

Pediatric readiness for EMS & ED providers: Trauma, Trends and WI insights

NWRTAC conference

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WI EMSC

No disclosures

Case 1

- Amish family in buggy struck by a truck

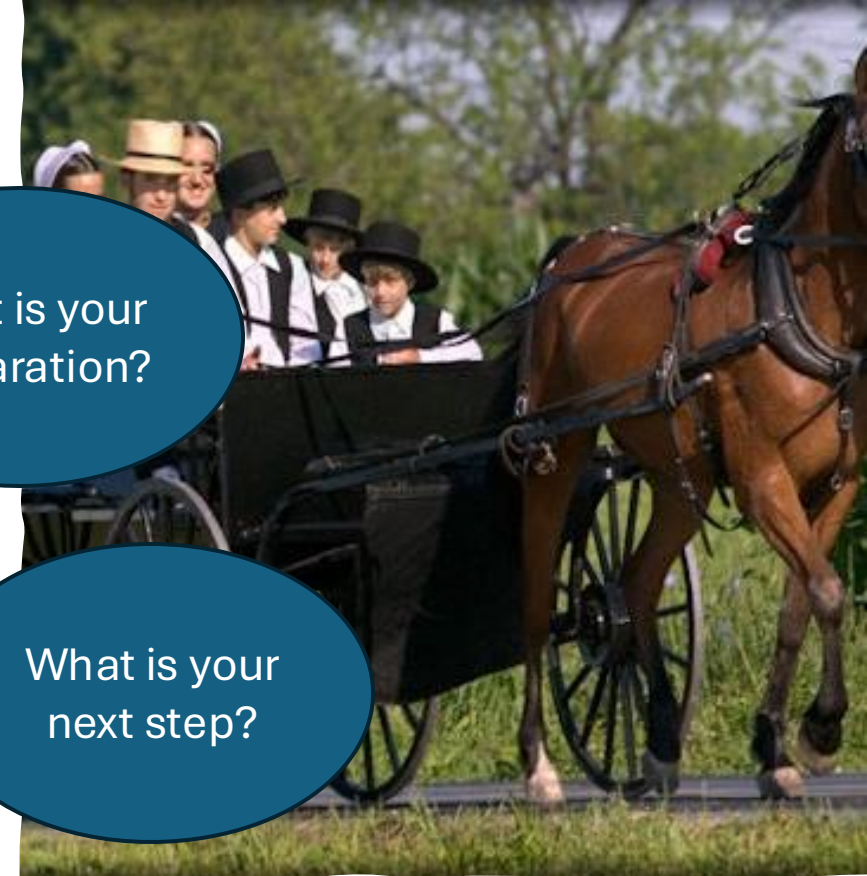
Case 1: Amish buggy struck by truck

- Family of 6 (4 children) with unknown injuries
- You are AEMT crew responding to the scene with PD
- Child #1 triaged black, **child #2 red**, child #3 green, child #4 green
- Mom is yellow and father green
- Child #2 (Pt) supine on the road crying
- Alert, no resp distress, pink
- Massive facial and upper torso injury with bleeding, C-collar

What is your preparation?

What is your next step?

Now what?



Patient #2 size up

- Lethargic, airway intact, intact resp effort and pulses
- Weight: not recorded
- VS attempted no success RR 16, GCS 10, pain 10
- Significant facial injury
- L femur deformity with good CRT, immobilized
- No pediatric collar
- IV attempts x 2 failed
- IO attempt not successful
- 10 min to critical access ED

What is your intervention?

What is your next step?



Patient #2: care sequence

- Additional EMT arrives
- Med Flight requested to meet at local ED 3.1 mi
- Moved to ambulance
- In transit, patient became quiet but cries to stimulation
- Arrived in ED and transferred care

At local ED

- P 148, R 28, SBP 72, SPO2 100%, Wt 25 Kg
- IO placed R Tibia after multiple failed attempts
- Right scalp hematoma, blood R ear
- Chest clear, CV mmm, ABD benign
- R femur deformity
- GCS 12
- HCT: skull fracture
- IV fentanyl and NS provided
- Repeat BP 121/86



MedFlight

- Returns from CT
- Intermittent lethargy
- US guided IV placed finally
- Periods of apnea
- ETT placed
- FAST negative
- Fentanyl/Ketamine drip
- 3% saline
- Soft BP in UW elevator
- Transferred care to ED team



Are you prepared?



The Six Rights of Safe Medication Administration

1. Right Patient ✓

- Ask the patient their first and last name
- Does the order match the patient?

2. Right Medication ✓

- Does the medication label match the order?
- Be vigilant with look-alike and sound-alike medications

3. Right Dose ✓

- Does the strength and dosage match the order?
- Is it half, whole or multiple tablets?

4. Right Time ✓

- Does the administration time match the order?
- Before administering a PRN medication, ensure specified time interval has passed

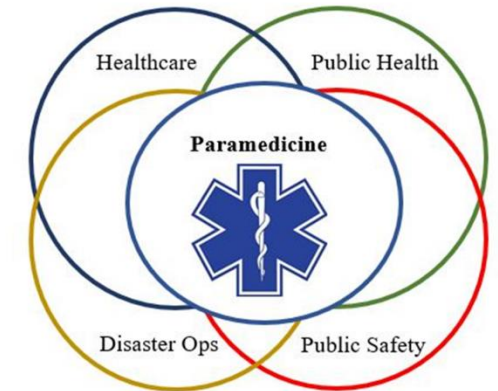
5. Right Route ✓

- Does the route match the order?
- Can this be crushed or mixed in other substances?
- Have any transdermal patches been removed?

6. Right Documentation ✓

- Document immediately after the medication is administered

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Objectives

- Understand why pediatric readiness is important
- Know the elements of pediatric readiness
- Know current status of peds readiness
 - EMS
 - ED
- How it relates to Trauma
 - WI STAC report
- Issue to raise
 - Mobility injuries
 - Firearm traumas
 - Field triage

What is pediatric readiness?

- Definition: readiness means that a system/agency/department is prepared – in equipment, training, protocols, infrastructure, coordination – to safely and effectively treat children.
- Key foundational elements:
 - Pediatric equipment/supplies, size-appropriate gear
 - Staffing/training (e.g., pediatric emergency care coordinator [PECC])
 - Policies, procedures, protocols that include pediatric patients
 - System coordination (pre-hospital to ED to trauma/transfer)
 - Quality improvement, pediatric metrics
- Reference national assessment: the Emergency Medical Services for Children Innovation & Improvement Center report (SGEM #425) found major variability in readiness; e.g., only ~37 % of EDs reported a PECC. [thesgem.com](https://www.thesgem.com/)+1
- Why it matters: The best outcomes in pediatric emergencies/trauma occur when the system is aligned for children (equipment, training, protocols).



EIIC
EMSC Innovation and
Improvement Center

Pediatric Readiness Initiatives





**Administration &
Coordination (PECCs)**



**Care Team
Competencies**



**Quality and Process
Improvement**



**Policies, Procedures,
and Protocols**



Support Services



**Pediatric Patient &
Medication Safety**



**Equipment, Supplies,
and Medications**



Education & Competencies



Equipment & Supplies



Patient & Medication Safety



Patient- & Family-Centered Care



Policies, Procedures, & Protocols (to include Medical Oversight)



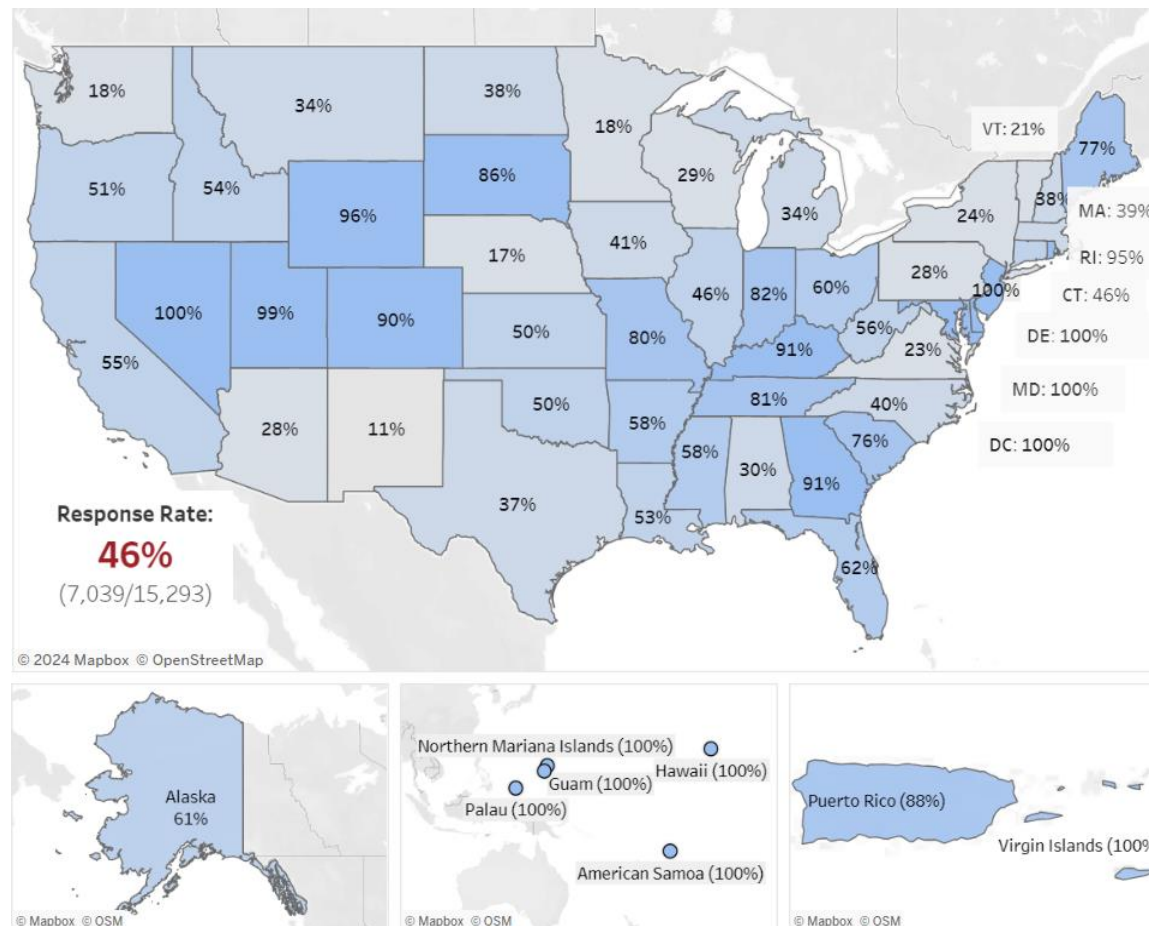
Quality & Process Improvement



Interactions with Systems of Care

Status of Prehospital Pediatric Readiness in WI





• ALS

Pediatric Readiness Score

Median Score	Average Score
74	71
n=105	n=105

• ILS

Pediatric Readiness Score

Median Score	Average Score
72	65
n=12	n=12

• BLS

Pediatric Readiness Score

Median Score	Average Score
45	46
n=81	n=81

Prehospital Pediatric Readiness Checklist

This checklist is based on the 2020 joint policy statement "Pediatric Readiness in Emergency Medical Services Systems", co-authored by the American Academy of Pediatrics (AAP), American College of Emergency Physicians, Emergency Nurses Association, National Association of EMS Physicians, and National Association of EMTs. Additional details can be found in the AAP Technical Report "Pediatric Readiness in Emergency Medical Services Systems".

Use this tool to check if your EMS or fire-rescue agency is ready to care for children as recommended in the policy statement and technical report. Consider using resources compiled by the National Prehospital Pediatric Readiness Project Steering Committee when implementing the recommendations noted here, to include the **Prehospital Pediatric Readiness Toolkit**.



Education & Competencies for Providers

- ☐ Process(es) for ongoing pediatric specific education using one or more of the following modalities:
 - Classroom/in-person didactic sessions
 - Online/distributive education
 - Skills stations with practice using pediatric equipment, medication and protocols
 - Simulated events

Process for evaluating pediatric-specific competencies for the following types of skills:

- ☐ Psychomotor skills, such as, but not limited to:
 - Airway management
 - Fluid therapy
 - Medication administration
 - Vital signs assessment
 - Weight assessment for medication dosing and equipment sizing
 - Specialized medical equipment
- ☐ Cognitive skills, such as, but not limited to:
 - Patient growth and development
 - Scene assessment
 - Pediatric Assessment Triangle (PAT) to perform assessment
 - Recognition of physical findings in children associated with serious illness
- ☐ Behavioral skills, such as, but not limited to:
 - Communication with children of various ages and with special health care needs
 - Patient and family centered care
 - Cultural awareness
 - Health care disparities
 - Team communication

Equipment and Supplies

- ☐ Utilize national consensus recommendations to guide availability of equipment and supplies to treat all ages
- ☐ Process for determining competency on available equipment and supplies

Patient and Medication Safety

- ☐ Utilization of tools to reduce pediatric medication dosing and administration errors, such as, but not limited to:
 - Length based tape
 - Volumetric dosing guide
- ☐ Policy for the safe transport of children
- ☐ Equipment necessary for the safe transport of children

Patient- and Family-Centered Care in EMS

Partner with families to integrate elements of patient- and family-centered care in policies, protocols, and training, including:

- ☐ Using lay terms to communicate with patients and families
- ☐ Having methods for accessing language services to communicate with non-English speaking/nonverbal patients and family members
- ☐ Narrating actions, and alerting patients and caregivers before interventions are performed

Policies and procedures that facilitate:

- ☐ Family presence during resuscitation
- ☐ The practice of cultural or religious customs
- ☐ A family member or guardian to accompany a pediatric patient during transport

Policies, Procedures, and Protocols (to include Medical Oversight)

- ☐ Prearrival instructions identified in EMS dispatch protocols include pediatric considerations, when relevant, such as, but not limited to:
 - Respiratory distress
 - Cardiac arrest
 - Choking
 - Seizure
 - Altered consciousness
- ☐ Policies, procedures, and protocols include pediatric considerations, such as, but not limited to:
 - Policy on pediatric refusals
 - Pediatric assessment
 - Consent and treatment of minors
 - Recognition and reporting of child maltreatment
 - Trauma triage
 - Children with special health care needs
- ☐ Direct medical oversight integrates pediatric-specific knowledge
- ☐ Protocols (indirect medical oversight) include pediatric evidence when available
- ☐ Destination policy that integrates pediatric-specific resources

Quality Improvement (QI)/ Performance Improvement (PI)

- ☐ PI process includes pediatric encounters
- ☐ Pediatric-specific measures are included in the PI process
- ☐ Submission of EMS agency data to the state's prehospital patient care database
- ☐ Submitted data is compliant with the current version of NEMSIS (version 3.5 or higher)
- ☐ Process to track pediatric patient centered outcomes across the continuum of care, such as, but not limited to:
 - Transport destination
 - Secondary transport destination
 - ED and hospital disposition
 - ED and hospital diagnoses
 - Survival to hospital admission
 - Survival to hospital discharge

