Reaching the Masses:

Strategies for Providing Broad Based Education

Session 3-301, Tuesday September 12, 2023 11:00-11:50am

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Speaker Disclosure

- **We have no financial interests or relationships to disclose**

Funding Acknowledgement

- We will discuss work with funding from the following entities

Objectives

- By the end of this session attendee should be able to:

1. Describe how collaboration can address the challenges SP programs face related to education

1. Identify the benefits and opportunities of sim-based education

1. Provide an example of the use of online education for reaching large groups of learners

1. Discuss critical partnerships and collaboratives that contribute to the success of online multi-state educational programs

MISSION: IMPOSSIBLE

“WHEN Do You Need That?”

- How’s Your Workload?
- How’s Your Attitude?
- Who Can Help?
- Get Creative
- Let’s Help Each Other!

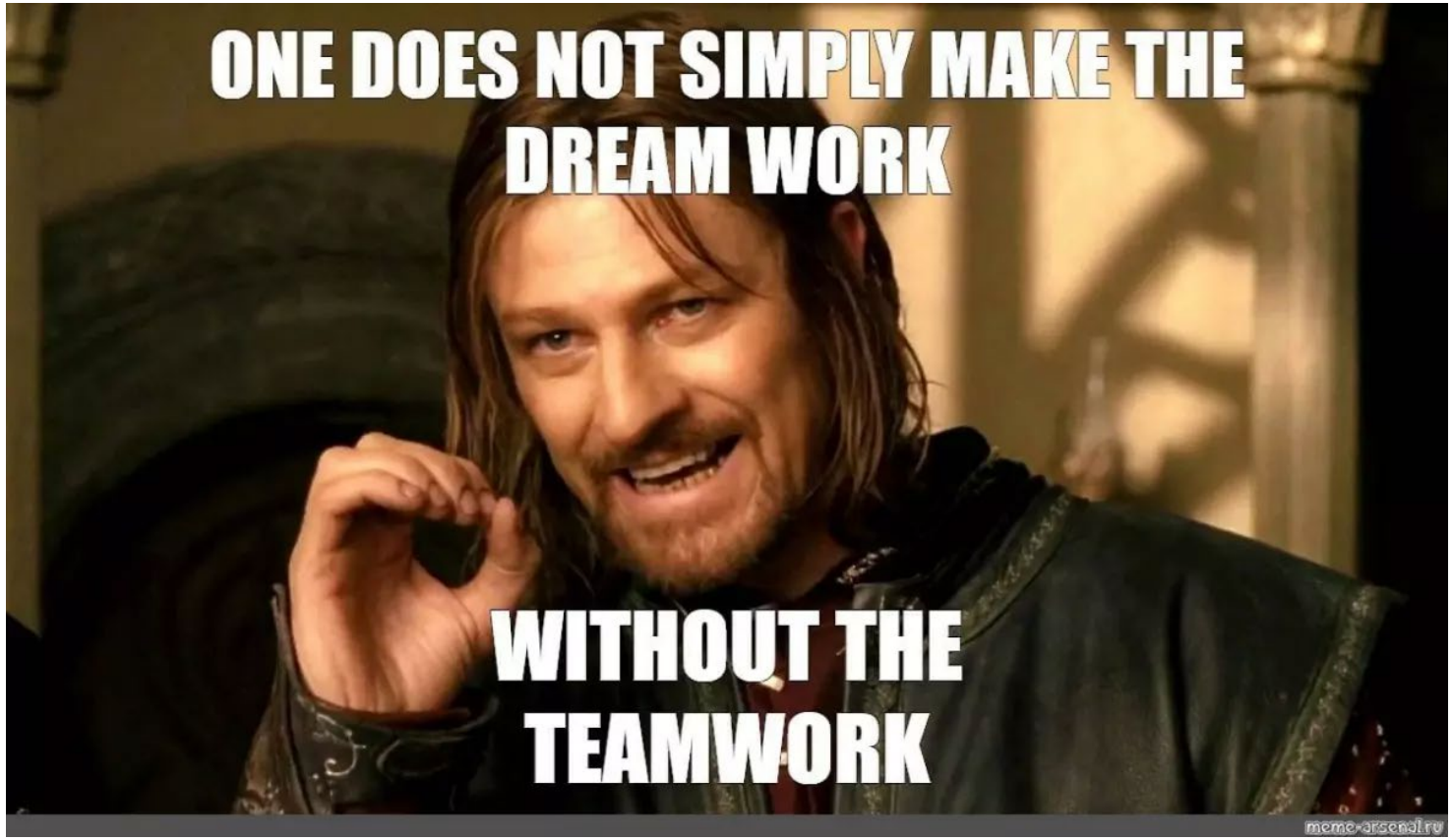
ann-shen.com

Who Can Help?

- Anyone, anyone…
- Let's Get Creative
- Let's Help Each Other!

