

Critical Pediatric Airway Cases

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DISCLOSURES

None

I do have many employers:



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Renown PICU Contact Info

- ▶ Renown PICU: (775) 982-4911
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(775) 982-2227
- ▶ My email: kdeeter@renown.org

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Level II Peds Trauma Accreditation



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Keep Calm
Carry on

- ▶ Assess
- ▶ Categorize
- ▶ Decide
- ▶ Act

Approach to Pediatric Assessment



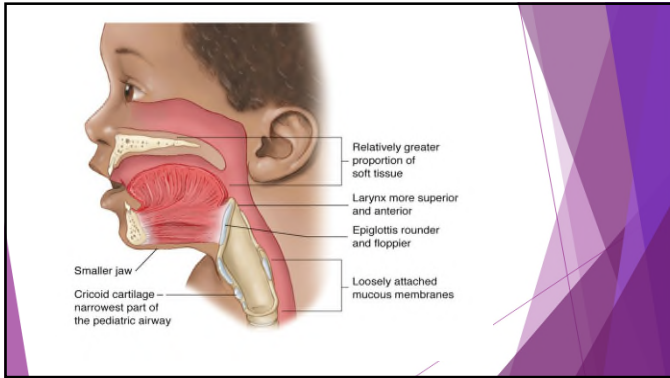
At any point → life-threatening problem → life-saving interventions

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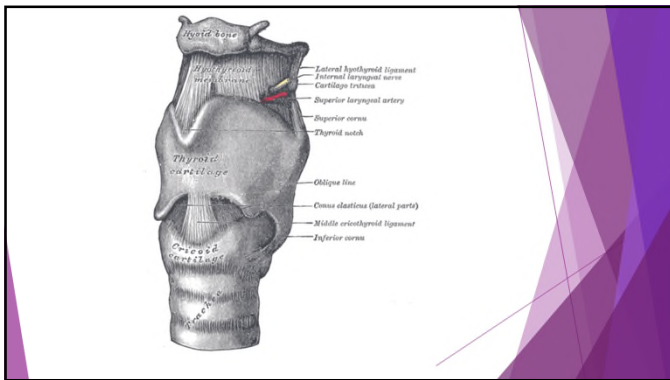
ASSESS



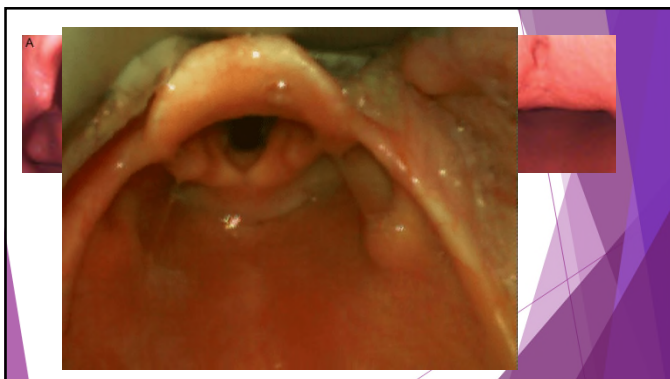
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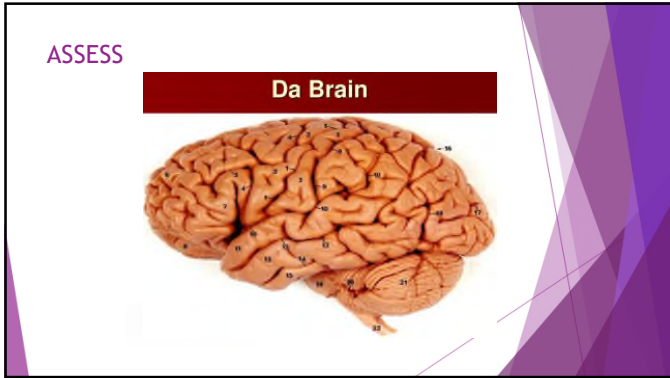
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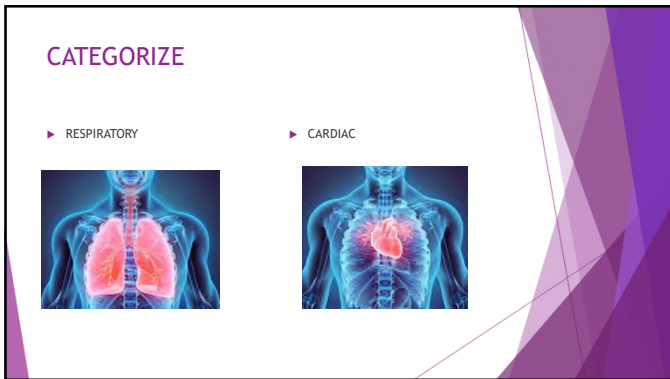
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INFANT		
Eyes Opening	Best Verbal Response	Best Motor Response
Spontaneous - 4	Coos, babbles - 5	Obeys command - 6
To command - 3	Irritable cries - 4	Localizes pain - 5
To Pain - 2	Cries to pain - 3	Withdraws from pain - 4
None - 1	Moans, grunts - 2	Flexion (decorticate) - 3
	No Response - 1	Extension (decerebrate) - 2
		No response - 1
CHILD / ADULT		
Eyes Opening	Best Verbal Response	Best Motor Response
Spontaneous - 4	Orientated - 5	Obeys command - 6
To command - 3	Confused - 4	Localizes pain - 5
To Pain - 2	Inappropriate words - 3	Withdraws from pain - 4
None - 1	Incomprehensible - 2	Flexion (decorticate) - 3
	No Response - 1	Extension (decerebrate) - 2
		No response - 1