Interaction with Systems of Care

Policies, procedures, protocols, and performance improvement initiatives involve ongoing collaboration with:

- ☐ Pediatric emergency care
- ☐ Public health
- ☐ Family advocates

Plans and exercises for disasters or mass casualty incidents include:

- ☐ Care of pediatric patients, such as, but not limited to:
 - Pediatric mental health first aid
 - Pediatric disaster triage
 - Pediatric dosing of medications used as antidotes
 - Pediatric mass transport
- ☐ Tracking of unaccompanied children
- ☐ Family reunification
- ☐ Collaborate with external personnel or have internal staff focused on enhancing pediatric care, such as, but not limited to:
 - Pediatric emergency care coordinator (PECC)/champion
 - Regional PECC/pediatric champion
 - Pediatric advisory council(s)
 - Medical director with pediatric knowledge and experience
- ☐ Understand pediatric capabilities at local and/or regional emergency departments for children with the following types of conditions:
 - Medical emergency
 - Traumatic injury
 - Behavioral health emergency
- ☐ Policies and/or procedures for transfer of responsibility of patient care at destination

Elements of EMS pediatric readiness

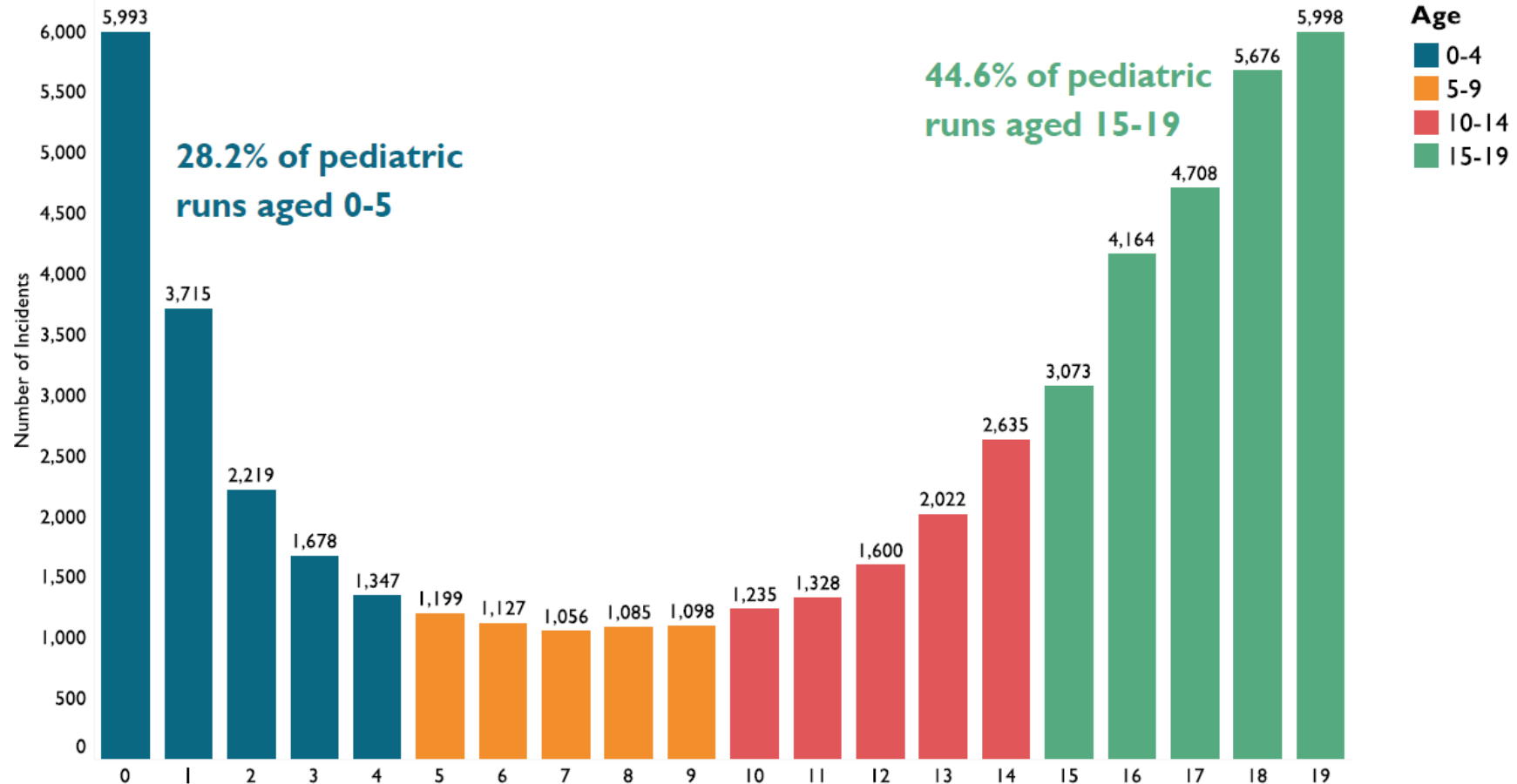
Opportunity #1:

- 6-month-old was involved in MVC without restraints and is unconscious...
 - What is your priority?
 - Assessment?
 - Interventions?
- Experience with traumatically injured infants
- Know all the equipment and how to use them
- Assessment and interaction with infant

In 2018, 7.5% of all EMS runs were 0-19 YO

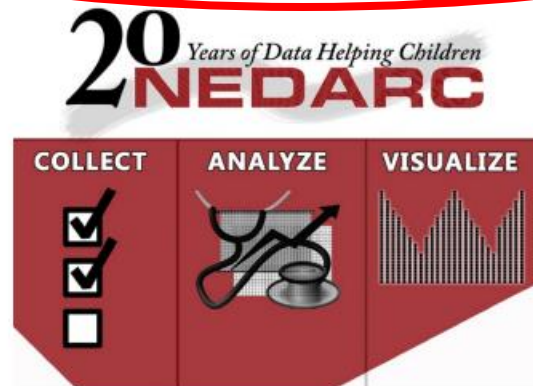
Volume of Pediatric Ambulance Runs by Age

Pediatric ambulance runs represented over 7.5% of all ambulance runs in 2018. There were marked variations in the number of pediatric ambulance runs based on age. Youth ages 15-19 represented the largest overall proportion of pediatric ambulance runs, followed by children ages 0-4.



EMS for Children Data Collection 2017-2018

- 11,027 EMS agencies contacted
- 8,730 EMS agencies responded (79.2%)
- 80% of EMS agencies see fewer than 8 pediatric patients per month

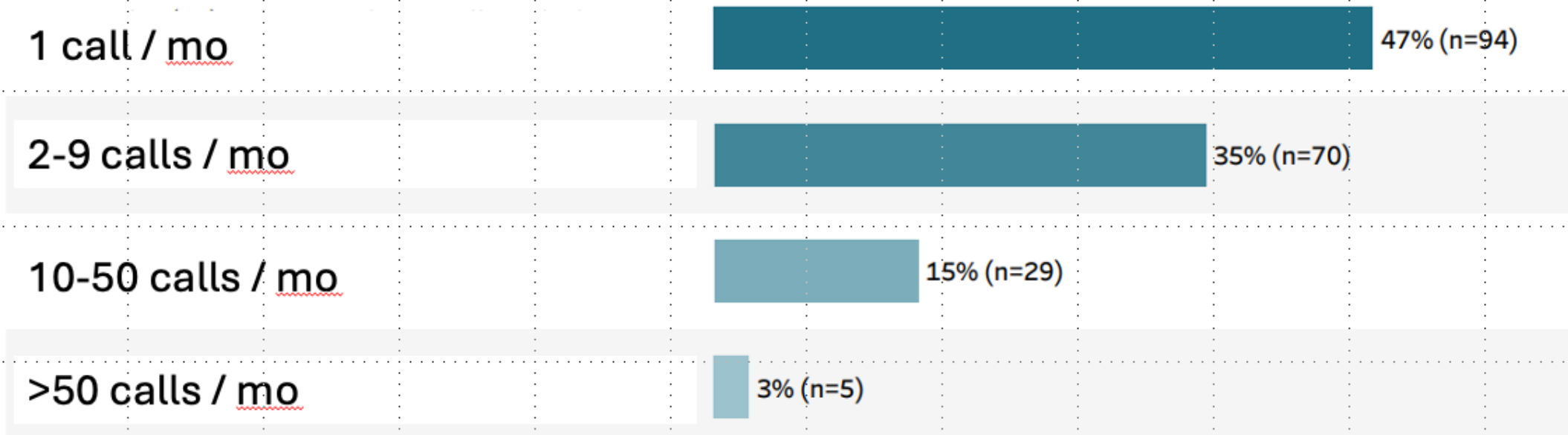


Annual 911 Pediatric Call Volume*

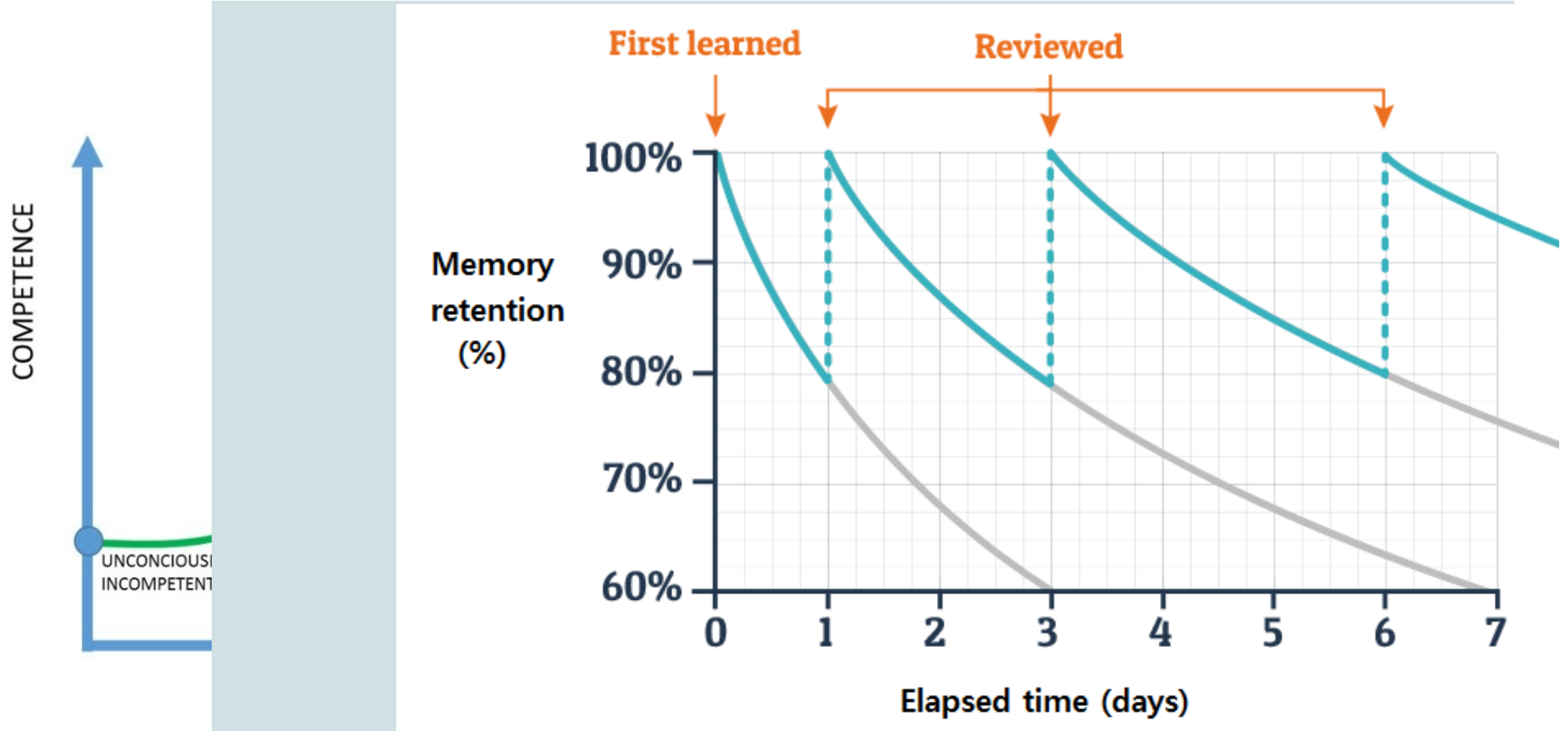
None - Zero pediatric calls in the last year	2.8% n=226 agencies
Low - Twelve (12) or fewer pediatric calls in the last year (1 or fewer pediatric calls per month)	39.4% n=3,219 agencies
Medium - Between 13-100 pediatric calls in the last year (1 - 8 pediatric calls per month)	39.0% n=3,186 agencies
Medium High - Between 101-600 pediatric calls in the last year (8 - 50 pediatric calls per month)	13.9% n=1,138 agencies
High - More than 600 pediatric calls in the last year (more than 50 pediatric calls per month)	4.4% n=357 agencies
Pediatric Call Volume Not Reported	0.5% n=40 agencies

2024 PPRP WI assessment

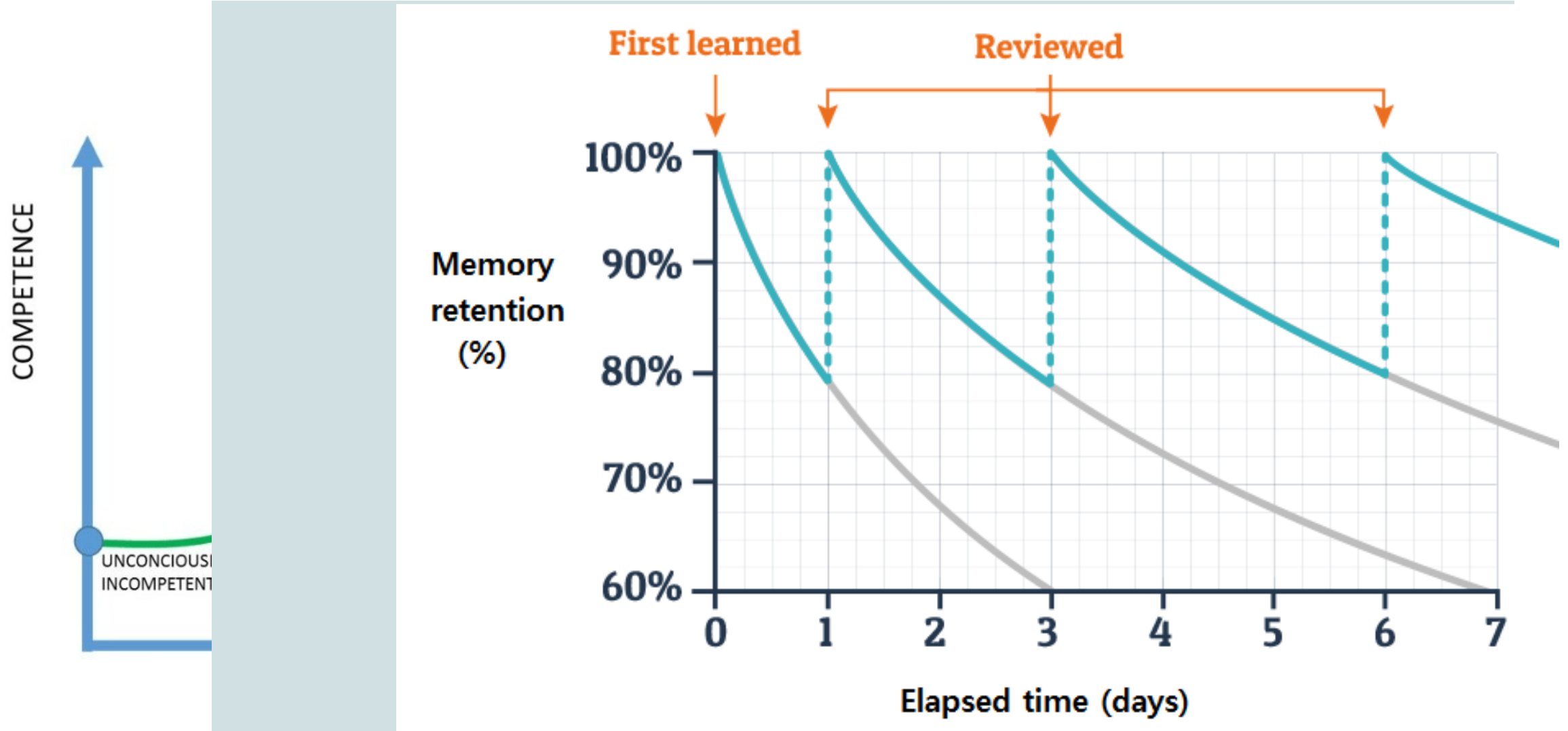
Pediatric Overall Call Volume



Barrier 1: training and education



Barrier 1: training and education (continuing)



