Patient seems much more comfortable now. His BP is 100/60, and his HR is now 150. We were able to get an IV. Secondary survey with no new significant findings."

**3 (min 12)**

- Team notes improvement in tachycardia and normal BP with appropriate pain management
- Asks for POC glucose
- Calculates the total body surface area (TBSA) burned
- Calculates the rate of resuscitation fluids using the "3 mL/kg LR x % TBSA burn PLUS D5LR or D5 1/2NS maintenance" formula

HR 150  
RR 24  
Sats 99% RA  
CRT 2 sec  
BP 100/60

"LR started. POC glucose is 107. Do we need to cover these burns?"

**4 (min 14)**

- Team dresses burns in dry, clean, sterile dressings
- Reassesses ABCDE
- Discusses the most appropriate destination for transfer (eg pediatric burn center) & contacts receiving team

HR 150  
RR 22  
Sats 99% RA  
CRT 2 sec  
BP 100/60

"We have covered the burns with dry, sterile dressings. He is calm and comfortable. Accepting team is ready for handoff."

**Wrap up (min 16)**

- Team handoffs to the receiving ER/ Pediatric Burn/ ICU team
- Formulates pain & fluid management plan for transport
- Updates family and answers their questions
- Prepares for transfer

HR 130  
RR 22  
Sats 99% RA  
CRT 2 sec  
BP 100/60  
T 37

Advanced learner option: Recognition and management of electrolyte disturbances and/or need for an advanced airway.

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

7

TeleSimBox Educational Media Version 3.0 2022

Signs/  
symptoms,  
allergies,  
medications,  
past medical  
history

# The Booklet: Teaching Content & Flashcard

## PEDIATRIC BURN MANAGEMENT

**Primary Survey**

- Airway/ Breathing**
  - Think of airway early
  - Assess for CO poisoning
  - Use humidified oxygen
- Circulation**
  - Initiate fluids early
  - Preferred IV fluid
  - Burns <20% TBSA
  - Do not bolus unless
  - Start IVF during transport
    - <5 y/o: 12
    - 6-13 y/o: 10
    - >14 y/o: 5
- Disability**
  - Altered mental status
  - related cause.
- Exposure**
  - Stop the burning
  - Remove all clothing
  - Examine for any
  - may mask less pain
  - Cover the wound
  - Take warming measures
  - cover the head to
  - Topical antibiotic
  - burn center.
  - Do not apply ice
  - and cold injury to
  - Burn debridement

**Secondary Survey**

- Fluid Resuscitation**
  - Total fluid volume to be replaced
  - >30kg: 2 mL/kg LR x %TBSA
  - <30kg: 3 mL/kg LR x %TBSA
  - Give half over the first 8
  - Give the other half over
  - Subtract any bolus fluid
  - Use LR for resuscitation
  - Only for second and third
  - Titrate based on response

E.g. 30 kg child with 40% TBSA  
Total fluid resuscitation in first 8  
3.600 mL / 2 = 1.800 mL to be  
will be 1.800 mL/ 8h = 225 mL/h

**SimBox** **Flashcard**

**Perform a thorough physical examination:**

- Evaluate for concomitant injury.
- Assess vascular status of extremities and thorax. Circumferential burns may result in vascular compromise and may require escharotomy.

**Treat pain and anxiety:**

- IN fentanyl, Tylenol suppository, IM Toradol if no IV access.
- Remember nonpharmacologic interventions: reassurance, soothing, distraction, child life specialists.

**"AMPLET" Mnemonic:**

- Allergies, Medications, Past medical and surgical history, Last intake, Events and Environment, Tetanus (tetanus prophylaxis should be considered for all burns).

**Ask for the circumstances of the injury:**

- Non accidental scalds are a common form of abuse.
- Is the story consistent with the injury pattern?
- Does the mechanism match the developmental stage of the child?
- Document: photographs are crucial.
- Reporting of child abuse is mandatory in the US. The child's pediatrician is often a valuable source of information.

**Labs:** CBC, serum electrolytes, CK, UA.

**Determine the total body surface area (TBSA) burned.**

**Estimating Percent Total Body Surface Area in Children Affected by Burns**

**Rule of 9s:** Used in adults but is not very accurate in children as the proportion of body surface area made by anatomic parts, especially the head, varies considerably by age.

**Lund Browder diagrams.**

**Palm method.** (fingertip to wrist equals 1% of TBSA)

Superficial burns are NOT included in TBSA.

**Flashcard**

Print and distribute to your participants



SimBox + TeleSimBox

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

**CLASSIFY BURNS BY DEPTH OF INJURY**

**SUPERFICIAL:** Dry, red. Blanches with pressure. Epidermis only.

**SUPERFICIAL PARTIAL-THICKNESS:** Blisters. Moist, red, weeping. Blanches with pressure. Extends into papillary dermis.

**DEEP PARTIAL-THICKNESS:** Blisters, easily unroofed. Wet or waxy dry. Variable color. Does not blanch with pressure. Includes more of the dermis.

