

# Perinatal, Neonatal, and Pediatric Surge Annex to the California Patient Movement Plan

September 2021



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Dear Emergency Management Partner,

The California Department of Public Health (CDPH) and the Emergency Medical Services Authority (EMSA) have a long history of working together along with California's local health jurisdictions to enhance the surge capacity and capabilities of the healthcare community in order to effectively prepare and respond to mass casualty incidents due to terrorism or natural disasters. Local, regional, state, and multi-state partnerships and collaborations and key stakeholder involvement are crucial for disaster preparedness and response among the perinatal, neonatal, and pediatric population. Well-coordinated, multiagency, community-based planning and response has been shown to be effective in reducing morbidity and mortality in the response to a disaster involving children.

A surge of victims during disasters requires modifications to the standard emergency medical care operations. In virtually every disaster, there is initial disorder in the first few minutes/hours. To most efficiently and effectively help some of the most vulnerable populations during times of disaster, our goal is to create an organized scalable structure to the response involving perinatal, neonatal, and pediatric patients. We endeavor to assist in effective and efficient resource allocation using this structure so that the providers in both the pre-hospital and hospital settings can focus on their respective roles.

This annex will allow the appropriate and efficient identification and seamless allocation of available resources — right patient, right transportation resource, right destination. The planning and training process will create relationships and partnerships which will increase the resilience of the healthcare system, as we work together toward this common goal. A successful response in a disaster requires the interaction of personnel and resources from multiple private and public agencies in an organized and coordinated manner according to a well-formulated plan. A coordinated regional model will reduce waste by limiting random patterns of transportation and increase the scope of available comprehensive and organized care. Relationships and communication between partners are invaluable.



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## Plan Organization

Section	Title	Description
I	<b>Introduction</b>	Provides a basic overview of pediatric patient movement in California.
II	<b>Concept of Operations</b>	Describes the state's strategic approach to pediatric, neonatal and obstetrical patient movement and how the system components would respond and coordinate activities to benefit those requiring movement.
III	<b>Background</b>	Describes the main components of the healthcare system for perinatal, neonatal, and pediatric patients that would be involved in large-scale patient movement, including local, regional, state, and federal resources.
IV	<b>Appendix</b>	Provides links to collections of resources, plans, reunification resources, exercise resources, and acronyms

# I. Introduction

## Executive Summary

Neonates, children, and perinatal patients (women and their unborn babies) face specialized medical issues due to their unique developmental and/or physiologic characteristics. Particularly challenging is the management of exposure to infectious diseases, trauma and other hazards in these vulnerable populations. Their care requires specialized training, equipment, supplies, and pharmaceuticals. A coordinated approach at the local, regional, state, and national level is necessary to manage their medical needs during disasters when highly capable system of care available on a daily basis are overwhelmed.

California's pediatric population has been steadily increasing over time, as has our need to care for pediatric patients. Unfortunately, California and our healthcare system has also experienced an increase in public health and medical disasters such as wildfires, earthquakes and active shooters. While many of the hospitals, hospital systems, local and regional response structures have disaster response plans in place for infants, children, and perinatal patients, there is no statewide plan specifically meeting the needs of these populations.

The plan is consistent and integrated with other existing plans, including but not limited to, the California State Emergency Plan (SEP), the California Public Health and Medical Emergency Operations Manual (EOM), the California Patient Movement Plan and local Medical/Health Operational Area Coordinator (MHOAC) Manuals. The MHOAC's in each jurisdiction will work closely with their Healthcare Coalitions, the Regional Disaster Medical Health Specialists (RDMHS) in each of the 6 mutual aid regions and with the Medical Health Coordinating Center (MHCC) in the Sacramento area. Implementation of a system wide response as required by California's Standardized Emergency Management System (SEMS) includes linking Hospital Command Centers (HCC), local/jurisdictional Emergency Operations Centers (EOC), regional EOCs (known as REOCs) and the State Operations Center (SOC). Subject matter experts (SMEs) in the pediatric, neonatal and obstetrical world will be strategically placed and linked into the medical/health mutual aid structure. Multi-state partnerships are being established in the western US, recognizing that our California resources will be inadequate to meet the needs of these vulnerable patient populations in a large disaster.

The plan includes the mother-baby couplet (perinatal), newborns (NICU and well newborns) and children from birth through 14 years of age. The focus of the plan is on movement of large numbers of patients:

- Field to initial hospital
- Initial hospital to destination hospital
- Evacuating facility to destination facility

This plan serves as a guideline and toolkit for surge and evacuation of perinatal, neonatal, and pediatric patients and services during/following a catastrophic event when local and regional resources are inadequate to meet the need. It will be used to educate hospitals

(administration, pediatric, neonatal, perinatal leaders/specialists, physicians and nurses, emergency management), EMS, and community partners (Healthcare Coalitions, urgent care, clinics, private offices) on disaster preparedness in anticipation of a catastrophic event.

## **Purpose**

- Create, implement and operationalize an organized scalable statewide structure to a surge response following a catastrophic event involving perinatal patients, neonates and children, so that resources will be efficiently and effectively used to minimize the effects of a disaster.
- Provide a statewide perinatal, neonatal, and pediatric surge plan as an annex to the California Patient Movement Plan of November 2018.
- The Plan will be used by healthcare partners (facilities, EMS, MHOAC, RDMHS, etc.) at local, regional, state, and federal levels as a resource and tool in coordinating the efficient provision of an appropriate and available level of care to perinatal patients, neonates, and children from geographic areas affected by a disaster.

## **Goals**

### ***“Right Patient, Right EMS Resource, Right Destination”***

- Ensure the optimal and efficient utilization of and access to our local, regional, state and national pediatric resources
- Leverage and maximize every available asset at all levels of capabilities at every hospital, large or small, rural or urban, pediatric or adult
- Recognize that a coordinated and integrated response requires the active participation of private and public resources and systems at every level
- Strive to equitably maximize the number of perinatal patients, neonates, and children receiving care appropriate for their needs during a disaster
- Recognize and acknowledge that in a major event, demand for perinatal, neonatal, and pediatric care will likely exceed resources and capacity. Operational areas, regions, and the state will move from individual-based care to population-based care with the focus on saving the maximum number of lives possible
- Extend critical care service capabilities in disasters by linking and creating partnerships between community, state, regional, and federal resources (both private and public) in order to maximize the efficient utilization of all available resources within California and the western United States
- Consider the capabilities and responses of the entire healthcare system in the continuum of care from home and ambulatory outpatient care to critical care in an Intensive Care Unit (ICU).

## II. Concept of Operations

### Goal

***“Right patient - Right EMS resource - Right destination”***

In an emergency or disaster (slowly progressing or sudden), this annex is a resource and tool to be used by EMS and facility partners in coordinating access to or transfer/transport to an appropriate and available level of care for perinatal, neonatal, and pediatric patients from geographic areas affected by a disaster.

### Definition

A DISASTER is a type of emergency that, due to its complexity, scope or duration, threatens the organizations capabilities and requires OUTSIDE ASSISTANCE to sustain patient care, safety or security functions. It is typically a low probability, high impact event, causing a significant spike in short or long-term demand for services requiring extraordinary measures to adequately address them.

### Activation Checklist

- Event – no notice or developing
- Emergency System Activation – according to EOM, SEMS, and HICS
  - notify and activate HCC, DOC, EOC, MOC, REOC, MHCC as appropriate
- Perform situational assessment (as per EOM procedures):
  - MHOAC and RDMHS establish bi-directional communication with affected healthcare facilities in the hot zone, and in neighboring and other potentially impacted jurisdictions
  - Field to Operational Area (OA), OA, and regional situation reports created and disseminated according to local procedures and EOM guidelines
- Decision to activate Pediatric Surge Plan
  - Notification of partners and stakeholders
  - Insert OB, neonatal and pediatric SMEs into HCC and DOC/EOC/MOC/REOC/MHCC as needed
  - SMEs facilitate communication and links between sending facilities, EMS resources and receiving facilities, and assess and monitor the gap between assessed need and hospital bed availability for OB, neonatal, and pediatric patients
  - Utilize tools such as this pediatric surge plan, TRAIN®, patient distribution plans, and existing electronic reporting systems (EMResource, Reddinet, etc.)

- Pediatric Situational Awareness: Determine surge need and available surge capacity using the four (4) S's – Staff, Space, Supplies and System. Regardless of the hazard, capacity and capability will depend on the impact of any event on one or more of these elements:
  - Space – acute beds, including perinatal, neonatal, pediatric (PICU, cardiovascular ICU, licensed pediatric beds), adult ICU/CCU, medical/surgical, and other specialty beds, such as negative airflow isolation rooms/areas
  - Staff – licensed healthcare professionals and support staff
  - Supplies – medications, personal protective equipment, decontamination systems, incubators, ventilators, masks, dialysis, pediatric sized equipment, and non-medical items such as formula, bottles, diapers, isolettes
  - Systems – hospital systems, EMS systems including Local EMS Agencies (LEMAs), California Public Health and Medical Mutual Aid System (RDMHS, MHOAC Programs)
  
- Resource Requesting (per California Public Health and Medical Emergency Operations Manual (EOM) procedures):
  - MHOAC Program assumes control of EMS assets and directs the allocation of scarce resources
  - MHOAC/RDMHS/MHCC coordinates the transportation and destination of perinatal, neonatal, and pediatric patients, utilizing available EMS resources and destination beds matching required patient levels of care
  - MHOAC/RDMHS/MHCC coordinate the acquisition and distribution of requested supplies for the response
  - MHOAC, RDMHS, MHCC request activation of MPERTs, DHV, MRC, CAL-MAT, CANG and federal assets as needed to staff alternate care sites, shelters, PODs, etc.
  - MHCC communicates with professional associations and Healthcare Coalitions to inform and define role of community providers integrating into the response
  
- Consider other operational plans including:
  - The California Patient Movement Plan
  - EOM
  - SEP
  - Medical/Health Disaster Plans – Operational Area – MHOAC Preparedness and Response Plans, HCC Preparedness and Response Plans
  - Regional MCI plans

- Local or regional plans which include movement of pediatric patients (See Appendix)

### **Triggers for Activation**

- Whenever facilities/systems providing healthcare to perinatal, neonatal, and pediatric patients and/or local EMS systems require local, regional, state or federal assistance to manage the movement of these patients.
  - This includes triage, treatment, stabilization and transportation of patients to definitive care, including the evacuation of existing healthcare facilities, as needed.
  - A local, state or federal declaration of emergency is not necessary.
  - Depending on the availability of resources in an affected area, this annex may be activated during a Level 1, 2, or 3, incident.
  - Plan activation may be requested by:
    - Two (2) or more Operational Area's (MHOAC Program – Health Officer, LEMSA Administrator, or designees)
    - A single RDMHC / RDMHS
    - CDPH Director or designee
    - EMSA Director or designee

### **Implications of Activation**

- Activation signals the need for transition from normal day-to-day operations to a disaster response structure, e.g. emergency system activation.
- There may be a need to allocate scarce medical/health resources and to prioritize incidents.
- New or amended medical/health policies may need to be proposed and enacted.
- Common medical/health issues among multiple entities (agencies, organizations, jurisdictions, etc.) will need to be resolved.

## Levels of Public Health and Medical Activation

The requesting of resources during a disaster will follow processes as outlined in the California State Emergency Plan (SEP), the California Public Health and Medical Emergency Operations Manual (EOM), the California Patient Movement Plan (PMP) and each jurisdictional MHOAC Program Manual.

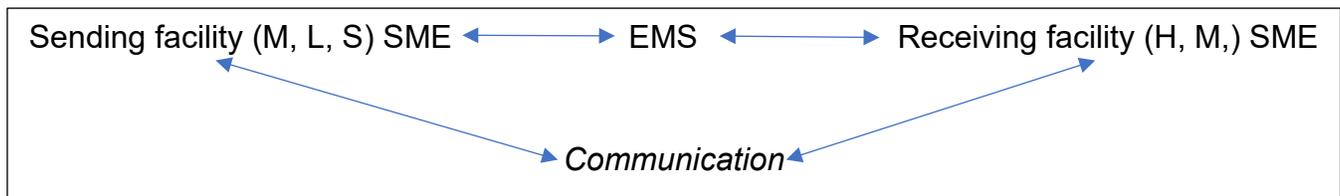
	Level 3 Incident (OA) Local resources sufficient	Level 2 Incident (region) Local resources insufficient	Level 1 Incident (state and beyond) regional or state resources insufficient
Definition	Requires resources or distribution of pediatric patients within the affected operational area only, or as available from other operational areas through existing agreements.	Requires resources from operational areas within the mutual aid region beyond existing agreements and may include the need for distribution of patients to other operational areas.	Requires resources or distribution of patients beyond the mutual aid region. May include resources from other mutual aid regions, state, other states, or federal
Emergency System Activation	HCC – Incorporation of clinical neonatal, pediatric, and/or perinatal medical providers at both sending and receiving facilities, live or remotely Health/Medical DOC/EOC/MOC – MHOAC	HCC - <b>Medical providers*</b> DOC/EOC/MOC – MHOAC* REOC – RDMHS* Regional Patient Movement Coordination Center **  <b>*Medical providers may be inserted at any location as available and indicated</b>  **undeveloped	HCC - <b>Medical providers*</b> DOC/EOC/MOC – MHOAC* REOC – RDMHS* Regional Patient Movement Coordination Center ** MHCC* – state level patient movement group** FCC/JFO  <b>*Medical providers may be inserted at any location as available and indicated</b>  **undeveloped
Response must be integrated with other applicable tools:	Internal facility/system disaster plans (e.g., decompression, surge) MOA/MOU/transfer agreements (catchment areas) OA MHOAC Program Manual, OA Emergency Operations Plan, EOM (for situational reporting only), Other existing local plans TRAIN HavBED or other electronic tool Neonatal Transport System	Additional tools:  EOM (for resource requesting) Patient Movement Plan Other existing regional plans (for example, LEMSA and regional MCI Plans)	Additional tools:  State Emergency Plan (SEP) National EMS Contract Regional (Western States) Partnerships WRAPEM (Clinical pediatric SMEs for all-hazards) Applicable federal plans

## Transition to SEMS

During a disaster, the management of perinatal, neonatal, and pediatric transfers will require continual assessment and reassessment of demand, bed availability, and acuity needs. All hospitals will need to consider the downgrading, repatriation, transfer, and/or potential discharge of existing patients where appropriate as part of their surge plan for lower acuity patients. For instance, facilities able to accept and care for lower acuity patients will allow for decompression of higher-level facilities and facilitate the accommodation of additional higher acuity perinatal, neonatal, and pediatric patients.

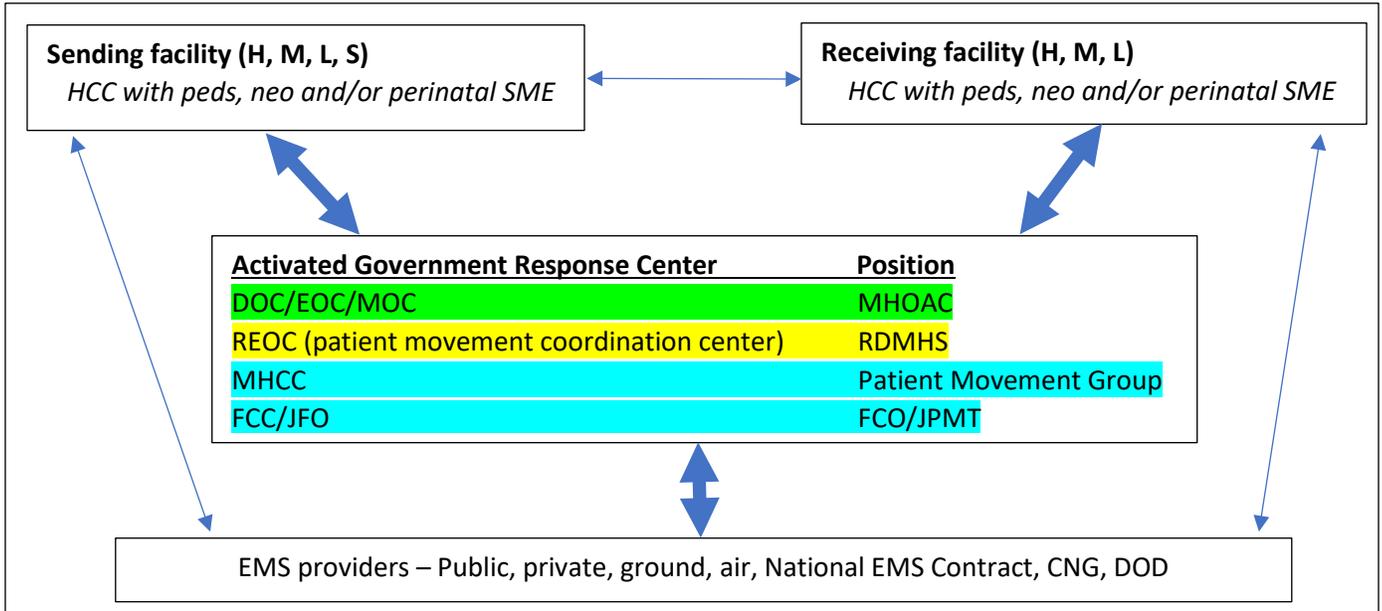
The determination of incident level (1, 2 or 3) will be dependent upon the assessment of the MHOAC Program within the OA. Once a Hospital Command Center (HCC) has exhausted all capacity and capabilities to care for the sick or injured patient, the HCC should contact the MHOAC Program using policy and procedures in the HICS, HCC and MHOAC Program Manuals. This assumes that all day-to-day agreements, MOUs, vendor agreements, and transfer agreements have already been identified and resources exhausted. The HCC will then make any requests for resources through the MHOAC Program. Resource requests can include durable and non-durable medical goods, pharmaceuticals, bed availability and transport resources. The MHOAC Program will attempt to fill the request using standard policy and procedures as outlined in the EOM and MHOAC Program Manuals.

### **1. Day-to-day movement of patients:**



- Facility resources are adequate to meet the need.
- Usually a transfer is from a MEDIUM, LOW, or SPECIALTY facility to a higher level of care (HIGH-level facility). (Please refer to accompanying Excel file for categorization of all facilities.)
- The appropriate subject matter expert (SME) is either perinatal, neonatal, or pediatric.
- Transfer Centers coordinate inter-facility transfers at many institutions, including EMS transport requests. They facilitate patient care handoff between institutions. They also bring perinatal/pediatric/neonatal expertise to other providers to support stabilization and ongoing care of patients.
- The authority to request a move rests with the SME at a sending facility.
- The authority to accept a patient belongs to the SME at the receiving facility.
- The responsibility to arrange an appropriate level of EMS transport belongs to the SMEs.
- Existing agreements may be used (catchment areas, transfer agreements, MOU, MOA).
- A MHOAC is not typically used as a resource or informed.