medium.com

Making the Dream Work



thinkremote.com

- Existing Resources
- Collaboration
- Economies of Scale

Democratizing Access to Pediatric Education

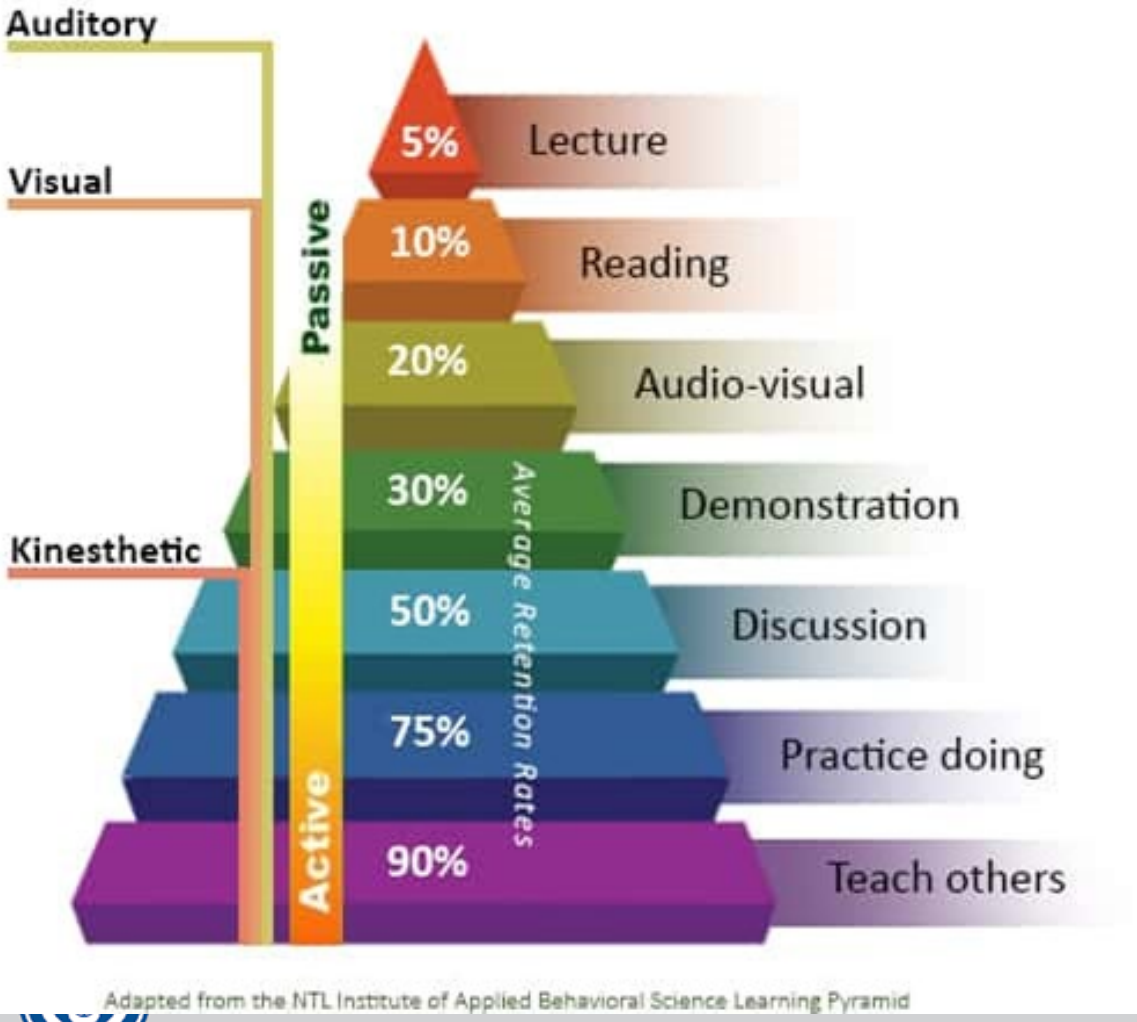
Emergency Care Continuum

Options for Educational Strategies

- Synchronous
  - Lectures
  - Case based discussion
  - Lectures
  - Simulation/skills training
  - Case reviews

- Asynchronous
  - Newsletters
  - Recorded webinars
  - Podcasts
  - Videos
  - Websites
  - Learning modules
  - Worksheets

Effectiveness of educational Strategies



Adapted from the NTL Institute of Applied Behavioral Science Learning Pyramid

Why Pediatric Simulation?

	Clinical	Simulation
Experiences	Few Unstructured Uncontrolled	Many Structured Controlled
Feedback	Rare	Frequent
Errors	Patient harm, unethical	Valuable to learning

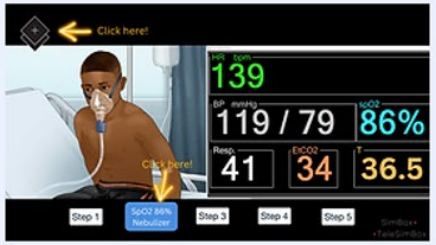
SimBox+
+ *Tele* SimBox

Free online simulation for everyone.

Step by step guide on how to facilitate a simulation.

Use to augment in-person, hybrid or distance simulation.

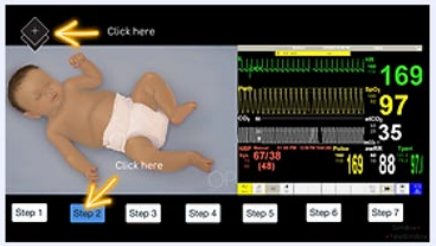
Low to no technology required.