**FULL THICKNESS:** Waxy white to gray to charred and black. Dry and inelastic. No blanching with pressure. All of dermis involved.

**FOURTH DEGREE:** Extends through the subcutaneous fat into the fascia and/or muscle.

**HOW ARE BURNS IN CHILDREN DIFFERENT THAN ADULTS?**

Infants and young children have a smaller body surface area (BSA) than adults, but are often exposed to the same offending agent (tap water, a hot drink, clothing iron), and thus sustain a proportionately larger TBSA burn than an adult.

A 7 kg child has a tenth of the weight of a 70 kg adult but a third of their TBSA. This relatively large body surface area results in both a greater surface exposure to the environment and a greater evaporative water loss per kg than adults. Therefore, children require more IV fluid per kg during resuscitation.

Infants less than 6 months have limited muscle mass, so cannot generate as much heat by shivering. Temperature regulation in this age group depends much more on environmental temperature control.

Children under age 2 years have thinner skin and are more prone to full thickness burns at lower temperatures or shorter duration of contact than adults.

**WHEN TO TRANSFER A CHILD TO A BURN CENTER?**

- Partial thickness burns >10% of TBSA.
- Full-thickness burns.
- Burns of the face, hands, feet, genitalia, perineum or major joints.
- Inhalation, electrical or chemical injuries.
- Significant pre-existing medical disorders, concomitant trauma or need for special social, emotional or rehabilitative intervention.
- Burned children in hospitals without qualified personnel or equipment for the care of children.

Suggested teaching content to guide the debriefing



# The Booklet: So much more

**SimBox Prebriefing Script**

Best practices for establishing psychological safety in simulation.

Basic Assumption: "We believe that everyone participating in our activities is intelligent, capable, cares about others, and will do their best." [Center for Medical Simulation](#)

**SimBox Debriefing Script**

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."

**Prebrief** (1-2 min): Welcome your team. "This simulated resuscitation is an emergency. We will debrief for 20 to 30 minutes. Your input from the team is important, everyone is here to do their best, everyone is here to learn, and everyone is here to be seriously as possible."

**Describe** (1-2 min): Describe simulator. "Act as you would in a real event unless your equipment should be attached using your equipment."

**Demo** (7-8 min): DEMO: Closed loop. Know your role and complete. Leader: Tech OK go. Tech: OK, I've got it. Tech: OK, I've got it.

**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.

Ref: PEARLS Debriefing Script. The 3D model of debriefing. *Semin Perinatol.* 2011;35(2):52-58. TeleSimBox Educational Media Version 3.0 2022

Pre-briefing /  
De-briefing guide

What are the educational goals for this simulation?



**SimBox Milestone Checklist**

TASK	DONE CORRECTLY	NOT DONE CORRECTLY	NOT DONE
<b>Team-centered care</b> Verbally assemble the necessary staff, equipment, and resources to care for a pediatric burn patient. Demonstrate effective teamwork and communication (i.e. designate leader/roles, directed orders, closed-loop communication, sharing mental model). Demonstrate appropriate PPE.			
<b>Family-centered care</b> Obtain an appropriate history from the family member (SAMPLE). Address family concerns, update on care (translate medical aspects of care in plain language).			
<b>Medical knowledge</b> Use the pediatric assessment triangle to assess the patient's clinical status. Perform an efficient primary and secondary survey. Prioritize early pain management (e.g. using intranasal fentanyl) when no IV access has yet been established. Appropriately estimate the percentage of TBSA burned. Prioritize appropriate fluid resuscitation. Take warming measures to conserve body temperature.			
<b>Psychomotor</b> Demonstrate appropriate wound management (removing clothing/diaper, using dry, sterile dressings). Decide on the appropriate destination for transfer.			
<b>Communication</b> Demonstrate handoff of care at the end of the case.			

**SimBox TeamSTEPPS Communications tools**

COMPONENTS OF EFFECTIVE TEAMS: TEAMSTEPS IN A NUTSHELL

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	Huddle	"I'M SAFE" for self evaluation Situation Task Team Environment Equipment	FEEDBACK Providing information for purpose of team improvement
			ADVOCACY & ASSERTION Advocating for patient in case of a disagreement with decision maker
			2 CHALLENGE RULE Information conflict regarding patient safety
			DESC Script Tool for personal conflict* 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

**SimBox Pediatric vital signs & assessment**

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)

Appearance (TICLS): Tone (Interactive/Compliable/Unresponsive), Interactions (Look/gaze/Speech/cry), Circulation (Color/Mottling/Cyanosis)

Work of breathing: Position, Breath sounds, Nasal flaring, Retractions, Grunting

Circulation: Pallor, Mottling, Cyanosis

SHOCK: CNS/METABOLIC, CARDIOPULMONARY FAILURE

STABLE: RESPIRATORY DISTRESS, RESPIRATORY FAILURE

and the Shared Mental Model: the airline industry) is based upon teaming clear roles for team members. Communication when used by all team members improves safety through: team members by name when assigning information when tasks are acknowledged or completed. It allows a team to anticipate the plan for equipment or medications might be needed.