## 2. Patient movement with emergency system activation



**Thin Lines = Communication    Heavy Lines = Decision Making (direction and authority)**

- Healthcare facility, OA, region or state resources are insufficient to meet the need (Levels 1, 2 or 3).
- The situation may involve a surge of patients from the field to healthcare facilities or from a healthcare facility needing to evacuate or decompress due to a surge to other facilities.
- Perinatal, neonatal, and/or pediatric SMEs may be at an HCC and at an activated government response center.
- The decision to evacuate or request assistance with transfer is the responsibility of the IC or designee according to internal disaster plans and local policy and procedures.
- Obtaining the requested resource is the responsibility of the activated government response center personnel.
- A potential transporting EMS provider or receiving facility has the right to accept/reject a request
- A request for assistance (available bed and/or EMS resource) goes from the sending facility/agency to the OA EOC and MHOAC.
- The role of the personnel in the activated government response center is one of support and coordination of resources and resource requests from facilities and EMS providers. When large-scale movement of patients occurs, as in a hospital evacuation or regional catastrophe, normal patient referral networks and transport team protocols will be suspended. In order to maximize the efficient utilization of all available and appropriate resources, requests for patient movement will be regulated by the DOC/EOC/MOC and

the MHOAC. Control of EMS assets will be under the control of the DOC/EOC/MOC and the MHOAC, including the allocation of scarce resources when the demand/need exceeds the available resources. If the DOC/EOC/MOC and MHOAC in the affected OA is unable to function, then the REOC and RDMHS will carry out these functions.

- Each receiving facility will appoint a liaison to the DOC/EOC/REOC (local control facility and LEMSA)
- This necessitates a shift in perspective from the traditional triage system which seeks to maximize resources and survival at a single locale toward a resource-based triage plan that would facilitate communication, transportation, and resource allocation between facilities throughout the region.
- Three (3) major issues must be addressed – evacuation, surge capacity and communication. There is a need for a local or regional central command unit that can be activated during appropriate times to match referring and receiving units. It would require an improved system of communications and the ability to follow the course and location of all the transfers. Our Medical/Health Mutual Aid System allows for evacuation to be directed by the IC and coordinated with the HCC and the MHOAC and RDMHS Programs.
- In addition to DOC/MOC/EOC/REOC/MHCC, available communication will need to be established according to plans, policy and procedures with:
  - Control facility
  - Regional control facility
  - CA Perinatal Transport System
  - Medical Group Supervisor

### **Medical Health Branch Coordination Activities**

Examples of activities performed by a Medical-Health Branch within an Operational Area EOC include but are not limited to:

- Collecting real time information from all hospitals in their area regarding patient census, bed availability, bed types, and hospital needs.
- Determining the admitting criteria/acuity levels for admission to High, Medium, and Low-level hospitals (EMTALA waiver, physician to physician transfer, public health guidance).
- Assisting in providing clinical assistance, i.e., clinical pathways, appropriate clinical consultation, etc., to those hospitals providing care to patients of higher acuity than they typically do.
- Providing appropriate communications to the health care community and the general public according to EOC procedures (liaisons, PIO).
- Working together with local, regional, state and federal disaster response entities to aid in acquiring, prioritizing, and distributing resources as needed to meet the needs of perinatal, neonatal and pediatric patients.

This centralized control is critical to the smooth flow of patients throughout the state. Individual perinatal, neonatal, and pediatric leaders will have limited visibility on the status of other perinatal, neonatal, and pediatric facilities in the region. If multiple hospitals are evacuating or experiencing a surge above capacity/capability, and each clinical leader attempts to secure bed space in non-affected hospitals, control of patient movement will rapidly deteriorate. MHOACs have the ability to track the status of all hospitals in their OA, and in working with the RDMHS/C Program are best positioned to distribute available ambulance assets and coordinate the assignment of beds to evacuated perinatal, neonatal, and pediatric patients both within and beyond the OA, region and state as appropriate.

### **TRAIN® (Triage by Resource Allocation for IN-patients)**

TRAIN® is a patient typing and ambulance asset triage tool, designed to maximize efficient use of paratransit, BLS, ALS, CCT and Specialized Ambulance services during a large disaster. It categorizes inpatients according to their resource transportation needs during an evacuation or mass casualty event requiring increased surge capacity. It accurately assesses patients quickly and easily to determine transportation needs, which allows facilities to request and receive resources required for evacuating patients to other facilities in a disaster. The tool is used to determine the number of each level of transportation required for evacuation. Appropriate levels of transportation are based on local EMS transport guidelines and protocols. While the TRAIN® tool closely follows patient acuity, it does not determine the level of care or inpatient bed type. It also does not identify a receiving facility. TRAIN® is most powerful when all institutions in a region use it to facilitate collaboration and communication.

When operationalized within an institution, the TRAIN® Tool can:

- rapidly determine resource requirements for the transport of patients
- improve accuracy of resource requests
- augment surge capacity by identifying potential patients for rapid discharge or transfer to a lower level of care
- identify gaps between transport needs and available resources
- streamline communication with a common code, including with receiving institutions and supporting agencies (EMS, MHOAC, RDMHS)
- increase awareness and disaster preparedness across a facility

Operationalization of the TRAIN® Tool would include regular education on how to use it to frontline staff and members of the hospital's incident management team. Without integration into an electronic health record, bedside and resource/charge nurses should assign the appropriate TRAIN® category which can be tracked on handoff sheets, central status board, or electronic health record. Quick reviews of a TRAIN® Summary Report for the unit can occur during shifts and handoffs. Daily use and knowledge of the tool ensures that it will be used during disaster. It can identify patients who can be discharged during a disaster ("Blue"/Car transport) as well as those who may be close to discharge during regular operations.

In the event of a disaster or hospital evacuation, the TRAIN® Summary Report can be quickly vetted by medical staff (medical provider + resource/charge nurse) and sent to the HCC. The HCC can then use the information and report it to the MHOAC in the EOC/MOC.

While the TRAIN® Tool is useful to individual facilities and healthcare systems, its true power lies in the ability to coordinate resources across a locality, region, or nation. All involved partners and stakeholders would need to agree to and understand its uses.

The TRAIN® Tool can help the MHOAC Program by matching patients with available ambulance resources. The MHOAC Program will still need to identify receiving facilities to match the patient's level of acuity. [reference NICU Policy Statement on Levels of Care and Pediatric Critical Care Levels here]

The California Association of Neonatologists and the District IX AAP Section on Perinatal Pediatrics have endorsed the TRAIN® Tool.

### **Role of Subject Matter Experts (SME)**

One of the most critical aspects of successful disaster management involves the quality, diversity of knowledge, and formal structure of the leadership in place. Key senior leadership functions include both non-clinical and clinical (physician and nurse) administration, communications manager, facilities, supply chain and transportation in a Hospital Command Center (HCC) – all linking through a liaison position with local government Emergency Operations Centers (DOC or MOC or OA EOC). There needs to be a designated role of addressing the disaster medical needs of pediatric, neonatal, and obstetrical patients. Preparedness of the team in advance of a disaster is key, as well as a can-do team spirit and flexibility in managing unique situations and conditions that accompany any disaster. This allows the leveraging of new and established partners in order to create a safe passage for patients in these vulnerable populations.

Communication among hospitals, which in pre-disaster times may be competing for the same patients in overlapping catchment areas, either directly or through a DOC/EOC/MOC becomes essential to identify available beds, as well as any issues with staffing, supplies, and facilities infrastructure. Although any disaster event can precipitate increased preterm labor in pregnant women, it is less likely that we will be confronted with a surge of neonatal or perinatal patients acutely injured or ill following an event. Pediatric patients would come from the field or from a compromised facility, whereas neonatal and obstetrical patients would largely be those already in acute care facilities. A surge of perinatal and neonatal patients is likely if there is an evacuation of hospital(s) serving these patient populations. Another possible scenario for a surge of perinatal, neonatal, and pediatric patients would be a pandemic or emerging infectious disease.

In HICS, Medical Technical Specialists (MTS) (also called Medical Staff Officer or Medical Care Officer) are individuals within the organization with an area of expertise that is critical to a specific incident response. MTS can be assigned to any part of the HICS structure including reporting directly to the Incident Commander (IC). A perinatal or pediatric MTS might provide

perinatal or pediatric care guidance to an Operations Section Chief and work with the Liaison Officer to provide information on transport needs and surge availability to external partners.

Hospital operations with pediatric impacts that require input from the appropriate clinical SME include:

- HIPAA consent for pediatrics (unaccompanied minors)
- Staff education for pediatrics
- Safety and security – Pediatric Safe Area
- Adapt HICS for pediatrics
- Children with access and functional needs
- Supplies for pediatric surge
- Disaster behavioral health for pediatrics
- Infection control
- Trauma and burn guidance
- Decontamination operations for pediatrics
- CHEMPACK for pediatrics
- Patient tracking
- Reunification
- Exercises and evaluation

Volunteer SMEs to be inserted into DOC/MOC/EOC/REOC/MHCC should be pre-identified by the MHOAC or designee and be pre-registered into DHV. SMEs can be recruited from unaffected areas by the MHOAC and RDMHS programs or the MHCC and placed in appropriate DOC/MOC/EOC/REOC/MHCCs that have been activated and functioning to maximize the efficient utilization of resources and appropriate destination for patients. When SMEs enter a government response entity, they lose their facility's identity and function as regional entities, looking out for all hospitals within the affected geographic areas. The MHOAC and RDMHS programs are responsible for an inventory of med/health resources – vehicles (ground/air), supplies, equipment, personnel/teams and healthcare facilities – public and private.

The DOC/MOC/EOC/REOC/MHCCs with SMEs inserted will function as local or regional central coordination units that can be activated during appropriate times and match referring and receiving units. This requires an improved system of communications and the ability to follow the course and location of all the transfers.

They will serve as central “clearing houses” and can rapidly assess the number and location of patients requiring different resources and the number and location of beds capable of meeting these needs. Once resource needs are assessed, even if timely patient transportation is impossible due to lack of ambulances, resources can be brought to the requesting healthcare facility using more readily available modes of transportation. For example, it might be more practical in certain situations to bring gas cylinders/generators rather than transporting neonates on ventilators. Physicians, nurses, and patient care coordinator teams (MRC,

MPERT, trauma teams) can be sent from one hospital to another overwhelmed hospital. The best way to avoid the need for “austere care” is to pool resources over a wide enough area to lower the risk of this happening. The key is to get the resources to where the people are rather than moving people.

Day-to-day EMS guidance usually requires immediate transport to pediatric facilities in less than 30 minutes from a non-trauma hospital to a trauma center and from Low/Medium healthcare facilities to High-level pediatric centers. However, following a large-scale event, flexibility will be required. Using all transportation options available is key, as EMS resources may be committed to responding to the community. Medical personnel must be prepared to accompany patients in non-traditional vehicles. Patients may continue to present to the closest and/or closed facilities and families will be calling to seek information when they hear about the evacuation. Hospitals within a system or with formal or informal affiliations with other hospitals are often able to mobilize alternative resources and move patients quickly.

In areas where specialized pediatric emergency and critical care are not available, the outcomes are worse. The death rate for trauma in children is higher than that of adults with similar injuries, and the discrepancy is greatest in areas without pediatric centers. The difference in mortality increases as the severity of the illness or injury increases.

Some HIGH-level facilities (with a PICU and/or Regional NICU) have one or more perinatal/neonatal/pediatric transport teams which can be utilized to transport critically ill patients. Transport teams are composed of highly trained personnel with advanced skills, and may consist of a physician, nurse, respiratory therapist and EMT/EMT-P. The resource and expertise of these specialized teams should be utilized during a disaster when critical care patients need to be transported. However, each disaster and each transfer/transport is unique, and teams may or may not be available depending on the nature of the event (patient surge, staff availability, etc.)

In addition to DOC/MOC/EOC/REOC/MHCC’s, SMEs may serve in pre-determined alternate care sites such as:

- First aid stations
- Reception areas
- Regional evacuation points
- Casualty collection points
- Treatment centers

In many cases, the most knowledgeable persons who are involved on a day-to-day basis in pediatric, neonatal and obstetrical patient movement will not be physicians, but may be the following:

- Transport coordinator
- Prehospital care coordinator
- Control facility supervisor

- Pediatric liaison nurse
- Paramedic liaison nurse
- LEMSAs Administrator
- Transport Supervisor
- Medical Group Supervisor (supported by Communications and Transportation staff and Air Operations Coordinator), under the authority of the Incident Commander

## **The “All-Hospitals” “Pediatric Ready” Concept**

Pediatric patients represent the healthiest segment of our population, but also present special clinical needs that are very different from adult patients. As such, non-pediatric “adult” hospitals throughout the state are normally presented with relatively few pediatric patients to care for – not enough for many to justify significant clinical pediatric specialty within their hospitals. Most refer all but the lowest acuity patients to a pediatric facility for best clinical outcomes.

Our everyday healthcare availability for pediatric patients is routinely near capacity. Very large rural areas have small or regional LEMSAs, limited ALS providers, lack of nurses and specialty physicians, community hospitals, communication gaps, poor coordination, and long transport times.

It is expected that the limited number of children’s hospitals will care for as many of the critically ill or injured children as possible. If HIGH or MEDIUM level hospitals become severely impacted and cannot accept or find appropriate alternate placement for all pediatric patients, non-pediatric hospitals throughout the state will necessarily be required to care for pediatric patients that they typically do not admit. All hospitals must be prepared to receive trauma victims, burn victims, and children, regardless of service capabilities. This plan is built on the assumption that sending all children to a HIGH or even MEDIUM level hospital will not be an option in the most severe emergencies or disasters.

Stable pediatric patients should be retained in the community or safely transferred back to local community hospitals where their care can be continued. Additionally, it is expected that ALL hospitals will participate in a large pediatric surge by developing their own internal options for increasing pediatric bed capacity and capability. Strategies could include modified triage tactics, early discharge decisions, accelerated inpatient care procedures, and omission of some patient care services.<sup>1</sup> Planning, staffing, training and equipping for this eventuality needs to occur well in advance of any disaster. Participation in the National EMSC Pediatric

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<sup>1</sup> (see “Strategies for Improved Hospital Response to Mass Casualty Incidents”, Disaster Medicine and Public Health Preparedness, page 1-13, 2018 <https://www.cambridge.org/core>)

Readiness Assessment Project and EMSC Facility Designation is known to improve pediatric day-to-day and disaster capability.,

Although EMS will attempt to match the victims' needs with the nearest appropriate hospital, recent experience and literature suggests that up to 50% of the victims arriving at a hospital under a surge (mass casualty) scenario will arrive by other means (e.g., private vehicle). Therefore, all health care facilities, not simply those with PICUs, must be prepared to accommodate a possible surge of pediatric patients. Hospitals that primarily care for adult patients should ensure that adequate, up-to-date stocks of pediatric supplies such as Broselow tapes, endotracheal tubes, intravenous catheters, interosseous needles, bag valve masks, and other equipment are on site. They should also diligently practice pediatric disaster exercises. All hospital disaster exercises should include perinatal, neonatal, and pediatric cases that mirror the typical inpatient population and the local population. This could mean that 25-27% of the case scenarios are perinatal/neonatal/pediatric in nature.

These activities should also include all staff that may be called on to deliver care to children, including respiratory therapists, radiologists and others. Facilities with PICUs and NICUs will serve as a resource for those facilities asked to keep or accept pediatric patients that normally would be transferred. Inpatient care is closely linked to care provided in the Emergency Department (ED). As an extension of care provided in the ED, hospitals should make every attempt to provide appropriate medical staff and supplies for inpatient care. Plans for rapid admission to the hospital will decompress the ED to allow it to better serve the community in crisis, especially the perinatal, neonatal, and pediatric patients.

MOUs or agreements and documentation should include:

- Lists with redundant contact information of locally available pediatricians, family practitioners, nurse practitioners, and nurses who can potentially report to the hospital in a surge.
- Provision for pediatric hospital clinicians (intensivists, neonatologists, hospitalists, pediatricians) to staff inpatient locations in hospitals asked to accept or keep pediatric patients during a surge.
- Process to extend emergency staff privileges for those physicians who are acutely needed to provide pediatric care in a facility that they do not usually work in.
- Protocols for patient transfers and other direct patient care activities.

In day-to-day operations, perinatal and pediatric patients are triaged, treated and then transported to a facility which can provide the level of care needed for the best outcome. However, with a surge of patients during a disaster, there will be times when patients need to be cared for at a facility that normally would transfer them to a higher level of care. In a disaster situation requiring increased surge capacity, all hospitals need to be able to care for children >14 years of age within their adult services. In a catastrophic event, this could be expanded to include those >8 years of age. This flexibility overrides any internal policies. Every hospital should be able to add 5% flex beds at a minimum (ideal – 20%).

Generally suggested criteria for transfer from a higher-level facility to a medium or low-level facility, when necessary, are as follows, in order of first to last transfer priority:

- Patients in decreasing order of age from 14 to 8 years of age, developmentally age appropriate, with medically stable condition(s), and no special equipment needs.
- Community level NICU patient to Intermediate NICU.
- Regional NICU patient to Community level NICU.

Patients that should stay at a HIGH-level facility, and should not be considered for transfer to a lower level of care include:

- Patients < 8 years of age.
- Patients with multiple medical issues or chronic medical conditions (e.g., cardiac, pulmonary, oncology, endocrine).
- Patients requiring specialized pediatric equipment or procedures or are medically unstable.

The reverse also applies. Those that are first priority to be transferred to a lower level of care as the situation requires would be the last to be considered for return to a higher level of care if their condition still dictated such as move.

### **Deactivation and Recovery**

As the MHOAC Program monitors bed availability and coordinates the distribution of pediatric patients, it will determine when the pediatric surge no longer exceeds capacity/capability and will notify all partners/stakeholders. The recovery process will include repatriation of patients, supplies, and staff, and the resolution of all financial issues.

## **III. Background**

### **Assumptions**

Although often neglected, preparations for the worst-case catastrophic scenario are a must. In addition, the perinatal, neonatal, and pediatric elements of preparation and response are often not adequately developed and integrated with the overall response. What is required for well-coordinated, multiagency, community-based planning is teamwork and flexibility, strong leadership, and the involvement of new and established partners.

Much mitigation and preparedness work has already been accomplished by Healthcare Coalitions, healthcare facilities, health systems, Operational Areas, regions, States, CDPH and EMSA. This document is an annex to the California Patient Movement Plan (November 2018) linking and integrating with 13 western state partners in response to the impact of a catastrophic event on the perinatal, neonatal and pediatric populations.

A common response process is important in minimizing potential chaos associated with any emergency or disaster. All personnel with a supervisory role including administrative and medical leadership staff must follow the federal National Incident Command System (NIMS), California's Standardized Emergency Management System (SEMS), and the Hospital Incident Command System (HICS) guidelines to coordinate a well-managed approach for any incident, assisting in resource coordination and allocation, and developing consistent patient tracking processes.

Clinical subject matter experts in the perinatal, neonatal and pediatric world need to be involved in community-level disaster planning and response and be integrated into the emergency operations centers at the Operational Area (EOC), regional (REOC), and state (MHCC) levels in order to enable efficient and effective medical control. The evacuation of perinatal, neonatal, and pediatric patients needs to be centrally coordinated at the intrastate or interstate levels.