A Child with Wheeze

Booklet

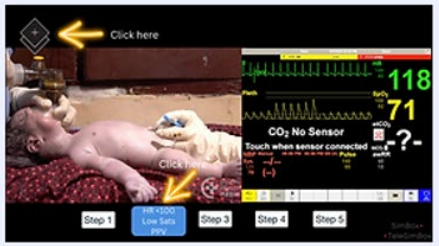
NEW: Interactive Video



Respiratory Distress

Booklet

NEW: Interactive Video

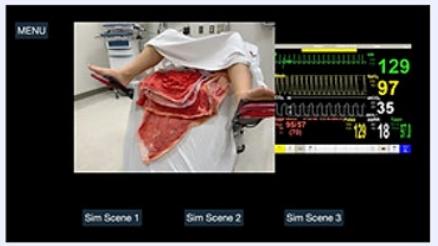


Newborn Resuscitation

NEW: Interactive Video

Booklet

Video



A Postpartum Complication

Booklet

NEW: Interactive Video

#EMSC23

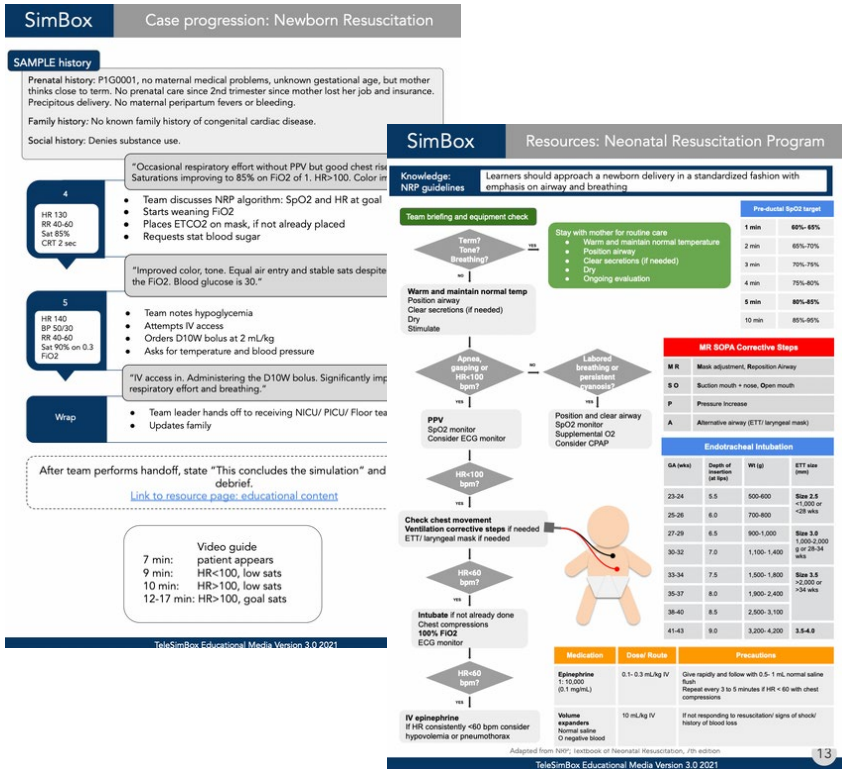
Nikiski Fire, Alaska

Booklet

Video

SimBox+
Tele SimBox

Newborn Resuscitation



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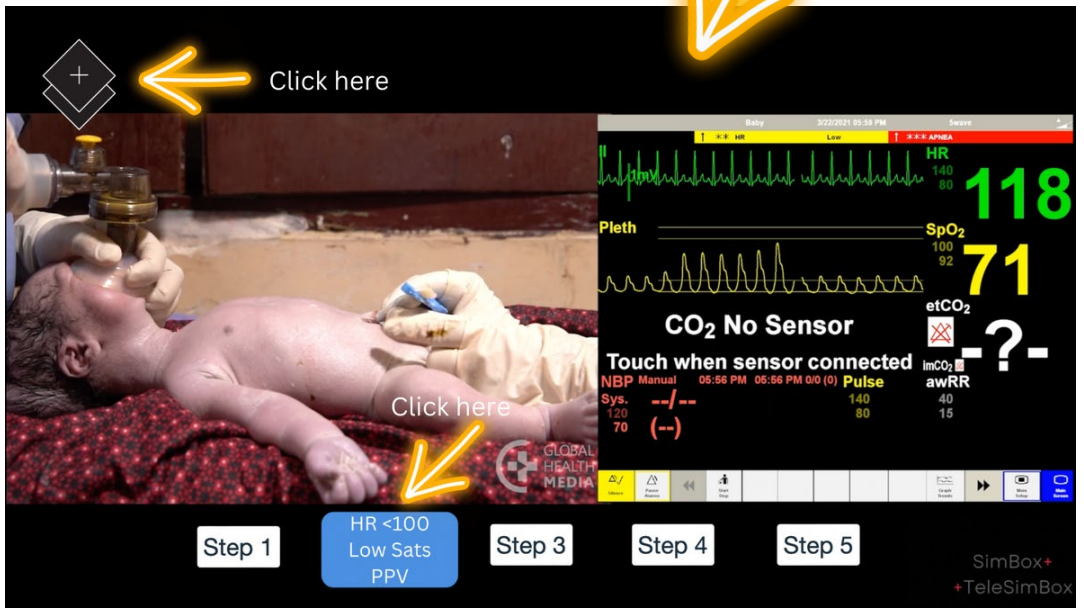


The Video

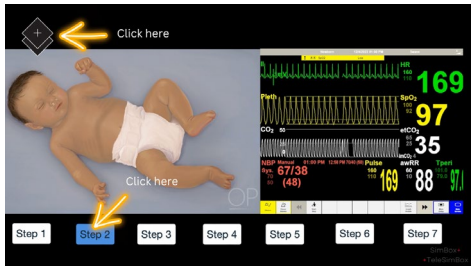
Prebrief

3 min

Dispatch and
2-min countdown
clock

2 min

Simulation



10 min

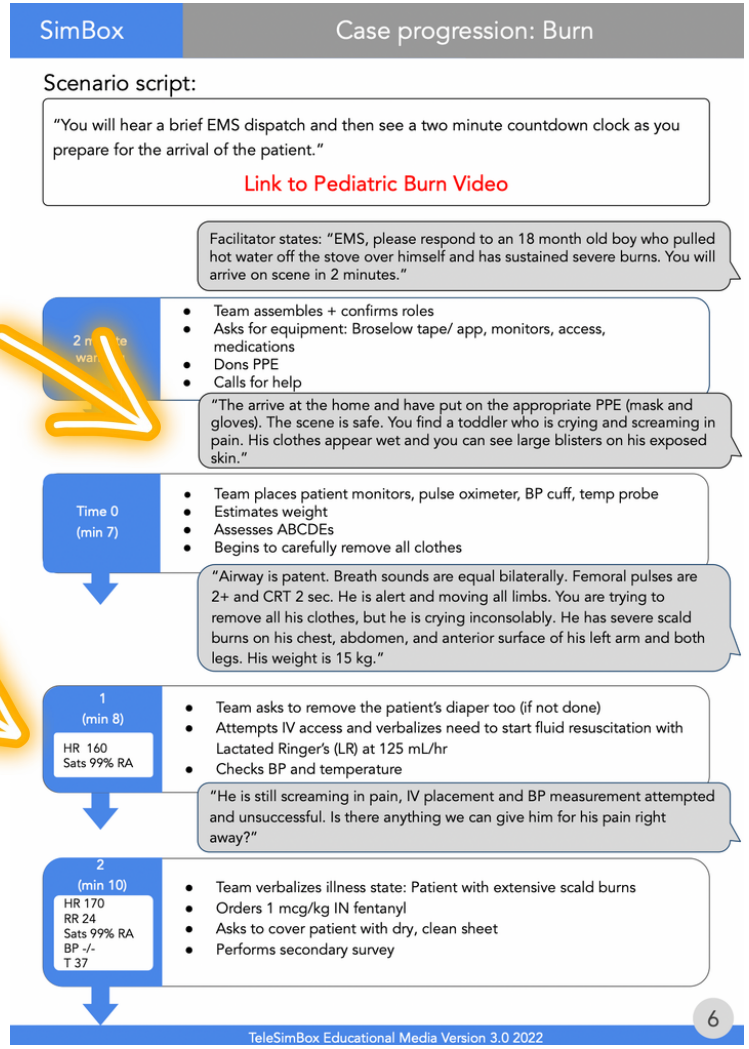
Debrief

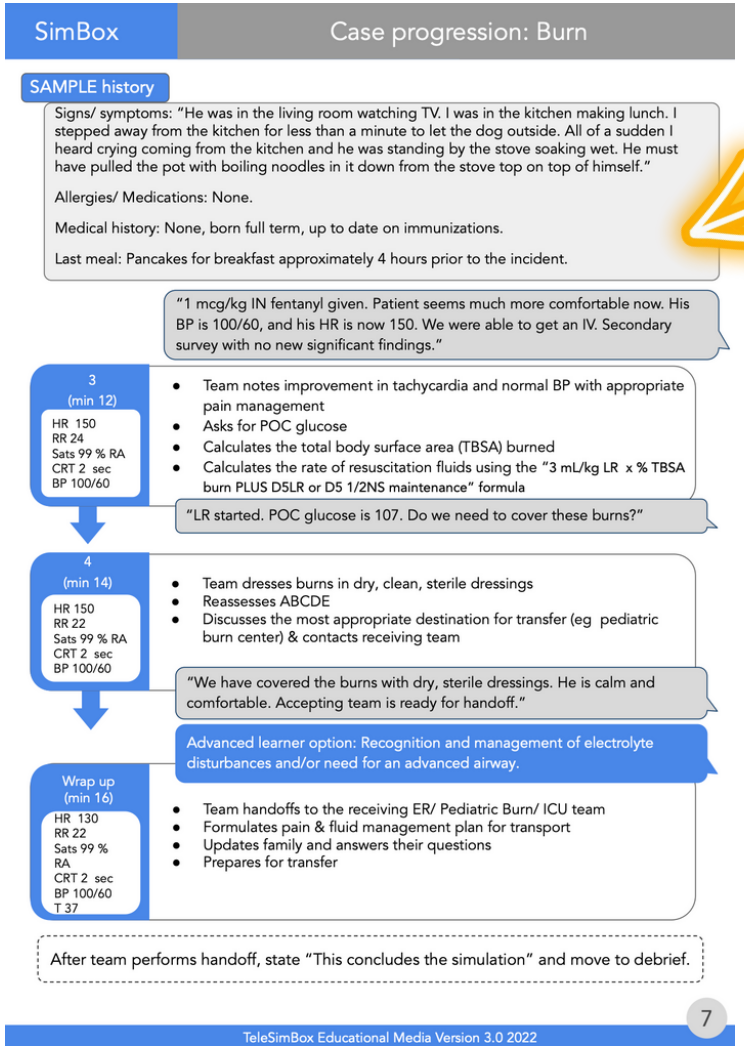
15 min

The Booklet: Case Progression

Facilitator prompts

Participants actions





Signs/ symptoms, allergies, medications, past medical history

The Booklet: Teaching Content & Flashcard

Print and distribute to your participants

SimBox Flashcard

PEDIATRIC BURN 🔥 MANAGEMENT

Primary Survey

🔥 Airway/ Breat
- Think of airway e
- Assess for CO po
- Use humidified o

🔥 Circulation
- Initiate fluids earl
- Preferred IV fluid
- Burns <20% TBS
- Do not bolus unle
- Start IVF during t
  - <5 y/o: 12
  - 6-13 y/o:
  - >14 y/o: 5

🔥 Disability
- Altered mental st related cause.

