

# ASPR TRACIE Technical Assistance Request

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**Response Date:** 23 August 2021; updated 16 November 2022

**Type of TA Request:** Complex

## Request:

ASPR TRACIE received a request for information on pediatric surge resources during the COVID-19 pandemic.

## Response:

The ASPR TRACIE Team reviewed material on our [COVID-19 Resources](#) page and searched for additional resources in our [Pediatric/Children Topic Collection](#) and [Pediatric Crisis Standards of Care Resources](#) technical assistance (TA) response document. Section I of this TA response document includes general considerations related to pediatric surge capacity, capability, management, and guidance. Section II provides healthcare coalition (HCC)-related resources and considerations. Section III includes resources that focus on operational considerations. Section IV provides resources and considerations specific to telehealth. Section V includes links to operationally focused resources and VI highlights additional related resources.

Please refer to the Centers for Disease Control and Prevention's [Coronavirus Disease 2019 webpage](#) and the National Institutes of Health [COVID-19 Treatment Guidelines](#) for the most up-to-date clinical guidance on COVID-19 outbreak management.

## I. Pediatric Surge Considerations

- Healthcare facilities should plan for a surge of COVID-19 cases due to the [Delta variant](#) (or other new variants) in their communities, including an increase in [cases among children](#), which have risen steadily across the country.
- Healthcare facilities should build new or maintain existing partnerships with children specialty hospitals; community hospitals; local, state, and federal agencies; and other partners to enhance or formulate cohesive plans, both individually and collectively as appropriate.
  - The Children's Hospital Association developed the [Coordinating Hospital Care for Children to Increase Capacity for Surge in COVID-19 Patients](#) document, which provides guidance to children's hospitals on how to distribute an increased patient load.
- Organizations should consider two strategies for managing pediatric patient surge: consolidate patients by age to ensure that younger patients receive the pediatric resources

required and ensure the availability in community hospitals for appropriate care of older patients as appropriate.

- The [Minnesota Pediatric Surge Plan](#) provides several planning assumptions that may be helpful to organizations facing a surge in pediatric patients. Assumptions include, but are not limited to, the following:
  - All hospitals that provide emergency services should be equipped to initially treat and stabilize pediatric patients based on their available resources.
  - Pediatric trauma centers should ensure their surge plans are maintained and up to date.
  - Response plans should utilize the National Incident Management System (NIMS) and the Hospital Incident Command System (HICS) (or a variation of HICS) response frameworks.
  - Specialty pediatric centers can provide definitive care for pediatric patients.
- Facilities caring for pediatric patients should prepare a [surge checklist](#) of supplies, equipment, and pharmaceuticals and ensure it is included in applicable surge plans.
  - An accurate inventory of supply and medication should be maintained at all times.
  - Appropriate staff should remain in contact with suppliers and identify possible new vendors if needed.
- Non-pediatric hospitals should ensure they are adequately prepared to receive pediatric patients.
  - Nationally 80% of all children are seen in “non-pediatric” Emergency Departments (ED). [This presentation](#) provides lessons learned from California and potential planning considerations.

## II. Healthcare Coalition-related Resources and Considerations

HCCs can use the following resources when planning for pediatric patient surges:

- [The 2019-2023 HPP Funding Opportunity Announcement](#) requires HCCs to develop a complimentary coalition-level pediatric annex to its base medical plans on surge/trauma mass casualty response. Factors to consider include:
  - Local risks for pediatric-specific mass casualty events.
  - Age-appropriate medical supplies.
  - Mental health and age-appropriate support resources.
  - Pediatric/Neonatal Intensive Care Unit (NICU) evacuation resources and coalition plan.
  - Coordination mechanisms with dedicated children’s hospital(s).
- The [ASPR TRACIE HCC Pediatric Surge Annex Template](#) is based in part on sample HCC plans and provides general headers and descriptions HCCs can use when creating their own.
  - ASPR TRACIE also developed a [Healthcare Coalitions](#) resource page with links to tools and templates to support HCC initiatives.
- [The National Advisory Committee on Children and Disasters \(NACCD\)](#) focused on three key areas directly tied to the Nation’s readiness to care for children affected by disasters,

which HCCs can also follow. These include: coalition building, workforce development, and medical countermeasures.