It is recommended that facilities test for communications redundancies due to the inherently fragile condition of the perinatal, NICU and PICU populations and their needs. This is essential for situational awareness, information sharing, and resource requesting processes.

A common component of disaster planning is bridging the gap between EMS partners and inpatient hospital departments. During a disaster, some infants and children will require advanced life support. Some may require transfer to a like-facility when there is a need for evacuation, some may require transport to a higher level of care, and some need transport from the field to a hospital facility. With limited resources, these possibilities may not be available immediately. In some cases, it may be more practical to transport a specialty team and/or equipment to a patient rather than transporting a patient to another location. On a day-to-day basis it may be preferable to bypass nearby providers of adult care to send pediatric patients to more specialized pediatric care facilities that are more geographically distant, but that may not be possible following a catastrophic event.

It is anticipated that non-federal hospitals will respond rapidly, improvising and evacuating critically ill children from a hazardous unsecured disaster zone. Federal support for the management and care of hospitalized patients during a crisis may be delayed. Federal, state, and local (public and private) efforts may initially be uncoordinated. We may well see volunteer physicians, hospitals, transport teams, etc. providing care before the government resources can begin functioning. Both systems need to function collaboratively and optimally during a disaster. There is need for enhanced collaboration of public and private skills, resources, talents and facilities. Systems that are activated at the local or regional level may prove more efficient than dependence on national or otherwise highly bureaucratic entities.

The scarcity of pediatric care resources when compared with adult care is partly an artifact of the care demands made by the pediatric population during normal operational periods. Pediatric emergencies occur less commonly than those for adults, therefore, skills retention is an important issue at all levels, especially in rural areas. A relatively large proportion of the adult population uses health care facilities compared with the relatively small proportion of the

pediatric population (<5%) that uses inpatient care. As a result, pediatric inpatient capacity is more limited relative to the baseline population of children. To significantly increase pediatric capacity during a disaster, a more regionalized approach must be considered for children. This means that increased geographic distance must be covered to manage care needs, and there needs to be interstate coordination between health care providers and state government agencies to accomplish such regional responses. If not managed well, there will be shortages of available resources while at the same time potential underutilization of other resources.

### **Specific Planning Assumptions:**

- Under the best of circumstances, any large disaster is characterized by initial chaos.
- Events may be no notice (earthquake), or evolving and sustained (pandemic), and may be local/regional/state/national.
- Key is to identify needed resources, and the actions required to obtain those resources.
- Normal patient referral networks and transport team protocols may be suspended to distribute the available assets equitably and efficiently.
- Pregnant women, neonates, and children may not be the only ones affected – multiple requests will be made for the same resources.
- Pregnant women, neonates, and children have rarely received the priority they deserve in planning for disasters.
- Although predictions are that we will have a severe pandemic or catastrophic earthquake, real life agendas and priorities push planning and exercising into the background.
- We will focus on children through age 14 and include perinatal patients – pregnant females and newborns.
- We will include specialty centers, specifically beds for burns, psychiatry, transplant, ECLS, and long-term/respite care.
- We have excellent perinatal, neonatal, and pediatric tertiary specialty centers with subject matter experts.
- We have a shrinking inpatient capacity and capability, so that even a moderately severe influenza season stresses our pediatric bed capacity, especially PICU beds.
- There is not good alignment of pediatric bed capacity with the geographic distribution of the pediatric population.
- A high proportion of specialty pediatric bed capacity lies on or near major identified earthquake fault lines.
- Hospitals have internal surge plans in order to decompress and increase their surge capacity.
- Specialty centers have their own catchment areas where patients are routinely transferred to a higher level of care.

- Plans and linkages allowing HIGH-level facilities to rapidly decompress and expand critical care capacity by transferring appropriate patients to a lower level of care are lacking.
- In a large-scale event, critically ill or injured children may present to the hospital that is closest, most convenient or most familiar, irrespective of its capability to care for these patients.
- Transport by emergency responders to specialty pediatric hospitals may be impossible due to shortage of vehicles and/or staff, impassable roads/bridges, or instability of the patient.
- Expanded use of telemedicine to advise clinical providers in community and critical access hospitals is known to reduce the need for patient movement.
- Participation in the National EMSC Pediatric Readiness and Facility Designation Programs are known to improve capability in all facilities.
- Specialty hospitals may be unable to receive patients due to over-capacity, uncontrolled patient distribution, or lack of structural integrity.
- Every hospital must establish and maintain at least a minimum capacity and capability to care for some pediatric patients, with staff training and age-appropriate equipment.
- A catastrophic event will require multi-state partnerships to access perinatal, neonatal, and pediatric beds, and state and federal support for EMS resources.
- We have a medical and health mutual aid system with local health departments, Healthcare Coalitions, MHOAC programs, LEMSAs, RDMHS/C programs, EMSA, and CDPH.
- Established linkages between hospitals and their perinatal, neonatal, and pediatric subject matter experts, EMS and the government emergency response system, with clear lines of authority for decision making in a catastrophic event are lacking and need to be developed.
- A statewide medical and health crisis standards of care plan has not yet been developed.

Hospital Emergency Operations Plans cover areas of operations that have perinatal, neonatal, and pediatric impacts, including:

- HIPAA/consent for minors
- Informatics
- Staff education on perinatal, neonatal, and pediatric care
- Safety and security – perinatal, neonatal, and pediatric safe area
- Adapting HICS for perinatal, neonatal, and pediatrics (situational awareness and information sharing)
- Children with access and functional needs
- Equipment, supplies and pharmaceuticals for pediatric surge
- Disaster behavioral health for pediatrics

- Infection control
- Trauma and burn pediatric guidance
- Decontamination operations for pediatrics
- CHEMPACK for pediatrics
- Patient tracking
- Family reunification
- Exercises and evaluation
- Bi-directional, non-exclusive MOUs/agreements with other facilities that cover both sending and receiving perinatal, neonatal, and pediatric patients during a surge or evacuation

The Joint Commission provides detailed guidance on the requirements for disaster preparedness in accredited hospitals. The following elements are required:

- Leaders, including those of the medical staff, actively participate in emergency planning
- A hazard vulnerability analysis (HVA) is conducted to identify events that could affect demand for services or ability to provide services
- In coordination with community partners, hazards identified in the HVA are prioritized
- Organization needs and vulnerabilities and community capabilities are communicated to regional emergency response agencies
- The organization develops mitigation, preparedness, response and recovery strategies for each identified threat in the HVA
- The organization maintains an inventory of assets and resources available during an emergency

The majority of planning will occur at the executive-level of hospital leadership and is beyond the scope of perinatal and pediatric leadership to implement independently. However, it is critical that perinatal and pediatric leadership ensure that such planning does not ignore or overlook the unique needs of their highly vulnerable patients. Perinatal and pediatric leaders should be cognizant of the organization's Emergency Operations Plan and the Hospital Incident Command System (HICS). They must be knowledgeable of where the perinatal and pediatric leadership falls in the communication and response chain of command and understand the expected staff roles and responsibilities during a disaster.

One of the most critical aspects of successful disaster management involves the quality, diversity of knowledge, and formal structure of the leadership in place. If the administrator on call is a non-clinical administrator, a clinical counterpart must be added quickly to the command structure. The physician-in-charge or designee is a vital part of the senior management team and plays an integral role in prioritizing risks to patients and the facility. Tasks may include developing an approach for assisting with evacuation, identification of staff to assist with transport, and prioritization of patients who require evacuation.

Although planning and exercising incurs expenses, they will help everyone, including top leadership, to understand roles and responsibilities for a more cohesive disaster response and improve health care resiliency within the hospital, institution, and/or health care enterprise. In the event of disaster, these plans and exercises may ultimately mitigate interruption to business continuity and decrease associated expenditures.

Although the general expectation is for children's hospitals to handle a surge of ill or injured children, children's hospitals may not have the capacity. It is likely that many children will need at least temporary care at a non-children's hospital after a disaster, but many of these hospitals have insufficient capability to care for ill or injured children after a disaster.

The planning team within the facility needs to include hospital administrators, clinical specialists (physicians, nurse practitioners, and nurses), emergency management, facilities/engineering, supply chain, finance, and nurse management.

The approach needs to include:

- Children's hospitals
- All facilities with perinatal and/or neonatal units
- All other general acute care hospitals (GACH)
- Pediatric long-term care facilities (LTC)
- Other specialty centers (burns, transplant, child/adolescent psychiatry)
- EMS providers and LEMSAs
- Ambulatory care providers (urgent care, clinics, private offices)
- Healthcare Coalitions
- RDMHS Program
- MHOAC Program (Public Health and EMS)
- Local and State OES
- CDPH
- EMSA
- Specialty organizations

In order for the plan to be operationalized, it must be followed by training and exercises (workshops, tabletops, drills and full-scale exercises), with lessons learned and revisions to the plan based on exercises, real events, and research.

## **Why do we need pediatric specific plans? - Kids are Unique<sup>2</sup>**

Perinatal, neonatal, and pediatric patients have increased vulnerabilities to the hazards of disasters. They have different patterns of injury and illness, and unique medical, physiological, and psychosocial needs. They are our largest vulnerable population, and some are disabled or technology dependent. Children with special healthcare needs may also be MCI (multi-casualty incident) victims. Many perinatal women and children live at or near the poverty level. They may not speak English or may not speak at all. Since infants and toddlers may be pre-verbal, and other children may be non-communicative, they cannot provide a family or medical history to their caregivers. They are reliant on adults, have a lack of self-preservation skills, do not know how to recognize danger, and when or how to flee danger before, during or after a disaster. Furthermore, they may also be uncooperative, especially if separated from a parent or other known adult. Neonates and children often do not carry identification.

Special considerations for neonates and children are necessary due to their unique physical characteristics. These differences make them more susceptible to physical injury from trauma, as they have proportionately larger heads, high surface area to weight, thinner skin, less body fat, smaller blood volume and high metabolic rates. They are more susceptible to dehydration and shock. Perinatal patients, neonates, and some children may have immature immune systems which make them more prone to infection (influenza), and they can be a source of infection for their families and caregivers.

Children's psychological response may be highly variable in its manifestations and duration. In addition to being dependent on their parents or caregivers, their psychological response may reflect that of their parents. They are at greater risk of acute stress, anxiety, depression, fears, phobias, post-traumatic stress disorder (PTSD), regression and somatization, all of which may be difficult to accurately diagnose.

They have increased risk for adverse effects of transdermal chemical exposure because of increased permeability of the skin and a larger surface-to-mass ratio. Children are at increased risk for inhalation toxicity with an airborne agent due to their higher respiratory rate. They live closer to the ground and would be at greater risk with any agent that would settle close to the ground. Infants are more vulnerable to cold (including during decontamination) and heat stress. They have increased vulnerability to the effects of radiation exposure, requiring more vigorous medical response than adults.

Pediatric critical care is lifesaving, highly specialized, and highly centralized. Triage guidelines differ for children. Appropriately sized equipment/supplies as well as age and weight appropriate medications are required. Effectively treating children requires specific knowledge

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<sup>2</sup> [https://www.aap.org/en-us/Documents/disasters\\_youngest\\_victims\\_disaster\\_preparedness.pdf](https://www.aap.org/en-us/Documents/disasters_youngest_victims_disaster_preparedness.pdf)

and skills. Furthermore, children are more likely than adults to respond to rapid and efficient medical care.

Perinatal patients (pregnant women and the mother-baby dyad) have unique needs that distinguish themselves from most other hospitalized patients. NICU patients are highly dependent on hospital staff for all aspects of their care. Many are critically ill and are heavily dependent on advanced technology for their survival.

## **Catastrophic Planning Assumptions**

Our approach includes 2 elements:

- Demographics by county of population <14 years of age
- Hazards

### **1. Demographics**

According to the California Department of Finance, the number of children in public schools is projected to remain virtually unchanged from 2013 through 2023-24. However, there is a trend toward urbanization and increased population density, with small rural counties in the north and east losing up to 5% of their pediatric population per year, and the southern and western counties gaining pediatric population. Because the numbers are small, the impact on the larger receiving counties is insignificant.

For purposes of this plan, a “pediatric” patient is defined as a non-neonatal patient through 14 years of age. The California Department of Finance projects that the total population of California in 2020 will be 40,639,392. The total of children aged 0 through 14 years of age will be 7,646,309, or 19% of the total population of California.

Here is the estimated breakdown of residents aged 0-14 years, by county and region, for year 2020:

**Region 1** – 3,466,155

**Region 2** – 1,560,755

**Region 3** – 148,868

**Region 4** – 752,097

**Region 5** – 715,457

**Region 6** – 1,713,470

County	Peds	Total	County	Peds	Total	County	Peds	Total
Alameda	290,981	1,703,660	Marin	40,369	265,152	San Mateo	136,512	792,271
Alpine	117	1,107	Mariposa	2,335	18,031	Santa Barbara	84,529	460,444
Amador	4,517	37,560	Mendocino	15,842	90,175	Santa Clara	370,918	2,011,436
Butte	37,635	230,701	Merced	66,260	286,746	Santa Cruz	49,286	282,627
Calaveras	5,740	44,953	Modoc	1,379	9,422	Shasta	31,003	180,198
Colusa	4,985	23,144	Mono	2,246	13,986	Sierra	397	3,129
Contra Costa	205,755	1,178,639	Monterey	96,518	454,599	Siskiyou	7,054	44,186
Del Norte	4,881	26,997	Napa	23,128	143,800	Solano	82,811	453,784
El Dorado	27,333	189,576	Nevada	12,809	99,548	Sonoma	78,155	515,486
Fresno	237,969	1,033,095	Orange	589,306	3,260,012	Stanislaus	122,874	572,000
Glenn	6,132	29,691	Placer	60,269	397,368	Sutter	20,632	101,418
Humboldt	23,384	137,711	Plumas	2,532	19,374	Tehama	12,990	65,119
Imperial	47,859	195,814	Riverside	496,221	2,500,975	Trinity	1,735	13,389
Inyo	3,304	18,724	Sacramento	301,728	1,572,886	Tulare	119,695	487,733
Kern	215,375	930,885	San Benito	11,510	60,067	Tuolumne	6,977	53,976
Kings	39,019	154,549	San Bernardino	482,671	2,230,602	Ventura	158,991	869,486
Lake	11,540	65,302	San Diego	681,171	3,398,672	Yolo	42,566	229,023
Lassen	4,479	30,626	San Francisco	119,165	905,637	Yuba	17,915	79,087
Los Angeles	1,882,360	10,435,036	San Joaquin	167,167	782,662			
Madera	34,804	162,990	San Luis Obispo	40,474	284,126			

The CDC defines individuals at risk for “Special Medical Care” as those with pre-existing medical conditions not requiring hospitalization or nursing home care but with significant medical care requirements and very likely to require care in a special sheltered environment.

Nearly 1 out of every 5 children in the United States has a special healthcare need. Children and youth with special healthcare needs (CFAN – Children with Functional and Access Needs), also known as [children with special healthcare needs \(CSHCN\)](#), require more care for their [physical](#), [developmental](#), [behavioral](#), or [emotional](#) differences than their typically developing peers. A special healthcare need can include physical, intellectual and developmental disabilities, as well as long-standing medical conditions (examples: [asthma](#), [diabetes](#) or cerebral palsy).

All children have [unique needs](#) in emergencies, but care for children with special healthcare needs is often more complex because of their various health conditions and extra care requirements. They may have difficulties moving from one place to another, urgent or constant medical needs, difficulty communicating, or have trouble with transitioning to different situations. A disaster can present all these difficulties at once.

California Children’s Services (CCS) data shows that >200,000 individuals were enrolled in 2014, with 25,000 < 1 year of age. This represents an increase of >35% since 2009.

**Definition:** Estimated percentage of children ages 0-17 with special health care needs (e.g., in 2011-2012, an estimated 15% of California children had special health care needs).

USA	19.8%		Placer	17.3%
California	15.0%		Riverside	15.8%
Alameda	16.5%		Sacramento	17.6%
Butte	18.0%		San Bernardino	16.2%
Contra Costa	16.7%		San Diego	16.1%
El Dorado	17.2%		San Francisco	15.9%
Fresno	15.5%		San Joaquin	16.0%
Humboldt	18.3%		San Luis Obispo	16.8%
Imperial	13.9%		San Mateo	15.0%
Kern	15.9%		Santa Barbara	14.9%
Kings	15.4%		Santa Clara	14.4%
Los Angeles	15.5%		Santa Cruz	15.6%
Madera	14.8%		Shasta	19.1%
Marin	16.6%		Solano	17.6%
Mendocino	16.8%		Sonoma	16.3%
Merced	15.1%		Stanislaus	16.0%
Monterey	14.4%		Sutter	15.7%
Napa	15.8%		Tulare	14.6%
Nevada	18.5%		Ventura	15.5%
Orange	15.1%		Yolo	15.6%
			Yuba	17.3%

Special Education Enrollment, by Disability, 2016:

California	Number
Autism	97,162
Deaf	3,449
Deaf-Blindness	103
Emotional Disturbance	24,316
Hard of Hearing	10,326
Intellectual Disability	43,913
Learning Disability	288,296
Multiple Disability	6,620

Orthopedic Impairment	11,745
Other Health Impairment	82,855
Speech or Language Impairment	159,755
Traumatic Brain Injury	1,706
Visual Impairment	3,670

## 2. Hazards

The primary threats to California’s children include earthquakes, wildfires, floods (landslides and/or dam failures), prolonged power outages, transportation accidents (school buses, hazardous materials), emerging infectious diseases, and CBRNE threats. Pediatric patients may be 1/3 to 1/2 of disaster victims, or 100% (e.g., school bus, school/child-care site, children’s theatre, tourist attraction). In a disaster, worst case projections call for 30% of California’s children being affected, or 2,293,892 age <=14. In addition, another factor will be the percentage of disruption of the healthcare system caring for children.

A catastrophic event is anticipated to cause:

- Widespread damage and death, with possible disruption to the health care system including hospitals, clinics, emergency care, primary care and public health services.
- Secondary hazards, such as fires and hazardous materials releases that may require the redirection of resources, population evacuation, and/or shelter-in-place events.
- Absence of key personnel due to illness or injury or delay in assuming emergency functions (while assuring the safety and welfare of their families and homes).
- Depletion of essential supplies and equipment with disruption of just-in-time supply chains.
- Serious transportation limitations including impassable roads that further delay emergency vehicles and responders.
- Communication disruptions for >48 hours after a major event, making accurate information about the nature and extent of damage including health care and resources initially unavailable or difficult to obtain.
- The need for mutual aid is likely to be required to meet the specialized medical care and transport requirements of perinatal, neonatal, and pediatric patients affected by a disaster, including a surge of new patients and the possible need for evacuation of already existing inpatients.

### Earthquake

The National Planning Scenario for an earthquake models an earthquake of magnitude 7.2 affecting 6 counties populated by 10 million people and causing 1,400 fatalities. There are projected to be >100,000 injuries with 18,000 hospitalizations, while twenty thousand persons

would be reported missing and 300,000 households displaced. Forty percent of buildings would suffer moderate damage and up to 150,000 buildings would be completely destroyed.