🔥 Exposure
- Stop the burning
- Remove all clothi
- Examine for any may mask less pa
- Cover the wound
- Take warming me cover the head to
- Topical antibiotic burn center.
- Do not apply ice and cold injury to
- Burn debridemen

Secondary Survey

🔥 Fluid Resuscitation

Total fluid volume to be replete
≥30kg: 2 mL/kg LR x %TBSA B
<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 thi
- Titrate based on respon

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

TeleSim

SimBox Flashcard

Secondary Survey (continued)

🔥 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.

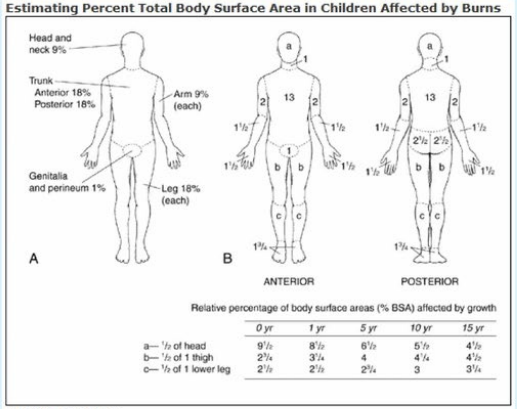
🔥 "AMPLET" Mnemonic:
- Allergies, Medications, Past medical and surgical history, Last intake, Events and Environment, Tetanus (tetanus prophylaxis should be considered for all burns).

🔥 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



Relative percentage of body surface areas (% BSA) affected by growth

	0 yr	1 yr	5 yr	10 yr	15 yr
a— ½ of head	9½	8½	6½	5½	4½
b— ½ of 1 thigh	2¾	3¼	4	4¼	4½
c— ½ of 1 lower leg	2½	2½	2¾	3	3¼

(A) Rule of "nines"
(B) Lund-Browder diagram for estimating extent of burns
U.S. Department of Health and Human Services, Public domain, via Wikimedia Commons

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.

SimBox 3.0

Content based on the guidelines issued by the American Burn Association

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TeleSimBox Educational Media Version 3.0 2022

SimBox Teaching Content

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 facia 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, concontaminant trauma or need for special social, emotional or rehabilitative intervention.
- Burned children in hospitals without qualified personnel or equipment for the care of children.

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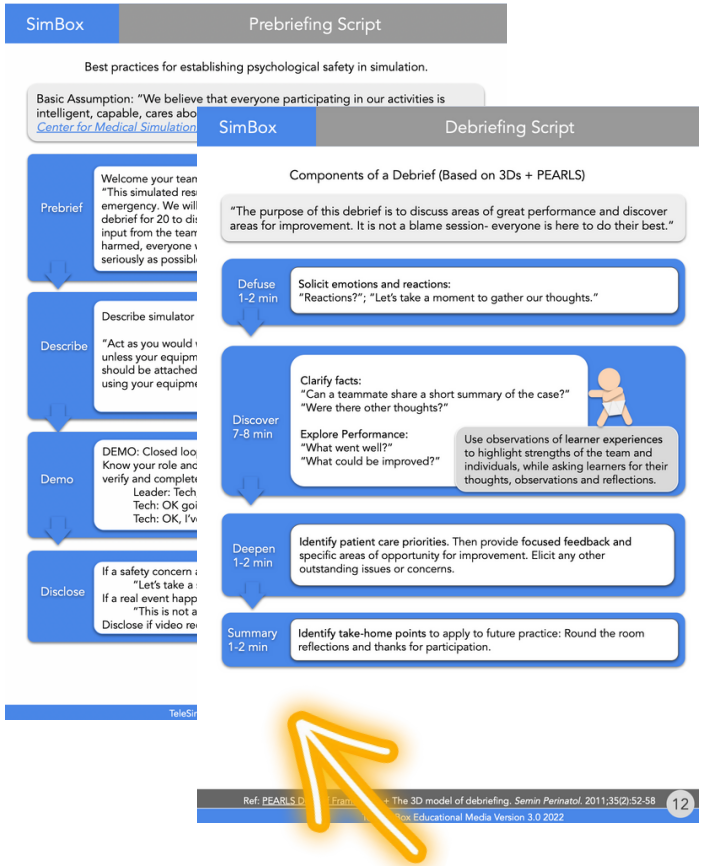
Suggested teaching content to guide the debriefing