### III. Operational Resources and Considerations

The following resources provide operational strategies healthcare facility staff can consider when planning to manage pediatric surge:

- A statement released in April 2020 by the Children’s Hospital Association describes the [coordination of hospital care for children during COVID-19](#) and provides guidance on the implementation of patient criteria using a tiered system. The tiered system helped prioritize pediatric patients and transfers from local children’s hospitals and their hospital partners.
- The authors of the article [Pediatric Hospital and Intensive Care Unit Capacity in Regional Disasters: Expanding Capacity by Altering Standards of Care](#) used a simulation to determine how altered standards of care during a large-scale emergency or disaster could expand pediatric intensive care unit (PICU) beds and non-ICU beds. Modeling showed that altered standards could increase capacity, but that the number of ICU beds would still be insufficient during large disasters.
- [An Approach to Consolidating Pediatric Hospital Beds During the COVID-19 Surge](#) provides guidance on expanding capacity in community hospitals caring for older patients while simultaneously providing care for pediatric patients (where pediatric resources are available).
- In [Strategies to Improve Pediatric Disaster Surge Response: Potential Mortality Reduction and Tradeoffs](#), the author discusses how expanding capacity by altering standards of care to provide only “essential” interventions.
- [Hospital Preparedness and Management of Pediatric Population during COVID-19 Outbreak](#) provides considerations for pediatric hospital preparedness regarding workforce, equipment, supply, capacity planning, and infection control strategies.
- This [Facility Pediatric Surge Preparedness Checklist](#) provides an assessment tool facilities can use to determine where they are in the planning process.
- The University of North Carolina provides the following resources regarding their pediatric COVID-19 surge plan:
  - [Children’s COVID Surge Plan](#)
  - [COVID Children’s Hospital Inpatient Management](#)
  - [Admissions Notification Pathway](#)
  - [Rapid Response Guide](#)
  - [Acute Care RN Orientation](#)
- [St. Luke’s Boise Children’s Hospital](#) created a tiered plan that can be activated to support a surge of pediatric patients.
- The webinar, [Preparing your Maternal and Neonatal Units to Respond to COVID-19](#) includes practical recommendations from a frontline hospital.

- This [Children and COVID-19: State Level Data Report](#) from the American Academy of Pediatrics and the Children’s Hospital Association provides publicly available data from states on pediatric COVID-19 cases.
- [A Pediatric Nursing Professional Development Team’s COVID-19 Response](#) describes how a team comprised of a clinical nurse specialist and clinical nurse educators in a large pediatric hospital optimized patient and associate safety during the pandemic.
- The authors of the article titled, “[Optimizing Nurse Staffing During a Pandemic](#)” designed a plan at a children’s hospital to create a rapid deployment onboarding plan.
- The CDC provides [Strategies to Mitigate Healthcare Personnel Staffing Shortages](#), which notes that at a baseline, healthcare facilities must:
  - Understand their staffing needs and the minimum number of staff needed to provide a safe work environment and reliable patient care.
  - Be in communication with local HCCs; and federal, state, and local public health partners to identify additional healthcare professionals, when needed.

#### IV. Telehealth-related Resources and Considerations

The following resources highlight how telehealth strategies have been used to help healthcare facilities provide pediatric care during the COVID-19 pandemic:

- The authors of the article [Rapid Implementation of Telehealth Services in a Pediatric Pulmonary Clinic During COVID-19](#) describe a QI-based approach that was successful in maintaining access to care via telehealth services for pediatric pulmonary patients during the COVID-19 pandemic and found high rates of satisfaction among patients and providers.
- In [Implementation and Usage of Telemedicine in General Pediatrics During the COVID-19 Pandemic](#), the authors note that many public health measures were put into place to decrease the spread of COVID-19. Implementing telehealth helped address patient anxiety about in-person visits, thus boosting clinic productivity.
- [Pediatric Telehealth in the COVID-19 Pandemic Era and Beyond](#) describes how telehealth has been used in pediatrics during the pandemic, how it can be successfully implemented and sustained, and what telehealth changes should remain in place or be developed further to ensure children have equitable access to high-quality care.

#### V. Additional Operational Resources

American Academy of Pediatrics. (2021). [COVID-19: Overview and Evaluation – Pediatric Collection](#)

This collection of open-access research and guidance recommendations related to COVID-19 is frequently updated.

American Academy of Pediatrics. (n.d.). [COVID-19 Interim Guidance](#). (Accessed 11/16/2022.)

This resource is treatment-specific and has been updated based on current evidence and information available at the time of publishing. Guidance will be regularly reviewed with regards to the evolving nature of the pandemic and emerging evidence. All interim guidance will be presumed to expire on September 30, 2021, unless otherwise specified.