Barrier 1: training and education (continuing)

- Pediatric Specific
 - Synchronous & asynchronous
 - Skills
 - Simulation
- What does your pediatric training consist of?
 - Content
 - Frequency
 - Quality



Psychomotor



Cognitive



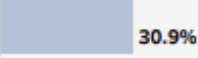
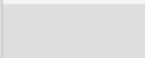
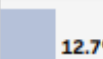
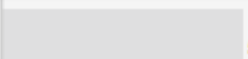
Behavioral

2024 PPRP WI assessment

Frequency Report - Education And Competencies For Providers (Q6-51)

Denominator Changes Based on Gateway Questions

Open-Ended Text Questions: 34, 39.7, 41.7, 43.7. These answers (if available) are shown on the following pages.

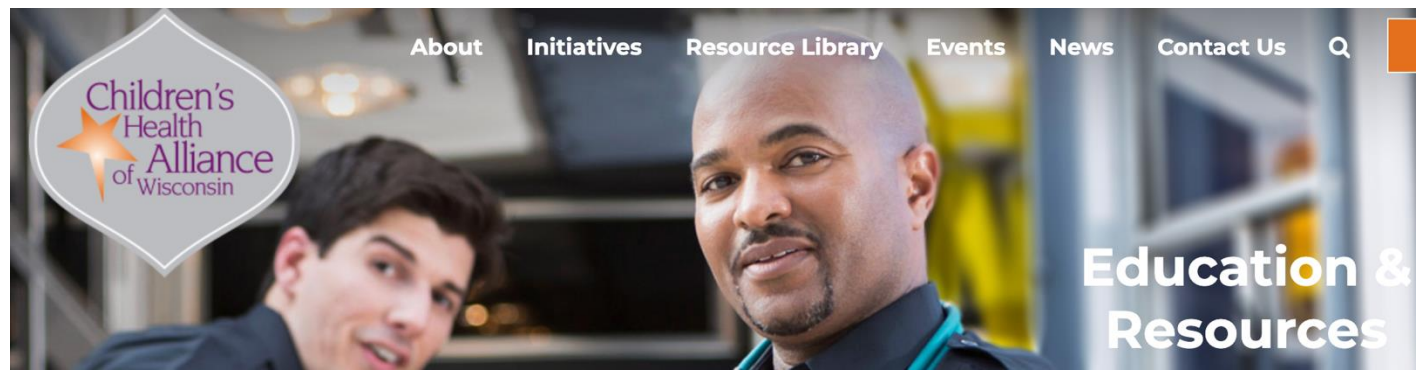
Q#	QScore	Question	Answer	BLS	ILS	ALS
6	0.2	At a skill station (not part of a simulated event), does your agency have a process which requires your EMS providers to physically demonstrate the correct use of pediatric-specific equipment? (This is an isolated skill-check rather than part of a simulated event.)	Yes	 67.9% (n=55/81)	 75.0% (n=9/12)	 83.8% (n=88/105)
7	0.2	[If yes to Q6] Skill station physical demonstration frequency	Less Than Once Per Two Years	 1.8% (n=1/55)		 4.5% (n=4/88)
			Once Per Two Years	 30.9% (n=17/55)	 11.1% (n=1/9)	 11.4% (n=10/88)
			Once Per Year	 54.5% (n=30/55)	 33.3% (n=3/9)	 56.8% (n=50/88)
			Two or More Per Year	 12.7% (n=7/55)	 55.6% (n=5/9)	 27.3% (n=24/88)

Does your EMS agency require physical hands-on demonstration (psychomotor) on the use of any pediatric equipment at least once every two years?

	BLS (%)	ILS (%)	ALS (%)
NP suctioning	47.5	90	56.6
BMV	100	100	98.9
Adjunct airway use	88.1	100	93.7
Safe transport	61	100	87.4
Cervical motion restriction	86.4	100	81.1
IV placement	?	90	69.5
IO placement	10.2	100	90.5
Dose calculation	33.2	100	96.8
Supraglottic airway device	39	100	89.9
ETT*	3.4?	?	74.7

Education method

	BLS (%)	ILS (%)	ALS (%)
Synchronous/didactic	61.7	83.3	87.6
Asynchronous	30.9	25	71.4
Skills Station	61.7	91.7	80
Simulation	43.2	66.7	81.9
Direct patient training	37	25	39



Resources

- <https://www.chawisconsin.org/initiatives/emergency-care/education-training/>
- WEMSA conference
- WEMSA online seminars
- UW EMS night
- Skills videos (coming)

Wisconsin EMSC Webinars

WI EMSC has hosted the below webinars focused on different areas of emergency department (ED) pediatric readiness.

- **Get Ready to be Peds-Ready: Dr. Katherine Remick**
- **Pediatric Behavioral and Mental Health: Dr. Moh Saidinejad**
- **Pediatric Minor Head Trauma and CT Use: Dr. Jeffrey Schunk** | Slides
- **ProHealth's Response – Waukesha Christmas Parade MCI Event: Michelle Hackett, Sherry Berg, Nicholle Palm** | Slides
 - [Example Staff Call List](#)
 - [Lessons Learned from MCI](#)
 - [Mass Casualty EMS Tracking Form](#)
 - [Mass Casualty Patient Tracking Form](#)
 - [Mass Casualty Roles Shared](#)
- **Using Simulation to Improve Pediatric Readiness: Dr. Marc Auerbach**
- **Wisconsin Pediatric Surge Plan: Amanda Hauser and Maureen Luetje, DO** | Slides

American Heart Association

Find pediatric life support courses and CPR information.

Autism Awareness and Interaction

Learn how to recognize and interact with children who have autism, and help reduce or eliminate dangerous behaviors.

Child Abuse Recognition

These modules will help you identify accidental and intentional injuries in children.

Midwest EMS for Children YouTube Channel

View previously recorded presentations from emergency care experts on a variety of topics.

National Child Traumatic Stress Network

Find the latest science-based trainings in the areas of assessment, treatment, research and evaluation, and organizational and systems change for traumatized children, adolescents and their families.

Pediatric Education and Advocacy Kits

Collections of best practice educational resources designed to empower to deliver the highest quality of care and support to children in emergency settings.

Pediatric Education for Prehospital Professionals

Developed by the American Academy of Pediatrics, PEPP is an exciting curriculum designed to teach prehospital professionals how to better assess and manage ill or injured children.

Pediatric Prehospital Education Toolbox

This toolbox provides resources to ensure prehospital professionals have the knowledge and skills necessary to provide safe, effective, family-centered emergency care for children.

Project ECHO

Project ECHO (Extension for Community Healthcare Outcomes) is a telehealth initiative that connects surgical specialists at UW-Madison with emergency care providers across the region. CE credit is available.

Putting Child Passenger Safety (CPS) in Emergency Vehicles

Online course designed to prepare EMS providers to safely transport children in emergency vehicles.

Respiratory Distress Course on TRAIN WI

Online course designed to prepare EMS providers to respond to pediatric respiratory distress.

Responding to Pediatric Tracheostomy & Ventilator Emergencies Course on TRAIN WI

Online course designed to prepare EMS providers to respond to emergencies involving infants and children with tracheostomies and ventilators.

Barrier #2: equipment

- 6-month-old was involved in MVC without restraints and is unconscious and cyanotic...





RECOMMENDED ESSENTIAL EQUIPMENT FOR PEDIATRIC ADVANCED LIFE SUPPORT (PALS) COURSE

John Lyng, MD, NRP, Bruce Chung, MD, NRP, Justin Beal, PHRN, Ken Williams, MD, Allen Yee, MD

Competency



Examples (checklists, inspection forms) • Elic



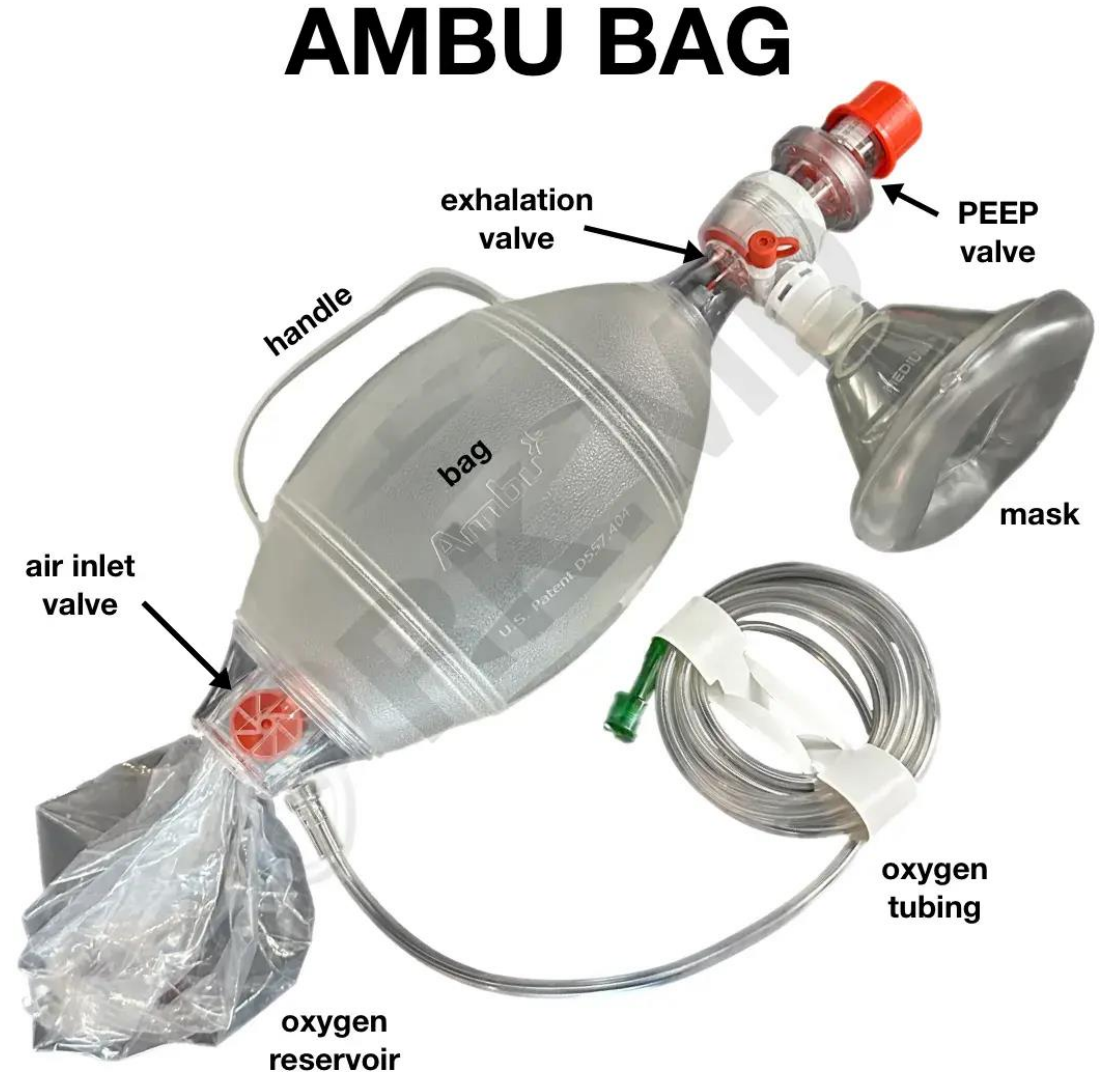
This Ambu bag is connected to 15l/min. How much oxygen is delivered here?

- a) 75-100%
- b) 51-75%
- c) 22-50%
- d) 21%
- e) <21%



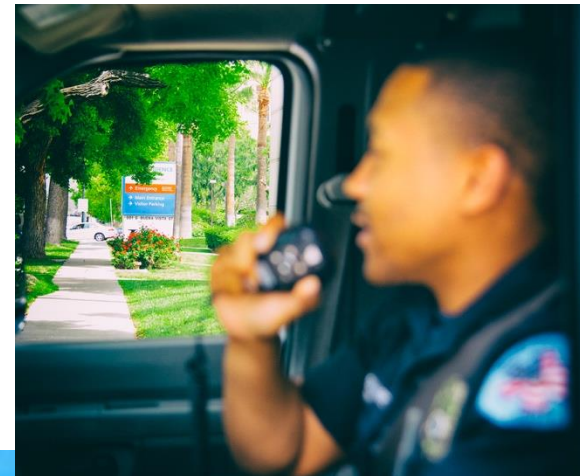
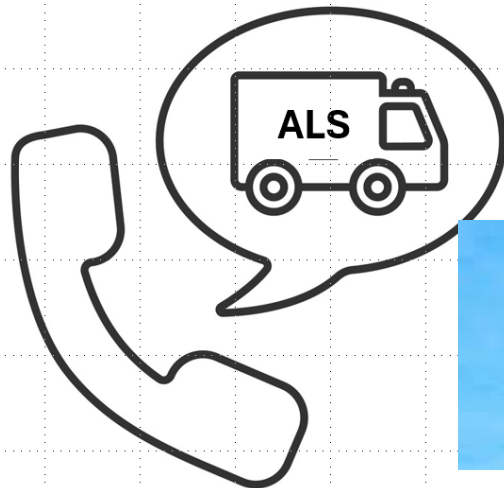
This Ambu bag is connected to 15l/min. How much oxygen is delivered here?