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DECIDE: Respiratory

- ▶ UPPER
- ▶ LOWER
- ▶ LUNG TISSUE
- ▶ DISORDERED CONTROL OF BREATHING

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Upper

- ▶ 3yo at daycare wakes up from a nap with respiratory distress

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Inside the Airway

Airway

Voice Box (Larynx)

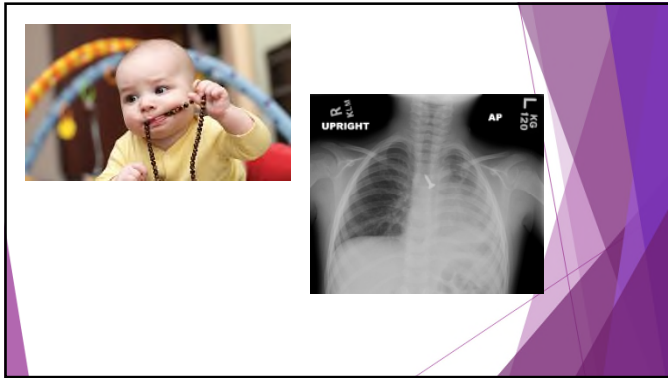
Air

Swelling

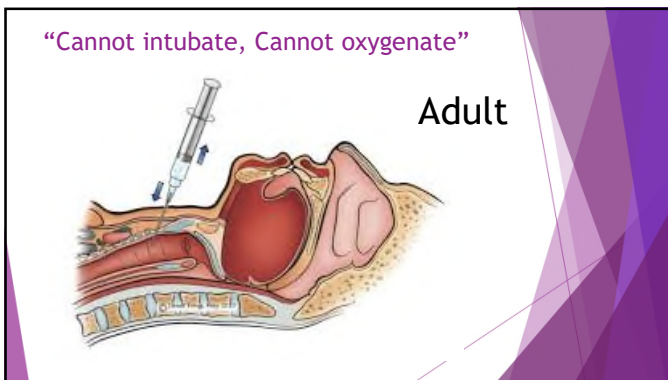
Healthy

Croup

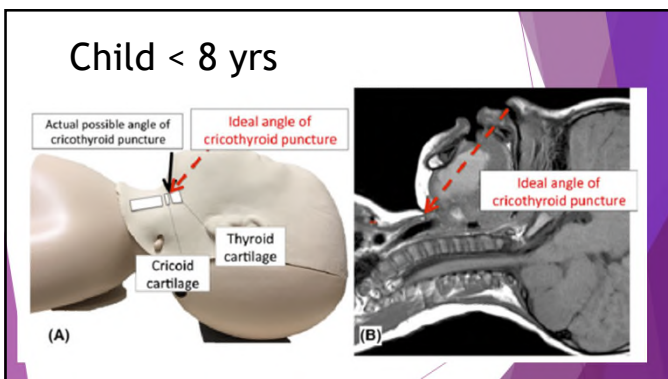
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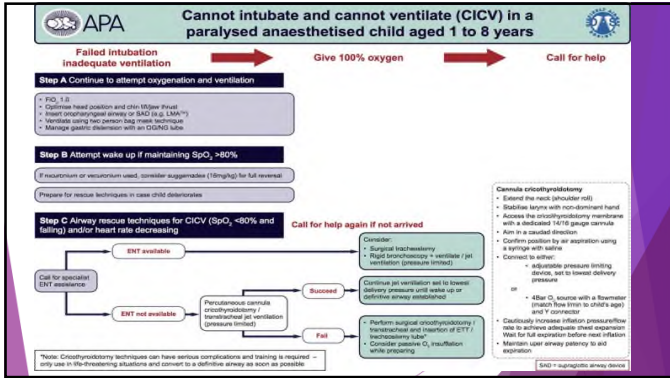
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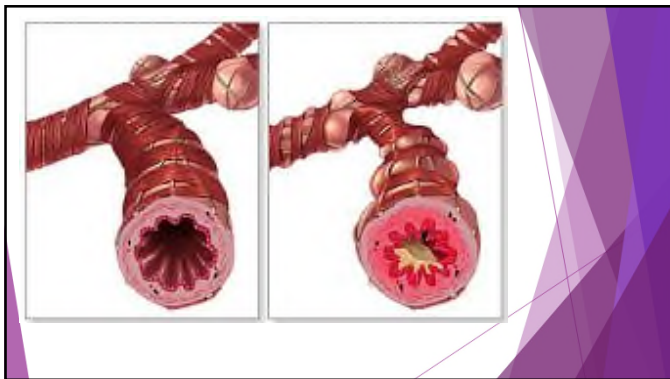