American College of Emergency Physicians (2021). [COVID-19 Clinical Alerts](#).

The COVID-19 Clinical Alert Repository assists with daily patient care by providing current updates to include recommendations for opening of schools in the fall 2021.

American College of Pediatricians. (2021). [COVID-19](#).

This web page includes a collection of press releases, blogs, and other information that can help providers support the care of children during the COVID-19 pandemic.

Centers for Disease Control and Prevention. (2020). [Guidance for Evaluating and Managing Neonates at Risk for COVID-19](#).

This guidance is intended to inform healthcare providers in the U.S. about the diagnosis, evaluation, infection prevention and control practices, and disposition of neonates ( $\leq 28$  days old) with suspected or confirmed SARS-CoV-2 infection or known SARS-CoV-2 exposure, including birth to a mother with suspected or confirmed COVID-19.

Centers for Disease Control and Prevention. (2020). [Information for Pediatric Healthcare Providers](#).

This webpage provides pediatric healthcare providers with up-to-date information on children (1 month to 18 years) with suspected or confirmed COVID-19 and how to care for them during the pandemic.

Children's Hospital Association. (n.d.). [COVID-19 Resources and Updates](#). (Accessed 11/16/2022.)

This website provides resources on a variety of topics to include virtual care, vaccines and distributions, therapeutics, personal protective equipment, testing, staffing/human resources, and legislation and guidance.

Contra Costa Health Services. (2015). [Pediatric/Neonatal Disaster and Medical Surge Toolkit.](#)

This planning tool estimates inpatient pediatric surge requirements for infectious agents such as pandemic flu. It considers demographics and unique pediatric considerations in planning.

Emergency Medical Services Los Angeles County. (2013). [Los Angeles County Pediatric Surge Plan.](#)

This is a countywide plan, which addresses how each hospital within Los Angeles County would contribute to caring for pediatric patients in the event of a surge that largely impacts pediatrics. The plan is to enhance surge capacity to meet the medical needs of children during a disaster.

National Institute of Health. (2021). [Special Considerations in Children COVID-19 Treatment Guidelines.](#)

This resource page includes patient care treatment guidance for children.

Northwest Oregon Healthcare Preparedness Resources. (2021). [Pediatric Surge.](#)

This webpage provides links to various resources related to pediatric surge events.

Oregon Health Authority. (2021). [Preparedness Resources for Partners.](#)

This webpage provides links to several resources including a Pediatric Annex for a Hospital Emergency Operations Plan, a Regional Pediatric Specialty Care Capacity Report, and a Pediatric Surge Planning Toolkit.

Pediatric Infectious Disease Society. (2020). [COVID-19 Resources.](#)

This site provides links to resources from the CDC, the American Academy of Pediatrics, the Society of Healthcare Epidemiology of America, the Infectious Disease Society of America, and other organizations.

Rady Children's Hospital, San Diego. (2011). [Pediatric Surge Planning: Train the Trainer.](#)

This online course provides an in-depth overview of the special considerations associated with pediatric surge planning. The authors describe hospital incident command system activation, specific tools and actions linked to pediatric surge, and provide tips for developing a surge plan.

Society of Critical Care Medicine. (2020). [Critical Care for the Non-ICU Clinician](#).

These free, online modules provide training for non-intensive care unit clinicians to provide care during a surge of critically ill patients. These resources are geared towards providers who may not typically work with pediatric patients: [Assessment of the Critically Ill Child](#), [Acute Respiratory Failure and Mechanical Ventilation](#), and [Cardiovascular Evaluation and Pediatric Shock](#).

The Pediatric Critical Care Medicine. (2020). [COVID-19 Rapid Resource Center](#).

This website provides updates on latest education and resource information on a multitude of topics associated with COVID-19.

Various Authors. (2012). [Regional Pediatric Surge Framework](#).

This framework covers both the referral area of Children's Hospital Central California and the seven counties in the California Emergency Management Agency Mutual Aid Region V. The document serves as a basis for regional and local community discussions about pediatric care during a wide-scale event. The intent is not to prescribe action, mandate responses or direct activity, but only to provide a framework for continuing collaboration.

## VI. Additional Relevant Resources

Abraham, H. (2014). [Planning for Pediatrics in Disasters](#). Journal of Emergency Medical Services. 39(9).

The author encourages emergency medical service planners to account for the unique physical, psychological, and communications needs of children when developing pre-hospital emergency response plans. The author shares pediatric-specific tips on decontamination, triage, airway procedures, drug dosage and delivery, and psychological care with an emphasis on emergency medical services.