- a) 75-100%
- b) 51-75%
- c) 22-50%
- d) 21%
- e) <21%



Barrier #3: policy and procedures

- 6-month-old was involved in MVC without restraints and is unconscious...
- Oxygen administered, P 175, BP 74/54, R 24, Pox: 91%
- Begins to seize...
- 18 yo babysitter was driving
- Unable to get a hold of parents



National Guideline for the Field Triage of Injured Patients

RED CRITERIA High Risk for Serious Injury

Injury Patterns	Mental Status & Vital Signs
• Penetrating injuries to head, neck, torso, and proximal extremities • Skull deformity, suspected skull fracture • Suspected spinal injury with new motor or sensory loss • Chest wall instability, deformity, or suspected flail chest • Suspected pelvic fracture • Suspected fracture of two or more proximal long bones • Crushed, degloved, mangled, or pulseless extremity • Amputation proximal to wrist or ankle • Active bleeding requiring a tourniquet or wound packing with continuous pressure	All Patients • Unable to follow commands (motor GCS < 6) • RR < 10 or > 29 breaths/min • Respiratory distress or need for respiratory support • Room-air pulse oximetry < 90% Age 0-9 years • SBP < 70mm Hg + (2 x age years) Age 10-64 years • SBP < 90 mmHg or • HR > SBP Age ≥ 65 years • SBP < 110 mmHg or • HR > SBP

Patients meeting any one of the above RED criteria should be transported to the highest-level trauma center available within the geographic constraints of the regional trauma system

YELLOW CRITERIA Moderate Risk for Serious Injury

Mechanism of Injury	EMS Judgment
• High-Risk Auto Crash – Partial or complete ejection – Significant intrusion (including roof) • >12 inches occupant site OR • >18 inches any site OR • Need for extrication for entrapped patient – Death in passenger compartment – Child (Age 0-9) unrestrained or in unsecured child safety seat – Vehicle telemetry data consistent with severe injury • Rider separated from transport vehicle with significant impact (eg, motorcycle, ATV, horse, etc.) • Pedestrian/bicycle rider thrown, run over, or with significant impact • Fall from height >10 feet (all ages)	Consider risk factors, including: • Low-level falls in young children (age ≤ 5 years) or older adults (age ≥ 65 years) with significant head impact • Anticoagulant use • Suspicion of child abuse • Special, high-resource healthcare needs • Pregnancy > 20 weeks • Burns in conjunction with trauma • Children should be triaged preferentially to pediatric capable centers If concerned, take to a trauma center

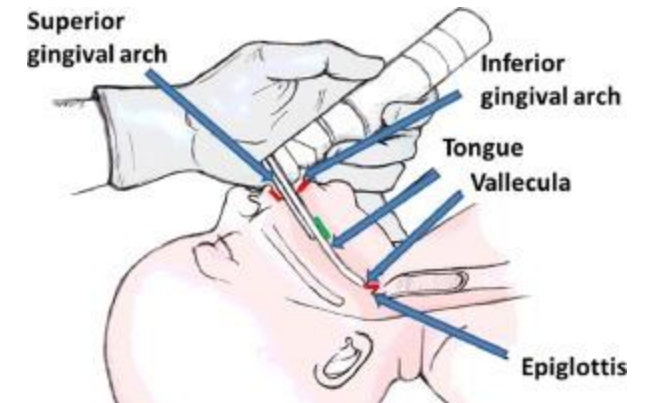
Patients meeting any one of the YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center, as available within the geographic constraints of the regional trauma system (need not be the highest-level trauma center)

Barrier #4: patient & medication safety

- 6-month-old was involved in MVC without restraints and is unconscious...
- Oxygen administered, P 175, BP 74/54, R 24, Pox: 91%
- Begins to seize...



VS



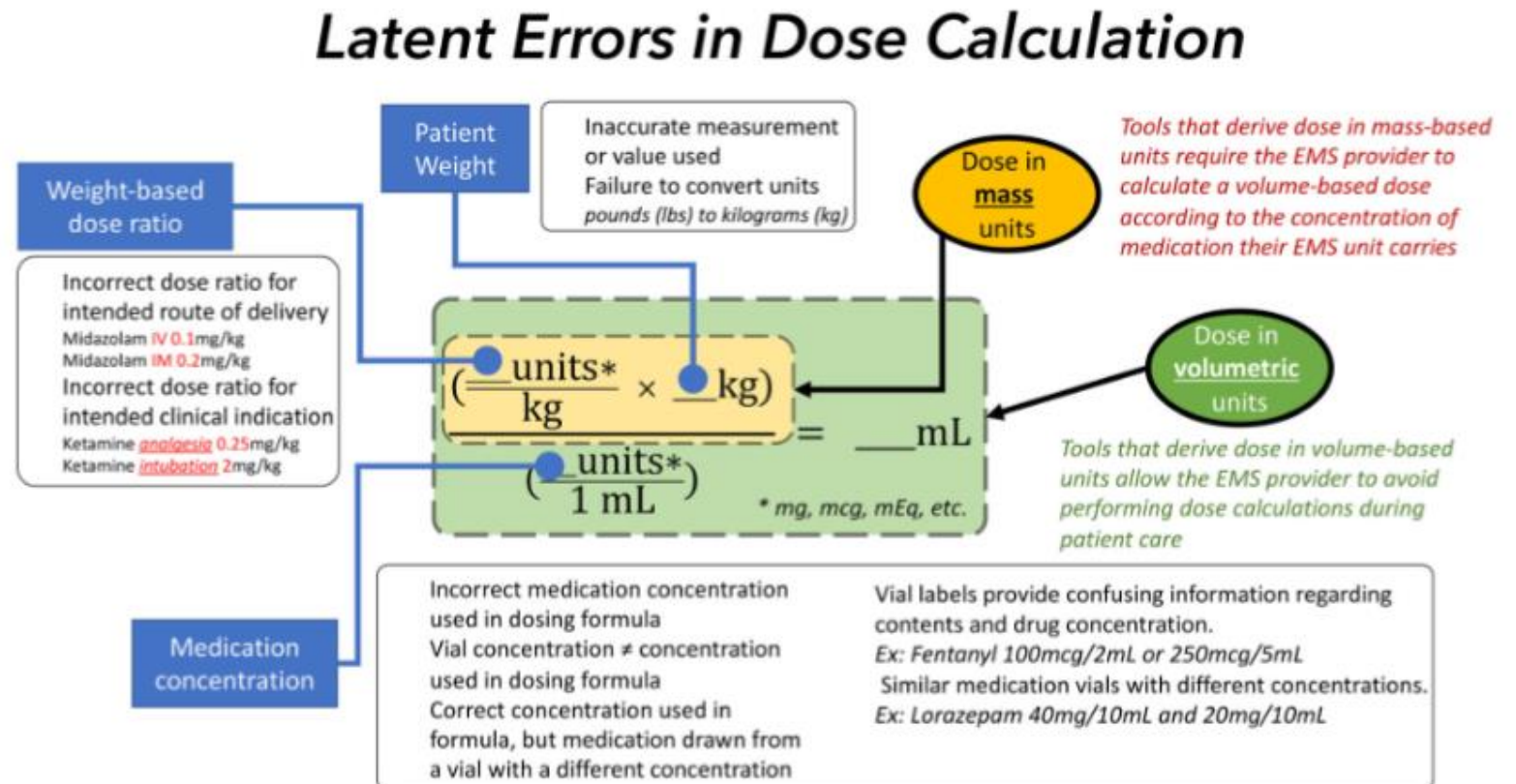
Midazolam Dose



Barrier #4: patient & medication safety

8? rights of EMS pediatric med administration

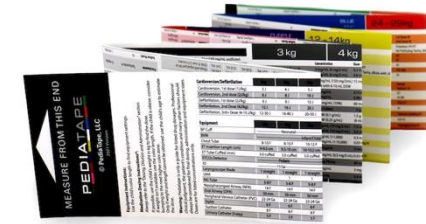
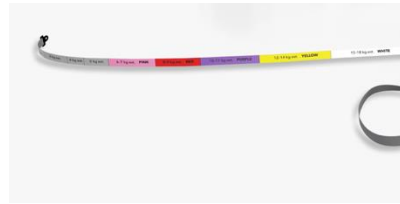
- Right weight
- Right medication
- Right indication
- Right concentration
- Right dose
- Right calculation
- Right route
- Right documentation



Barrier #4: patient & medication safety

8? rights of EMS pediatric med administration

- Right weight
- Right medication
- Right indication
- Right concentration
- Right dose
- Right calculation
- Right route
- Right documentation



Enter patient weight:

40 Lbs 12.1 Oz

18.486 Kg 5 Years 0 Months

Male estimated at 50th percentile

Weight Conversions

< Drugs Septra®, CA-MRSA

trimethoprim/sulfamethoxazole

Antibiotic, Sulfonamide

Suggested PO dose for 10.0 Kg

Give 49.9mg (6.2ml)

Of 40mg/5ml

Drug Dosing

Age

Bilirubin

BMI

BP Screen

Calculators



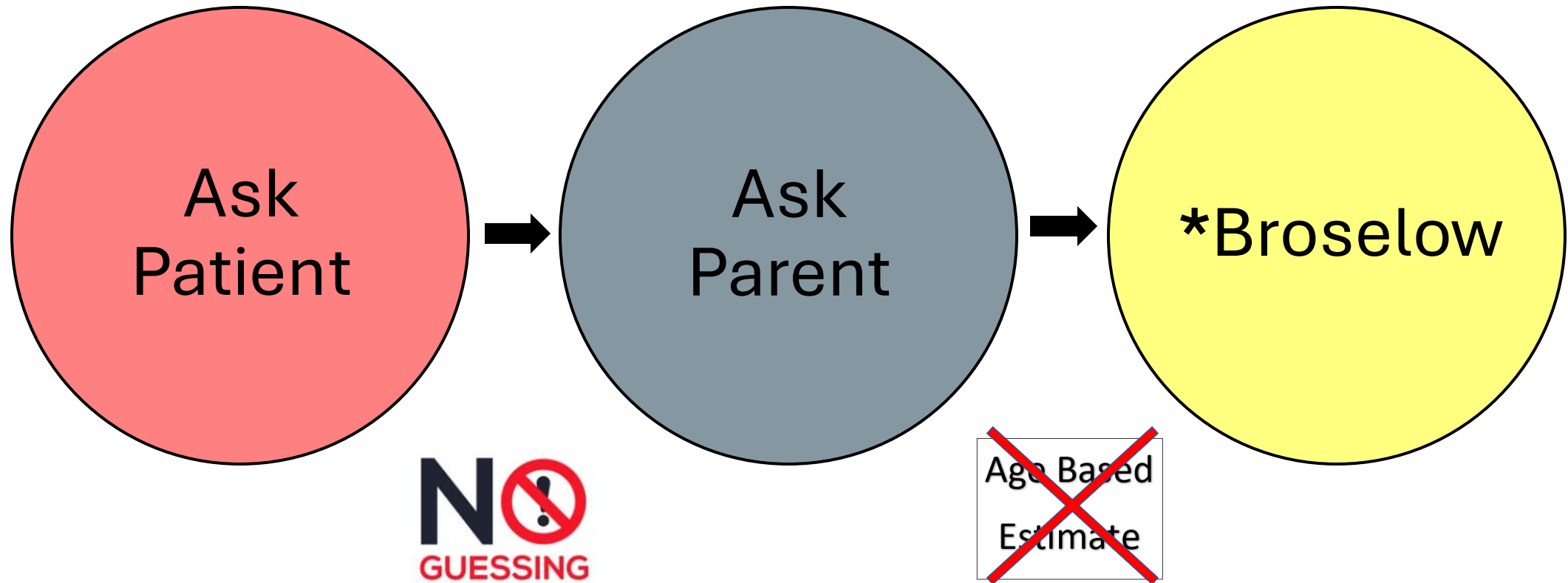
Barrier #4: patient & medication safety

Accurate
weight
estimate

Kg only

Volumetric
dose
reference

Pediatric Weight Estimate Algorithm



Policies: Safety

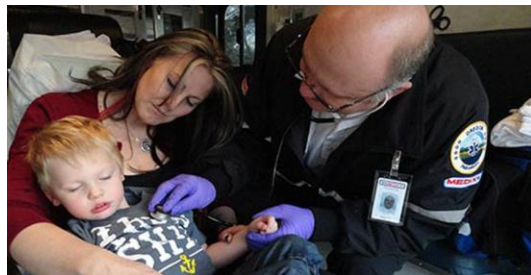
	BLS	ILS	ALS
Presence during resuscitation	28.4	50	32.4
Guardian ride along	46.9	83.3	84.8
Language services	34.6	66.7	67.6
Length based tape or volumetric dosing	53.1	100	100
Dosing error review	27.2	66.7	84.6
Proper restraint use	35.8	91.7	90.5

Barrier #5: patient and family centered care

- 6-month-old was involved in MVC without restraints and is unconscious...
- Intubated after Midazolam and stabilized.
- Mom, in broken English, insists on
 - Holding hand while you intubate
 - Riding along
 - ED 1 hr away

Barrier #5: patient and family centered care

- 6-month-old was involved in MVC without restraints and is unconscious...
- Intubated after Midazolam and stabilized.
- Mom, in broken English, insists on
 - Holding hand while you intubate
 - Riding along
 - ED 1 hr away



Interpreters

We Interpret
spoken
language



DIVERSITY
of people,
perspectives



EQUITY
in policy, practice
& position



INCLUSION
via power, voice &
organizational culture



Policies: Patient and Centered Care

	BLS	ILS	ALS
Presence during resuscitation	28.4	50	32.4
Guardian ride along	46.9	83.3	84.8
Language services	34.6	66.7	67.6
Length based tape or volumetric dosing	53.1	100	100
Dosing error review	27.2	66.7	84.6
Proper restraint use	35.8	91.7	90.5

Barrier #6: Quality improvement & Performance Improvement

- 6-month-old was involved in MVC without restraints and is unconscious...
- Stabilized and begin to transport
- Then Intraosseous line infiltrates... like last three times...



Prehospital Pediatric Readiness Checklist

This checklist is based on the 2020 joint policy statement "Pediatric Readiness in Emergency Medical Services Systems", co-authored by the American Academy of Pediatrics (AAP), American College of Emergency Physicians, Emergency Nurses Association, National Association of EMS Physicians, and National Association of EMTs. Additional details can be found in the AAP Technical Report "Pediatric Readiness in Emergency Medical Services Systems".