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Pediatric educational resources

# The Video

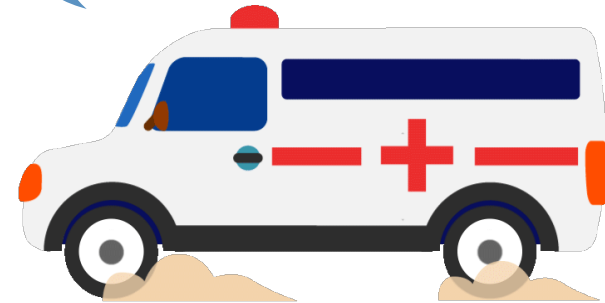
Prebrief



3 min



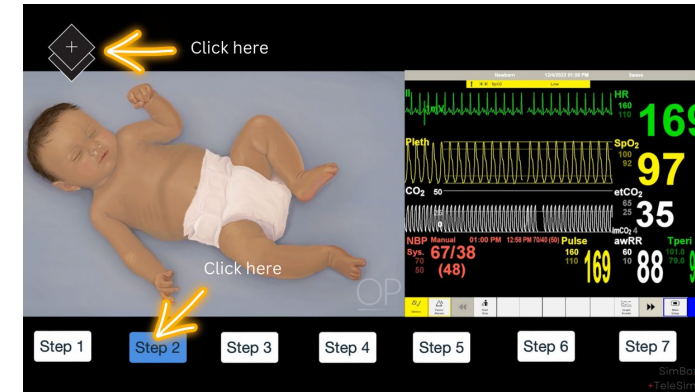
Dispatch and  
2-min countdown  
clock



2 min



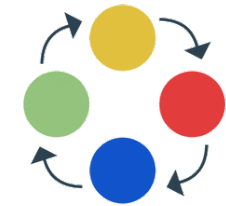
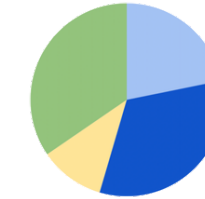
Simulation



10 min



Debrief



15 min



# Sim Agenda

## Remote facilitator

### Set up:

- Teleconnect with In-person facilitator (10mins)

### Sim:

- Intro/Prebrief (5mins)
- Sim (screen share YouTube video & play role of parent historian (10mins)
- Debrief (15mins)

## In-person facilitator

### Set up:

- Gather manikin, equipment, 2 computers
- Establish situational awareness with Charge Nurse
- Teleconnect with Remote facilitator, audio-visual check (10mins)

### Sim:

- Play role of embedded RN participant: report physical exam findings, labs, meds given, access requests

# Pre-Brief

Prior to the simulation activity

Introductions

Agenda review

Review of essential information about the scenario

Background information

TeleSimBox prebriefing toolkit

- Script tips to establish psychological safety

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.

# How the room is usually set up



Print the booklet so that you can reference it during the simulation.



You can use any workplace monitor or computer you have available to stream and navigate the video