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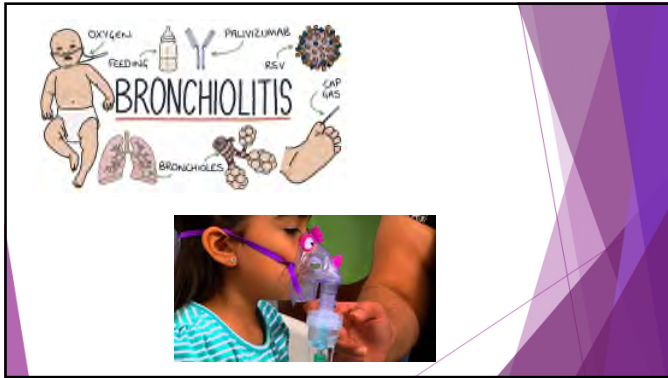
Lower

► 5yo at home, parents call 911 because his breathing is fast, he looks tired, and he is turning blue

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Lung Tissue

- ▶ 5yo at home, parents call 911 because his breathing is fast, he looks tired, and he is turning blue

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Pneumonia


A composite image for pneumonia. On the left is a chest X-ray showing lung opacities. On the right are two diagrams: "Healthy Small Airway" showing a clear airway with "Air" entering, and "Small Airway With Pneumonia" showing the airway filled with "Germs, White Blood Cells, and Mucus".