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Education & Competencies for Providers

- ☐ Process(es) for ongoing pediatric specific education using one or more of the following modalities:
 - Classroom/in-person didactic sessions
 - Online/distributive education
 - Skills stations with practice using pediatric equipment, medication and protocols
 - Simulated events

Process for evaluating pediatric-specific competencies for the following types of skills:

- ☐ Psychomotor skills, such as, but not limited to:
 - Airway management
 - Fluid therapy
 - Medication administration
 - Vital signs assessment
 - Weight assessment for medication dosing and equipment sizing
 - Specialized medical equipment
- ☐ Cognitive skills, such as, but not limited to:
 - Patient growth and development
 - Scene assessment
 - Pediatric Assessment Triangle (PAT) to perform assessment
 - Recognition of physical findings in children associated with serious illness
- ☐ Behavioral skills, such as, but not limited to:
 - Communication with children of various ages and with special health care needs
 - Patient and family centered care
 - Cultural awareness
 - Health care disparities
 - Team communication

Equipment and Supplies

- ☐ Utilize national consensus recommendations to guide availability of equipment and supplies to treat all ages
- ☐ Process for determining competency on available equipment and supplies

Patient and Medication Safety

- ☐ Utilization of tools to reduce pediatric medication dosing and administration errors, such as, but not limited to:
 - Length based tape
 - Volumetric dosing guide
- ☐ Policy for the safe transport of children
- ☐ Equipment necessary for the safe transport of children

Patient- and Family-Centered Care in EMS

Partner with families to integrate elements of patient- and family-centered care in policies, protocols, and training, including:

- ☐ Using lay terms to communicate with patients and families
- ☐ Having methods for accessing language services to communicate with non-English speaking/nonverbal patients and family members
- ☐ Narrating actions, and alerting patients and caregivers before interventions are performed

Policies and procedures that facilitate:

- ☐ Family presence during resuscitation
- ☐ The practice of cultural or religious customs
- ☐ A family member or guardian to accompany a pediatric patient during transport

Policies, Procedures, and Protocols (to include Medical Oversight)

- ☐ Prearrival instructions identified in EMS dispatch protocols include pediatric considerations, when relevant, such as, but not limited to:
 - Respiratory distress
 - Cardiac arrest
 - Choking
 - Seizure
 - Altered consciousness
- ☐ Policies, procedures, and protocols include pediatric considerations, such as, but not limited to:
 - Policy on pediatric refusals
 - Pediatric assessment
 - Consent and treatment of minors
 - Recognition and reporting of child maltreatment
 - Trauma triage
 - Children with special health care needs
- ☐ Direct medical oversight integrates pediatric-specific knowledge
- ☐ Protocols (indirect medical oversight) include pediatric evidence when available
- ☐ Destination policy that integrates pediatric-specific resources

Quality Improvement (QI)/ Performance Improvement (PI)

- ☐ PI process includes pediatric encounters
- ☐ Pediatric-specific measures are included in the PI process
- ☐ Submission of EMS agency data to the state's prehospital patient care database
- ☐ Submitted data is compliant with the current version of NEMSIS (version 3.5 or higher)
- ☐ Process to track pediatric patient centered outcomes across the continuum of care, such as, but not limited to:
 - Transport destination
 - Secondary transport destination
 - ED and hospital disposition
 - ED and hospital diagnoses
 - Survival to hospital admission
 - Survival to hospital discharge

Interaction with Systems of Care

Policies, procedures, protocols, and performance improvement initiatives involve ongoing collaboration with:

- ☐ Pediatric emergency care
- ☐ Public health
- ☐ Family advocates

Plans and exercises for disasters or mass casualty incidents include:

- ☐ Care of pediatric patients, such as, but not limited to:
 - Pediatric mental health first aid
 - Pediatric disaster triage
 - Pediatric dosing of medications used as antidotes
 - Pediatric mass transport
- ☐ Tracking of unaccompanied children
- ☐ Family reunification
- ☐ Collaborate with external personnel or have internal staff focused on enhancing pediatric care, such as, but not limited to:
 - Pediatric emergency care coordinator (PECC)/champion
 - Regional PECC/pediatric champion
 - Pediatric advisory council(s)
 - Medical director with pediatric knowledge and experience
- ☐ Understand pediatric capabilities at local and/or regional emergency departments for children with the following types of conditions:
 - Medical emergency
 - Traumatic injury
 - Behavioral health emergency
- ☐ Policies and/or procedures for transfer of responsibility of patient care at destination



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Barrier #6: Quality improvement & Performance Improvement

- 1) First time success rate for intubation
 - 2) Adequate saturation before intubation
 - 3) Bronchodilator administration in asthma
 - 4) Hypoglycemia correction in symptomatic patient
 - 5) Full assessment in respiratory distress
 - 6) O2 administration in hypoxic patient
 - 7) **Weight documented in Kg in <18 yo**
 - 8) Proportion of not using lights & siren
 - 9) **Peds restraint device <8 yo**
 - 10) Benzo administration in Sz patient
 - 11) Stroke assessment
 - 12) Pox, EtCO2, SBP in TBI
 - 13) Pain assessment
 - 14) Pain score improved
 - 15) Trauma center transport
 - 16) GCS, RR, and SBP documentation in trauma
 - 17) Trauma alert initiated when CDC criteria met
 - 18) VS in no transport
- Critical pediatric events? (debrief)
 - Track patient level data?
 - Refusals, outcomes, hospital data?

Barrier #7: Interaction with systems of care

- 6-month-old was involved in MVC without restraints and is unconscious...
- Stabilized and begin to transport
- MedFlight dispatched and scheduled to meet 5 mi from scene



Barrier #7: Interaction with systems of care

- Disaster plan
- Special needs patients
- Mental health needs
- Pediatric emergency care resources in the community



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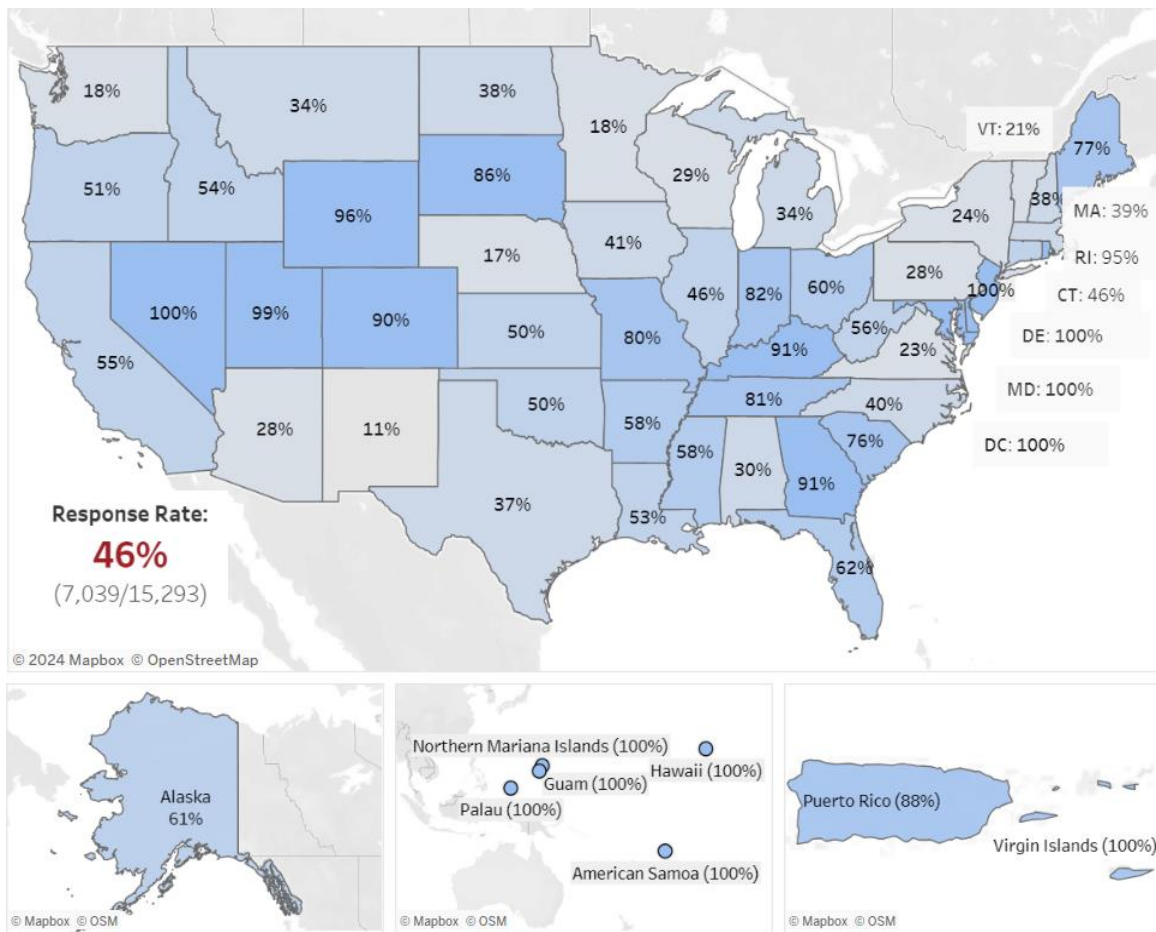
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• ALS

Pediatric Readiness Score

Median Score	Average Score
74	71
n=105	n=105

• ILS

Pediatric Readiness Score

Median Score	Average Score
72	65
n=12	n=12

• BLS

Pediatric Readiness Score

Median Score	Average Score
45	46
n=81	n=81

Points Earned by Assessment Domain

The assessment covers eight “domains,” or focus areas. The table below shows the average number and percentage of points earned in each domain.

Average Points Earned and Percent by ILS Agencies in Each Domain (sorted highest to lowest by percentage)

	Points Earned	Points Possible	Percentage
Equipment and Supplies*	11.2	12	93%
Policies, Procedures, and Protocols	9.6	13	74%
Patient and Family-Centered Care in EMS	6.8	10	68%
Patient and Medication Safety	9.4	14	67%
Education and Competencies for Providers	10.0	15	67%
Coordination of Pediatric Emergency Care	8.5	14	61%
Interaction with Systems of Care	5.3	10	53%
Quality Improvement/Performance Improvement	4.5	12	38%

¹ Estimated response rate based on known licensure data. The response rate may affect the representativeness of the data.

* [Recommended Essential Equipment for Basic Life Support and Advanced Life Support Ground Ambulances 2020: A Joint Position Statement](#)

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Take home

- Assess and improve your pediatric readiness
- Advocate
- Become a PECC
- Pediatric readiness recognition program coming



Status of
Emergency
Department
Pediatric
Readiness in WI





Pediatric Readiness Saves Lives



High levels of Pediatric Readiness in emergency departments (EDs)—or scoring a minimum of 88 points (ideally 100) on the National Pediatric Readiness Project Assessment—improve outcomes for children. While research in prehospital settings is ongoing, a similar impact is anticipated.

**High levels of Pediatric Readiness in EDs are associated
with the potential for:**

76%

lower mortality
risk in children^{1,2}

2,143

children's lives saved
across the U.S. each year³

3-FOLD

reduction in racial and ethnic
disparities in mortality⁴

and only cost between \$4–48 per patient.⁵



The Power of PECCs:

Designating individuals as pediatric emergency care coordinators (PECCs), or pediatric champions, in EMS agencies and EDs is the best way to increase readiness.

Gap Reports

Wisconsin Score	National Score
68	70
Median Score out of 100 (n=96)	Median Score out of 100 (n=3,557)

WI Response Rate: 77% (101 out of 132) - 5 record(s) in this dataset were excluded from the state median score.

Other Wisconsin Indicators for Readiness

97%	of Recommended Pediatric Equipment is Available in EDs (on Average)
72%	of EDs Weigh and Record in Kilograms
69%	of EDs Have a Behavioral Health Policy that Includes Pediatric Components

LEGEND:

 Readiness Met  Do Not Have Item

Guidelines for Administration and Coordination of the ED for the Care of Children				
	PREVIOUS: 05/24/2018	CURRENT: 8/25/2021	Points Possible:	Readiness:
Physician Coordinator	9.5	9.5	9.5	
Nurse Coordinator	9.5	9.5	9.5	
Your Section Score: 19.0 out of 19				

Physicians, Nurses, and Other Health Care Providers Who Staff the ED				
	PREVIOUS: 05/24/2018	CURRENT: 8/25/2021	Points Possible:	Readiness:
Physician Competency Evaluations	2.5	2.5	2.5	
Physician Maintenance of Board Certification		2.5	2.5	
Nurse Competency Evaluations	2.5	2.5	2.5	
Nurse Maintenance of Specialty Certification		0.0	2.5	
Your Section Score: 7.5 out of 10				

Guidelines for QI/PI in the ED				
	PREVIOUS: 05/24/2018	CURRENT: 8/25/2021	Points Possible:	Readiness:
Patient care review process (chart review)	1.4	1.4	1.4	
Identification of quality indicators for children	1.4	1.4	1.4	
Collection and analysis of pediatric emergency care data	1.4	1.4	1.4	
Development of a plan for improvement in pediatric emergency care	1.4	1.4	1.4	
Re-evaluation of performance using outcomes-based measures	1.4	1.4	1.4	
Your Section Score: 7.0 out of 7				



**Administration &
Coordination (PECCs)**



**Care Team
Competencies**



**Quality and Process
Improvement**



**Policies, Procedures,
and Protocols**



Support Services

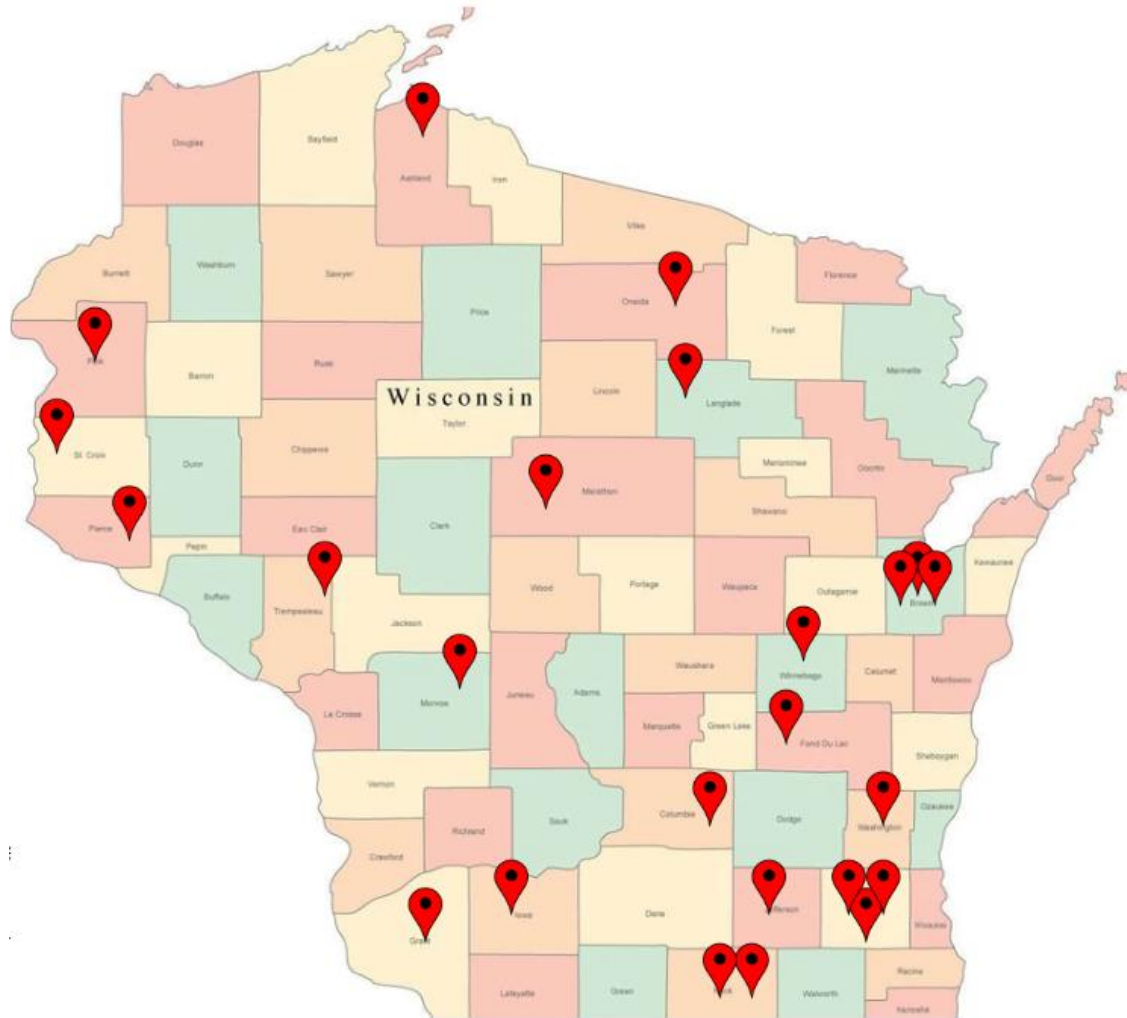


**Pediatric Patient &
Medication Safety**



**Equipment, Supplies,
and Medications**

Pediatric Readiness Program



Cohort 1 EDs

- Aspirus – Rhinelander (St. Mary's)
- Aurora – Oshkosh
- Aurora – Summit
- Froedtert – Menomonee Falls
- Froedtert – West Bend
- Grant Regional Health Center
- HSHS – St. Vincent Hospital
- Prairie Ridge Health
- River Falls Area Hospital
- SSM Health Ripon Community Hospital
- St. Croix Regional Medical Center
- Tomah Health