# Soldotna Fire, Alaska

Monitor or laptop streaming the video



Embedded participant/parent



Mannequin



Sim Box+  
+Tele Sim Bo

x



# Soldotna Fire, Alaska

Embedded participant/parent



Sim Box+  
+Tele Sim Bo

x

# Nikiski Fire, Alaska



Monitor  
streaming  
the video

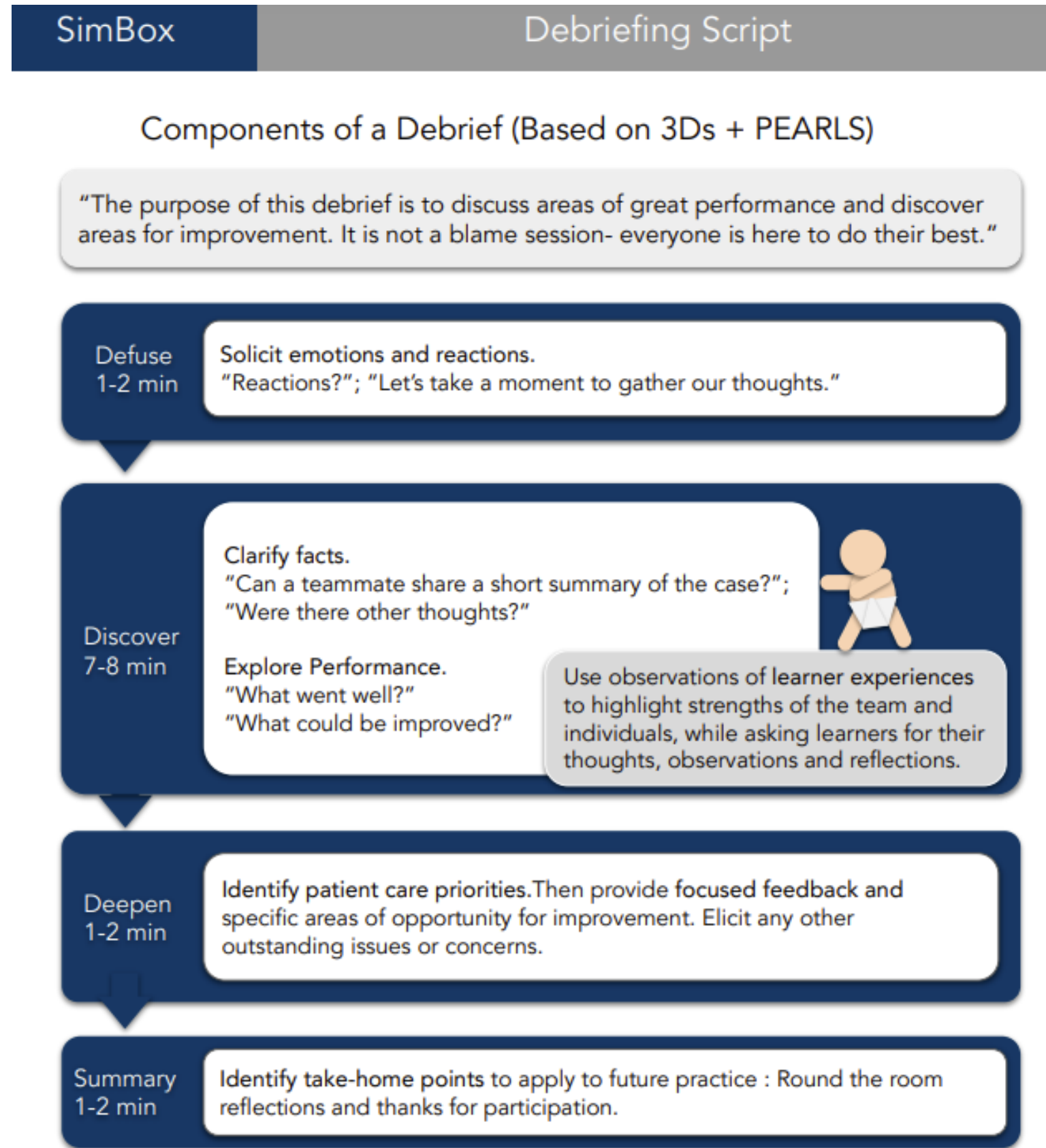
Em bedded  
particip ant/  
parent

The facilitator uses  
their laptop to  
navigate the video  
based on the  
participants' actions

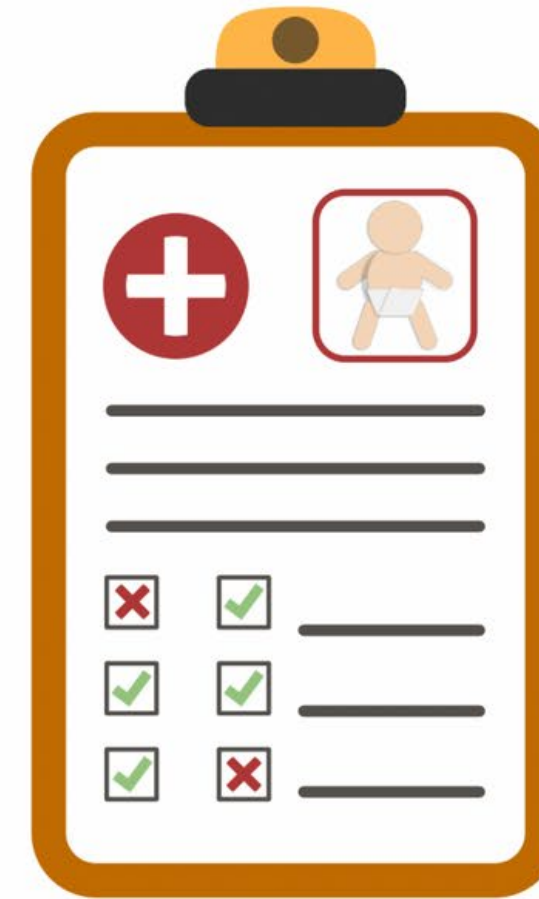
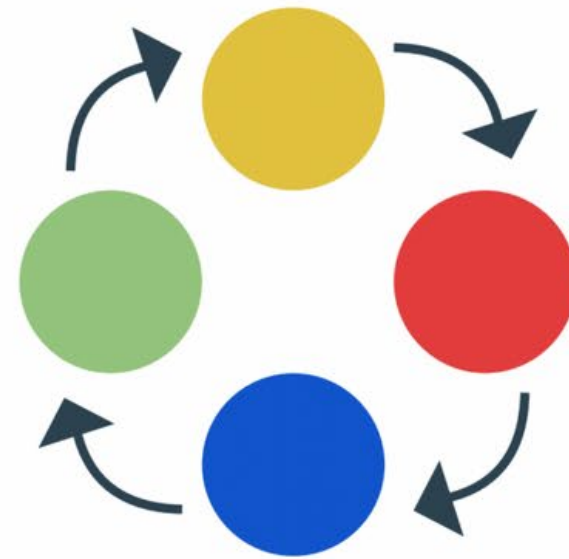
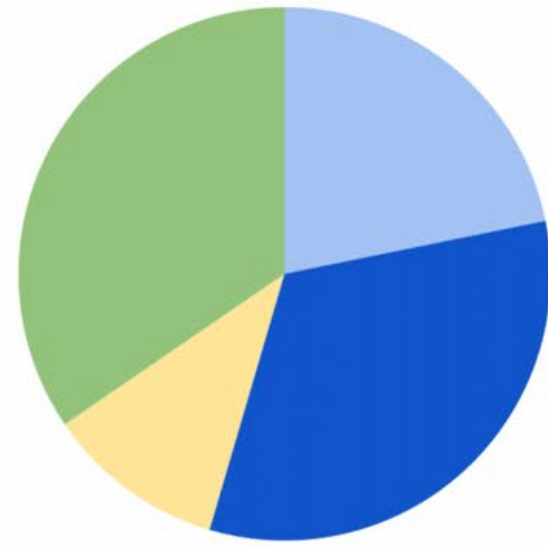
Particip ants use  
their own  
equipment and  
supplies to  
simulate what  
would happen in  
the field.