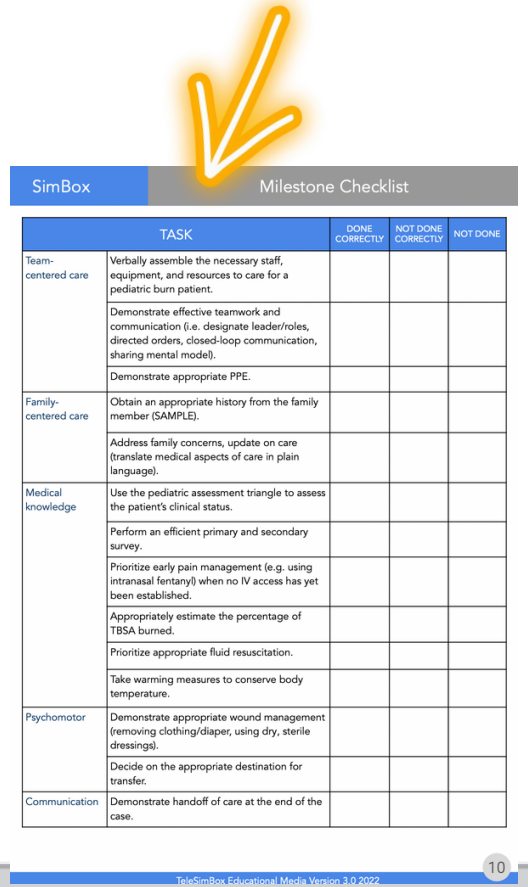
The Booklet: So much more

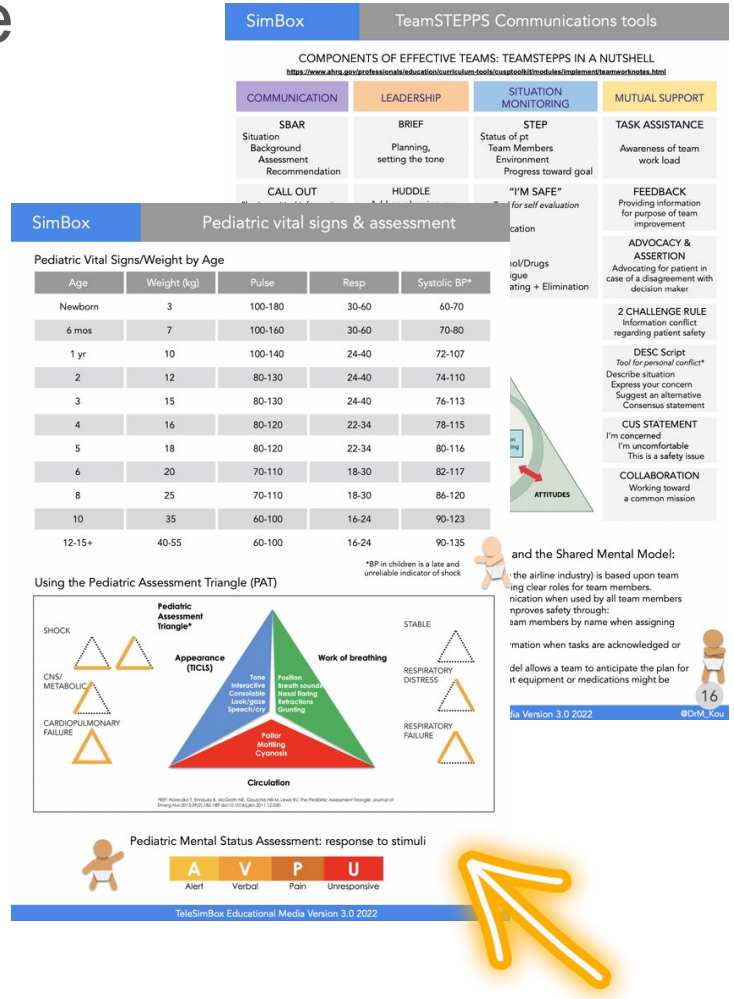


Pre-briefing/

De-briefing guide

What are the educational goals for this simulation?





Pedi educational resources

School Nurse Emergency Care (SNEC) Course

Transitioning to an Online Format

School Nurse Emergency Care (SNEC) course

- **1996** - Illinois EMSC initially rolled out course
  - Based on a course by the University of Connecticut through an EMSC Targeted Issue grant
  - Reviews appropriate assessment, triage, and initial management of medical emergencies in the school setting
  - Incorporates EMS and disaster preparedness concepts
  - Course length – 3 days
  - Team taught by emergency nurses and school nurses
  - Includes lectures, case presentations/scenarios, and skill stations
- **Ongoing** - Revisions to curricular materials
  - *7th Edition* is current version

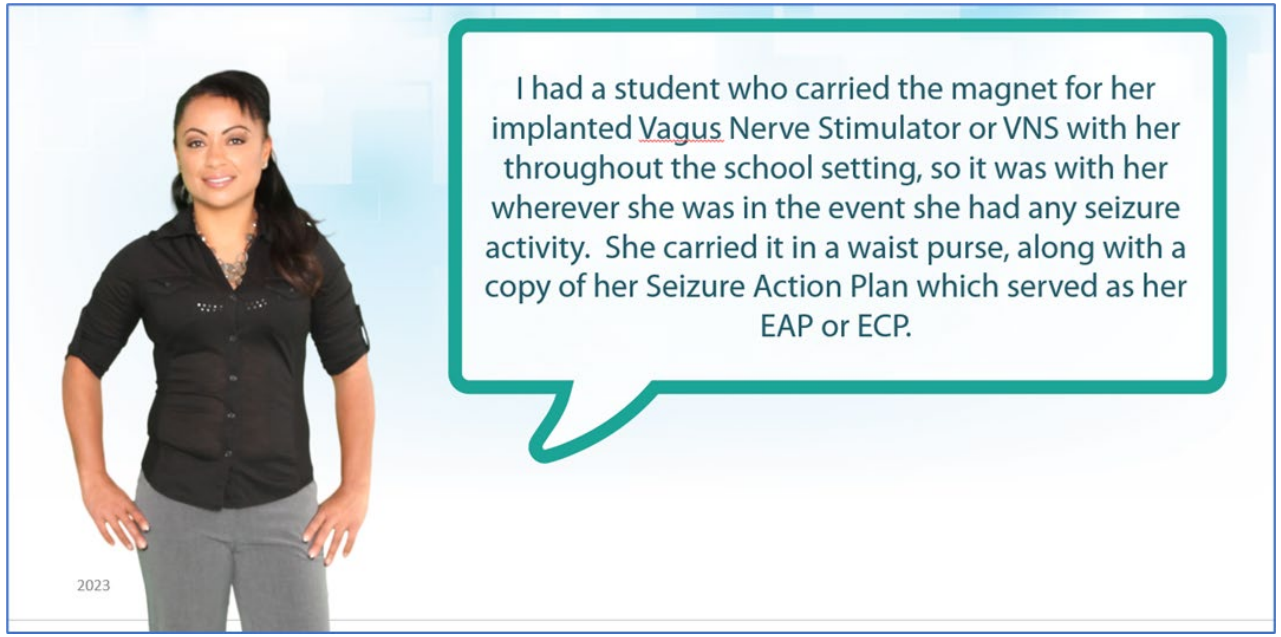
Challenges

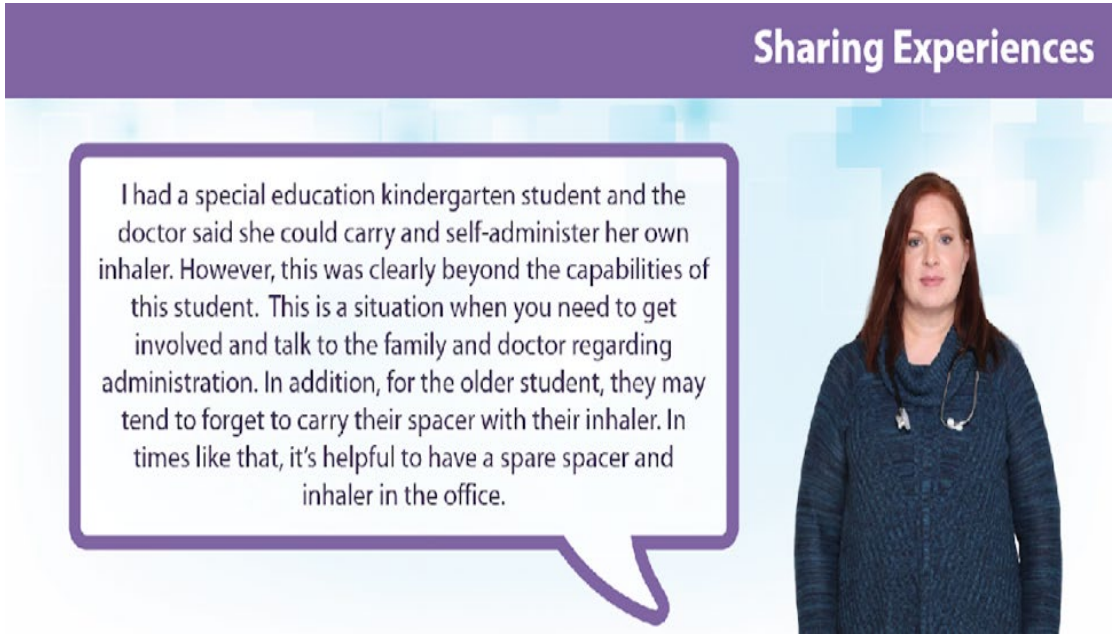
- Reaching all sectors of the state
- Maintaining instructor base
- Addressing the needs of schools nurses unable to attend in-person courses
- Funding needs
- COVID-19 Pandemic