Cohort 2 EDs

- Aspirus Langlade Hospital
- Aspirus Wausau Hospital
- Aurora – BayCare
- Bellin Memorial Hospital – Green Bay
- Beloit Memorial Hospital
- Fort HealthCare
- Gundersen Tri-County Hospital
- Indianhead Medical Center
- Tamarack Health Ashland Medical Center
- Mercyhealth – Janesville
- ProHealth Waukesha Memorial Hospital
- Upland Hills Health
- Western Wisconsin Health

Table of Contents

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[What is pediatric readiness? - page 4](#)

[What is the National Pediatric Readiness Program \(NPRP\) Assessment? - page 4](#)

[How do we take the NPRP Assessment? - page 4](#)

[How is our score determined? - page 5](#)

[What does our score mean? - page 5](#)

NPRP Question	Sections	Points	Toolkit Page Number
Administration and Coordination of Care – 19 points			
22-24	Physician Pediatric Coordinator	9.5	11
25-27	Nurse Pediatric Coordinator	9.5	13
Physicians, Advanced Practice Providers (APPs), Nurses, Other ED Healthcare Providers – 10 points			
28-33	Pediatric competencies for physician credentialing	5	16
34-37	Pediatric competencies in nurse credentialing	2.5	18
38-42	Maintenance of specialty certification for nurses	2.5	20
Quality Improvement – 7 points			
43-44	Patient Care Review Process	1.4	22
	Quality Indicators for Children	1.4	
	Collection of Pediatric Data	1.4	
	Pediatric Improvement Plans	1.4	
	Using Outcome-Based Measures	1.4	
Pediatric Patient Safety – 14 points			
45-46	Weights in Kilograms	3	25
47-51	Vital Sign Processes	6.5	27
52	Pre-Calculated Medication Dosing	3	30
53	Interpreter Services	0.5	32
54-55	Mental Status and Pain Assessment	1	33
Policies, Procedures, and Protocols – 17 points			
56	Pediatric Triage Policy	2	36
57	Prescribed Pediatric Policies	9	38
60-61	Family-Centered Care Policy	2	48
62-67	Pediatric Disaster Preparedness	2	50
68-69	Transfer Guidelines for Children	2	53
Equipment, Supplies, and Medications for the Care of Pediatric Patients in the ED – 33 points			
71-73	General Supplies Management	9	57
74	Monitoring Equipment	3	58
	Resuscitation Equipment	2	
	Airway Equipment	19	

- Recruitment
- Pre-assessment
- One on one intro and planning
- Individual coaching and support
- Post assessment
- One on one post assessment interview



Pediatric Readiness Program

**Average Pediatric
Readiness Score
Improvement**

18.66

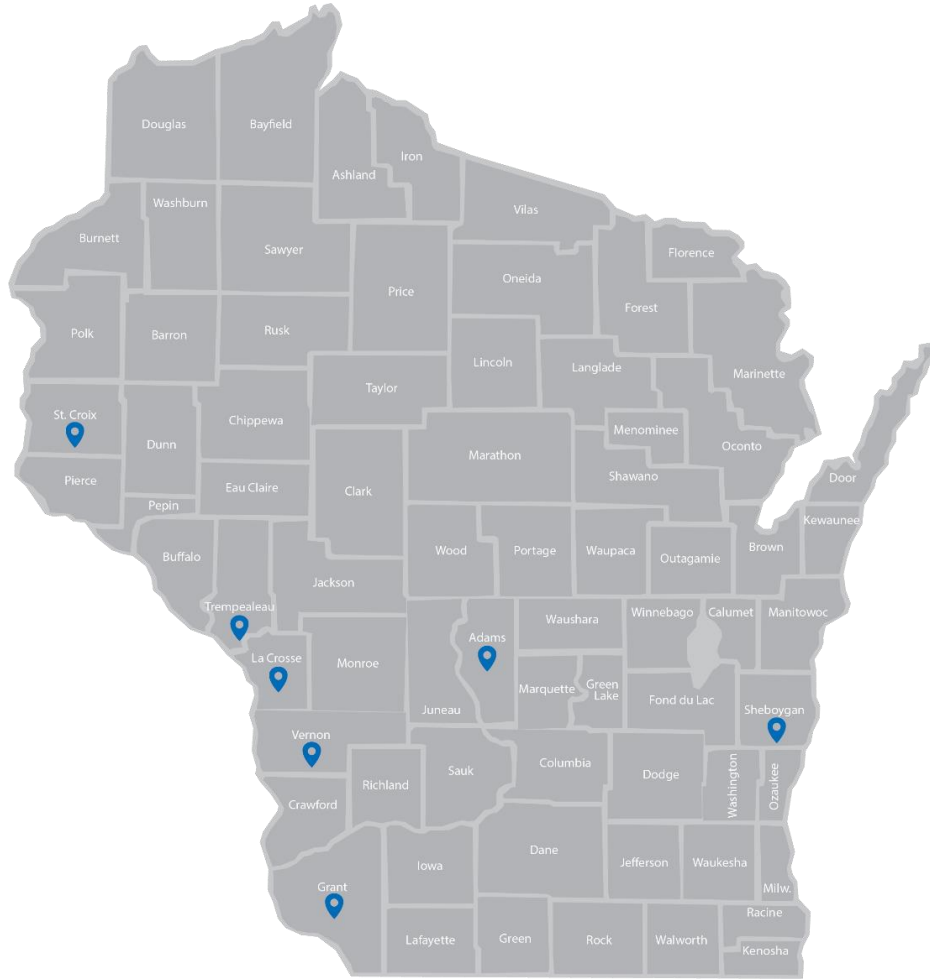
**New nurse and
physician PECCs
identified**

23

**Six EDs have a final
assessment score
above**

88

WI EMSC Facility Recognition Program



Currently Recognized Facilities

- Aurora Medical Center-Sheboygan
- **Western Wisconsin Health**
- Gundersen Health Systems-Boscobel
- Gundersen Health Systems-Friendship
- Gundersen Health Systems-Hillsboro
- Gundersen Health Systems-Lacrosse
- **Gundersen Health Systems-Whitehall**



Emergency Medical Services for Children is funded by the Wisconsin Department of Health Services, Division of Public Health, through the National Emergency Medical Services for Children program, administered by the Health Resources and Services Administration's Maternal and Child Health Bureau.

Trauma system verification & pediatric readiness

- Overview of trauma verification/trauma system levels: what does it mean to be a pediatric trauma center or verified trauma center level I/II/III/IV with pediatric capabilities?
- Why verification matters for children: access to pediatric surgical specialists, PICU, child-friendly environment, pediatric trauma protocols.
- The role of EMS in trauma system: prehospital triage, transport decisions (direct to pediatric trauma center vs nearest facility), coordination with ED/trauma center.
- Review of triage/transport considerations unique to pediatric trauma: e.g., size/weight variation, mechanism of injury differences, physiological differences, compensation/resuscitation.
- Highlight the coupling of pediatric readiness (for all EDs/EMS) with trauma system readiness (for e.g., pediatric verification) — communities may not always have pediatric verified centers, so readiness of the nearest facility/EMS is crucial.

Emergency Department Pediatric Readiness of US Trauma Centers

Associations with Trauma Center Type and Facility Characteristics

We evaluated
Emergency Department
Pediatric Readiness
for 749 US trauma centers
that contributed facility-level
data to the NTDB in 2021.



Median weighted Pediatric
Readiness score was 78.5 / 100
nationally for all trauma centers.



Median Scores for:
ACS Level 1 PTC: 98 / 100
Level 1 & 2 Adult TC: 78 / 100
Level 3 & 4 Adult TC: 72 / 100



Adult centers less frequently
had an identified Pediatric
Emergency Care Coordinator
(PECC), a pediatric-specific QI
plan, or a pediatric-specific
disaster plan.

Efforts should focus on
improving ED Pediatric
Readiness in adult trauma
centers that frequently transfer
children out.

Melhado CG et al. *Journal of Trauma and Acute Care Surgery*.
DOI: 10.1097/TA.0000000000004387

@JTraumAcuteSurg

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The Journal of
**Trauma and
Acute Care Surgery®**

	Level	Criterion	Type
10(a)	III	A TCF that stabilizes pediatric trauma patients in the emergency department must have guidelines to assure appropriate and safe care of children. A TCF's pediatric trauma guidelines must include: (1) Child maltreatment assessment, treatment or transfer and reporting protocols including a list of indicators of possible physical abuse. (2) Imaging guidelines, including age and weight-based criteria based on as low as reasonably achievable guidelines. (3) A system to assure appropriate sizing and dosing of resuscitation equipment and medications. (4) Dosing guidelines for intubation, code and neurologic drugs. (5) Guidelines for administration of sedation.	2

Do you have the following guidelines:

Child maltreatment guideline including assessment, treatment or transfer, reporting and list of possible indicators of abuse.	☐ Yes	☐ No
Imaging guidelines including age and weight-based criteria.	☐ Yes	☐ No
A system to assure appropriate sizing and dosing of resuscitation equipment and medication.	☐ Yes	☐ No
Guidelines for administration of sedation.	☐ Yes	☐ No

10(b)	III	A TCF that stabilizes pediatric trauma patients in the emergency department must have the following medications and equipment: (1) Mannitol or 3% saline. (2) Intubation, code and neurologic medications. (3) Catheter-over-the-needle device; 22 and 24 gauge. (4) Pediatric intraosseous needles or device. (5) Intravenous solutions including the following: normal saline and dextrose 5% normal saline. (6) Infant and child c-collars. (7) Cuffed endotracheal tubes: 3.5, 4.5, 5.5, and 6.5 millimeters. (8) Laryngoscope: Straight: 1, Straight: 2, and Curved: 2. (9) Infant and child nasopharyngeal airways. (10) Oropharyngeal airways, sizes 0,1,2,3 and 4. (11) Pediatric stylets for endotracheal tubes. (12) Infant and child suction catheters. (13) Bag-mask device, self-inflating: infant: 450 milliliters. (14) Masks to fit bag-mask device adaptor for infants and children. (15) Clear oxygen masks: partial non-breather infant and partial nonbreather child. (16) Infant and child nasal cannulas. (17) Nasogastric tubes: Infant: 8 French size and child: 10 French size. (18) Laryngeal mask airway: sizes 1.5, 2, 2.5, and 3. (19) Chest tubes: Infant: 10 or 12 French size and Child: one in the 16-24 French size range.	2
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Do you have each of the above medications and equipment?

☐ Yes

☐ No

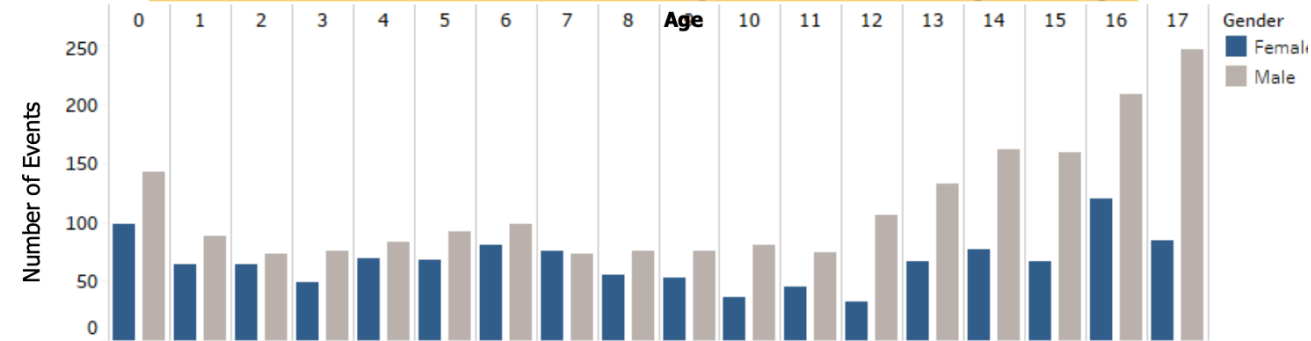
If no, please describe:

WI Trauma report

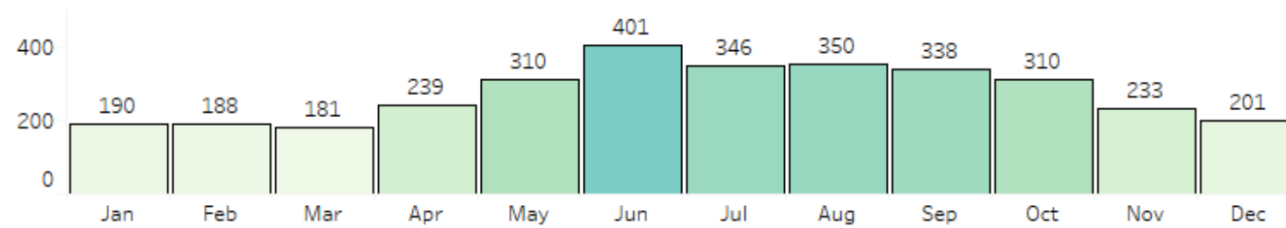
2024 Pediatric Trauma Data

4,166 Pediatric Records
3,268 Unique Injury Events

Volume of Pediatric Patients by Gender and Age Range



Volume of Pediatric Trauma Patients by Emergency Department Admission Month



Top 5 Pediatric Injury Categories by Age Group

(ICD-10 Code Category) Mechanisms of Injury

	0-4	5-9	10-14	15-17
(W00-W19) Slipping, tripping, stumbling, and falls	478	394	200	103
(V40-V59) Occupant car, pick-up truck, or van injured in transport accident	30	51	98	253
(V80-V89) Other land transport accidents	16	69	106	127
(W20-W49) Exposure to inanimate mechanical forces	69	60	88	72
(V00-V02, V10-V13, and V17-V19) Recreational transport injury (bike, ski, skateboard, etc) not caused by a vehicle	18	75	121	65