# Debrief

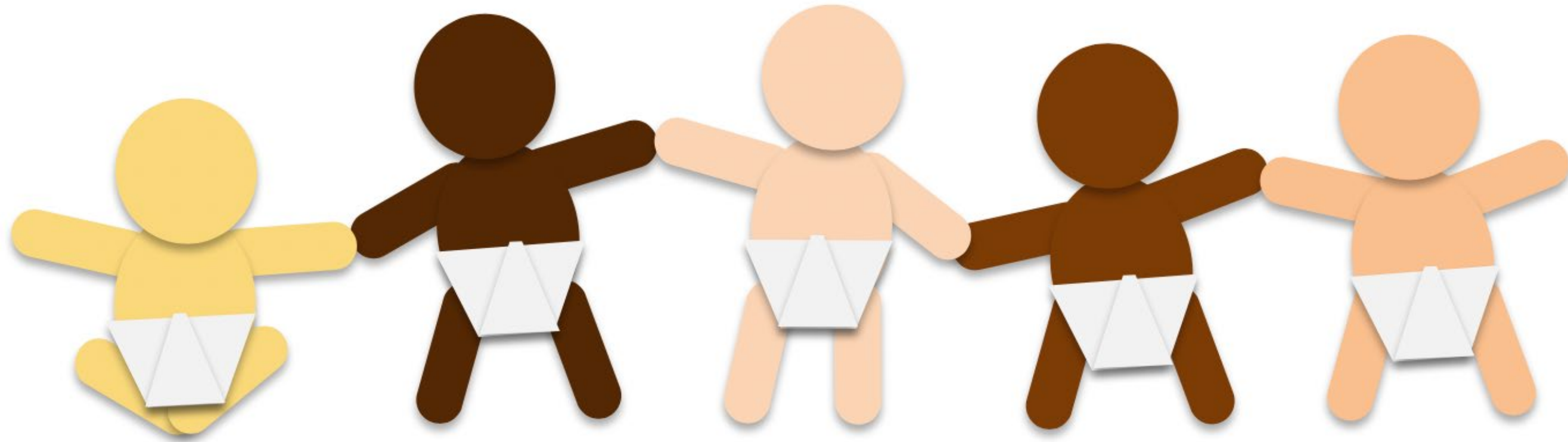
- A facilitated, interactive conversation between two or more people to review a real or simulated event in which *participants* analyze their actions to:
  - Reflect on the role of
  - Thought processes
  - Psychomotor skills
  - Emotional state in a stressful situation
  - To improve or sustain performance in the future
- (Adapted from CMS & AAP)