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Disordered Control

▶ 6 month old breathing very slowly, lethargic, occasional apnea

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RESPIRATORY TERMINOLOGY

APNEA	The absence of breathing during sleep	
BRADYPNEA	An abnormally low respiratory rate (less than 12 breaths per minute)	
DYSPNEA	Difficulty breathing, usually associated with a cough	
EUPNEA	Normal, relaxed breathing	
HYPERPNEA	Very rapid breathing, often associated with anxiety	
ORTHOPNEA	Difficulty breathing while lying down	
TACHYPNEA	An abnormally high respiratory rate (more than 20 breaths per minute)	
KUSSMAUL	An abnormally high respiratory rate, often associated with metabolic acidosis	
CHEYNE-STOKES	Periodic breathing and apnea, often associated with heart failure	

RESPIRATORY PATTERNS

Eupnea Hyperpnea
 Bradypnea Tachypnea
 Apnea Cheyne-Stokes
 Biot Kussmaul

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Asphyxia =

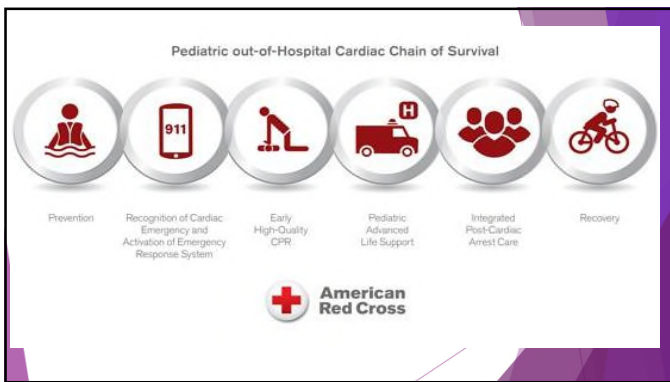
Hypoxia, hypercarbia, and acidosis =

Cardiac arrest due to global ischemia

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THE SAD TRUTH

Resuscitation
Volume 97, October 2016, Pages 121-128

Unchanged pediatric out-of-hospital cardiac arrest incidence and survival rates with regional variation in North America

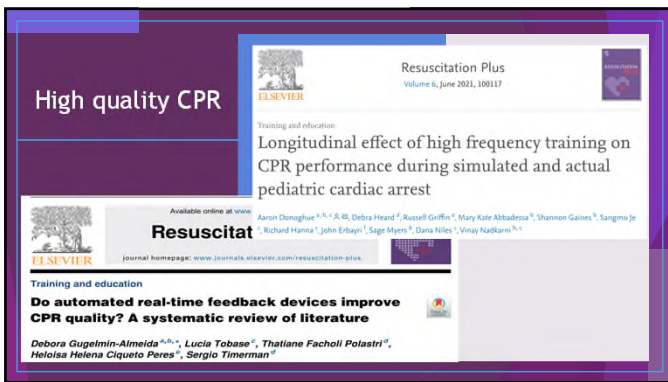
Survival Trends in Pediatric In-Hospital Cardiac Arrests
An Analysis From Get With The Guidelines-Resuscitation

Pediatric Traumatic Cardiac Arrest
Traumatic Cardiac Arrest in Pediatric Patients: An Analysis of the National Trauma Database 2007-2016

