

Pediatric Readiness: The Fatal Consequences of Unpreparedness



Children are

4X

more likely to die in
hospital emergency rooms
with the lowest pediatric
readiness scores.¹

Are you pediatric ready?

Emergency departments (EDs) must be ready for anything. In critical situations, every minute matters. So does having the right equipment. EDs must be prepared to manage critical pediatric cases effectively, yet only **14% of non-pediatric hospitals in the United States meet pediatric readiness certification standards.**²

Lax regulations, or a total absence of verification programs in most states, mean that hospitals aren't mandated to maintain a high level of pediatric readiness. The result is higher mortality rates and

avoidable patient deaths. Given the stark disparity in preparedness levels, a national initiative to mandate pediatric readiness is not just warranted but essential.

Assessing the Landscape of Pediatric Readiness

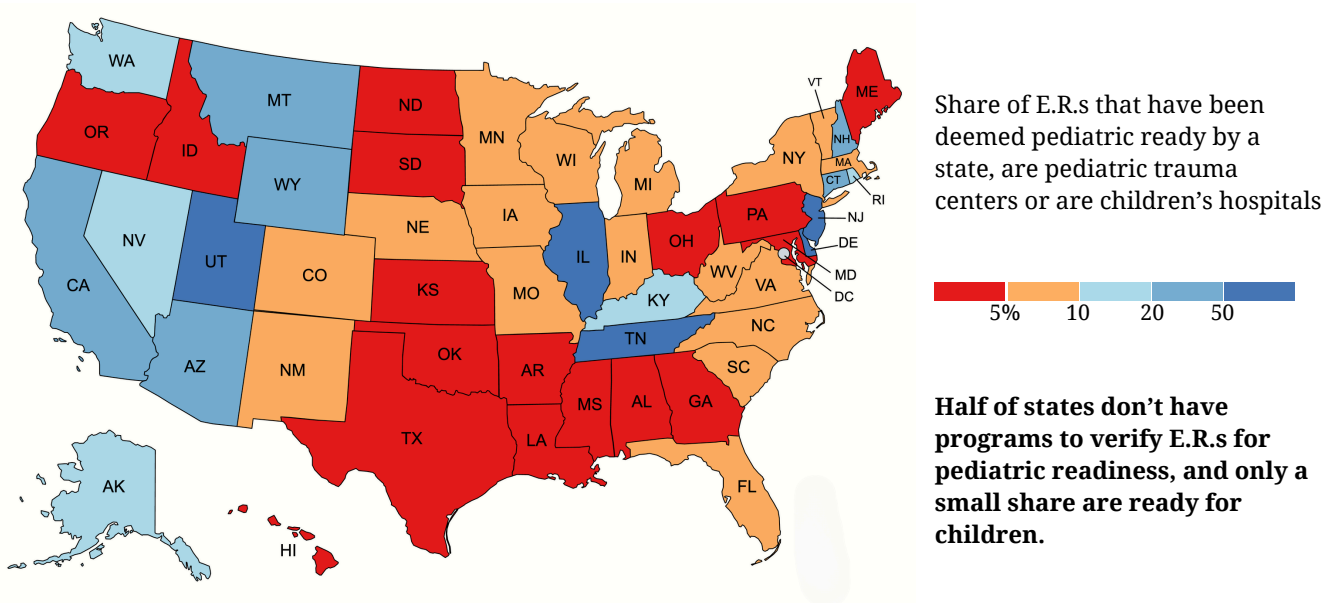
In the dynamic field of emergency medicine, numerous assessment scales and scoring systems are utilized to rapidly evaluate both patient conditions and the capabilities of the treating facility.

- Children represent 20% of all ED visits³
- 50% of states don't have programs to verify EDs for pediatric readiness

The National Pediatric Readiness Project (NPRP) defines a high level of pediatric readiness as a score of 88 or higher on a 100-point scale. Facilities achieving this benchmark report a 76% lower mortality rate in critically ill children and a 60% reduction in injury-related pediatric deaths.⁴

Despite the compelling evidence supporting high

Figure 1
Pediatric-ready Hospitals by State



pediatric readiness, only five states—Delaware, Utah, Illinois, New Jersey, and Tennessee—exceed a 50% readiness threshold.⁵ Notably, only Illinois, New Jersey, and Tennessee have mandatory pediatric preparedness programs, while the remaining states rely on voluntary participation. Disturbingly, 34 states fall below a 10% readiness level, emphasizing the urgent need for systemic reform (Figure 1).⁵

Consequences of Pediatric Unpreparedness

Pediatric patients are not simply smaller adults; their physiology, fluid dynamics, and resuscitation needs differ substantially. A six-month-old infant can experience decompensated hypotensive shock after losing merely 180 mL of fluid. Without immediate and precise intervention, mortality risk escalates.⁶