- Age based injury
 - Falls
 - Vehicular
 - Recreational vehicle
- Injury prevention efforts

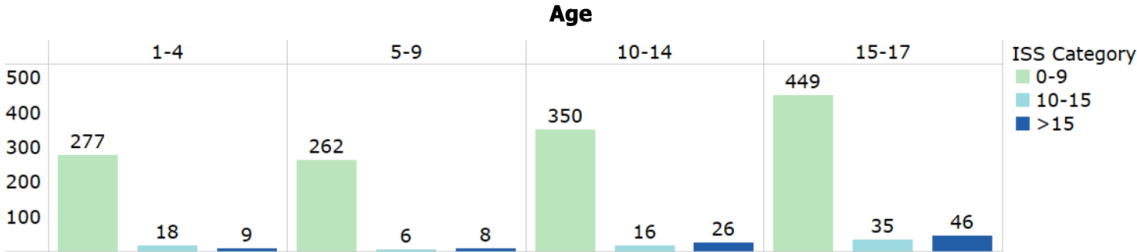
The importance of non-pediatric trauma care centers



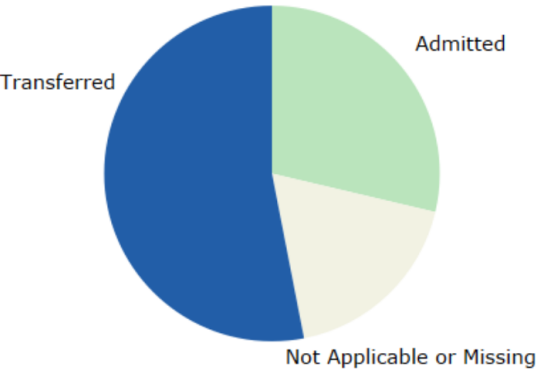
Almost **6 of 10** pediatric patients (57%) whose injuries met inclusion criteria received their initial care at a hospital that is not designated as a Level I or Level II Pediatric Trauma Center. This highlights the role that non-pediatric trauma centers play in caring for our sick and injured pediatric trauma patients in Wisconsin.

In the state, **seven non-pediatric trauma hospitals are recognized as Pediatric Ready by Wisconsin EMS for Children.** These hospitals meet additional requirements for training, resources, and staffing that ensure they provide high-quality care for pediatric patients. High levels of pediatric readiness are associated with lower mortality rates for injured and ill children.

Volume of Pediatric Trauma Patients Initially Seen at Non-Pediatric Trauma Care Centers by Age and Injury Severity Score (ISS)



Admission and Transfers Among Major Trauma (ISS >15) Pediatric Patients Seen at Non-Pediatric Trauma Care Centers for Initial Care

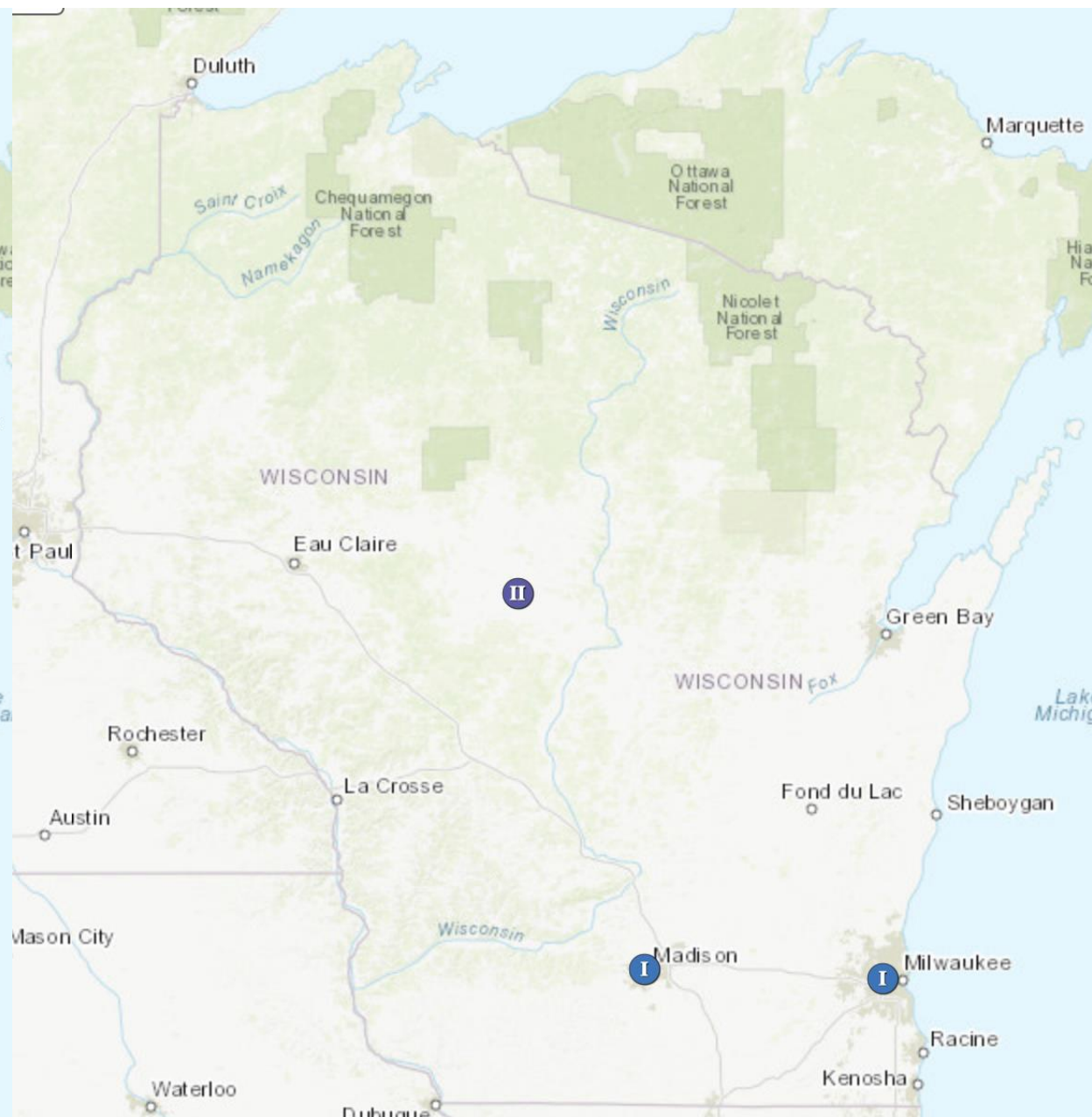
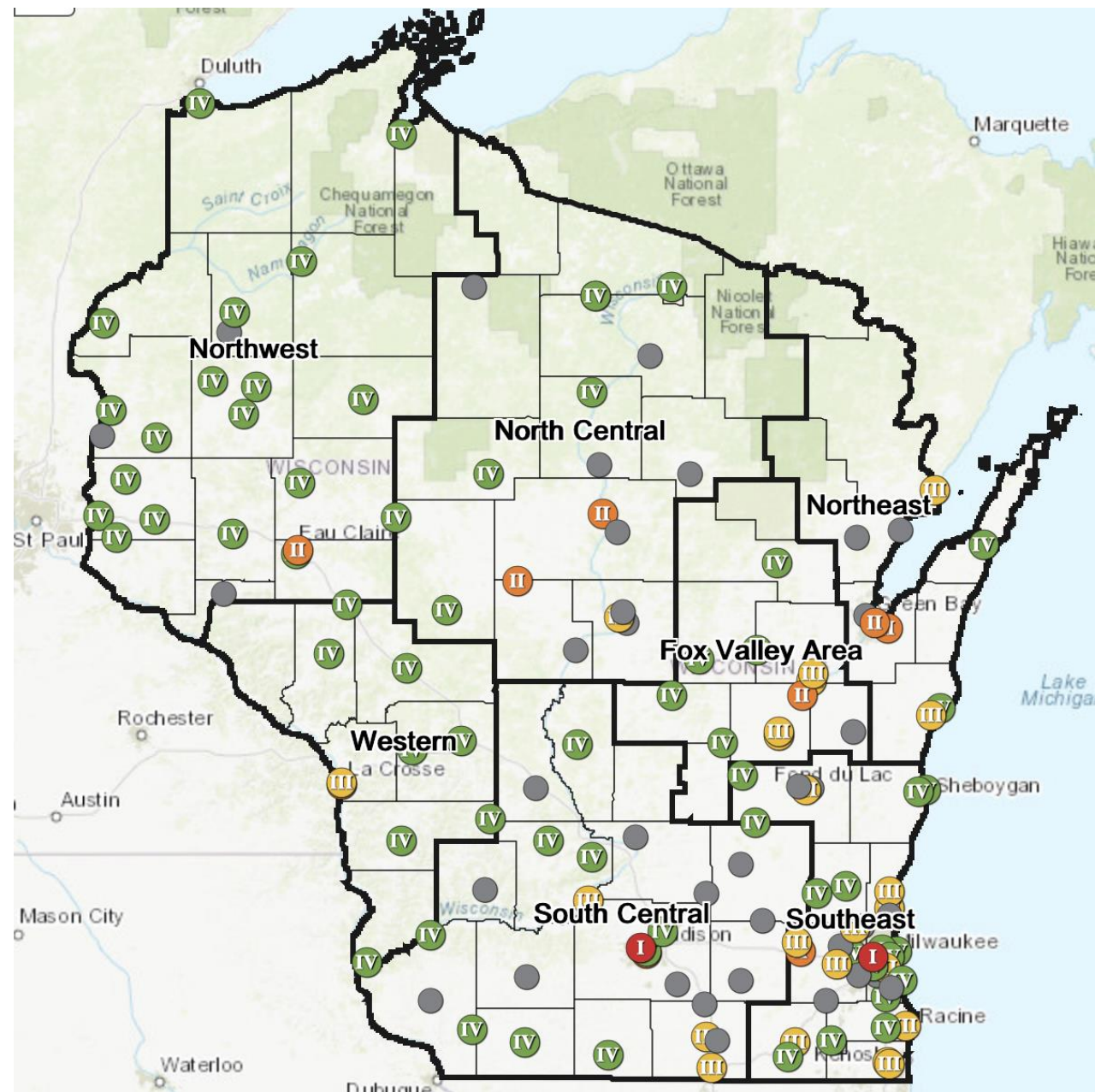


29% of major trauma patients aged 17 and under that were initially seen at a non-pediatric trauma care center were admitted to that hospital.

53% of these patients were transferred to another hospital.

The remaining 18% is made up those who were not transferred or admitted or for whom this information was missing.

- 57% seen at non pediatric trauma centers
- 53% transferred
- Importance of community EDs
- 7 EDs recognized as pediatric ready



Summary

- Many trauma centers, but few pediatric trauma centers
- Median ED pediatric readiness is 68 (30-99)
- EMS pediatric readiness is being assessed

Exercise

8 yo with bilateral ankle injuries with deformity

10 mo falls off changing table with LOC

6 yo with abd pain and bruise after fall off bike

16 yo with LOC and back pain after ATV injury

6 mo old with sz like activity with forehead bruise



Local emergency department



Adult Trauma Center



Pediatric Trauma Center

Excercise

8 yo with bilateral ankle injuries with deformity

10 mo falls off changing table with LOC

6 yo with abd pain and bruise after fall off bike

16 yo with LOC and back pain after ATV injury

6 mo old with sz like activity and scalp hematoma

Reduction in OR

Subdural hematoma, admission for observation

Liver laceration and admitted for observation

Concussion and thoracic compression Fx

Epidural hematoma from NAT

National Guideline for the Field Triage of Injured Patients

RED CRITERIA

High Risk for Serious Injury

Injury Patterns	Mental Status & Vital Signs
• Penetrating injuries to head, neck, torso, and proximal extremities • Skull deformity, suspected skull fracture • Suspected spinal injury with new motor or sensory loss • Chest wall instability, deformity, or suspected flail chest • Suspected pelvic fracture • Suspected fracture of two or more proximal long bones • Crushed, degloved, mangled, or pulseless extremity • Amputation proximal to wrist or ankle • Active bleeding requiring a tourniquet or wound packing with continuous pressure	All Patients • Unable to follow commands (motor GCS < 6) • RR < 10 or > 29 breaths/min • Respiratory distress or need for respiratory support • Room-air pulse oximetry < 90% Age 0–9 years • SBP < 70mm Hg + (2 x age years) Age 10–64 years • SBP < 90 mmHg or • HR > SBP Age ≥ 65 years • SBP < 110 mmHg or • HR > SBP
<i>Patients meeting any one of the above RED criteria should be transported to the highest-level trauma center available within the geographic constraints of the regional trauma system</i>	

YELLOW CRITERIA

Moderate Risk for Serious Injury

Mechanism of Injury	EMS Judgment
• High-Risk Auto Crash – Partial or complete ejection – Significant intrusion (including roof) • >12 inches occupant site OR • >18 inches any site OR • Need for extrication for entrapped patient – Death in passenger compartment – Child (Age 0–9) unrestrained or in unsecured child safety seat – Vehicle telemetry data consistent with severe injury • Rider separated from transport vehicle with significant impact (eg, motorcycle, ATV, horse, etc.) • Pedestrian/bicycle rider thrown, run over, or with significant impact • Fall from height > 10 feet (all ages)	Consider risk factors, including: • Low-level falls in young children (age ≤ 5 years) or older adults (age ≥ 65 years) with significant head impact • Anticoagulant use • Suspicion of child abuse • Special, high-resource healthcare needs • Pregnancy > 20 weeks • Burns in conjunction with trauma • Children should be triaged preferentially to pediatric capable centers If concerned, take to a trauma center
<i>Patients meeting any one of the YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center, as available within the geographic constraints of the regional trauma system (need not be the highest-level trauma center)</i>	

Why trauma centers

Outcomes: PTC versus ATC

Table 4
Mortality by age group.

	Verified PTC	Not Verified PTC	p-value
Emergency Department (ED) Mortality			
1–3 Years Old	10 (0.6)	8 (0.9)	0.461
4–6 Years Old	7 (0.4)	13 (1.5)	0.009
7–12 Years Old	8 (0.2)	15 (0.8)	0.007
13–15 Years Old	7 (0.2)	33 (1.3)	<0.001
Overall Mortality			
1–3 Years Old	116 (6.9)	80 (8.6)	0.110
4–6 Years Old	75 (4.6)	57 (6.2)	0.093
7–12 Years Old	136 (3.9)	112 (5.6)	0.003
13–15 Years Old	175 (6.0)	230 (8.5)	<0.001

Bolded values indicate statistically significant differences between groups.