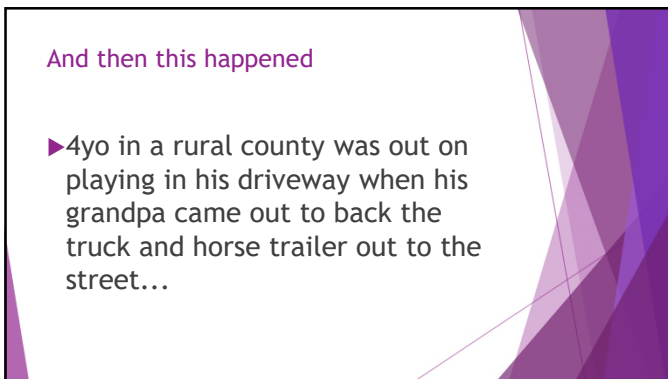
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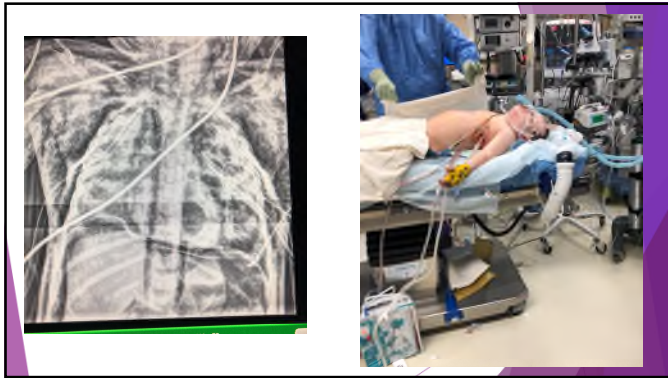
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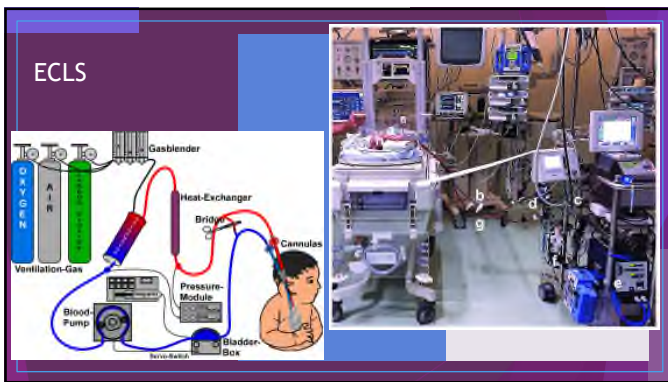
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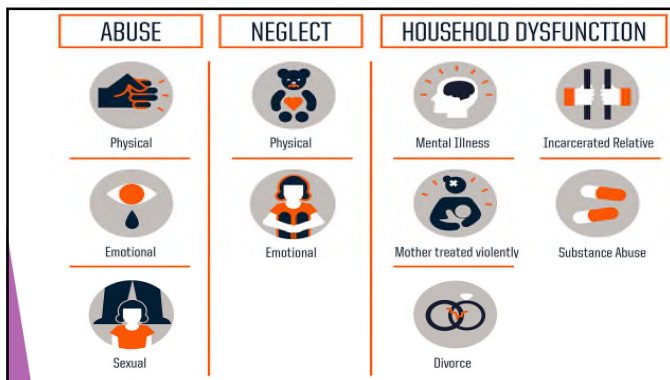


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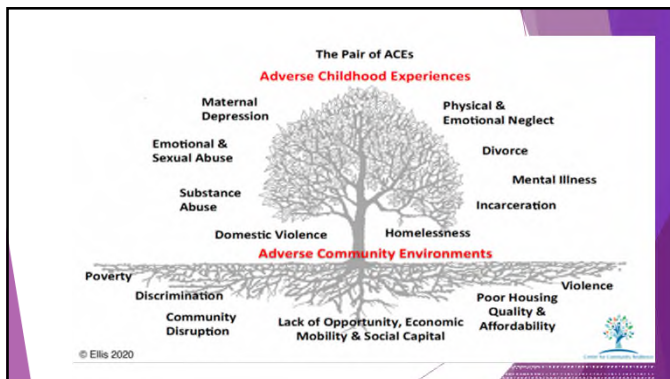
ACEs