Virtual Course Development

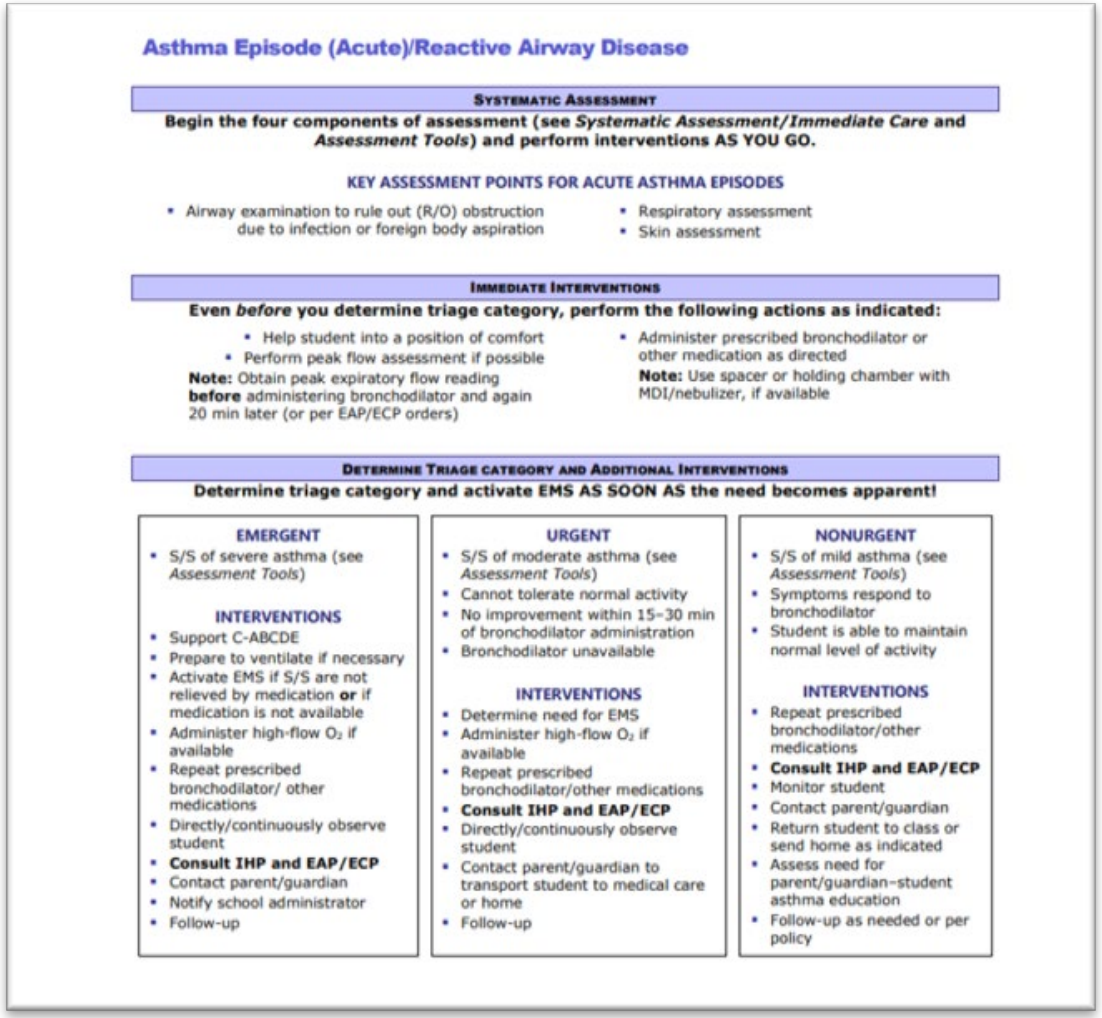
- Secured COVID supplemental funding
  - Educational design contractor
  - Videographer
- Convened an ad-hoc SME workgroup
- Key partners - Illinois Assn of School Nurses, Illinois Emergency Nurses Assn, Illinois State Board of Education, Illinois Department of Public Health School Health program
- Created a self-study narrated virtual SNEC course in < 1 year
  - 17 course modules
  - 5 skill demonstration videos
  - Post-test bank
  - Evaluation
  - Nursing CE certificate (meets Illinois nursing licensure requirements)
- Course is hosted on a learning management platform
  - https://www.publichealthlearning.com

Sharing Experiences Component





School Nurse Treatment Guidelines



Asthma Episode (Acute)/Reactive Airway Disease

SYSTEMATIC ASSESSMENT

Begin the four components of assessment (see *Systematic Assessment/Immediate Care* and *Assessment Tools*) and perform interventions AS YOU GO.

KEY ASSESSMENT POINTS FOR ACUTE ASTHMA EPISODES

- Airway examination to rule out (R/O) obstruction due to infection or foreign body aspiration
- Respiratory assessment
- Skin assessment

IMMEDIATE INTERVENTIONS

Even *before* you determine triage category, perform the following actions as indicated:

- Help student into a position of comfort
- Perform peak flow assessment if possible

Note: Obtain peak expiratory flow reading **before** administering bronchodilator and again 20 min later (or per EAP/ECP orders)

- Administer prescribed bronchodilator or other medication as directed

Note: Use spacer or holding chamber with MDI/nebulizer, if available

DETERMINE TRIAGE CATEGORY AND ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT

- S/S of severe asthma (see *Assessment Tools*)

INTERVENTIONS

- Support C-ABCDE
- Prepare to ventilate if necessary
- Activate EMS if S/S are not relieved by medication **or** if medication is not available
- Administer high-flow O_2 if available
- Repeat prescribed bronchodilator/ other medications
- Directly/continuously observe student
- **Consult IHP and EAP/ECP**
- Contact parent/guardian
- Notify school administrator
- Follow-up

URGENT

- S/S of moderate asthma (see *Assessment Tools*)
- Cannot tolerate normal activity
- No improvement within 15–30 min of bronchodilator administration
- Bronchodilator unavailable

INTERVENTIONS

- Determine need for EMS
- Administer high-flow O_2 if available
- Repeat prescribed bronchodilator/other medications
- **Consult IHP and EAP/ECP**
- Directly/continuously observe student
- Contact parent/guardian to transport student to medical care or home
- Follow-up

NONURGENT

- S/S of mild asthma (see *Assessment Tools*)
- Symptoms respond to bronchodilator
- Student is able to maintain normal level of activity

INTERVENTIONS

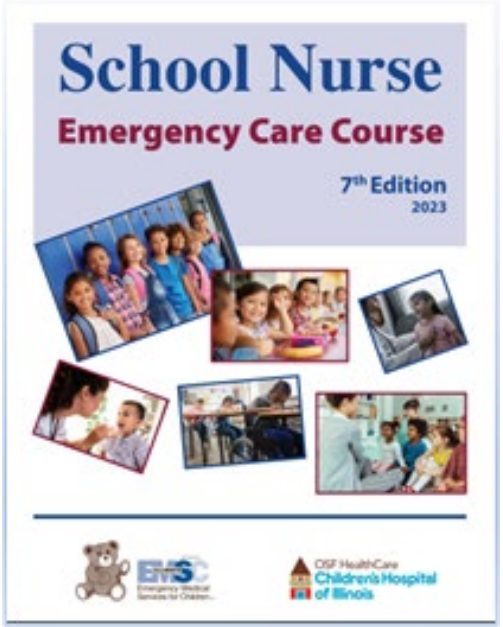
- Repeat prescribed bronchodilator/other medications
- **Consult IHP and EAP/ECP**
- Monitor student
- Contact parent/guardian
- Return student to class or send home as indicated
- Assess need for parent/guardian–student asthma education
- Follow-up as needed or per policy