*Pediatric-ready Hospitals by State*⁵

States with no readiness program

- AL, AR, GA, HI, ID, KS, LA, MD, MS, ND, OH, OK, OR, PA, SD, FL, MA, MI, MN, NC, VT, VA, NV, RI, WA

States with voluntary program

- ME, TX, CO, IN, IA, MO, NE, NM, NY, SC, WV, WI, AK, KY, AZ, CA, CT, MT, NH, WY, DE, UT

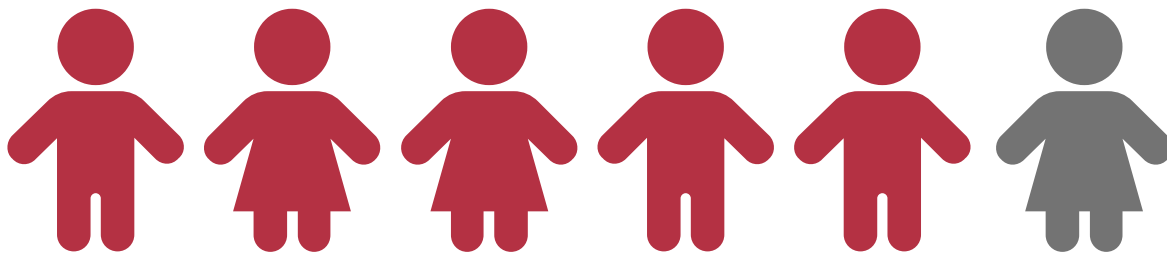
States with mandatory program

- IL, NJ, TN

According to a study from JAMA Network, an estimated 2,143 pediatric lives may be saved each year through universal high ED pediatric readiness.⁷

5 OUT OF 6

CHILDREN PRESENT TO A NON-PEDIATRIC FACILITY⁸



Furthermore, five out of six pediatric patients first receive emergency care in non-pediatric facilities, placing them at a heightened risk due to inadequate resources and training.⁸ Given these numbers, an enormous number of children receive care each year in facilities where they do not have the best chance of survival.^{2,4,9}

Advancing Pediatric Readiness: A Path Forward

EDs must adopt evidence-based strategies to enhance pediatric readiness. Doing so acknowledges the unique needs of our youngest patients and the specialized attention and equipment needed to care for them in emergent situations.

LifeFlow stands ready to be a partner in the campaign for pediatric readiness and is uniquely positioned to address one of the most common challenges in pediatric ED visits: rapid blood and fluid administration. Treating shock, dehydration, and severe blood loss relies on quickly replenishing blood or fluid volume.⁶ The handheld LifeFlow PLUS rapid infuser is easy to set up and can be operated one-handed by a single provider to infuse

fluids or blood products in a controlled manner. The device's patented Force Reducer smooths pulsatile flow, enabling rapid fluid resuscitation through small-bore IV catheters faster than other commonly used techniques like push-pull, electronic IV pumps, and pressure bags. LifeFlow also reduces the risk of infections and related complications by ensuring the provider never touches the syringe plunger during administration.¹⁰

Clinical experience underscores the impact of rapid intervention as noted by Simone Greenberg, RN, BSN, CPEN of Joe DiMaggio Children's Hospital, "**Massive transfusion protocols are always stressful, particularly when it's a pediatric case. Using LifeFlow in our pediatric traumas has helped us initiate the resuscitation quickly and simplify the administration of blood, which is critical for stabilizing the patient prior to transfer to the OR.**"

Conclusion

The case for national pediatric readiness in EDs is clear. Current deficiencies expose thousands of children to preventable mortality each year.

Standardizing preparedness protocols and integrating advanced resuscitation tools are critical steps toward ensuring that every child receives optimal emergency care. The goal is simple: saving lives. The National Pediatric Readiness Project (NPRP) aims to ensure every emergency department (ED) has the resources, competencies, and policies needed for high-quality, equitable pediatric emergency care. Visit their website to learn more.

Patient Case Presentation

The Mt. Graham Regional Medical Center in Safford, Arizona is a 25-bed critical access hospital with a Level IV Trauma Center certified Emergency Department. The ED received a call from EMS that two pediatric patients had been involved in a severe MVA in which they were both ejected from the vehicle.

The first patient, a two-year-old, arrived at the ED unconscious and unresponsive with a presumed head injury. Initial assessment revealed that the patient was tachycardic for their age, and EMS reported a heart rate of 150-160 in transit. The patient also displayed classic signs of shock and appeared mottled with cool, diaphoretic skin.

The patient's four-year-old sibling arrived at the same time with altered mental status and vomiting. A head injury was also suspected for this patient. Over ten minutes, the second patient's status deteriorated, resulting in the need for intubation. Based on the patient's initial presentation, the team was able to acquire lab work indicating low hemoglobin and hematocrit values.