The San Francisco Bay Area Earthquake Plan projects:

- 25-50% of EDs will be non-functional (with 90% non-functional in heavy shake zones).
- A surge of 21,000 – 82,000 ED visits.
- 19-41 hospitals will require full or partial evacuation.
- 720 – 2,900 new patients requiring inpatient care (137-551 children).
- 120-560 new patients requiring ICU care (23-106 children).
- 38,000 – 140,000 persons requiring outpatient medical care (7,220 – 26,600 children).
- 23,000 – 28,000 patients with acute mental health needs (4,370 – 5,320 children).

The Southern California Catastrophic Earthquake Plan projects:

- hospital capacity will be reduced by 30-75% in specific Operational Areas.
- A loss of 13,000 hospital beds.
- 53,000 injuries (10,070 children).
- USGS projects that 250,000 persons would be displaced by an R7.8 earthquake on the San Andreas fault (47,500 children).
- Los Angeles County estimates in a major earthquake that 5,047 total patients will need 2,205 ICU beds (959 ped med/surg beds and 419 PICU beds).
- Patients with Special Medical Needs:
  - 40% will require immediate assistance.
  - An additional 40% requiring care within 72 hours.
  - Remaining 20% will require care within the first week.

Cascadia Earthquake:

- 2% of the population will be injured.
- 24% of the casualties will be children.
- Loss of 50% of healthcare capacity.
- In addition, coastal communities face possible tsunami risk.

Pediatric Traumatic Injury Projections Earthquake Scenario Using PEDSS (Pediatric Emergency Decision Support System), compiled by Pat Frost, EMS Director, Contra Costa County

Using the PEDSS tool, it is estimated that 0.15% of all children in each age category would have significant injuries requiring care following a catastrophic earthquake:

41	10	31	64	Placer	84,654	127	57	16	13	10	10	6	6	6	4	15
0	0	0	0	Plumas	3,857	6	3	1	1	0	0	0	0	0	0	1
122	8	114	120	Riverside	614,983	922	415	115	92	74	74	46	46	46	28	111
143	46	97	160	Sacramento	377,245	566	255	71	57	45	45	28	28	28	17	68
0	0	0	0	San Benito	17,962	27	12	3	3	2	2	1	1	1	1	3
338	97	241	222	San Bernadino	609,585	914	411	114	91	73	73	46	46	46	27	110
276	54	222	312	San Diego	807,600	1211	545	151	121	97	97	61	61	61	36	145
179	39	140	129	San Francisco	119,130	179	80	22	18	14	14	9	9	9	5	21
44	0	44	55	San Joaquin	235,268	353	159	44	35	28	28	18	18	18	11	42
12	0	12	22	San Luis Obispo	53,526	80	36	10	8	6	6	4	4	4	2	10
14	0	14	12	San Mateo	162,870	244	110	31	24	20	20	12	12	12	7	29
25	5	20	22	Santa Barbara	105,127	158	71	20	16	13	13	8	8	8	5	19
317	68	249	256	Santa Clara	451,611	677	305	85	68	54	54	34	34	34	20	81
9	0	9	24	Santa Cruz	57,353	86	39	11	9	7	7	4	4	4	3	10
19	0	19	16	Shasta	42,490	64	29	8	6	5	5	3	3	3	2	8
0	0	0	0	Sierra	555	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	Siskiyou	9,494	14	6	2	1	1	1	1	1	1	1	2
0	0	0	0	Solano	108,533	163	73	20	16	13	13	8	8	8	5	20
13	10	3	33	Sonoma	117,990	177	80	22	18	14	14	9	9	9	5	21
32	0	32	70	Stanislaus	172,366	259	116	32	26	21	21	13	13	13	8	31
14	0	14	4	Sutter	29,811	45	20	6	4	4	4	2	2	2	1	5
0	0	0	0	Tehama	15,059	23	10	3	2	2	2	1	1	1	1	3
0	0	0	0	Trinity	2,787	4	2	1	0	0	0	0	0	0	0	1
24	0	24	19	Tulare	140,493	211	95	26	21	17	17	11	11	11	6	25
0	0	0	0	Tuolumne	9,656	14	7	2	1	1	1	1	1	1	0	2
30	0	30	82	Ventura	214,841	322	145	40	32	26	26	16	16	16	10	39
7	0	7	4	Yolo	48,195	72	33	9	7	6	6	4	4	4	2	9
0	0	0	0	Yuba	22,980	34	16	4	3	3	3	2	2	2	1	4
3603	685	2918	3566	<b>Total</b>	<b>9,992,333</b>	<b>14988</b>	<b>6745</b>	<b>1874</b>	<b>1499</b>	<b>1199</b>	<b>1199</b>	<b>749</b>	<b>749</b>	<b>749</b>	<b>450</b>	<b>1799</b>
<b>Total Licensed Pediatric Acute Care Beds (Includes PICU beds) as reported by OSHPD 2009</b>	<b>PICU beds</b>	<b>Pedi Acute Care Beds without PICU beds included</b>	<b>Licensed NICU Beds</b>	<b>County</b>	<b>Pediatric Population 2009 (0-17) Kids data.org</b>	<b>Number of pediatric victims per PEDSS Earthquake Projections</b>	<b># with extremity fracture (45%)</b>	<b># with Abdominal trauma (12.5%)</b>	<b># with Laceration (10%)</b>	<b># with Closed Head injury (8%)</b>	<b># with anxiety (8%)</b>	<b># Asthma (5%)</b>	<b># Burns (5%)</b>	<b># Chest Trauma (5%)</b>	<b># Spine Injury (3%)</b>	<b># requiring intubation (12%)</b>

Total Licensed Pediatric Acute Care Beds (Includes ICU beds) as reported by OSHPD 2009	PICU beds	Pedi Acute Care Beds without PICU beds included	Licensed NICU Beds	County	Pediatric Population 2009 (0-17) Kids data.org	Number of pediatric victims per PEDSS Earthquake Projections	# with extremity fracture (45%)	# with Abdominal trauma (12.5%)	# with Laceration (10%)	# with Closed Head injury (8%)	# with anxiety (8%)	# Asthma (5%)	# Burns (5%)	# Chest Trauma (5%)	# Spine Injury (3%)	# requiring intubation (12%)
185	30	155	154	Alameda	361,074	542	244	68	54	43	43	27	27	27	16	65
0	0	0	0	Alpine	226	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	Amador	6,485	10	4	1	1	1	1	0	0	0	0	1
4	0	4	4	Butte	48,097	72	32	9	7	6	6	4	4	4	2	9
0	0	0	0	Calaveras	8,014	12	5	2	1	1	1	1	1	1	0	1
0	0	0	0	Colusa	6,475	10	4	1	1	1	1	0	0	0	0	1
15	0	15	68	Contra Costa	253,468	380	171	48	38	30	30	19	19	19	11	46
0	0	0	0	Del Norte	6,330	9	4	1	1	1	1	0	0	0	0	1
0	0	0	0	El Dorado	39,778	60	27	7	6	5	5	3	3	3	2	7
8	0	8	96	Fresno	278,530	418	188	52	42	33	33	21	21	21	13	50
0	0	0	0	Glenn	8,078	12	5	2	1	1	1	1	1	1	0	1
0	0	0	5	Humboldt	27,462	41	19	5	4	3	3	2	2	2	1	5
24	0	24	11	Imperial	47,800	72	32	9	7	6	6	4	4	4	2	9
4	0	4	0	Inyo	3,870	6	3	1	1	0	0	0	0	0	0	1
40	0	40	65	Kern	256,241	384	173	48	38	31	31	19	19	19	12	46
0	0	0	0	Kings	45,515	68	31	9	7	5	5	3	3	3	2	8
0	0	0	0	Lake	12,889	19	9	2	2	2	2	1	1	1	1	2
0	0	0	0	Lassen	6,789	10	5	1	1	1	1	1	1	1	0	1
1228	242	986	1132	Los Angeles	2,758,141	4137	1862	517	414	331	331	207	207	207	124	496
134	34	100	104	Madera	43,172	65	29	8	6	5	5	3	3	3	2	8
14	0	14	8	Marin	53,513	80	36	10	8	6	6	4	4	4	2	10
0	0	0	0	Mariposa	3,020	5	2	1	0	0	0	0	0	0	0	1
0	0	0	0	Mendocino	20,440	31	14	4	3	2	2	2	2	2	1	4
7	0	7	0	Merced	81,370	122	55	15	12	10	10	6	6	6	4	15
0	0	0	0	Modoc	2,103	3	1	0	0	0	0	0	0	0	0	0
0	0	0	0	Mono	3,001	5	2	1	0	0	0	0	0	0	0	1
26	0	26	34	Monterey	120,841	181	82	23	18	15	15	9	9	9	5	22
0	0	0	6	Napa	35,277	53	24	7	5	4	4	3	3	3	2	6
0	0	0	0	Nevada	18,216	27	12	3	3	2	2	1	1	1	1	3
255	42	213	253	Orange	800,097	1200	540	150	120	96	96	60	60	60	36	144

**Greater Bay Area (Mutual Aid Region II) Pediatric Traumatic Injury Projections Earthquake Scenario using PEDSS**

Total Licensed Pediatric Acute Care Beds (Includes PICU beds) as reported by OSHPD 2009	PICU beds	Pedi Acute Care Beds without PICU beds included	Licensed NICU Beds	County	Pediatric Population 2009 (0-17) Kids data.org	Number of pediatric victims per PEDSS Earthquake Projections	# with extremity fracture (45%)	# with Abdominal trauma (12.5%)	# with Laceration (10%)	# with Closed Head injury (8%)	# with anxiety (8%)	# Asthma (5%)	# Burns (5%)	# Chest Trauma (5%)	# Spine Injury (3%)	# requiring intubation (12%)
185	30	155	154	Alameda	361,074	542	244	68	54	43	43	27	27	27	16	65
15	0	15	68	Contra Costa	253,468	380	171	48	38	30	30	19	19	19	11	46
0	0	0	0	Del Norte	6,330	9	4	1	1	1	1	0	0	0	0	1
0	0	0	5	Humboldt	27,462	41	19	5	4	3	3	2	2	2	1	5
0	0	0	0	Lake	12,889	19	9	2	2	2	2	1	1	1	1	2
14	0	14	8	Marin	53,513	80	36	10	8	6	6	4	4	4	2	10
0	0	0	0	Mendocino	20,440	31	14	4	3	2	2	2	2	2	1	4
26	0	26	34	Monterey	120,841	181	82	23	18	15	15	9	9	9	5	22
0	0	0	6	Napa	35,277	53	24	7	5	4	4	3	3	3	2	6
0	0	0	0	San Benito	17,962	27	12	3	3	2	2	1	1	1	1	3
179	39	140	129	San Francisco	119,130	179	80	22	18	14	14	9	9	9	5	21
14	0	14	12	San Mateo	162,870	244	110	31	24	20	20	12	12	12	7	29
317	68	249	256	Santa Clara	451,611	677	305	85	68	54	54	34	34	34	20	81
9	0	9	24	Santa Cruz	57,353	86	39	11	9	7	7	4	4	4	3	10
0	0	0	0	Solano	108,533	163	73	20	16	13	13	8	8	8	5	20
13	10	3	33	Sonoma	117,990	177	80	22	18	14	14	9	9	9	5	21
772	147	625	729	Total	1,926,743	2890	1301	361	289	231	231	145	145	145	87	347

Source: California Neonatal/Pediatric Disaster Coalition October 2012

For more information contact Pat Frost EMS Director Contra Costa County at Patricia.Frost@hsd.cccounty.us

PEDSS: Pediatric Emergency Disaster Support Software developed by Children's LA visit <http://pedss.isi.edu/pedss/> for more information

\*\*\*Note: The PEDSS Tool is no longer available\*\*\*

1994 Northridge (6.7R) data for all ages:

- 16 hospitals, 33 fatalities, 133 hospitalizations – most due to extremity trauma

- Single extremity – 55%
- Multiple extremity – 45%
- Emergency surgery – 21%
- Thoracic/abdominal trauma – 17%
- Ortho – 42%, tib/fib – 97.6%, femur – 13%
- Soft tissue – 42%
- Thoracic/lung – 7-9%

### Pandemic Influenza

The CDC pandemic expectation is that a 300% increase in PICU beds will be needed (up to 1,800 PICU beds).

The National Planning Scenario for an influenza pandemic calls for up to 1.9 million deaths, with 9.9 million hospitalizations and 18 million outpatient visits. The numbers will vary depending on the Attack Rate (AR range of 15-35%) and the Case Fatality Rate (CFR of 2-5%).

In the influenza pandemic of 1918, the CFR was 2.5%. RAND projections call for an AR of 5-25%, and a CFR of 5% (2-10%).

In the 2009-10 mild-to-moderate H1N1 pandemic, Contra Costa and Alameda Counties experienced:

- 30-50% surge in pediatric ED visits.
- A pediatric bed surge of 25-50%.
- 13% of admitted patients needed a PICU bed, including Extracorporeal Life Support (ECLS)/Extracorporeal Membrane Oxygenation (ECMO)

Pandemic Influenza Estimates (based on 2009 H1N1):

- Moderate 85%, LOS (length of stay) – 6.4 days, 6% deaths.
- Severe 15%, LOS – 11.8 days, 25% deaths.

Los Angeles County projects the need for 97,470 pediatric med surg beds and 28,136 PICU beds during a pandemic (based on no mitigation efforts such as vaccines being available).

### Terrorism Considerations

Al-Qaeda has publicly asserted the “right” to kill 2,000,000 American children, with “operations in stages of preparation”:<sup>3</sup>

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<sup>3</sup> Source: Grossman and Rassa, “Mass Slaughter in Our Schools: The Terrorists’ Chilling Plan”, quoted by Dr. Michael Frogel of the NYC Pediatric Disaster Coalition.

- Videos show Al-Qaeda terrorists practicing the takeover of a school.
- The trainees issue commands in English.
- They rehearse separating youngsters into manageable groups.
- They practice meeting any resistance with violence.
- Some “hostages” are taken to the rooftop, dangled over the edge, then shot.

## Chemical Biological Radiological Nuclear Explosives (CBRNE) Incidents

### Chemical:

Chlorine – 99% irritated, 1% incapacitated, no deaths, but LOS 2-18 days.

### Biological:

Smallpox modeling (WHO)-

- 0.5/1000 infection rate
- 5000 cases in kids
- Almost 20% of pop is immunosuppressed
- Highest infection rate age 5-19 years
- Highest death rate >45 years of age
- CFR 50-70% in non-immunosuppressed population
- Smallpox – long LOS with 34% deaths

Anthrax Modeling- LOS – 15 days, deaths 45-80% mild-severe.

Botulism Modeling- LOS – 16-31 days, deaths – 11-30%.

Plague Modeling- LOS 7 days, deaths 35%.

### Nuclear

A nuclear detonation or Improvised Nuclear Device (IND) will result in a combination of trauma, radiation and burn elements, often involving the same patient. For a 20 kiloton (kt) tactical nuclear weapon or 550 kt Russian arsenal weapon:

- Direct radiation (flash burns) > 90 % of all burn victims.
- If 550 kt, >10 km from epicenter will receive flash burns.
- 20 kt in Los Angeles – surviving burn injuries >28,000.
- 550 kt in Los Angeles – 185,000 surviving burn injuries.
- 1kt and 10kt nuclear – burns, trauma (lacerations, blunt, crush), radiation, fallout- high deaths and LOS.
- Same for RDD and radiological point source.

## Explosives

Projections for an IED event estimate the need for 195 pediatric acute care beds plus 52 PICU beds, all dependent on the percentage of children at or near an event (AHRQ Hospital Surge Model).<sup>4</sup>

**The table below lists the type of casualties that users can specify for each scenario:**

Scenario	Types of Casualties
Anthrax	<ol style="list-style-type: none"><li>1. <b>Mild:</b> When victims become ill they are more than 3 days away from death, assuming no treatment.</li><li>2. <b>Severe:</b> When victims become ill they are 3 or fewer days away from death, assuming no treatment.</li></ol>
Smallpox	<ol style="list-style-type: none"><li>1. <b>Onset:</b> Mild, generalized symptoms.</li></ol>
Pandemic Flu	<ol style="list-style-type: none"><li>1. <b>Moderate:</b> Patients arriving at the hospital with moderate flu symptoms go to the floor for medical care.</li><li>2. <b>Severe:</b> Patients arriving at the hospital with severe flu symptoms go to the ICU for medical care.</li></ol>
Plague	<ol style="list-style-type: none"><li>1. <b>Moderate:</b> Patient requires hospitalization, but not in the ICU.</li><li>2. <b>Severe:</b> Patient requires hospitalization in the ICU.</li></ol>
Mustard	<ol style="list-style-type: none"><li>1. <b>Irritated:</b> Hoarseness or burning in throat and lungs, irritation in eyes.</li><li>2. <b>Severe:</b> Temporary blindness, permanent eye damage, bronchopneumonia, and skin damage.</li></ol>
Sarin	<ol style="list-style-type: none"><li>1. <b>Mild:</b> Miosis, ocular pain, tearing, rhinorrhea, bronchospasm, slight dyspnea, respiratory secretions, salivation, diaphoresis.</li><li>2. <b>Moderate:</b> Moderate dyspnea, nausea, vomiting, diarrhea.</li><li>3. <b>Severe:</b> Loss of consciousness, convulsions, paralysis, copious secretions, apnea.</li></ol>
Nuclear Device	<ol style="list-style-type: none"><li>1. <b>Burns/moderate:</b> Second-degree burns on hands and face.</li><li>2. <b>Burns/severe:</b> Third-degree burns on hands and face (and first-degree over the rest of the body).</li><li>3. <b>Trauma/people in collapsed skyscrapers .</b></li><li>4. <b>Trauma/people in collapsed houses and other light buildings.</b></li><li>5. <b>Trauma/people who receive multiple lacerations from flying glass .</b></li><li>6. <b>Trauma/people outside who receive blunt trauma .</b></li><li>7. <b>Radiation/mild:</b> Nausea, vomiting, anorexia, fever, infections .</li><li>8. <b>Radiation/moderate:</b> More severe mild symptoms, plus bleeding, fatigue, and weakness.</li></ol>

<sup>4</sup> <https://archive.ahrq.gov/prep/hospurgemodell> (tool no longer available)

	<ol style="list-style-type: none"> <li>9. <b>Radiation/severe:</b> More severe moderate symptoms, plus headache, prostration, dizziness, and disorientation.</li> <li>10. <b>Fallout/mild:</b> 1Gy equivalent dose for blood effects, no other equivalent dose (some bleeding and infection issues).</li> <li>11. <b>Fallout/severe:</b> 4Gy for blood effects (problems with bleeding and infection) and about 7.5 Gy for lethality and gastrointestinal (GI) effects (some small fraction of people will die, and others get nausea, vomiting, etc.).</li> </ol>
Radiological Dispersion Device (RDD)	<ol style="list-style-type: none"> <li>1. <b>Mild:</b> 1Gy equivalent dose for blood effects, no other equivalent dose (some bleeding and infection issues).</li> <li>2. <b>Severe:</b> 4Gy for blood effects (problems with bleeding and infection) and about 7.5 Gy for lethality and GI effects (some small fraction of people will die, and others get nausea, vomiting, etc.).</li> </ol>
Radiological Point Source	<ol style="list-style-type: none"> <li>1. <b>Mild:</b> Nausea, vomiting, anorexia, fever, infections.</li> <li>2. <b>Moderate:</b> Mild symptoms as above, plus bleeding, fatigue and weakness.</li> <li>3. <b>Severe:</b> Moderate symptoms as above, plus headache, prostration, dizziness and disorientation.</li> </ol>
Foodborne	<ol style="list-style-type: none"> <li>1. <b>Adult Moderate:</b> Adults show symptoms but are able to be treated outside of the ICU.</li> <li>2. <b>Child Moderate:</b> Children show symptoms but are able to be treated outside of the ICU.</li> <li>3. <b>Adult Severe:</b> Adults present at the hospital with severe symptoms requiring a ventilator.</li> <li>4. <b>Child Severe:</b> Children present at the hospital with severe symptoms requiring a ventilator.</li> </ol>
Improvised Explosive Device (IED)	<ol style="list-style-type: none"> <li>1. <b>Affected:</b> Victims suffer from one type of blast injury including lacerations, fractures, burns, and pulmonary blast.</li> <li>2. <b>Moderate:</b> Victims suffer from two types of blast injuries including lacerations, fractures, burns, and pulmonary blast.</li> <li>3. <b>Severe:</b> Victims suffer from three or more types of blast injuries including lacerations, fractures, burns, and pulmonary blast.</li> </ol>

## System Description

There are approximately 250 pediatric hospitals nationwide, 2% of the total number of hospitals in the US. Since children account for 26% of the population through 18 years of age, this gap represents a major risk in disaster response. It would be more apparent should a disaster necessitate the evacuation of a pediatric center. Nearly all facilities would need to rapidly increase their surge capacity to accommodate this influx. This is particularly problematic for the high acuity complex patients whose management requires specialized resources that may not be readily available at nearby centers.