# Questions?



# Simulation #1



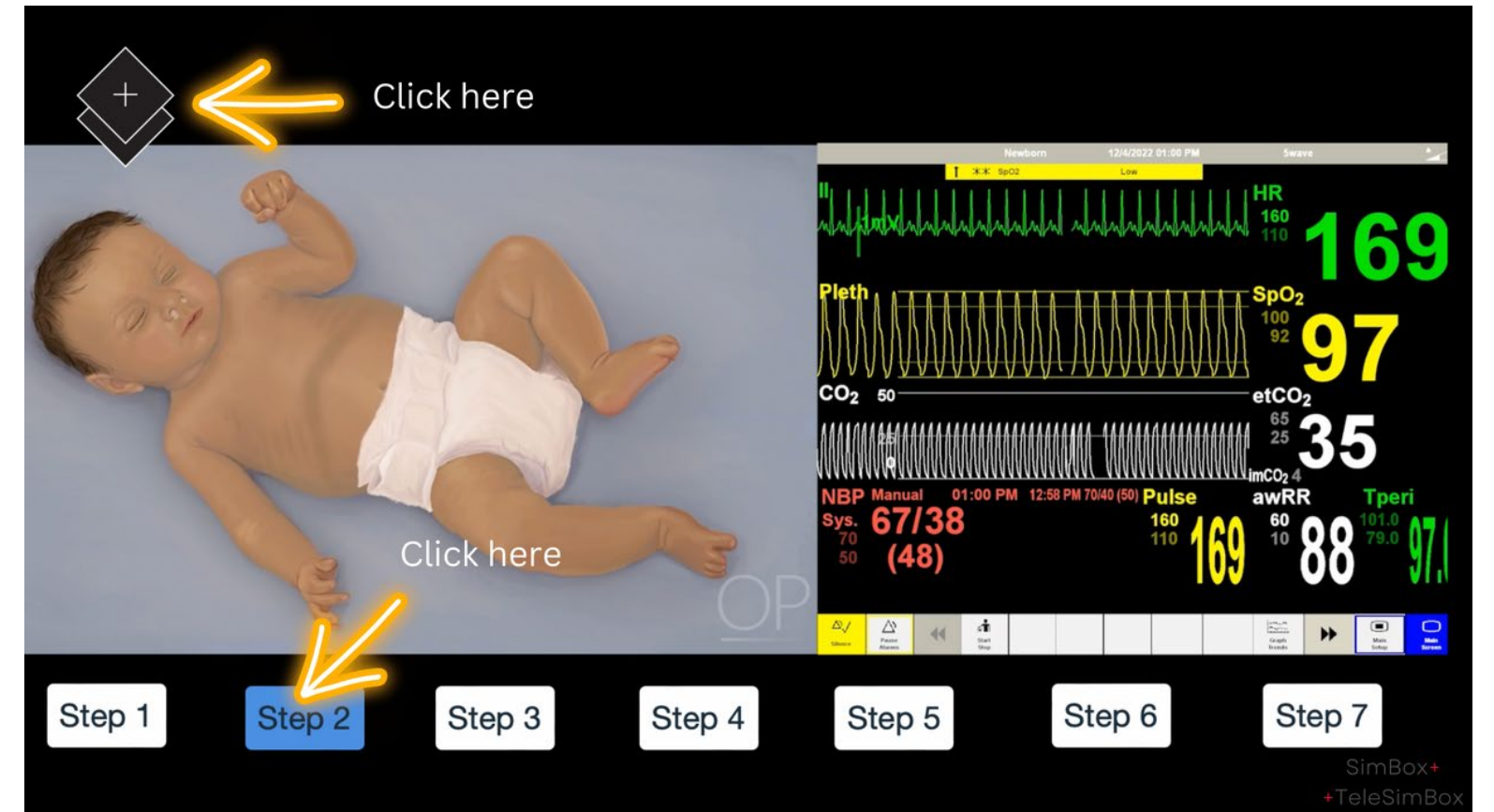
# Simulation #1

## Reflections

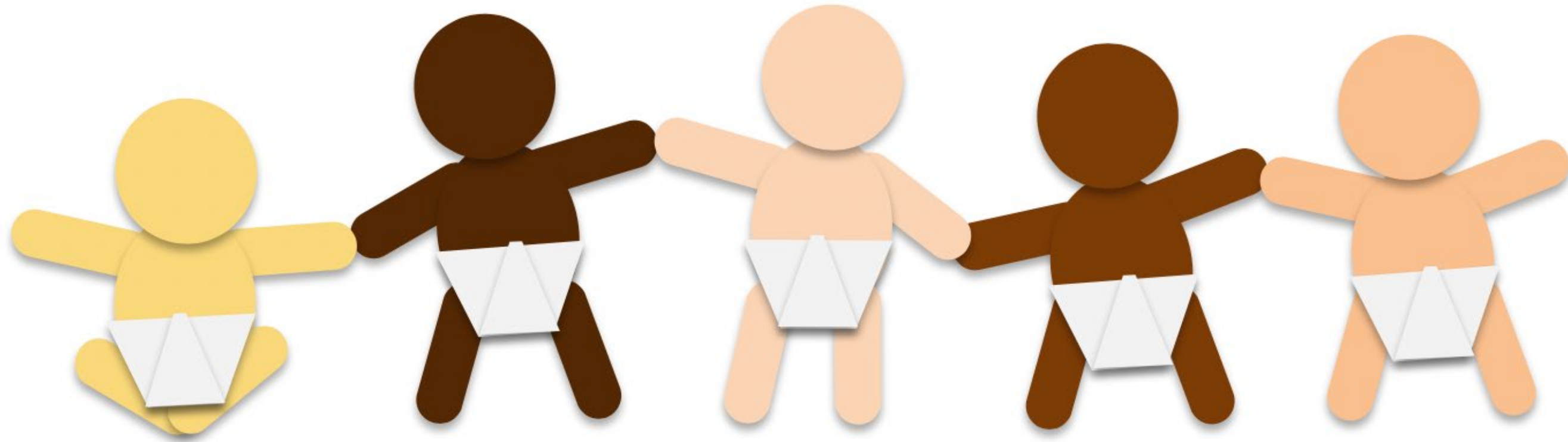
What went well?