Trauma verification

	Pediatric Level 1	Level 1	Level 2
Trauma surgeon response time			
24 hr ED physician			
Neurosurgeon response time			
CV surgeon			
Ortho			
Anesthesia			
radiology			
Critical care MD			
Research			
Separate Peds ED			
PICU			
Behavioral support			
Pediatric Inpatient beds			

Trauma verification

	Pediatric Level 1	Level 1	Level 2
Trauma surgeon response time			
24 hr ED physician			
Neurosurgeon response time			
CV surgeon			
Ortho			
Anesthesia			
radiology			
Critical care MD			
Research			
Separate Peds ED			
PICU			
Behavioral support			
Pediatric Inpatient beds			

Trauma verification

	Pediatric Level 1	Level 1	Level 2
Trauma surgeon response time			15 min
24 hr ED physician			Y
Neurosurgeon response time			30 min
CV surgeon			Y
Ortho			General
Anesthesia			24/7
radiology			24/7
Critical care MD			15 min
Research			N
Separate Peds ED			N
PICU			N
Behavioral support			N
Pediatric Inpatient beds			

Trauma verification

	Pediatric Level 1	Level 1	Level 2
Trauma surgeon response time		15 min	15 min
24 hr ED physician		Y	Y
Neurosurgeon response time		30 min	30 min
CV surgeon		On call 24/7	Y
Ortho		BC	General
Anesthesia		24/7	24/7
radiology		24/7	24/7
Critical care MD		24/7	15 min
Research		Y	N
Separate Peds ED		N	N
PICU		N	N
Behavioral support		N	N
Pediatric Inpatient beds			

Trauma verification

	Pediatric Level 1	Level 1	Level 2
Trauma surgeon response time	Peds trauma surgeon 15 min	15 min	15 min
24 hr ED physician	Pediatric EM	Y	Y
Neurosurgeon response time	Pediatric neurosurgeon	30 min	30 min
CV surgeon	Pediatric CV surgeon	On call 24/7	Y
Ortho	Pediatric Ortho	BC	General
Anesthesia	Pediatric anesthesiologist	24/7	24/7
radiology	Pediatric radiologist	24/7	24/7
Critical care MD	Pediatric ICU MD	24/7	15 min
Research	Yes	Y	N
Separate Peds ED	Yes	N	N
PICU	Yes	N	N
Behavioral support	Yes	N	N
Pediatric Inpatient beds	Yes		

Pediatric Trauma Center vs. Adult Trauma Center

- Systemic review an meta-analysis
- 34 studies with 286,051 pts
- Mortality: 41%
- CT use: 52%
- Operative management: 64%
- Older patients: no difference

• Moore L, Freire G, Turgeon AF, et al. Pediatric vs Adult or Mixed Trauma Centers in Children Admitted to Hospitals Following Trauma: A Systematic Review and Meta-Analysis. *JAMA Netw Open*. 2023;6(9):e2334266. doi:10.1001/jamanetworkopen.2023.34266

Outcomes: PTC versus ATC

Table 3

Summary statistics by adult and pediatric trauma center verification status.

	POTC 4,855 (31 %)	MTC 4,641 (29 %)	UTC 3,485 (22 %)	AOTC 2,911 (18 %)	p-value
Age ^a	9 [5–13]	10 [5–13]	10 [5–14]	12 [7–15]	<0.001
ISS ^a	21 [17–26]	21 [17–26]	21 [17–26]	21 [17–26]	0.008
Elevated SIPA	1,621 (32)	1,597 (35)	1,092 (30)	942 (33)	<0.001
Overall Mortality	209 (4.1)	293 (6.3)	223 (6.1)	256 (8.8)	<0.001
ED Mortality	10 (0.2)	22 (0.5)	35 (1.0)	34 (1.2)	<0.001

POTC: pediatric-only trauma center; MTC: mixed trauma center; AOTC: adult-only trauma center; UTC: undesignated trauma center; ED: Emergency Department.

Bolded values indicate statistically significant differences between groups.

^a Reported as median [interquartile range].

Creating a Pediatric Prehospital Destination Decision Tool Using a Modified Delphi Method

- Nearest ED if
 - Unstable airway
 - Cardiac arrest
 - Prolonged transport
- Pediatric facility if
 - Meets trauma levelling
 - Neck and neuro deficits
 - Suspicious for nonaccidental trauma
 - Significant soft tissue injury
 - Elbow injury/deformity
 - Long bone deformity
 - Femur Fx

Outcomes: PTC versus ATC

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Common reasons for transfer to PTC from other EDs

- Surgical
- Sedation & subspecialty
- Nonaccidental Trauma
- Resource and provider limitations
- Comfort level

Other intangibles

- Mental health and behavioral support (i.e. Child Life Specialist)
- Pediatric staff (RN, RT)
- Kid friendly environment (toys, popsicles...)
- Secondary transfer
 - Delay in care
 - \$\$\$

Transport limitations to trauma centers

- Extreme acuity
- Geographic and transport challenges
- Trauma triage protocol restrictions
- Hospital diversion and capacity issues
- Medical direction and protocol compliance
- Insurance and financial barriers
- Parental preference

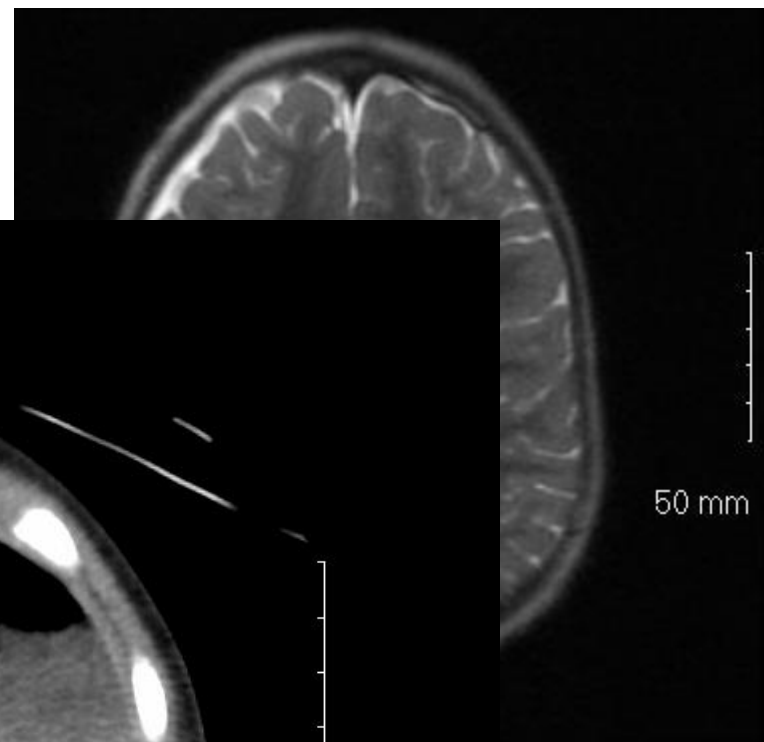
Patient #2: follow up

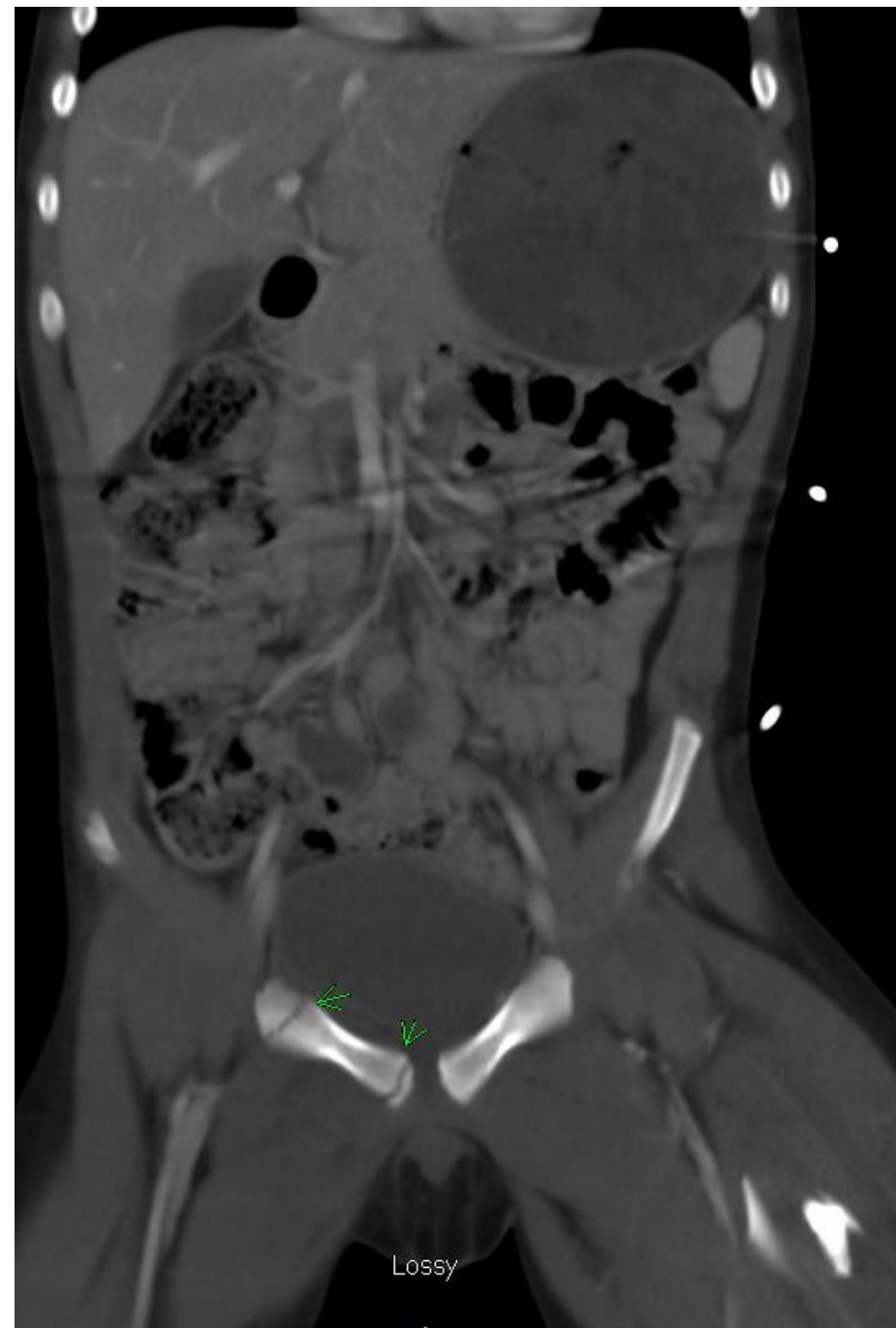
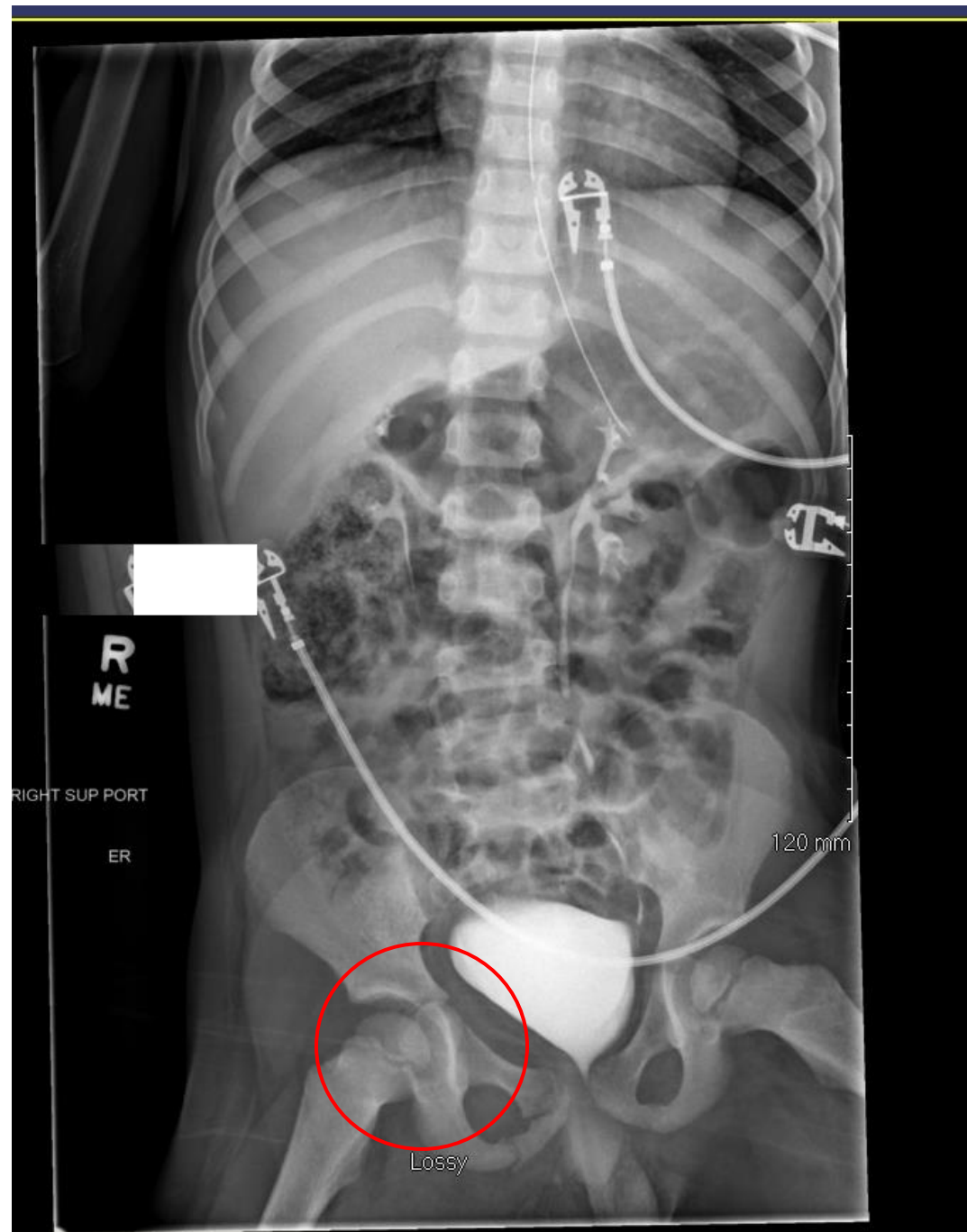
At AFCH ED/PICU

- Intubated, BS clear, pink
- P112, BP 110/52, SPO2 100%
- R parietal hematoma, blood in R ear canal
- ABD and pelvis with abrasions
- R tibia swollen and cool with decreased pulse
- FAST+ pelvis fluid
- CT: no intracranial bleed, mandibular Fx, spleen laceration, pelvis hemoperitoneum, multiple rib Fx, LLL pulm contusion, pelvis Fx, C5-6 facet injury
- Stable in ED and admitted to PICU









Hospital course

- Stabilizers for mandibular fx placed
- L femur nail placed
- NGT feeds started
- Wheelchair training
- Discharged 9 days later



Take home

- Ask “Are we ready for kids”?
- Be the advocate, Be a PECC!
- WI EMSC open for business
 - ED Pediatric readiness program
 - EMS pediatric readiness improvement
 - ED facility recognition
 - Educational resources



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