The focus in this guidance and toolkit is on the capacity and capability of the healthcare system following a catastrophic event as it relates to the pediatric population. Of significance regarding the perinatal and neonatal population is that there are almost twice as many NICU beds as there are PICU beds, but they are more frequently found in community hospitals.

The next section outlines the pre-event capacity and capability of the healthcare system during day-to-day conditions. As we have looked at a sample of projected needs in a variety of possible events in the previous section, the gap becomes obvious, demonstrating the need for a multi-state approach.

The framework is for a tiered system that emphasizes the use of the medical and health mutual aid system. This includes private and public resources, hospitals, trauma centers, emergency medical services resources and the local healthcare coalitions in order to integrate the medical response capabilities with local, regional, state and federal resources.

Along the continuum of care, our system which cares for children includes the following elements:

- Inpatient facilities – private/public, systems, MOUs and transfer agreements, internal surge plans
- Professional associations
- Joint Commission, CMS, HPP surge requirements
- California Perinatal Transport System
- EMS – public and private, air/ground, LEMSAs and EMSA
- EDs, EMSC, EDAP and Pediatric Readiness Project
- Electronic systems – Reddinet, EMResource, HAvBED, CalEOC, EHRs, etc.
- EOM, MHOAC Program Manual, Patient Movement Plan, SEP
- Healthcare Coalitions
- MHOAC Programs in 61 Operational Areas
- RDMHS Programs in 6 Regions
- MHCC (CDPH and EMSA)
- Outpatient facilities and providers – pediatric clinics as alternate treatment sites

## **1. Hospitals**

Guidelines from EMSA and the Hospital Preparedness Program (HPP) call for facilities to prepare for a 20% increase in their capability/capacity to care for inpatients over and above their normal experience for at least three days. Applying these requirements to a potential influenza pandemic is challenging, since projections would need to account for factors such as the attack rate of the specific organism and whether children are disproportionately affected. In the recent past, the 2009 H1N1 pandemic, which was relatively mild, resulted in surges far above these targets. In severe incidents, it will be essential that all facilities be prepared to care for (both keep and receive) some children that they would normally refer to a higher-level of care. It is inevitable that all hospitals in a large-scale disaster involving pediatric patients will be overwhelmed, however, this could occur even in smaller incidents. Since the healthcare system in California runs near saturation on a day-to-day basis, even a moderate event could overload the system, regardless of the cause.

Although children represent 19% of the population, and up to 1/3 to 1/2 of disaster victims, children do not have the need for as many inpatient and ICU beds as adults on a day-to-day basis. Only 10% of the ICU beds in the state are PICU beds. This is appropriate under normal conditions, since the pediatric population is a higher risk but lower frequency population regarding hospitalization. However, in a disaster, the pediatric population may become high risk, high frequency. Pediatric critical care is lifesaving, highly specialized, and highly regionalized.

FEMA expectations recommend 500 pediatric beds per 1 million which is equivalent to 3,823 beds. California has 4,007 acute care pediatric beds (PICU plus licensed pediatric beds), which demonstrates the potential capacity for a surge of 4.8% above the FEMA recommendation. Unfortunately, identifying a potential bed does not mean that it is in the right geographic area, or that the bed can be staffed with trained personnel provided with appropriate equipment for children.

The capacity of pediatric beds is strained on a day-to-day basis, with patients routinely being turned away due to insufficient capacity, especially in winter (recall the 2009-10 H1N1 pandemic, a relatively mild event). Plans should be based on the projected number of critically ill or injured patients resulting from specific scenarios, including a consideration of PICU patient care requirements and must factor in resource constraints that may limit the ability to provide care.

Hospital surge capacity and the levels of care that can be provided in catastrophic scenarios has been defined as follows:<sup>5</sup>

Conventional care – Space, staff and supplies are consistent with daily practice within the institution used during a multi-casualty incident (MCI) that triggers activation of the facility emergency operations plan. In this case, expectations would be for expansion of critical care by as much as 20% above baseline ICU maximum capacity using facility resources.

Contingency care – Space, staff and supplies are not consistent with daily practice but maintain or have minimal impact on usual patient care practices. These spaces or practices may be used temporarily during an MCI or on a more sustained basis during a disaster. In this case, expectations would be for expansion of critical care by at least 100% above baseline ICU maximum capacity to meet patient demand using local and regional resources.

Crisis care – Adaptive spaces, staff and supplies are not consistent with the usual standards of care but provide sufficiency of care in the setting of a catastrophic disaster,

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<sup>5</sup> Chest 2014: 146 (4\_Suppl): e15-e16s, Hick: Surge Capacity Principles – Care of the Critically Ill or Injured During Pandemics and Disasters – CHEST Consensus Statement

providing the best possible care to patients given the circumstances and resources available. In this case, expectations would be for expansion of critical care by at least 200% above baseline ICU maximum capacity to meet patient demand using local, regional, state, interstate and national resources.

Hospitals should have written pediatric interfacility transfer procedures and/or agreements that include the following components:

- Defined processes for the initiation of transfer, including the roles and responsibilities of the referring facility and referral center (including responsibilities for requesting transfer, method of transport and communication).
- A transport plan to deliver children safely and in a timely manner to the appropriate facility that can provide definitive care.
- Processes for selecting the appropriate care facility for pediatric specialty services that are not available at the referring hospital (e.g., critical care, specialty surgical care, trauma and burn care, psychiatric, perinatal emergencies, rehabilitation).
- Processes for selecting the appropriately staffed transport service to match a patient's acuity level (i.e., level of care and equipment needed for transport) and that are appropriate for children with special health care needs.
- Processes for patient transfer, including obtaining informed consent if possible.
- A plan for the transfer of critical patient information (i.e., medical record, imaging and copy of signed transport consent) as well as personal belongings and the provision of directions and referral institution information to the family, enabling family re-unification.
- Processes for the return transfer of the pediatric patient to the referring facility as appropriate.
- Integration with telehealth and/or telecommunications processes and mobile-integrated health and/or community paramedicine as appropriate.

MOUs should be bi-directional and non-exclusive. Hospitals typically have catchment areas where patients are transferred from lower capability facilities to a higher level of care. There are typically transfer agreements with tertiary facilities serving as regional referral centers.

There are eight (9) private freestanding children's hospitals that are members of the California Children's Hospital Association (CCHA):

- Children's Hospital of Los Angeles
- Children's Health of Orange County (CHOC)
- Loma Linda University Children's Hospital
- Lucile Packard Children's Hospital Stanford
- Mattell Children's Hospital at UCLA
- Miller Children and Women's Hospital Long Beach
- Rady Children's Hospital San Diego

- UCSF Benioff Children’s Hospital – Mission Bay and Oakland
- Valley Children’s Hospital

Physicians with pediatric expertise include those in-training (Residents and Fellows). In 2014, the numbers were reported as follows:

- CCHA hospitals – 460 – 51% of the total of 900 in California
- Total residents CCHA – 890 – 11.2% of total of 7964 in California for all specialties
- Fellows, CCHA – 184 – 13.4% of the total of 1346 in California

(Note: ACGME has policies that if a residency is unable to resume operations within 10 days, the residents must be transferred to other programs, such as happened during Hurricane Katrina)

The eight (8) CCHA hospitals have:

- 1417 licensed peds beds – 42% of the licensed pediatric beds in California
- 296 PICU beds – 49% of total
- 27,000 employees

There is an assumption that children’s hospital bed availability is always available when needed during normal operations. However, even under normal busy conditions, such as winter flu season, this system becomes stressed and bed availability rapidly declines. Most children continue to be cared for locally, in hospitals which may or may not have a PICU or licensed pediatric beds or may be a general acute care hospital (GACH) with medical/surgical beds serving all ages. Thirty-one percent of hospitals have licensed pediatric beds, and eleven percent have a PICU. Many hospitals routinely send children to other facilities for a “higher level of care” when bed availability allows transfer.

The following organizations may act as hubs for information dissemination regarding hospital care:

- California Association of Neonatologists: <https://canneo.groupsite.com/main/summary>
- California Children’s Hospital Association: <https://www.ccha.org/our-member-hospitals>
- California Hospital Association: <https://www.calhospital.org/>
- Children’s Hospital Association: <https://www.childrenshospitals.org>

Out-of-State Children’s Hospitals in the western USA that are members of the Children’s Hospital Association:

Arizona:

- Hospitals that have Pediatric Prepared Advance Care Certification from the Arizona Chapter of the American Academy of Pediatrics

Colorado:

- Children’s Hospital of Colorado (Aurora)

New Mexico:

- Carrie Tingley Hospital (Albuquerque)
- University of New Mexico Children’s Hospital

Nevada:

- Children’s Hospital of Nevada at University Medical Center – Las Vegas
- Renown Children’s Hospital at Renown Regional Medical Center – Reno

Oregon:

- Doernbecher Children’s Hospital at Oregon Health Sciences University
- Providence St Vincent Medical Center
- Randall Children’s Hospital at Legacy Emanuel
- Shriners

Texas:

- Baylor Scott White McLane Children’s Medical Center (Temple)
- Children’s Health Dallas
- Children’s Hospital of San Antonio
- Children’s Memorial Hermann Hospital (Houston)
- Cook Children’ Medical Center (Ft Worth)
- Covenant Children’s (Lubbock)
- Dell Children’s Medical Center of Central Texas (Austin)
- Driscoll Children’s Hospital (Corpus Christi)
- El Paso Children’s Hospital
- Medical City Children’s Hospital (Dallas)
- Our Children’s House (Dallas)
- Shriners Hospitals for Children (Galveston)
- Shriners Hospitals for Children (Houston)
- Texas Children’s Hospital (Houston)
- Texas Scottish Rite Hospital for Children (Dallas)
- The Children’s Center at Renaissance (Edinburg)
- University Health System Children’s Health (San Antonio)

Utah:

- Primary Children’s Hospital
- Shriner’s

Washington:

- Mary Bridge Children’s Hospital (Tacoma)
- Sacred Heart (Spokane)
- Seattle Children’s Hospital
- Shriners (Spokane)

### Western Pediatric Preparedness Partnership (WPPP)

Areas targeted by the WPPP include Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, the Pacific Islands in FEMA Region IX, as well as, parts of Canada and Mexico. These jurisdictions define the current membership. Other states may be considered if natural partnerships exist between pediatric hospitals. By engaging multi-disciplinary factions, the WPPP serves as an incubator to harness ideas and technologies that enable cross-pollination of concepts. As WPPP relationships continue to develop, county public health, emergency management and tribal government partners may be included in state discussions and pediatric disaster coalitions to gather their input and recommendations.

The focus of the WPPP is:

- Create state/regional pediatric disaster coalitions linked to the following partners: Health Care Coalitions (HCCs) that receive Health Preparedness and Response funding, state public health and emergency management, state chapters of the American Academy of Pediatrics (AAP), Emergency Medical Systems (EMS), Emergency Medical System for Children Improvement and Innovation Center (EMSC-IIC), and state funded EMSC partners. Also conduct periodic meetings and work groups, to focus on specific tasks to improve pediatric emergency preparedness.
- Develop a universal pediatric patient identifier, standardized procedures, and tools with Essential Elements of Information (EEl)s for pediatric patient tracking, across states and countries. The purpose of this effort is for family reunification following an emergency incident.
- Reach out to technology contacts for collaboration on solutions for pediatric patient tracking.
- Create data sharing strategies to capture the required information to meet hospital pediatric capabilities.
- Promote a tiered evacuation process that integrates hospital pediatric emergency care certification, identifying the level of hospital preparedness/ability to receive, stabilize, and manage pediatric patients during a catastrophic event or other emergency incident involving cross-state pediatric transfers.
- Assist state/regional pediatric disaster coalitions in defining membership that includes key partners.
- Assist jurisdictions in defining and determining resources and tools for pediatric surge.

- Identify necessary equipment, accommodations, and procedures that support safe pediatric transport and enable air/ground ambulance and other vehicle/aircraft pediatric transfers.
- Advise Health Care Coalitions (HCCs) about pediatric access and functional needs populations, pediatric mental health, and family reunification best practices.
- Share pediatric best practices for integration in HCC plans, including: Crisis Standards of Care, Emergency Preparedness, Response, Continuity of Operations, and Family Reunification.
- Encourage participation in the annual National Pediatric Disaster Coalition conference and other pediatric preparedness meetings, to elevate pediatric disaster attention and foster community resilience by advocating for best practices and current emergency preparedness strategies.
- Support disaster responder/care and provider pediatric education.

### Western Region Alliance for Pediatric Emergency Management (WRAP-EM)

On September 30 2019, the U.S. Department of Health and Human Services' Office of the Assistant Secretary of Preparedness and Response (ASPR) awarded grants to two centers to support the creation of Pediatric Disaster Care Centers of Excellence (COE). These pilot projects are intended to define the delivery of pediatric clinical care when existing systems are stressed or overwhelmed by enhancing rapid sharing of expertise and assets throughout a state or region. This FOA funds demonstration projects to help identify issues, develop best practices, and demonstrate the potential effectiveness and viability of this concept. COEs will be expected to develop and/or improve their capability and capacity to provide highly specialized care to pediatric patients within and outside their own region. Recipients should have existing pediatric preparedness capabilities and the capacity to manage pediatric patients within their own state and within a self-defined multi-state region during a disaster.

One of the COEs is the Western Region Alliance for Pediatric Emergency Management (WRAP-EM). WRAP-EM is a public-private partnership comprised of pediatric preparedness and response experts from Washington, Oregon, California, Nevada, Arizona, and Utah. WRAP-EM's mission is to increase pediatric care and capacity during disasters for the over 13 million children across our region. To that end, WRAP-EM strives to support state EOC and Health Care Coalitions in their pediatric preparedness and response. Below is a list of the focus groups within WRAP-EM working toward these efforts.

- Gap Analysis
- Patient Movement / Tracking / Reunification / Evacuations
- Education / IT
- Regional Drills
- Surge Capacity
- NICU / OB / Special Needs
- Telemedicine
- Mental Health

- CBRN / Infections
- Burns
- Trauma / MCI / No Notice Events
- EMSC / Peds Ready
- Supply Chain
- Deployable Assets
- Quality Improvement
- Legal / Agency Integration
- Disaster Healthcare Inequities

More information is available at <https://wrap-em.org/>.

#### WRAPEM Abstract:

In July 2019, the Assistant Secretary for Preparedness and Response issued a funding opportunity announcement aimed at the creation of centers of excellence for comprehensive regional pediatric disaster management. In response, an alliance of health care providers, pediatric medical centers, subject matter experts and government agencies throughout California, Oregon, Nevada, Arizona and Washington joined together to form the Western Region Alliance for Pediatric Emergency Management (WRAPEM). This alliance represents the most extensive collection of pediatric preparedness and response experts ever conceived of, in a region with nearly 13 million children.

UC San Francisco Health System and UCSF Benioff Children’s Hospitals, has assumed the role of leading the alliance. WRAPEM now includes the majority of the western states pediatric medical centers, disaster coalitions, large community health care systems, representatives from state and local agencies, and coalition partners. The group includes subject matter expertise in CBRNE, trauma, burns, disaster mental health, telemedicine, education, EMS, obstetrics, ethics and law. The goal of WRAPEM is to develop a coordinated, collaborative and sustainable regional pediatric disaster planning and response capability that effectively matches resources to needs and allows the entire region to effectively respond during large scale pediatric mass casualty events. WRAPEM will be governed by a leadership board and operational staff that represent all of the areas served and incorporates institutional expertise from medical centers, subject matter experts, and government agencies.

To ensure sustainability, we established a process and timetable to address the goals and objectives of the ASPR initiative and which accomplish the deliverables stated. During the first 3 months, a comprehensive review will be conducted of all available resources, which will then be catalogued into a resource guide that aligns existing capabilities with regional needs. This activity will include defining the core elements of regional capabilities including available assets, supply chains, existing surge and evacuation plans, outcomes and lessons learned from exercise and real time events , current legal and ethical policies, current deployable staff equipment and assets, telemedicine capabilities, patient tracking and reunification, communications, and pediatric disaster mental health considerations. An evaluation of existing training and educational, (including web-based) communications tools, situational awareness and pediatric readiness metrics and regional readiness assessment tools will be completed. Training will be developed to enhance the capacity and capabilities for responding to pediatric patients involved in mass casualty events involving chemical, biological, radiological and

nuclear defense (CBRN) agents, penetrating and other trauma, burns, and epidemic infectious diseases. A publicly accessible website and telecommunications platform will be the core repository for all of these efforts.