Adverse Childhood Experiences

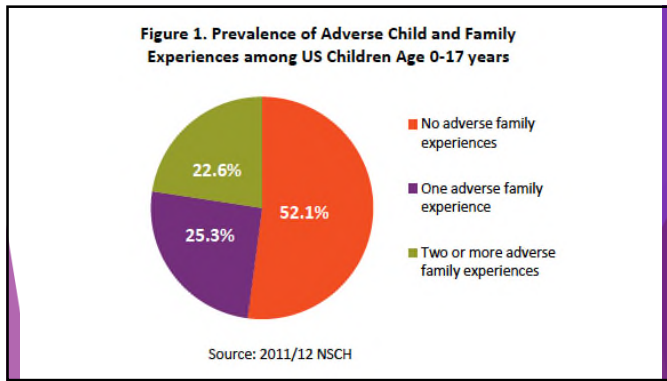
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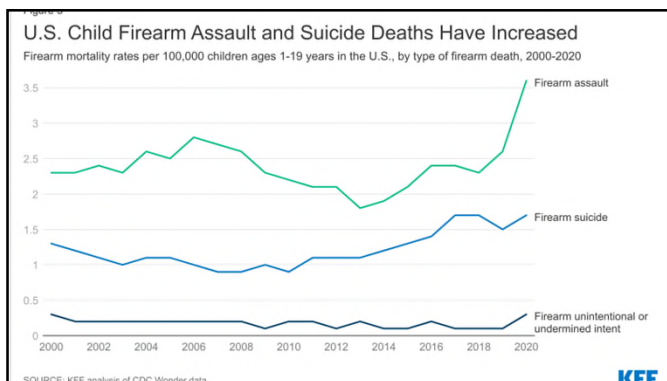


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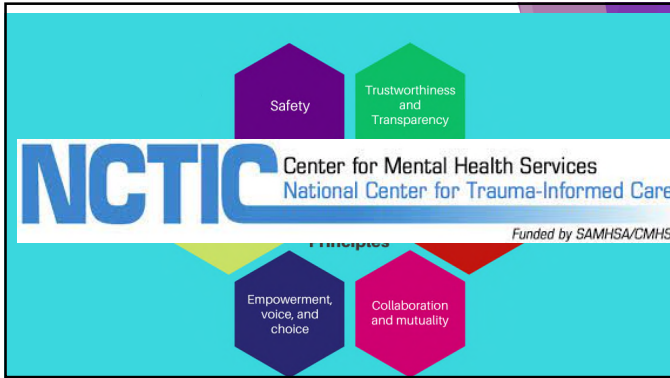
	Firearm	Motor vehicles	Other injuries	Congenital disease	Cancer	Substance use	Heart disease
U.S.	1 (4,337)	2 (4,112)	3 (3,879)	4 (3,196)	5 (1,797)	6 (1,352)	7 (687)
Australia	11 (10)	1 (188)	4 (95)	3 (104)	2 (166)	8 (79)	6 (22)
Austria	9 (4)	1 (49)	4 (39)	2 (42)	2 (42)	6 (9)	7 (6)
Belgium	9 (5)	1 (73)	3 (42)	3 (42)	2 (64)	11 (4)	7 (10)
Canada	5 (49)	1 (234)	4 (153)	3 (163)	2 (234)	6 (45)	8 (33)
France	8 (49)	1 (474)	3 (29)	4 (328)	2 (411)	12 (17)	6 (19)
Germany	13 (14)	2 (409)	4 (194)	3 (309)	1 (411)	9 (28)	6 (17)
Japan	15 (5)	2 (369)	4 (138)	3 (339)	1 (492)	14 (9)	6 (114)
Netherlands	13 (2)	2 (73)	4 (38)	3 (79)	1 (103)	11 (4)	7 (12)
Sweden	9 (4)	2 (38)	4 (27)	3 (32)	1 (62)	6 (9)	6 (8)

SOURCE: KFF analysis of CDC Wonder and Institute for Health Metrics and Evaluation (IHME) Global Burden of Disease data