38 School Nurse Guidelines (examples)

- Abdominal Pain
- Anaphylaxis/Allergic Reaction
- Asthma/Reactive Airway Disease
- Burns
- Chest Pain
- Diabetic Emergencies
- Drowning/Submersion Injuries
- Headache
- Head Injury
- Heat Related Injuries
- Respiratory Distress
- Seizures
- Toxic Exposure
- Trauma

Benefits

- Leveraged already existent course
- Education now available to
  - Broader school nurse audience
  - Those unable to attend in-person courses
  - Seeking a refresher course
- Provides access to
  - User friendly educational program
  - Many resources/templates
- Promotes *Pediatric Readiness* in the school setting



Collaboration

Common Goals, Multiplying Benefits

Collaboration

- Sharing, Coaching, Mentoring
- Inter-State Partnerships
- Regional Collaboratives

Livestorm

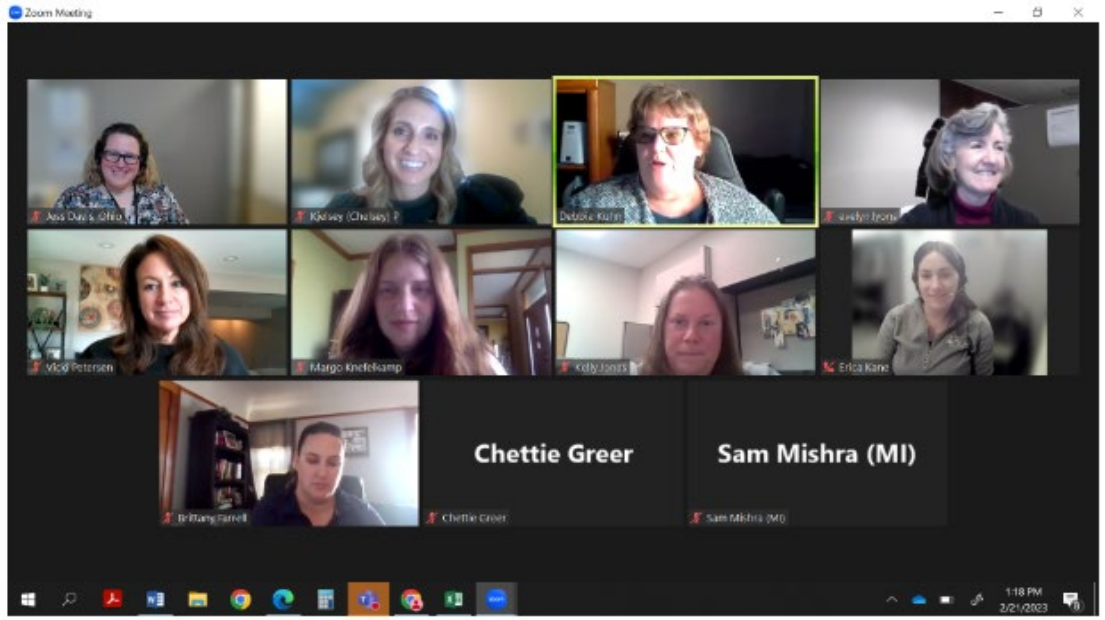
Heartland EMS for Children Virtual Pediatric Symposiums

- 10,000+ Viewers
- 37 Continuing Ed Hours
- Tech Geniuses
- Fits the Budget
- 97% Good/Excellent

#EMSC23

Midwest EMSC Collaborative

- 13 States
- Virtual PECC/Peds Champion Symposiums
- Hospital Track
- EMS Track



State Partnership Library Project

- EMSC Fellows Project
- Program Manager Driven
- Resource Sharing
- Attribution
- Make It Your Own

Don’t Reinvent the Wheel! Collaborate to make a BETTER WHEEL

Facilitated group discussion

Wrap-up/Take home points

- Access and leverage existing resources
- Develop and maintain partnerships
- Harness the power of collaboration
- Remember ~ we're all in this together!!

Collaboration

"***If you want to go fast, go alone. If you want to go far, go together***." ~ African proverb

"***Alone we can do so little; together we can do so much***." ~ Helen Keller

"***There is immense power when a group of people with similar interests get together to work toward the same goals***." ~ Idowu Koyenikan

"***It is the long history of humankind (and animal kind, too) that those who learned to collaborate and improvise most effectively have prevailed***." ~ Charles Darwin

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EIIC Emergency Medical Services for Children Innovation and Improvement Center

Focus Areas Funded Programs QI Collaboratives Education Our Impact Audiences

Disaster Preparedness

Trauma

Prehospital Based Care

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#EM

Pediatric Education and Advocacy Kit (PEAK): Status Epilepticus

Pediatric seizure is one of the most common neurologic emergencies in children. Prolonged seizure (status epilepticus) can be very difficult to manage and can create stress and anxiety not just to the patient family, but also to the healthcare provider. As the goal of seizure management is to stop the seizure as soon as possible, identifying best practices for treatment is important. The following PEAK content is provided to help with managing status epilepticus from prehospital to the hospital environment and highlight available resources for our patients and families with epilepsy.

Last updated: April 2022

Article

Article: Multicenter Evaluation of Prehosptial Seizure Management of Children

20 minutes — Details

Interactive Module

Choose Your Own Adventure: Individual Learner Simulation

10 minutes — Details

Video

EIIC Interview: Multicenter Evaluation of Prehospital Seizure Management of Children Webinar

20 minutes — Details

Simulation **Video**

EIIC Nursing Perspective: Caring for the Pediatric Patient in Status Epilepticus Video

8 minutes — Details

Interactive Module

EIIC Prehospital Pediatric Seizure Learning Module

20 minutes — Details

Interactive Module

EIIC Prehospital Pediatric Seizure Learning Module (view module by creating an account with OPENPediatrics)