As the resource library is being developed, a formal regional gap analysis will be conducted. This is expected to be completed over the ensuing 3-4 months to inform our assessment of WRAPEM's ability to establish a comprehensive and integrated response model that addresses CBRN, trauma, burns and other natural and technologic disasters that potentially have a disproportionately high impact on children. During the remaining 6 months, WRAPEM will focus on several key projects with deliverable products and measurable impact. These include: (1) developing a published guide for accessing regional pediatric disaster response expertise, along with an operational coordination center integrating established state and federal responders, (2) compiling regional resource material that align interstate pediatric best practice and policy, (3) developing training modules with a pediatric-specific focus for all event types, (4) establishing telemedicine interconnectedness across the region, (5) Implementing regular pediatric focused exercises with broad regional participation, (6) developing patient tracking, reunification and information-sharing practices that address interstate operational complexity, and (7) formulating a regional Pediatric Disaster Mental Health plan.

These efforts will be closely coordinated with ASPR and the other selected Center. The accomplishments will be used to define a pediatric regional health care response system model that can be further enhanced and integrated with overall emergency operation plans to deliver the very best outcomes for children and their families.

### Hospital Tiers

The California Pediatric Surge Plan, Hospital Workgroup, has identified the following tiers. Note that these integrate closely with other nomenclature, including the California Emergency Medical Services for Children (EMSC), American Academy of Pediatrics (AAP), Western Pediatric Preparedness Partnership (WPPP), Mountain States Pediatric Disaster Coalition (MSPDC) and New York City.

- HIGH – CCS tertiary hospital – must have a Regional NICU and a PICU, most have Adult and/or Pediatric Trauma Designation, equivalent to EMSC Comprehensive designation
- MEDIUM – GACH with licensed peds beds and Regional, Community or Intermediate NICU, may have Trauma Designation, equivalent to EMSC Advanced designation
- LOW – GACH with medical/surgical beds, is a 911 receiving center, has a NICU or perinatal service (AAP Level 1 or Birth Center)., equivalent to EMSC general designation
- SPECIALTY – beds for a specific specialty category.

Tier:	HIGH	MEDIUM	LOW	SPECIALTY
Name:	Pediatric Tertiary Center	Pediatric Community Hospital	General Community Hospital	Specialty Care Services or Facilities
Definition:	A referral/receiving hospital providing comprehensive specialized pediatric medical and surgical care to the most critically ill or injured children	A community-based hospital with licensed pediatric beds, able to provide some pediatric services, with consultative support from a Pediatric Tertiary Center. In a surge, a community-based hospital may be required to keep or receive children who normally would be transferred to a Tertiary Center.	A usually small community hospital (includes rural Critical Access Hospitals) that has general medical/surge beds, able to provide basic inpatient pediatric services to children. In a surge, a community hospital may be required to keep or receive children who normally would be transferred to a higher level of care (e.g. trauma in an older child requiring surgery or caring for a child in the adult ICU.)	A facility, or specialty service within a facility, that is not a 911 receiving facility. This includes burn centers, Long-term or respite care, Psych, ECLS (ECMO), Transplant Some of these facilities (burns, psych) may be asked to take a surge of specialty patients following a disaster due to new injuries or loss of existing facilities. If forced to evacuate, destination will be according to previously determined plans or in coordination with the MHOAC and RDMHS.
Criteria:	<ul style="list-style-type: none"> <li>- Must have: <ul style="list-style-type: none"> <li>- Regional NICU</li> <li>- PICU</li> <li>- Licensed pediatric beds</li> </ul> </li> <li>- May have: <ul style="list-style-type: none"> <li>- designation as a Trauma Center, ideally Pediatric</li> </ul> </li> <li>- Must be able to provide consultation by phone, text, e-mail,</li> </ul>	<ul style="list-style-type: none"> <li>- Must have: <ul style="list-style-type: none"> <li>- NICU (Regional, Community, or Intermediate)</li> <li>- licensed pediatric beds</li> </ul> </li> <li>- May have: <ul style="list-style-type: none"> <li>- designation as a Trauma Center (Pediatric or Adult)</li> </ul> </li> <li>- Must have a formal written agreement with a Pediatric</li> </ul>	<ul style="list-style-type: none"> <li>-Must have: <ul style="list-style-type: none"> <li>- general acute care beds</li> <li>- 911 Receiving Center</li> </ul> </li> <li>May have: <ul style="list-style-type: none"> <li>- NICU</li> <li>- adult ICU</li> </ul> </li> <li>- Must have a formal written agreement with a high or medium level pediatric</li> </ul>	<ul style="list-style-type: none"> <li>- Must have: <ul style="list-style-type: none"> <li>- physician staffing or available for consultation 24/7</li> </ul> </li> <li>- Must have: <ul style="list-style-type: none"> <li>- licensed specialty beds appropriate for the type of services provided: <ul style="list-style-type: none"> <li>- burns</li> <li>- long-term care</li> <li>- psych</li> <li>- ECLS (ECMO)</li> <li>- transplant</li> </ul> </li> </ul> </li> </ul>

	<p>or telehealth for emergency care, stabilization, transfer, and transport as appropriate.</p> <p>- Must have established transfer agreements and serve as a regional referral center for the specialized care of pediatric patients.</p>	<p>Tertiary Center for consultation, stabilization, and transfer of pediatric patients allowing for the highest level of care indicated and available.</p>	<p>facility for consultation, stabilization, and transfer of pediatric patients allowing for the highest level of care indicated and available.</p>	<p>- Must have a formal written agreement with a higher-level facility for consultation, stabilization, and transfer of pediatric patients allowing for the highest level of care indicated and available.</p>
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**PICU beds:**

(Note: Since this policy statement was published in October 2019, it has not yet been “socialized”, and the 39 PICUs in California have not yet been categorized according to these three levels.)

An updated policy statement published in October 2019 from the American Academy of Pediatrics (AAP) and Society of Critical Care Medicine (SCCM) establishes a revised set of guidelines in aligning existing PICUs to established standards. The statement organizes PICUs into three distinct levels, outlining the services provided and personnel required for each level.

The 2004 version of the policy described level I and level II PICUs. In general, less severe but critically ill pediatric patients could be managed in level II PICUs, and those at the highest severity and with the most intensive needs would require level I PICUs.

The 2019 policy establishes three levels of PICUs: community based PICU, tertiary PICU, and quaternary or specialized PICU.

Community based PICUs play an important role in health care systems that provide care to infants and children. In general, these centers are mostly located in hospitals that offer medical-surgical care and a range of services targeted at the most fundamental level of pediatric intensive care services.

Tertiary PICUs have enhanced ability to care for critical care pediatric patients compared to community based PICUs. Tertiary PICUs can provide advanced respiratory support such as high frequency oscillatory ventilation. However, they would not be expected to provide ECMO support or transplantation services. In tertiary PICUs, the majority of pediatric medical and surgical services should be available, although in-house coverage would not be expected.

A quaternary or specialized PICU facility serves as a regional center and possesses a large catchment area likely to encompass tertiary and community based PICUs. These centers provide comprehensive services to all pediatric critically ill patients, including cardiovascular surgical services, transplantation services, and neurocritical intensive care services. This

highest level of PICU would be capable of supporting an American College of Surgeons-verified level I or level II children's surgical center or Level I or level II pediatric trauma center.

The executive summary provides a high-level view:

<https://doi.org/10.1542/peds.2019-2433>

The statement explores the specific requirements for each PICU level including the services offered as well as the personnel needed to provide these services. The statement can help providers of pediatric care understand the services and capabilities of PICUs in their communities as well as the availability of community based, tertiary, or quaternary PICUs in their state or nationally.

[https://journals.lww.com/pccmjournal/Fulltext/2019/09000/Criteria\\_for\\_Critical\\_Care\\_Infants\\_and\\_Children\\_.7.aspx](https://journals.lww.com/pccmjournal/Fulltext/2019/09000/Criteria_for_Critical_Care_Infants_and_Children_.7.aspx)

### NICU Beds

According to CCS:

NICU Regional = in a CCS approved tertiary hospital, providing intensive, intermediate, and continuing care

NICU Community = in a CCS approved Pediatric Community, General Community, or Special Hospital, providing intensive, intermediate, or continuing care

NICU Intermediate = in a CCS approved Pediatric Community, General Community, or Special Hospital, providing intermediate and continuing care

According to AAP, Arizona Pediatric Disaster Coalition (APDC), Mountain States Pediatric Disaster Coalition (MSPDC) (using EMResource categories):

NICU 4 (IV) = Regional NICU, handles complex surgical patients, with surgical subspecialists, facilitates transport and outreach education

NICU 3 (III) = NICU, <32 weeks, sustained life support, pediatric surgery, anesthesiology and ophthalmology

NICU 2 (II) = a/k/a special care nursery, 32-35 weeks, transfers <32 weeks, short term ventilation

NICU 1 (I) = basic well baby nursery, >37 weeks, stabilize and transfer <35 weeks

### Burn Beds

The American Burn Association has designated five regions. The Western Region encompasses Burn Centers located west of Montana, Wyoming, Colorado, and New Mexico, including Alaska and Hawaii. The Western Region Burn Disaster Consortium (WRBDC) is a

Utah-based consortium of 26 burn centers who have joined together to support disaster response efforts for one another throughout the Western Region. The Western Region Burn Coordination Center (WRBCC) is one of three (3) centers (Utah, Colorado and Arizona) throughout the west with redundant communication technologies to support disaster response efforts for burn centers.

For a burn mass casualty incident (MCI), the WRBDC serves as a communications and coordination center to support Burn Center(s) with burn bed census and/or patient triage and transfer. Upon request by a referring Burn Center, the WRBCC conducts a bed census of Western Region Burn Centers using the Utah Notification and Information System (UNIS) Burn Provider Group. It supports and assists with regional efforts for patient triage and transfer when requested.

**\*\*The WRBCC 24-hour Emergency Hotline is 866-364-8824\*\***

Upon notification, the WRBDC:

- Activates the regional burn disaster plan.
- Conducts burn bed census of non-affected Western Region Burn Centers at 2, 12 and 24-hour intervals.
- Coordinates requests for patient transfer between referring and receiving Burn Centers.<sup>6</sup>

### Maternal Care

Levels of maternal care for obstetric patients (includes laboring patients, maternal high risk, and postpartum patients):

The American College of Obstetrics and Gynecology (ACOG) has published their “Levels of Maternal Care”<sup>7</sup>

- Birth Center
- Level I (Basic Care)
- Level II (Specialty Care)
- Level III (Subspecialty Care)

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<sup>6</sup> The Western Region Burn Mass Casualty Incident Response Plan:

<http://ameriburn.org/wp-content/uploads/2018/03/westernregionmciplan-1.pdf>

<sup>7</sup> (Obstet Gynecol 2019; 125:502-15)

- Level IV (Regional Perinatal Health Care Centers)

At this time, there is no mandate or license in California required for hospitals to be at a certain level, or to verify their self-reported level of care. Staff at the Community Perinatal Network have been working with the Maternal, Child and Adolescent Health Division in the Center for Family Health within the California Department of Public Health and the CDC on presumptive levels of maternal care for every hospital within the state. Using the CDC Levels of Care Assessment Tool (LOCATe), they now have self-reported (but non-verified) data from 242 hospitals, all with >50 births in at least one of the last 3 years. However, the self-designations do not necessarily use the ACOG categories. Attempts are being made to match the LOCATE criteria, ACOG categories, and the self-reporting from hospitals.

A survey performed in 2015 also identified whether a hospital had a maternal transport team – there are a small number. Work is ongoing to provide resources to EMS to assist in determining appropriate destination for maternal transport from field to hospital. Since levels of maternal care are not identified, this tool has limited applicability for application in possible evacuation of perinatal patients following a disaster.

Contacts:

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- Lucy Van Otterloo - [lucy@perinatalnetwork.org](mailto:lucy@perinatalnetwork.org)
- Kevin Van Otterloo – [kevin@perinatalnetwork.org](mailto:kevin@perinatalnetwork.org)
- Lisa Bollman – [lisa@perinatalnetwork.org](mailto:lisa@perinatalnetwork.org)
- Kay Daniels, Co-Director of Disaster Planning for the Johnson Center for Pregnancy and Newborn Services, Stanford University School of Medicine, [kdaniels@stanford.edu](mailto:kdaniels@stanford.edu)

Data elements in the accompanying Excel table and map tool include:

- County and Region
- Peds population 0-14 years of age (same as EMSC)
- Hospitals, including physical address, phone numbers (main, L and D, NICU, PICU, and Maternity, Neonatal, and Pediatric Transport), GIS coordinates
- tier (H, M, L, SB (burns), SE (ECLS, a/k/a ECMO), SP (psychiatry), SR (respite), ST (transplant), Trauma Designation
- # of beds: total, PICU, licensed pediatric, medical/surgical, NICU (Regional, Community, Intermediate), perinatal, ICU
- CCS Certification
- CPeTS (California Perinatal Transport System) region
- Trauma Designation (Adult 1 through 4, Pediatric 1 and 2)

Definition and availability of bed types is a moving target due to a variety of factors:

- PICU beds may be specific to a specialty service such as transplant or cardiovascular

- staffing on any given day, especially during a disaster, is not a given
- a facility may not be fully functional following a disaster, due to a host of reasons
- CDPH Licensing and Certification data may not be current or completely accurate bed availability is changing moment to moment

## 2. EMS

On a day-to-day basis, a low percentage of EMS 911 calls involve children. There are fewer prehospital interventions than those for older patients, therefore, skills retention is an important issue for EMS personnel, especially in rural areas. There is a tendency to “scoop and run” when transport can be achieved quickly. There are deficiencies in the preparedness plans for children with special needs such as those in wheelchairs, on ventilators, and those with mobility problems.

### EMS aspects needing clarification:

- EMS capacity/capability on any given day would be event dependent.
- EMS providers can expand the scope of practice through emergency declaration at the local or state level.
- It is difficult to determine how much in the way of resources needs to be specialized.
- How quickly resources can be mobilized through mutual aid and the National Ambulance Contract is difficult to ascertain and will be dependent on the nature of the event.

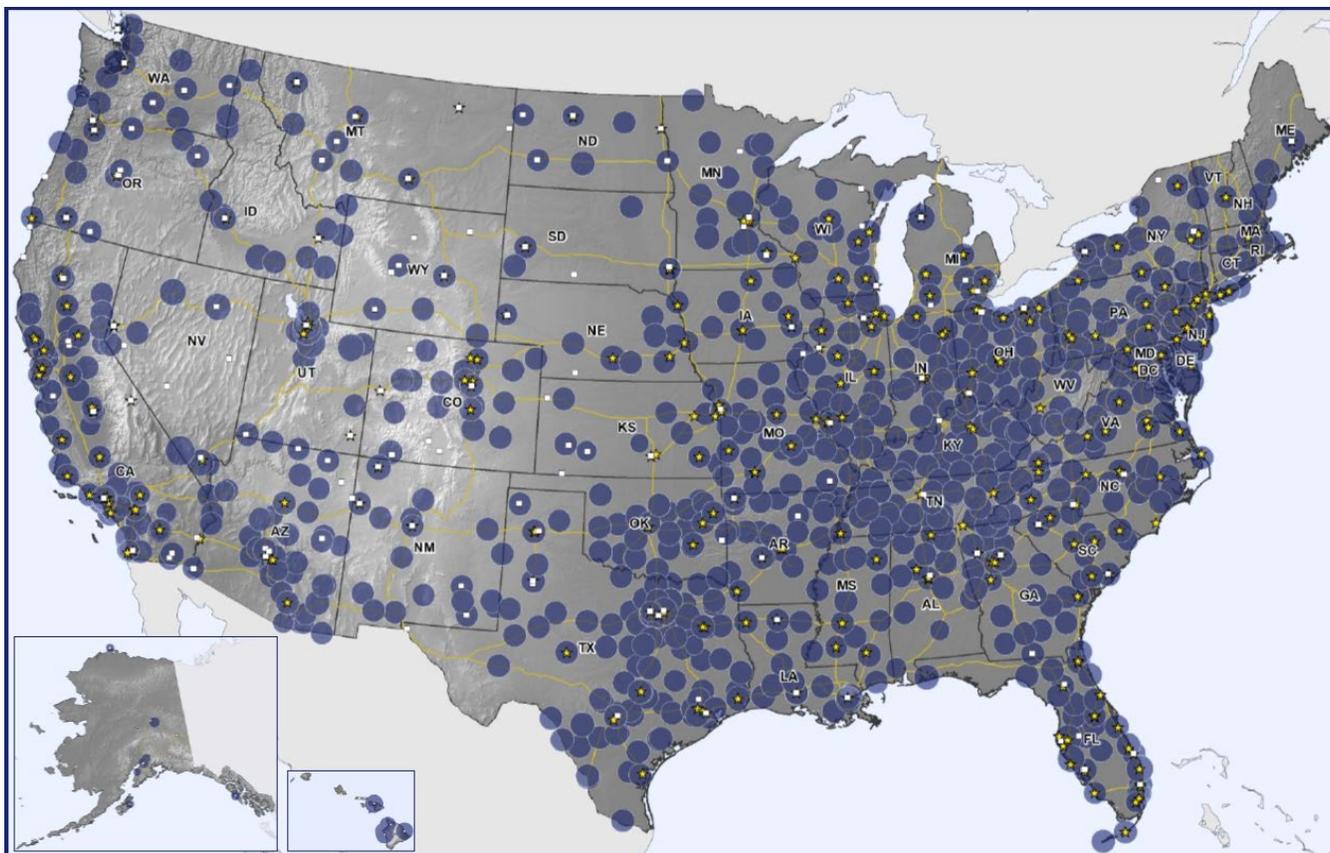
### Local EMS Agencies (LEMSA): There are 33 LEMSAs in California, which:

- Direct interfacility consultation, transfer and transport.
- Have agreements with tertiary care centers and other facilities outside LEMSA jurisdiction for pediatric patients requiring a higher level of care or specialized care.
- Have destination policies.
- Have methods of field communication with the receiving hospitals.
- Requirements for equipment and supplies are issued by LEMSAs and EMSC.
- The LEMSA Administrator and the Health Officer or their designees are identified in statute as the Medical Health Operational Area Coordinators (MHOAC). The MHOAC Program is required to have a Resource Directory, which includes EMS resources, both ground and air.

The LEMSA Administrator or their designee as a part of the Operational Area MHOAC Program would be the source for assessment of pediatric EMS capability/capacity data at the time of an incident.