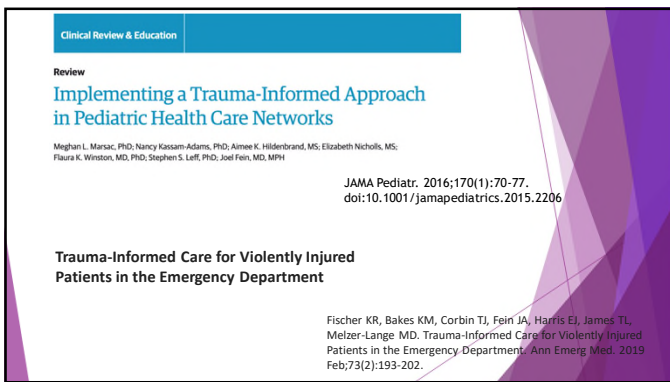
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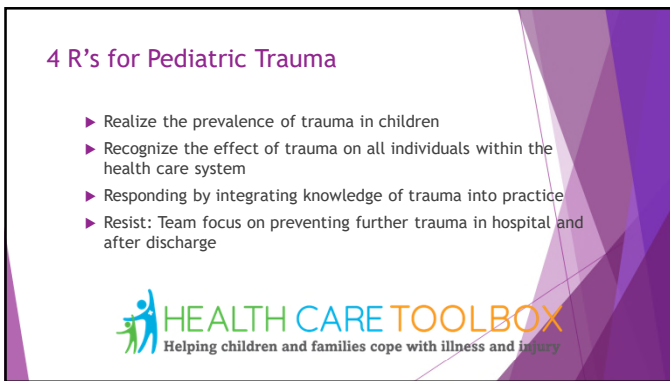
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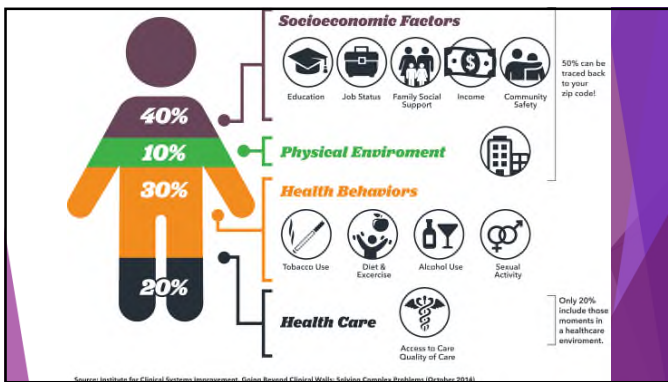
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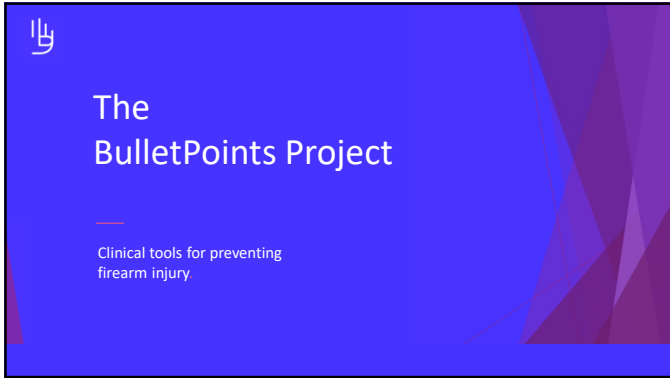
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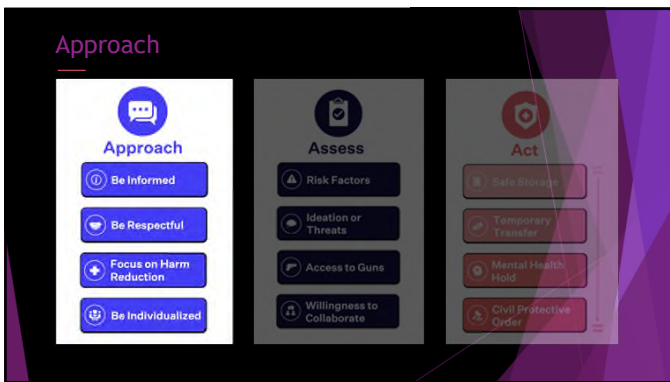
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Healthcare Providers' Guide to Traumatic Stress in Ill or Injured Children	
...AFTER THE ABCs, CONSIDER THE DEFs	
D DISTRESS	<ul style="list-style-type: none"> Assess and manage pain. Ask about fears and worries. Consider grief and loss.
E EMOTIONAL SUPPORT	<ul style="list-style-type: none"> Who and what does the patient need now? Barriers to mobilizing existing supports?
F FAMILY	<ul style="list-style-type: none"> Assess parents' or siblings' and others' distress. Gauge family stressors and resources. Address other needs (beyond medical).