20 minutes — Details

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

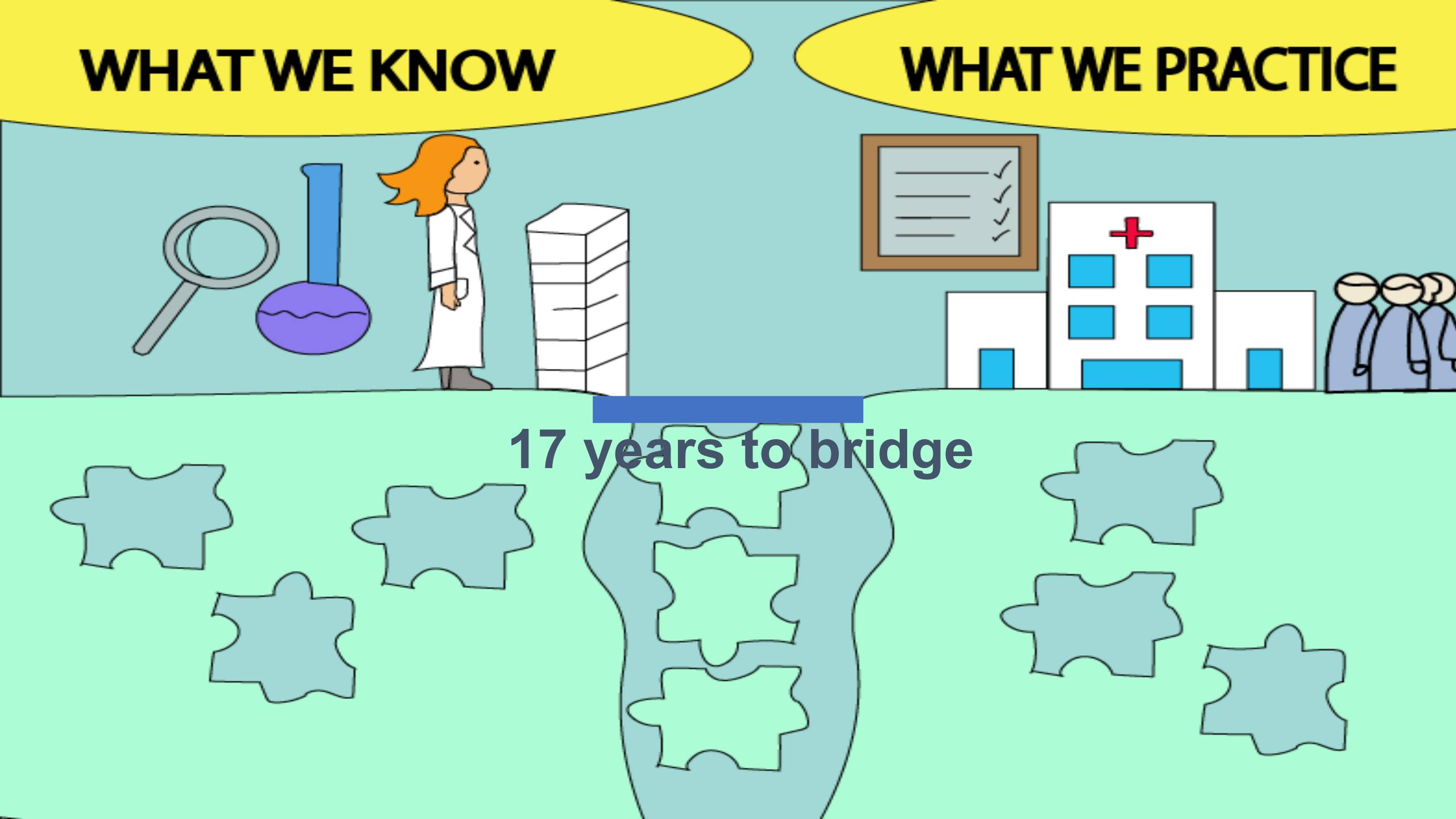
Reassess ABCs, monitor for respiratory depression. If still seizing:

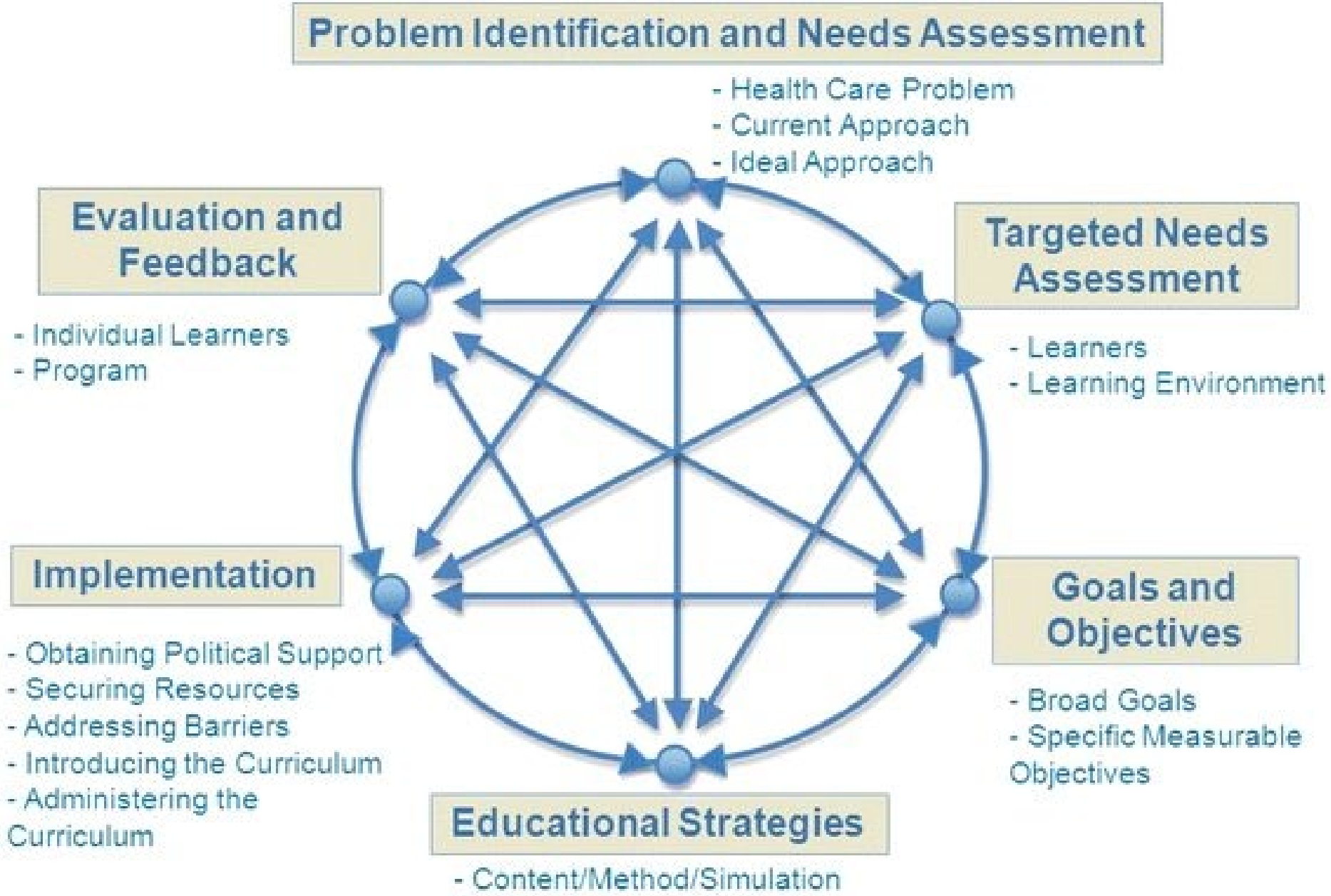
Administer alternative second line agent (e.g., if fosphenytoin given, use levetiracetam)

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 — trekk *Translating Emergency Knowledge for Kids*


WHAT WE KNOW
WHAT WE PRACTICE
17 years to bridge


Problem Identification and Needs Assessment
- Health Care Problem
- Current Approach
- Ideal Approach
Targeted Needs Assessment
- Learners
- Learning Environment
Goals and Objectives
- Broad Goals
- Specific Measurable Objectives
Educational Strategies
- Content/Method/Simulation
Implementation
- Obtaining Political Support
- Securing Resources
- Addressing Barriers
- Introducing the Curriculum
- Administering the Curriculum
Evaluation and Feedback
- Individual Learners
- Program