The Association of Air Medical Services has created The Atlas and Database of Air Medical Services (ADAMS). ADAMS was initially developed with support from the Federal Highway

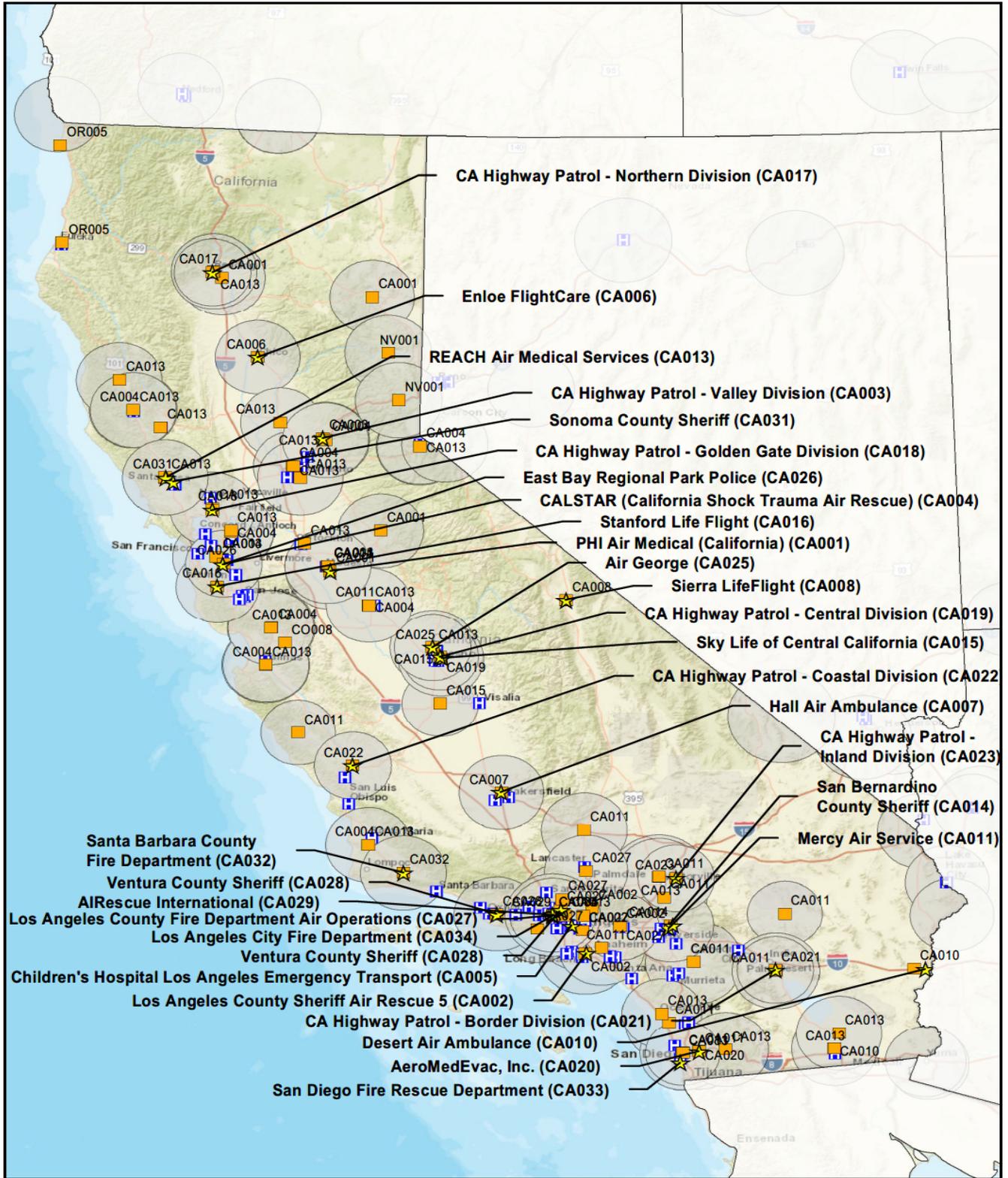
Administration (FHWA). The database is implemented in a web-based Geographic Information System to provide a map context for data query and analysis. Specifically, ADAMS includes descriptive & geographic information on air medical service providers, their communication centers, base helipads, rotor and fixed wing aircraft and receiving hospitals.<sup>8</sup>



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<sup>8</sup> <https://aams.org/> and [http://www.adamsairmed.org/public\\_site.html](http://www.adamsairmed.org/public_site.html)

# California 2018



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## Tools for EMS regarding destination choices

EMS providers must be able to identify the most appropriate destination facility when treating children with potentially severe illness and/or injury. Currently, no validated tool exists to assist EMS providers in identifying children who need transport to a hospital with higher-level pediatric care. A national expert panel developed a 13-item consensus-based criterion standard definition for identifying children with medical complaints who need the resources of a hospital equipped to provide higher-level pediatric services. This criterion standard will allow creation of a tool to improve pediatric patient care by assisting EMS providers in identifying the most appropriate destination facility for ill children.<sup>9</sup>

“The right care at the right time” is a long-held mantra in EMS. For adult cardiac centers, adult stroke centers and major trauma centers, most EMS agencies across the country have specific protocols directing transport to an optimal destination. Pediatric hospital care is increasingly concentrated in an ever-shrinking number of sites. A recent study showed that in the overwhelming majority of hospitals in four large states, most pediatric patients who require admission require interfacility transport to a second hospital for completion of care. When EMS transports a pediatric patient, we know that providers choose what care the patient is likely to need and choose an optimal destination. In fact, EMS bypasses the closest facility for about 40% of children. They usually make these decisions based on personal clinical experience as there are no widespread evidence-based guidelines like that of the adult and trauma guidelines. The Pediatric Decision Tree (PDTree for short) is a decision support tool to help EMS providers choose an optimal destination for their pediatric patient.

The PDTree Tool: The PDTree tool was developed using the available evidence base and providing the evidence to an expert panel of stakeholders, including EM physicians, pediatric physicians, EMS medical directors, EMS providers and a parent/family representative. The panel reviewed the evidence and determined an optimal destination type for 17 pediatric conditions that can be identified by EMS providers. The panel used a priori definition of 4 levels of hospital capabilities which are broadly defined and publicly available (designated trauma center, pediatric ICU care, pediatric inpatient care or 24/7 pediatric board-certified physician in ED, local hospital). Each of the 17 conditions was matched to the capability level most likely required for patient care. The goal of the project is to balance under-triage and over-triage of pediatric patients. There are many conditions where local hospitals or regional pediatric capable centers are appropriate and available, while for other conditions transport to a centrally located tertiary care hospital is most appropriate. The PDTree project is currently in pilot test for field use in three EMS jurisdictions in Maryland (urban, suburban and rural EMS agencies) with results anticipated in 2019.

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<sup>9</sup> See Academic Emergency Medicine, published online 10/3/18, <https://onlinelibrary.wiley.com/doi/abs/10.1111/acem.13625>

The PDTree team has developed a smartphone application which is available on both iOS and Android platforms. It can be found by searching “PDTree” in the app stores. The app is free to users and input is welcomed! The next phases of the project will aim for adaptation of the PDTree for use by EMS in other geographic areas, particularly focusing on the differences in needs where multiple destination options are available for an EMS agency and where few destination options are available.<sup>10</sup>

### **3. Transport System/Teams**

The California Perinatal Transport Systems (CPeTS)<sup>11</sup> was established in 1976 pursuant to the enactment of California Assembly Bill 4439. This act appropriated funds for the development of a dispatch service to address the need for facilitating transport of critically ill infants and mothers with high risk conditions to regional Neonatal Intensive Care Units (NICUs) and Perinatal High-Risk Units (PHRUs). There are on-average about 7,000 acute neonatal transports each year in California, with approximately 8% via air.

#### Northern California Perinatal Transport System (NCPeTS):

- Phone: (650) 736-2210

#### Southern California Perinatal Transport System (SCPeTS):

- Phone:(714) 921-9755

The role of CPeTS is information sharing. CPeTS can assist health care professionals in the referral of high-risk pregnant women and newborn infants. An updated bed availability status is obtained daily (and with any significant change) from regional CCS-California Children Services approved neonatal intensive care units. There are many NICUs participating in this daily survey that includes an array of county, for-profit, non-profit, university affiliated and HMO-owned facilities. The information is available on their website and includes the name and contact information for the transport coordinator. A call to CPeTS would also enable assistance. Currently there is no data for perinatal beds. Limitations to the data include accuracy, being up-to-date and bed availability versus availability of staff and/or “stuff.”

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<sup>10</sup> Additional information is available on the project website [www.pdtree.org](http://www.pdtree.org).

<sup>11</sup> California Perinatal Transport System – Nor Cal and So Cal – [www.perinatal.org](http://www.perinatal.org)

### Specific Legislative Mandate:

Establish a 24-hour-a-day, year-round dispatch center that links all hospitals providing obstetrical services with neonatal intensive care nurseries.

Assist, if needed, in referral of critical newborn infants to appropriate California Children Services (CCS) certified neonatal intensive care centers.

Generate a centralized data base, consisting of statistical information for monitoring and evaluating the functions, efficiency, and timeliness of all infant transports within the Northern California region.

NCPeTS Provide service in the following sixteen California counties: Del Norte, Humboldt, Mendocino, Lake, Sonoma, Napa, Marin, Contra Costa, Alameda, San Francisco, San Mateo, Santa Clara, Santa Cruz, Monterey, San Benito and San Luis.

SCPeTS Provide service for the region south of the Tehachapi Mountains (Southern California) encompassing the following 11 counties: Imperial, Inyo, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura.

### What Services Are Provided:

- Provides emergency access to the perinatal system for high-risk maternity patients and critical neonates.
- Assists in the referral and transport of high-risk maternity patients and critical neonates to appropriate CCS approved perinatal and neonatal care facilities.
- Maintains a bed-availability roster for neonatal intensive care facilities. Direct assistance for consultation/referral may be obtained by calling the respective Dispatch Center above.
- Collection and analysis of perinatal and neonatal transport data for regional planning, outreach program development, and outcome analysis. This information is reported to participating hospitals, and the Division of Maternal, Child, and Adolescent Health of the California Department of Public Health
- Support of an integrated network of regional perinatal programs in California. Opportunities for regional perinatal programs to share and solve their common problems are provided through meetings of its Regional Quality Improvement Committee.

When the Governor of the State of California has declared a “Designated Disaster Area,” infants being transported from or to a facility in order to comply with evacuation orders DO NOT need a completed CPeTS Neonatal Transport Form.

Critical care transport (CCT) for children evolved as a result of the regionalization of neonatal and pediatric specialty care. This occurred first in the world of neonatal transport in the 1960’s and ‘70’s, followed about a decade later by the development of pediatric transport teams. In the continuum of care for critically ill or injured children, the chain often starts with EMS beginning care at the scene and continuing until transferring care at the local community

hospital. After stabilization in the local hospital's ED, interfacility transport teams continue the patient's care on the way to the definitive care center. Over the years, neonatal and pediatric subspecialty transport teams have evolved to excel at improving patients' conditions during the interval from the bedside at the referring facility to patient hand-off at the accepting facility – all while minimizing the potential adverse effects of the mobile environment. This practice is in contrast to the common prehospital EMS approach of “scoop and run” from the scene of an incident to the ED when only minimal interventions needed to resuscitate and stabilize the patient are initiated in order to expedite transport.

Although there is a tremendous amount of variability amongst how neonatal-pediatric transport teams are configured. Key commonalities include:

- Real-time medical direction by “medical control” physicians knowledgeable of critical care and the peculiarities of transport medicine.
- Vehicles adequately equipped to allow personnel to deliver critical interventions and therapeutics without relying on supplies from the referring facilities.
- Communication/dispatch capabilities.
- Standard operating procedures and clinical guidelines or protocols.
- Quality review and improvement programs.
- Medical and nursing clinical directors.
- Administrative support.
- Business and financial support for sustainability.

Ideally, a transport team should be capable of arranging transfer of a patient via ambulance, helicopter or fixed wing even if they cannot complete the transfer themselves. As described in the Emergency Medical Treatment and Active Labor Act (EMTALA), technically the referring physician is responsible for determining the mode of transport and the composition of the transporting team. However, in practice, these decisions are either deferred to the transport teams or made collaboratively with the referring physician.

Transports are not limited to those bringing patients to the specialty centers. Best practices support policies and interfacility agreements that facilitate “reverse transports” as well. These are transports to local community hospitals when hospitalization is still required but subspecialty intensive care is no longer or not necessary. This is an important mechanism for freeing up bed capacity during surge events in pediatric and neonatal intensive care units.

All of the HIGH-level facilities have some capability for transport of perinatal, neonatal, and/or pediatric patients. Most have specialized staff either contracted, in-house, or on-call. The specialized transport equipment is either provided by the hospital or the transport provider, either ground or air. Only a few facilities have transportation resources in-house; most have pre-existing agreements with private ground and air ambulance providers.

#### 4. Emergency Department (ED)

There are approximately 137 million ED visits annually in the US and around 21 million of those patients arrive by ambulance via EMS. Of those, 1.2 million EMS arrivals are children <15 years of age. In 2014, approximately 20 percent of ED visits were for children <15 years of age. The majority of children (83 percent) who are ill or injured are brought to community hospital emergency departments by virtue of proximity. Over 69 percent are cared for in EDs that see fewer than 15 pediatric patients per day. According to the Agency for Healthcare Research and Quality (AHRQ), national data for 2015 (using OSHPD data for California) showed that 17 percent of all children in the United States sought emergency care at least once. Although reasons for pediatric ED visits vary by age and season, conditions such as wounds, sprains and strains, and viral and respiratory infections are common, as well as symptoms such as fever, cough, nausea, vomiting and abdominal pain. More than 96 percent of visits resulted in treat and release, with almost 4 percent resulting in hospital admission.

The American Academy of Pediatrics (AAP), American College of Emergency Physicians (ACEP) and the Emergency Nurses Association (ENA), published updated joint guidelines in the November 2018 issue of Pediatrics titled, "Pediatric Readiness in the Emergency Department". This policy recommends ways that health care providers can make sure every injured or critically ill child receives the best care possible. This is a revision of a 2009 AAP policy statement that highlights recent advances in pediatric emergency care that can be incorporated into all hospital emergency departments that care for children. It recommends that all hospital emergency departments have the appropriate resources (medications, equipment, policies, and education) and capable staff to provide effective emergency care for children, and when appropriate, timely transfer to a facility with specialized pediatric services. However, approximately half of hospitals reported lacking disaster plans (53.2%) that include specific care needs for children.

Attempts to assess and score EDs has been met with limited success, as only a limited number of EDs have completed the voluntary National Pediatric Readiness Assessment. The focus is often on beds, so we seek to define hospitals through horizontal and vertical categorization in order to do system-wide planning. It is extremely important for disaster planning to understand which hospitals can take neonates or critical pediatric patients. This will assist in decision-making so that the right EMS resource is used to take a patient to a destination with an appropriate bed. Our goal is to foster accurate, meaningful, useful, and integrated decisions defined by clinical personnel. This includes a clearly outlined scope of expectations (staffing, equipment, transportation resource, destination bed type, transport teams, use of mobile teams).

In recent years, national experts have raised concerns about pediatric emergency preparedness in community hospitals and have released guidelines to promote greater equity in pediatric emergency care. Hospitals that provide comprehensive emergency services and meet defined pediatric emergency care requirements can seek recognition as an Emergency

Department Approved for Pediatrics (EDAP), a program originating in Los Angeles County in the early 1980's.<sup>12</sup>

EDAPs offer:

- Equipment specially designed for pediatric patients.
- A staff of physicians and nurse who are trained in both pediatric and emergency medicine and pediatric advanced life support.
- A Medical Director who is responsible for assuring quality of care by reviewing pediatric patient medical records.
- An ED Nurse Manager/Director and Pediatric Liaison Nurse who oversees the quality improvement program and ensures that the EDAP meets established standards.

The National Pediatric Readiness Project was launched in 2013. It is a quality improvement initiative to ensure that all hospital emergency departments in the US have the essential materials, training, and resources in place to provide effective emergency care to children. The National Pediatric Readiness Project brings together the federal Emergency Medical Services for Children (EMSC) Program, the American Academy of Pediatrics (AAP), the American College of Emergency Physicians (ACEP), and the Emergency Nurses Association (ENA), all of whom have a vested interest in working collaboratively to improve pediatric emergency care. The EMSC Program is also utilizing the expertise of its two resource centers -- the EMSC Innovation and Improvement Center (EIIC) and the National EMSC Data Analysis Resource Center (NEDARC) -- as well as its State Partnership grantees to implement this project. A national assessment of emergency department's readiness to care for children was completed in 2013. Below is information regarding the assessment, state-specific response rates, and national results.<sup>13</sup>

A follow-up project coordinated by the EMSC EIIC is the Pediatric Readiness Quality Collaborative,<sup>14</sup> which aims to improve pediatric readiness of community emergency departments with interventions developed to address gaps in care. The PRQC has over 120 emergency departments across 16 states actively engaged in this quality improvement interventions. The objective of these interventions is to improve pediatric readiness scores by 10 points by December 2019 in these participating facilities.

An important first step in improving the pediatric readiness of an ED is the identification of a physician and nurse coordinator for pediatric emergency care. A pediatric emergency care coordinator (PECC) is a physician coordinator identified by the ED Medical Director or an RN

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<sup>12</sup> See [http://file.lacounty.gov/SDSInter/dhs/232654\\_2015EDAP\\_brochure.pdf](http://file.lacounty.gov/SDSInter/dhs/232654_2015EDAP_brochure.pdf)

<sup>13</sup> [https://tableau.utahdcc.org/t/nedarc/views/2013-14NationalResultsPublic\\_0/NationalPediatricReadinessProject?:embed=y&:display\\_spinner=no&:showShareOptions=true&:loadOrderID=0&:display\\_count=no&:showVizHome=no](https://tableau.utahdcc.org/t/nedarc/views/2013-14NationalResultsPublic_0/NationalPediatricReadinessProject?:embed=y&:display_spinner=no&:showShareOptions=true&:loadOrderID=0&:display_count=no&:showVizHome=no)

<sup>14</sup> <https://emscimprovement.center/collaboratives/prqc/>

coordinator identified by the ED Nurse Director. One of their functions is to facilitate the integration of pediatric needs in hospital disaster and/or emergency preparedness plans and promoting the inclusion of pediatric patients in disaster exercises (to include triage, isolation, quarantine, decontamination, tracking, identification of unaccompanied minors, family reunification and the determination of pediatric surge capacity.) They serve as liaisons and/or coordinators in collaboration with appropriate in-hospital and out-of-hospital pediatric care committees in the community and/or region and EMS, trauma, and emergency preparedness coordinators. They also serve as liaisons to definitive-care hospitals, such as regional pediatric referral hospitals and trauma centers, EMS agencies, primary care providers, health insurers, and any other care resources needed to integrate services along the pediatric care continuum.

Analysis of Pediatric Readiness assessment data validated that having pediatric emergency care coordinators (PECC) in an emergency department (ED) increased the likelihood of emergency department readiness for children. According to a recently released article by Marianne Gausche-Hill, MD, "The presence of physician and nurse PECC's was associated with a higher adjusted median pediatric readiness scores (**82.2**) compared with no PECC (**66.5**) across all pediatric volume categories. The presence of PECC's increased the likelihood of having all the recommended components, including a pediatric quality improvement process."<sup>15</sup>

Links for further information:

[www.Pediatricreadiness.org](http://www.Pediatricreadiness.org)

[www.pedsready.org](http://www.pedsready.org)

[www.lapedstry.org](http://www.lapedstry.org)

<http://www.traumanurses.org/inter-facility-tool-kit-for-the-pediatric-patient>

## **5. Emergency Medical Services for Children (EMSC)**

California has established an EMSC system. This includes accreditation and categorization of hospitals based on available equipment, supplies and medication requirements, staffing and training, medical direction for prehospital care, and rapid consultation with a comprehensive regional pediatric center. Formal relationships through agreements or memorandums of understanding and interfacility transfer agreements are established proactively.<sup>16</sup>

The EMSC Pediatric Disaster Preparedness Guide states:

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<sup>15</sup> A National Assessment of Pediatric Readiness of Emergency Departments. *JAMA Pediatric*. 2015;169(6):527-534. doi:10.1001/jamapediatrics.2015.138.