Anderson, M., Amparo, A., Kaplowitz, L., et al. (2015). [Near-Term Strategies to Improve Pediatric Surge Capacity During Infectious Disease Outbreaks](#). U.S. Department of Health and Human Services, Office of the Assistant Secretary of Preparedness and Response.

This report summarizes the methods, limitations, gaps, key findings, and results of the National Advisory Committee on Children and Disasters Surge Capacity Work Group's assessment of national pediatric surge capacity conduct in late 2014-early 2015. The group focused on transporting large numbers of critically ill children; the current state of general emergency/pediatric emergency surge capacity; current readiness of children's hospitals to surge during an infectious disease outbreak; and the current state of non-



pediatric hospitals to care for children in a large-scale disease outbreak. Included in the report are mitigation strategies for identified gaps, best practices, and tools that can help healthcare coalitions improve community readiness to care for children.

Anthony, C., Thomas, T., Berg, B., et al. (2017). [Factors Associated with Preparedness of the US Healthcare System to Respond to a Pediatric Surge during an Infectious Disease Pandemic: Is our Nation Prepared?](#) American Journal of Disaster Medicine.12(4):203-226.

The authors reviewed past infectious disease incidents that resulted in a pediatric surge and noted that there is a gap between efficient plans and a structured and coordinated regional response to pediatric surge.

ASPR TRACIE. (2020). [Up-Training Resources for Healthcare Staff during COVID-19 Surge.](#)

This ASPR TRACIE technical assistance response document provides resources on cross-training (or up-training) for nurses and other clinical staff to meet the needs of high acuity COVID-19 surge.

Boyer, E.W., Fitch, J., and Shannon, M. (2009). [Pediatric Hospital Surge Capacity in Public Health Emergencies. \(Archived.\)](#) Agency for Healthcare Research and Quality.

The special medical needs of children make it essential that healthcare facilities be prepared for both pediatric and adult victims of bioterrorism attacks and other public health emergencies. Clinicians and hospital administrators may use the report's recommendations to develop unique responses to mass casualty events involving pediatric patients.

Emergency Medical Services for Children Innovation and Improvement Center. (n.d.). [Policies, Procedures, Protocols, Mental and Behavioral Health, and Information for Minor \(Child or Adolescent\) Patients with Suspected or Confirmed COVID-19 who are Discharged Home.](#) (Accessed 11/16/2022.)

These three pages provide links to resources in various areas specific to care of the pediatric patient during COVID-19 and beyond.

Emergency Medical Services for Children Innovation and Improvement Center. (n.d.). [Coronavirus \(COVID-19\).](#) (Accessed 11/16/2022.)

The information on this webpage provides resources from the CDC, ASPR and other experts and is intended for hospital-based, prehospital, and community-based providers. Several pediatric-related resources are included.



Foster, C., Marquez, L., Davis, A., et al. (2021). [A Surge in Pediatric Coronavirus Disease 2019 Cases: The Experience of Texas Children's Hospital from March to June 2020](#). Journal of the Pediatric Infectious Diseases Society. 10(5):593-598.

The authors of this article performed a retrospective review of all children presenting to the Texas Children's Hospital system who were tested for COVID-19 from March 10, 2020, through June 28, 2020. Their goal was to better understand diverse pediatric patients' clinical characteristics in order to optimize the response of healthcare providers during the pandemic.

Frogel, M., Flamm, A., Sagy, M., et al. (2017). [Utilizing a Pediatric Disaster Coalition Model to Increase Pediatric Critical Care Surge Capacity in New York City](#). Disaster Medicine and Public Health Preparedness. 11(4): 473-478.

The authors describe the stepwise development of the NYC Pediatric Disaster Coalition as a model for other cities to replicate in planning for pediatric disaster patients. They also discuss how the coalition supported hospitals in planning for pediatric surge.

Hick, J., Einav, S., Hanfling, D., et al. (2014). [Surge Capacity Principles](#). CHEST Journal. 146(4).

The authors provide suggestions for expanding critical care surge capacity and extension of critical care service capabilities in disasters or pandemics. This resource focuses on principles and frameworks for expansion of intensive care services in hospitals.

Kanter, R., Moran, J., (2007). [Pediatric Hospital and Intensive Care Unit Capacity in Regional Disasters: Expanding Capacity by Altering Standards of Care](#). Journal of the Academy of Pediatrics. 119(1):94-100.