What could have been done differently?

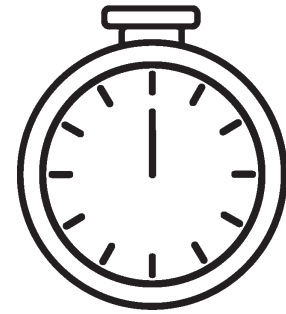
What were particular challenges?



## Simulation #2

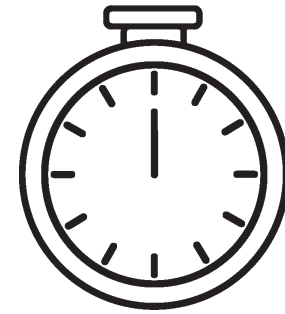


# Time line



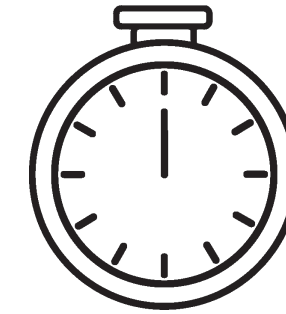
Prebrief

10 min



Simulation

10 min



Debrief

20 min



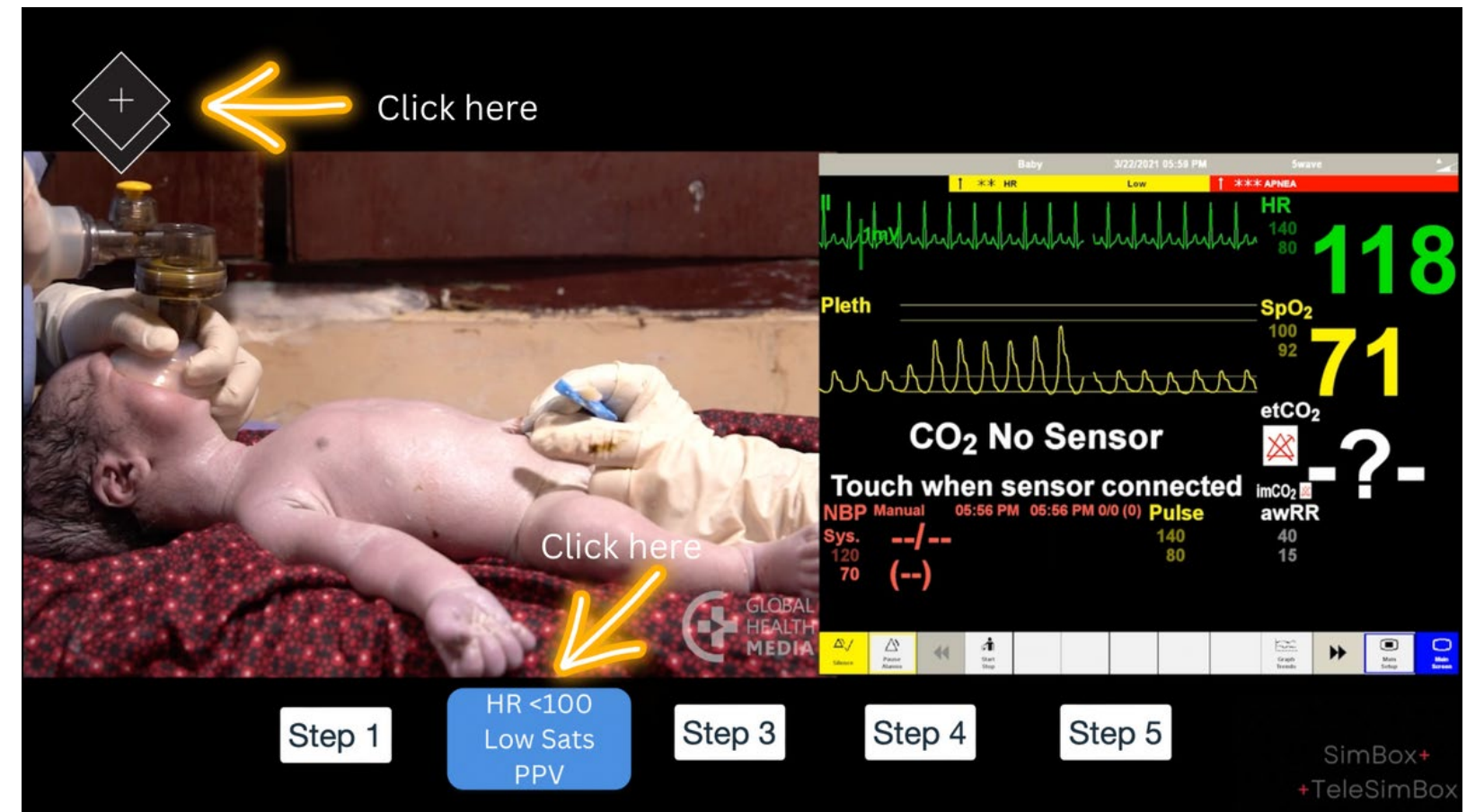
# Simulation #2

## Reflections

What went well?