Due to the patients' ages and critical status, the team was unable to obtain an accurate blood pressure reading for either during the initial assessment period. Neither patient was known to have a significant prior medical history.

The two-year-old patient's unresponsive state prompted the medical team to intubate immediately upon arrival. Intraosseous (IO) access was established, and a rapid blood transfusion was ordered to treat suspected shock.

Providers used the LifeFlow PLUS handheld rapid infuser to administer 120 mL of packed red blood cells (PRBCs) via the IO site over ten minutes. Following a reassessment that failed to show improvement, the patient was given another 120 mL

bolus of PRBCs over 10 minutes using LifeFlow.

Following the four-year-old patient's deterioration in the ED, intubation was also necessary. The patient's symptoms, also indicative of shock, prompted the team to administer a 170 mL infusion of PRBCs over 30 minutes using the LifeFlow.

The blood infusions for both patients were warmed according to facility protocol using a QinFlow Warrior warmer.

Following blood administration, both patients demonstrated improvement. Both patients' skin became warm and dry and showed decreased mottling. The two-year-old patient did not regain consciousness but had an improved heart rate of 110. The team's findings did not indicate the need for further rapid volume administration, and neither patient required pressor medications to stabilize their vital signs.

Following these interventions, both patients remained intubated and were transferred to a Level I pediatric facility.

The Mt. Graham ED had received LifeFlow units just one week prior to the arrival of these two patients. Thanks to the device's simple setup and ease of use, the nurses could use them to stabilize two critically injured patients with minimal training. One clinician noted how the simplicity of LifeFlow, including the minimal training required to set up and operate it in a chaotic situation, helped the emergency team immensely.

LifeFlow PLUS takes less than three minutes for a new user to set up and about one minute for an experienced user. This allows providers to begin infusing fluids and blood products much faster than traditional methods. Rapid infusion with LifeFlow also allows providers to immediately reassess the patient, determine the efficacy of each intervention, and order additional blood or fluids if needed.

Speaking on the importance of pediatric readiness, a hospital representative commented,

"We see roughly four to eight really critical pediatric patients per year... now we're seeing some of these patients survive that realistically would not have before."

In a race against the clock, LifeFlow is a fast, effective solution for rapid volume resuscitation. For pediatrics in particular, LifeFlow offers a tool for rapid and controlled administration of blood and IV fluids that make it simple and easy, even for hospitals who don't frequently see critically ill or injured pediatric patients.

LifeFlow for Pediatric Readiness

Simple set-up · Rapid blood and fluid delivery · Easy to use.

- LifeFlow effectively and efficiently achieves rapid blood and fluid resuscitation with even the smallest of IV catheters.
- LifeFlow is uniquely designed to facilitate rapid, controlled administration of blood and IV fluids in pediatric patients with shock and hypotension.
- LifeFlow can eliminate a potential source of catheter-associated bloodstream infections and CLABSI.



LifeFlow Pediatric Cases



Circulation First! Resuscitation
in Pediatric Trauma Webinar

References

1. Stefanie G. Ames, Billie S. Davis, Jennifer R. Marin, Ericka L. Fink, Lenora M. Olson, Marianne Gausche-Hill, Jeremy M. Kahn; Emergency Department Pediatric Readiness and Mortality in Critically Ill Children. *Pediatrics* September 2019; 144 (3): e20190568. 10.1542/peds.2019-0568
2. https://www.wsj.com/health/healthcare/emergency-rooms-hospitals-kids-1c41a8a8?mod=article_inline
3. <https://firstfocus.org/resource/saving-lives-every-hospital-needs-to-be-prepared-for-pediatric-emergencies/>
4. <https://emscimprovement.center/news/investing-in-pediatric-emergency-care-could-save-2100-lives/>
5. <https://www.beckershospitalreview.com/rankings-and-ratings/best-worst-states-for-ed-pediatric-preparedness.html> utm_medium=email&utm_content=newsletter
6. <https://410medical.com/2019/10/01/when-minutes-matter-treating-pediatric-hypovolemic-shock-part-1/>
7. Newgard CD, Lin A, Goldhaber-Fiebert JD, et al. State and National Estimates of the Cost of Emergency Department Pediatric Readiness and Lives Saved. *JAMA Netw Open*. 2024;7(11):e2442154. doi:10.1001/jamanetworkopen.2024.42154
8. <https://trauma-news.com/2023/09/pediatric-readiness-a-concise-guide-to-complying-with-acs-standard-5-10/>
9. Newgard CD, Lin A, Malveau S, et al. Emergency Department Pediatric Readiness and Short-term and Long-term Mortality Among Children Receiving Emergency Care. *JAMA Netw Open*. 2023;6(1):e2250941. doi:10.1001/jamanetworkopen.2022.50941
10. <https://410medical.com/about/how-it-works/>