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
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Be Informed: Language Matters

- “Secure storage” or “safe storage” when talking about storage (rather than “gun safety”)
- “Reducing access” when talking about making guns inaccessible to those who should not have access
- “Temporary” and “voluntary” when talking about options for getting guns out of home “during times of crisis or risk”
- When possible, “voluntary and collaborative”



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Approach

Approach	Assess	Act
Be Informed	Risk Factors	Safe Storage
Be Respectful	Ideation or Threats	Temporary Transfer
Focus on Harm Reduction	Access to Guns	Mental Health Hold
Be Individualized	Willingness to Collaborate	Civil Protective Order

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Assess

- **Risk Factors**
 - ▶ Several factors increase the risk of suicide or interpersonal violence to patients or others
- **Ideation or Threats**
 - ▶ Certain situations are always considered higher-risk, if a patient
 - ▶ has thoughts about harming themselves or someone else, or
 - ▶ has made threats to hurt themselves or someone else
- **Access to Guns**
 - ▶ If ideation, threats, or other risk factors are present, it's relevant to ask about access to firearms
- **Willingness to Collaborate**
 - ▶ If a patient is at risk and has access to firearms, assess their ability and willingness to collaborate

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Risk Factors

Individual risk factors

- ▶ Certain psychiatric disorders like depression, bipolar disorder, or schizophrenia
- ▶ Substance misuse, especially alcohol and stimulants
- ▶ History of suicide attempts
- ▶ History of violence
- ▶ Intimate partner violence or domestic abuse
- ▶ Dementia or other cognitive impairment
- ▶ Recent relationship or job loss
- ▶ Storing guns in a way that they are easily accessible to at-risk people

Chesney et al. 2014; Swanson et al. 2015; Branas et al. 2016; Wintemute et al. 2018; McKein et al. 2014; McGinty et al. 2016; Johnson et al. 2009; Wintemute et al. 2008; Rowhani-Rubbar et al. 2015; Cunningham et al. 2013; Zohr et al. 2014; Bailey et al. 1997; Rosen et al. 2019; Lippert et al. 2013; Campbell et al. 2004; Gosselin et al. 2005; Monuteaux et al. 2019.

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Approach

Approach	Assess	Act
<ul style="list-style-type: none"> Be Informed Be Respectful Focus on Harm Reduction Be Individualized 	<ul style="list-style-type: none"> Risk Factors Ideation or Threats Access to Guns Willingness to Collaborate 	<ul style="list-style-type: none"> Safe Storage Temporary Transfer Mental Health Hold Civil Protective Order

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Act

- ◻ Safe Storage
- ◻ Temporary Transfer of Firearms
- ◻ Mental Health Holds
- ◻ Civil Protective Orders

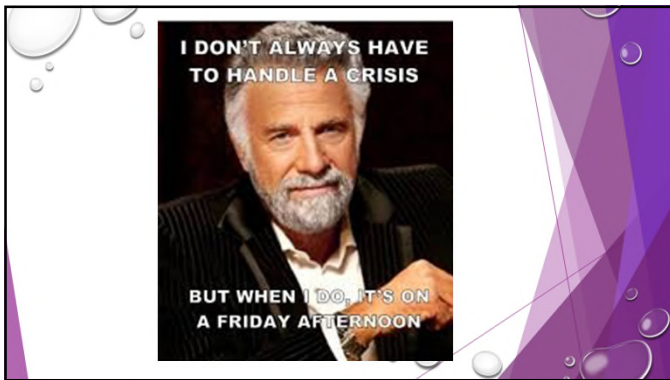
"Doctors, nurses, medics, and other health professionals face the horrific reality of gun violence every day. We're uniquely situated to address this senseless public health epidemic head-on."

— Brady Board Member and @ThisIsOurLane Founder Dr. Joseph V. Sakran

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