What could have been done differently?

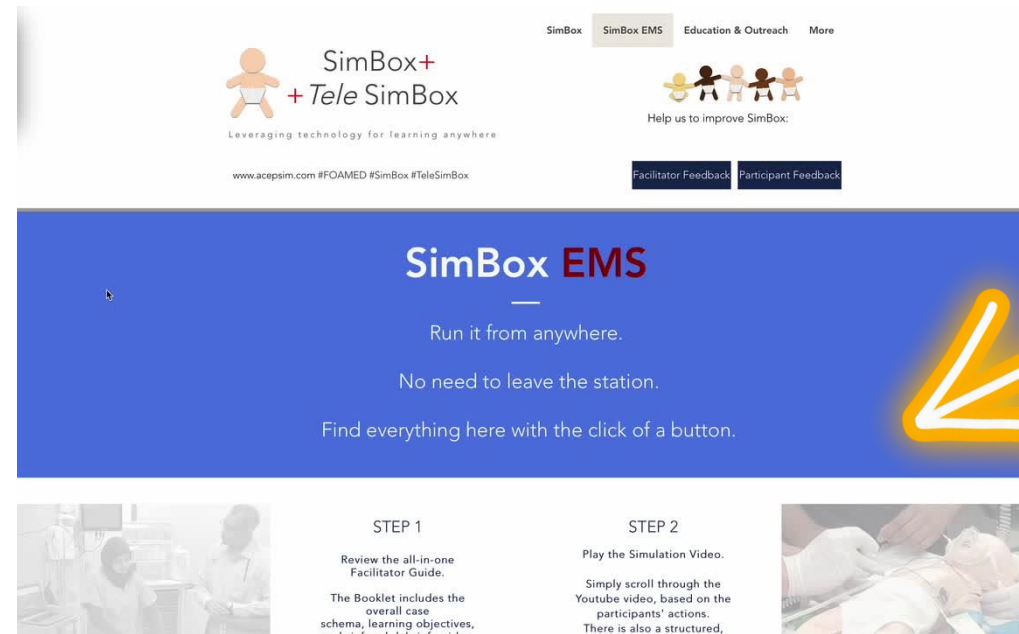
What did you like? What did you not like?



# Objectives:

You are now able to...

- Locate the resources needed to conduct a simulation using Sim Box.



- Describe the steps/ process to conduct a simulation using Sim Box.



- Commit to conducting a Sim Box Simulation in the next month.

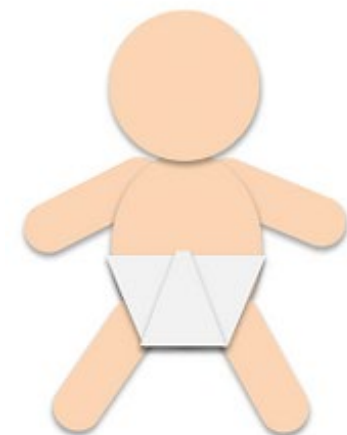


# Overall Impressions & Feedback

Would SimBox be a useful tool in your clinical environment?

How can we make this better?

How can we support you best?



SimBox+  
+ *Tele* SimBox

# Next Steps



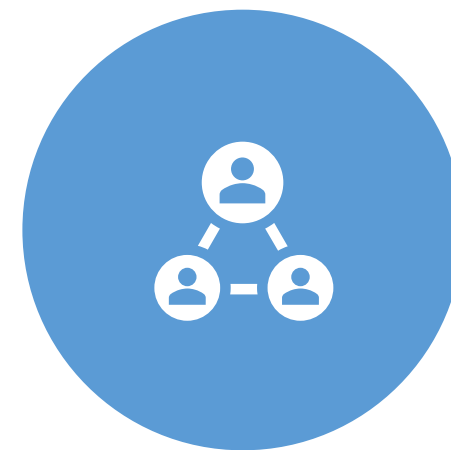
Review the course content



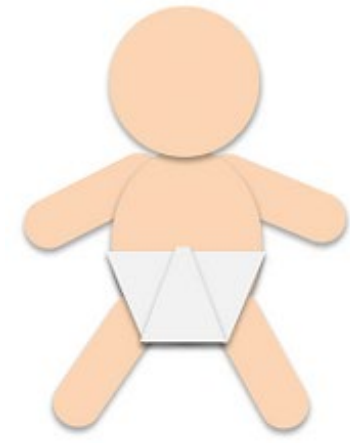
Meet with your PECC



Schedule in-person SimBox facilitation



Co Facilitate!



SimBox+  
+ *Tele* SimBox

Thank you so much for your time and  
p a r t i c i p a t i o n !