The authors quantify how close hospitals came to exhausting capacity during the outbreak of pandemic influenza A (H1N1) 2009 in helping the healthcare system to plan for more virulent pandemics.

Kelen, G., Troncoso, R., Trebach, J., et al. (2017). [Effect of Reverse Triage on Creation of Surge Capacity in a Pediatric Hospital](#). (Abstract only.) Journal of American Medical Association Pediatrics. 171(4).

The authors conducted a yearlong retrospective cohort study, 11% of 501 patients in aggregate from seven hospital services were eligible for immediate-low-risk reverse triage, with the psychiatry unit accounting for more than half of this incremental capacity. The authors concluded that with multiple strategies that included reverse triage, an estimated 84% surge capacity could be realized within four days.

Kim, J., Lame, M., Szalay, L., et al. (2021). [Telemedicine Surge for Pediatric Patients in Response to the COVID-19 Pandemic in New York City](#). Journal of the American Telemedicine Association. Online ahead of print.

The authors of this article describe their pediatric virtual urgent care experience during the COVID-19 pandemic at a large urban academic medical center in New York City. They conducted a retrospective cohort study of patients less than 18 years of age, from March 1 to May 31, 2020. Data included expansion of staffing, patient demographics, virtual care, and outcomes. 406 pediatric patients were evaluated with median age of 4.4 years and 53.9% males. Median call time was 5:12pm, median time to provider was 5.7 min, and median duration of the call was 11.1 min. The most common reasons for a visit were COVID-19 related symptoms (36%), dermatologic (15%), and trauma (10%).

Klein, M., Cheng, C., Lii, E., et al. (2020). [COVID-19 Models for Hospital Surge Capacity Planning: A Systematic Review](#). Disaster Medicine Public Health Preparedness.

This article highlights several tools that were developed to assist in the COVID-19 surge planning process.

Los Angeles County Emergency Medical Services Agency (2012). [Pediatric Surge Quick Reference Guide](#).

This document contains summaries of critical information for managing the care of children during emergencies or disasters, including vital signs; risks during disasters; signs of respiratory distress; equipment sizes; and fluid resuscitation.

National Pediatric Disaster Coalition. (n.d.). [COVID-19 Resources](#).

This site provides a collection of resource items related to the ongoing pandemic.

Rady Children's Hospital, San Diego. (2011). [Pediatric Surge Planning: Train the Trainer](#).

This online course provides an in-depth overview of the special considerations associated with pediatric surge planning. The authors describe hospital incident command system activation, specific tools and actions linked to pediatric surge, and provide tips for developing a surge plan.

Remick, K., Gausche-Hill, M., Joseph, M., et al. (2018). [Pediatric Readiness in the Emergency Department](#). Journal of the American Academy of Pediatrics. 142(5).

The authors provide a revision of the previous joint Policy Statements titled “Guidelines for Care of Children in the Emergency Department.” These updated recommendations are intended to serve as a resource for clinical and administrative leadership in EDs as they strive to improve their readiness for children of all ages.

Sills, M., Hall, M., Fieldston, E., et al. (2011). [Inpatient Capacity at Children's Hospitals during Pandemic \(H1N1\) 2009 Outbreak, United States](#). Journal of Emerging Infectious Diseases. 17(9):1685-1691.

The authors looked at how close hospitals came to exhausting their capacity during the outbreak of pandemic influenza A (H1N1) 2009. They built 5 models projecting inpatient occupancy, varying the ED visit numbers and admission rate for influenza related ED visits. The 5 scenarios projected median occupancy as high as 132% capacity. The pandemic did not exhaust inpatient bed capacity, but a more virulent pandemic has the potential to drive children's hospitals past their maximum inpatient capacity.

Shkerdemian, L., Mahmood, N., Wolfe, K. (2020). [Characteristics and Outcomes of Children With Coronavirus Disease 2019 \(COVID-19\) Infection Admitted to US and Canadian Pediatric Intensive Care Units](#). Journal of the American Medical Association Pediatrics. 174(9):868-873.

The authors conducted a cross-sectional study of 46 North American PICUs where 48 children were admitted to 14 PICUs in the U.S., between March 14 and April 3, 2020. The study shows that COVID-19 can result in a significant disease burden in children but confirms that severe illness is less frequent and early hospital outcomes in children are better than in adults.

Western Regional Alliance for Pediatric Emergency Management (WRAP-EM). (n.d.). [Mental Health Resources for Children, Families and Providers](#).

This website provides a list of speaker series focused on pediatric-specific lessons learned during the COVID-19 pandemic.