<sup>16</sup> <https://emscimprovement.center/resources/publications/pediatric-regionalization-of-care-primer/>

- Destination policies must be in place for responding to numerous children in an MCI, including transfer to higher levels of care for more seriously ill or injured children.
- Agreements must be made with pediatric tertiary care centers and other facilities outside of the LEMSAs jurisdiction for pediatric patients requiring a higher level of care or specialized care.
- Mutual aid agreements must be made with other health care facilities, such as pediatric long-term care and rehabilitation facilities.
- School, faith-based and pediatric clinics, for potential use as alternate treatment areas, should be identified and included in disaster planning.
- Relationships must be established with pediatric tertiary care centers for assistance in disasters.

EMSC embodies a system that provides a continuum of care for the pediatric patient. In the midst of a disaster, this includes access to medical care, prehospital emergency care, emergency department care and inpatient care (including specialized pediatric critical care when necessary), discharge planning, and follow-up care. Individual patients may require one or many of these components. Although individual features may vary as a function of age of the patient, severity of illness or injury, geographical location of the event, and the nature of the event, the central theme is that a system of care is required to ensure that all pediatric patients receive the care they need.

Healthcare systems have historically been oriented toward adult care. The assessment and management of critical illness and injury in pediatric patients requires specialized staff with training and experience, equipment and medications, which are not readily available in all geographic areas, and are concentrated in urban areas, many of which are most susceptible to compromised capability during disasters. In areas or disaster events where specialized pediatric critical care is not available, the outcome of pediatric critical illness and injury is adversely affected.

Therefore, a regional approach, requiring linkages between government response entities, outpatient providers, EMS providers and hospitals, is essential. To truly achieve a continuum of care, bridges must be established between government and private entities, across healthcare systems, beyond catchment areas, and in a catastrophic event, across state lines. Regionalization is the process of organizing resources within a geographic area to ensure access to medical care of a level appropriate to the patient’s needs, while maintaining efficient use of the available resources – “right care, at the right place, at the right time.”

Regionalization of healthcare can best be defined as a structured system of care to improve patient outcomes by directing patients to facilities with optimal capabilities for a given type of illness or injury.

Regionalization of disaster response is particularly important for children, because of the small number of tertiary centers capable of caring for the most critically ill pediatric patients. Pediatric regionalization facilitates match appropriate resources to an ill or injured child’s needs.

### Pediatric regionalization:

- Facilitates matching appropriate resources to a child’s healthcare needs.
- Increases access to healthcare specialists and pediatric specific resources, such as pediatric critical care.
- Helps to control healthcare costs and improve quality of care across a population.

Geography and jurisdictional boundaries often impose community isolation from the very pediatric centers and specialists that critically ill and injured children may need. Pediatric specialists are few in number in comparison to the general pediatric population, and often are described as being maldistributed and not readily available in every community. Pediatric specialty centers and specialists are primarily found in urban, tertiary, academic medical centers. Thus, children needing access to specialists will need to be transferred or the resources/specialists will need to be brought to them.<sup>17</sup>

## **6. Outpatient Facilities**

Outpatient facilities are practice-based primary care providers, community health centers, health clinics, rural health clinics, tribal clinics, and other community non-hospital ambulatory healthcare partners, both affiliated and non-affiliated.

Many persons with healthcare needs do not need the 911 system, EMS, the ED, or hospital care, and their needs can be provided in the available healthcare system for outpatients. Having a fully functional outpatient system that is integrated into the overall healthcare response will serve to alleviate the surge on the higher levels of care that need to be decompressed following a catastrophic event. Failures, damage, or compromise to ambulatory care operations can dramatically increase the stress on the EMS and hospital systems and also result in exacerbations of chronic medical conditions that add additional healthcare burdens.<sup>18</sup>

During disasters and/or public health emergencies, outpatient facilities play a critical part in the response by addressing the needs of patients with both acute and chronic conditions. Their extensive geographic coverage, strong community ties and ability to serve medically underserved areas enable them to play essential roles in ensuring a coordinated response should an event strike the communities they serve. Being integrated into their community’s emergency management framework during disasters will assist them in maintaining their

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<sup>17</sup> <https://emscimprovement.center/resources/publications/pediatric-regionalization-of-care-primer/>

<sup>18</sup> <https://disasterinfo.nlm.nih.gov/search/id:13725>

continuity of operations. The relationships that will provide them with planning and response resources include:

- The local Healthcare Coalition (HCC)
- Nearby hospitals
- Local Health Department (LHD)
- Local Office of Emergency Services (OES)
- LEMSA
- Professional associations

Benefits of participation in preparedness activities (such as the Pediatric Readiness Program):

- A culture of preparedness among staff.
- An awareness of ways to improve readiness at the facility.
- The ability to maintain operations and revenue stream despite infrastructure or other challenges (power outages, supply chain issues) during an emergency (continuity of operations).
- A plan for the orderly referral of patients to other facilities if the facility is forced to close in a disaster.
- The ability to quickly respond to a surge of injured or ill children and provide appropriate treatment and triage in coordination with other parts of the healthcare system.
- A better understanding of community/region needs and vulnerabilities (Hazard Vulnerability Assessment, improved information sharing with improved situational awareness, and pre-established communication linkages).
- Recognition and respect for their own capabilities.

A Topic Collection from TRACIE (Technical Resources, Assistance Center, and Information Exchange), updated in February 2019, provides resources that can help emergency planners in emergency clinics, community health centers, mental/behavioral healthcare providers, federally qualified health centers, private physician offices, and other outpatient facilities plan for and respond to a variety of incidents, disasters and emergencies. Resource topics include Community Integration, Education and Training, Guidance, Lessons Learned, and Plans, Tools, and Templates.<sup>19</sup>

Community partners should be prepared to provide care for children and families who have relocated to ensure that care is available to those who do not have financial resources. Many will be without records or knowledge of their medical conditions and treatment regimens. Many will have undergone traumatic changes in their lives, loss of personal resources and/or loss of

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<sup>19</sup> <https://asprtracie.hhs.gov/technical-resources/49/ambulatory-care-and-federally-qualified-health-centers-fqhc/47>

family, community, and social support networks. Needs will include triage and treatment for new conditions brought on or caused by the event itself and caring for chronic medical conditions exacerbated by the disruption of the usual support and care system and the event.

Providers will include non-hospital clinical resources, affiliated and non-affiliated, community healthcare providers/partners and ambulatory care.

### Healthcare Coalitions

The level of community clinic involvement in disaster planning for pediatric patients may have recently been improved through the development of local Healthcare Coalitions (HCC). Due in part to time limitations, primary care providers are unlikely to be directly engaged in HCCs. However, they have interest in assuring that they can quickly respond to and recover from catastrophic incidents to ensure that they can continue providing patient care. The development and promotion of resources addressing business continuity planning, alternate practice site identification, supply chain considerations, reporting of unusual presentations, and collaboration with the local hospitals and EMS systems to support medical surge in disasters is critical.

The Healthcare Coalition is useful for all phases of comprehensive Emergency Management, but its primary mission should be to support healthcare organizations during emergency response and recovery. An element of this mission is promoting integration of coalition member organizations into the broader community response.

### Specific objectives may include:

- Facilitate information sharing among participating healthcare organizations and jurisdictional authorities to promote common situational awareness.
- Facilitate resource support by expediting the mutual aid process or other resource sharing arrangements among Coalition members and supporting the request and receipt of assistance from local, State and Federal authorities.
- Facilitate the coordination of incident response actions for the participating healthcare organizations so that incident objectives, strategy and tactics are consistent for the healthcare response.
- Facilitate the interface between the HCC and relevant jurisdictional authorities to establish effective support for healthcare system resiliency and medical surge.

The key is for providers in the ambulatory care system to be connected to other response entities so that they will be able to receive and can contribute to situational awareness and be integrated into the response structure in any medical surge. This requires a communications plan including ambulatory care providers, hospitals, health department, emergency management and EMS.

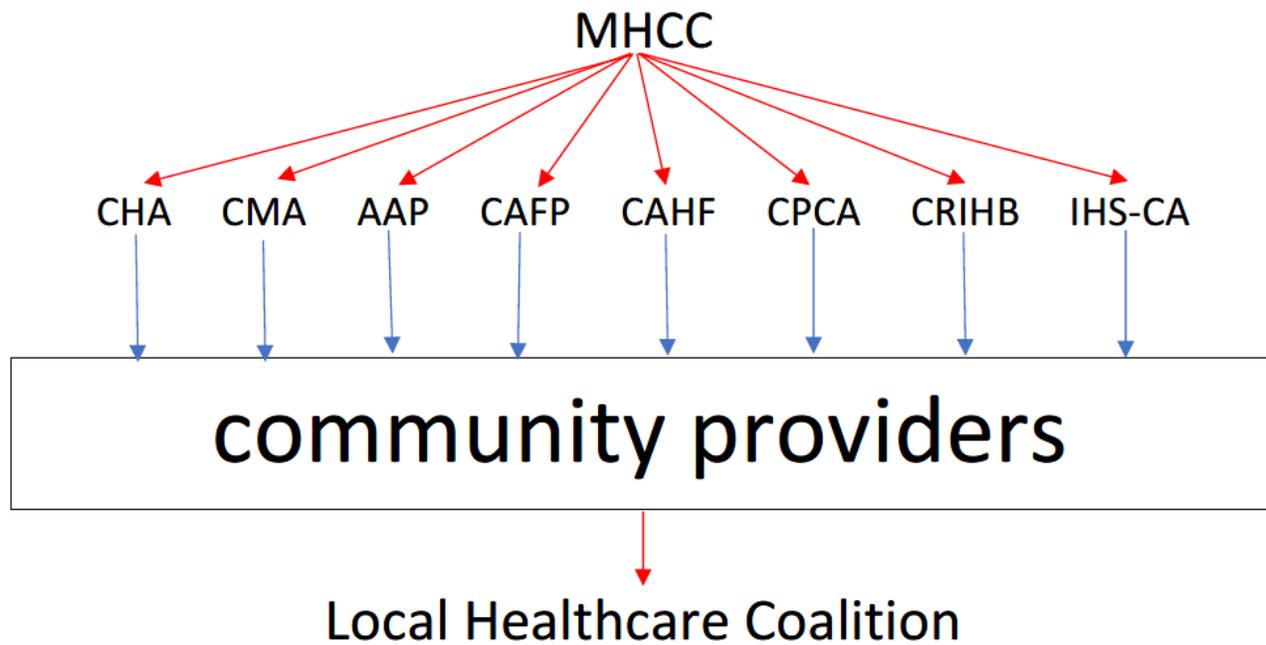
Steps to be taken include:

- Planning how a healthcare practice would respond during likely emergency scenarios.
- Ensuring a healthcare practice is signed up to receive emergency notifications from local HCC response partners and agencies and establish a process for sharing this information with staff.
- Identifying roles and responsibilities for your personnel.
- Knowing who to contact to request or offer support during an emergency.

Professional Associations

Since many community providers may not be part of local HCCs, plan on utilizing professional associations with established communication networks to contact their constituents during an emergency in order to maximize their ability to be integrated into the local response in coordination with the MHOAC.

## Integrating community providers into local response



CHA – California Hospital Association

CMA – California Medical Association

AAP – American Academy of Pediatrics

CAFP – California Academy of Family Physicians

CAHF – California Association of Health Facilities

CPCA – California Primary Care Association

CRIHB – California Rural Indian Health Board

HIS-CA – Indian Health Service California

Partners actively involved in preparing their constituents for responding to the needs of pediatric patients include:

American Academy of Pediatrics:

- Disaster Preparedness Advisory Council (DPAC), Strategic Plan 2016-2020:
  - #3.C. Support the development of collaborative networks within states and regions. Encourage state-level collaborations with AAP Chapters and EMSC grantees.
  - #3.D. Encourage drills and exercises to address children’s issues
  - #4.C. Work with the CDC to engage children’s hospitals in discussions and plans to improve pediatric surge for an ID outbreak or PH emergency.
  - #5. Support AAP Chapters and members in their response to and recovery from a disaster
- As of Fall, 2019, the AAP DPAC has now become the Council on Disaster Preparedness and Recovery
- Children and Disasters: Pediatric Disaster Preparedness and Response Topical Collection
  - Author: Chung, S., Foltin, G., Schonfeld, D.J., et. al
  - Source: American Academy of Pediatrics
  - Date Published: 2019
  - Annotation: This collection is based on an all-hazards approach and is designed for use by pediatricians and other healthcare providers who would care for children in a disaster. First responders; shelter, school, and child care personnel; volunteers; emergency planners; and policy makers can use the information to better understand and meet the specific needs of children during disasters.<sup>20</sup>
- Sean Diederich, Program Manager, Disaster Preparedness and Response
  - AAP
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<sup>20</sup> <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Children-and-Disasters/Pages/Pediatric-Terrorism-And-Disaster-Preparedness-Resource.aspx>

- Laura Aird, Senior Manager, Disaster Preparedness and Response  
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415-345-8667  
[cafp@familydocs.org](mailto:cafp@familydocs.org)  
[www.familydocs.org](http://www.familydocs.org)

California Rural Indian Health Board (CRIHB)  
Nicamer Tolentino  
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Dr. Thomas Kim, MD, MPH, Medical Director/Epidemiologist  
[tkim@crihb.org](mailto:tkim@crihb.org)  
1020 Sundown Way  
Roseville CA 95661  
916-929-9761  
<https://crihb.org><sup>21</sup>

Indian Health Service/California Area Office  
Dr. Charles Magruder  
Tribal Health Programs (not associated with CRIHB)  
916-930-3927  
[Charles.magruder@ihs.gov](mailto:Charles.magruder@ihs.gov)

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<sup>21</sup> CRIHB is a primary care association providing technical assistance to independent tribally owned clinics. There are 8 consortiums representing approx. 50 tribes at 25 sites, mostly in central and northern California. Clinics vary in size from a single provider up to 9-10 providers. The majority of the clinics are engaged with their local Healthcare Coalitions.

California Primary Care Association  
Amanda Willard, Emergency Preparedness Lead  
916-440-8170, Ext 1083  
[awillard@cpc.org](mailto:awillard@cpc.org)  
<https://www.cpc.org> <sup>22</sup>

California Association of Health Facilities  
916-432-5194  
Jason Belden  
[jbelden@cahf.org](mailto:jbelden@cahf.org)  
<http://www.cahfdisasterprep.com>

California Medical Association  
916-551-2020  
1201 K St, Suite 800  
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## 7. National Disaster Medical System (NDMS)

The National Disaster Medical System (NDMS) is a federally coordinated system that augments the nation's emergency medical response capacity. It provides for large-scale patient movement from disaster areas to non-impacted adjacent regions. It is a public/private partnership between government agencies, Disaster Medical Assistance Teams (DMAT), civilian hospitals and emergency response organizations. In 1984, by declaration of the President, NDMS became an agency of the US Public Health Service within the Department of Health and Human Services (HHS). In March 2003, NDMS was transferred to the Response Division of FEMA under the Department of Homeland Security (DHS).

Pediatric Subspecialty Teams (PST) are specialty DMATs and have been developed to serve the unique needs of pediatric victims of disaster. PSTs provide pediatric specific equipment,

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<sup>22</sup> CPCA represents approx. 1,300 health centers, including FQHCs, RHCs, Indian Health Centers, and includes primary care providers, dental providers, and behavioral health providers. CPCA acts as a resource for their members in preparedness, providing training, technical assistance, and best practices, amidst the usual constraints of staff turnover and time and financial stress. They are organized with regional consortia and do have the ability to target their contacts in a given area. They encourage their constituents to link with their local Healthcare Coalitions on an ongoing basis. They are interested in partnering with the MHCC in being the primary source of information during a disaster. The Emergency Preparedness Lead would be the contact at the above #. They do not have a 24/7 capability, but in a catastrophic event, would likely be aware and able to place themselves into the role of facilitating bidirectional information exchange between the MHCC and their local health centers.

supplies and pharmaceuticals, and members include pediatric emergency medicine, pediatric trauma surgery, general pediatrics, neonatology, anesthesiology, and toxicology physicians and nurses, as well as respiratory therapists and pharmacists. The critical functions of PSTs are the same as for DMATs.

Pediatric specific disaster related considerations include:

- The specific vulnerabilities of children to hazards of disaster.
- Unique patterns of injury and illness in children.
- Pediatric appropriate evaluation and management.

There are no PSTs in California.

Experience has taught that even under the best circumstances, a national disaster response (especially for a widespread or large-scale disaster) will likely not be adequate. Even when pre-deployed, it is difficult, if not impossible, for teams to be on-site soon enough to save critically injured victims who require treatment within those first few hours. The axiom “all disasters are local” emphasizes this point.

Systems that are activated at the local or regional level may prove more efficient than dependence on national or otherwise highly bureaucratic entities. Volunteer healthcare providers, hospitals, transport teams, and the public may well be providing care before government resources can start functioning. Previous experience in disasters has identified poor coordination between federal and private resources in the ordering and delivery of resources. There is a need for enhanced collaboration of public and private skills, resources, expertise, and facilities.

NDMS patient categories only include:

- Critical care
- Burns
- Medical/surgical
- Pediatric
- Psychiatric

NICU and perinatal patients are not separately identified.

In addition, the ASPR TRACIE Team has commented that “while we don’t say DOD will never carry these types of patients (neonatal/pediatric), it is best to plan that DOD will not carry these patients on DOD aircraft. It is due to the fact that DOD does not have the proper equipment, nor do they have the trained personnel. The state should plan for these patients to be moved utilizing the National EMS Contract. It is also important to point out that these assets (the aircraft from the EMS contract), will be under the control of the state and as such these patients will not be NDMS patients.” These NDMS and DOD guidelines are also followed by the California National Guard (CANG).

The formal response to a national disaster depends on the activation of the NDMS. However, activation of NDMS following Katrina produced suboptimal benefits for pediatric patients. NDMS activation did not significantly impact immediate patient care. Evacuation of pediatric patients across state lines was not formally considered part of the NDMS response structure, and pediatric providers were not formally involved in the local NDMS responses.

NDMS participating hospitals are civilian hospitals that have signed a MOA with a Federal Coordinating Center (FCC) to provide medical care to patients evacuated through the NDMS system. In California, there are FCCs in San Francisco, Los Angeles, and San Diego. There are >1600 NDMS-participating hospitals nationwide, with beds designated in 6 categories including medical/surgical, critical care pediatrics, critical care adult, pediatric, psychiatric and burns. The NDMS hospitals report the total number of available beds to the FCC within 12, 24, and 48-hours.

### **Telemedicine**

Telemedicine is a valuable tool that can be used to expand the capability of MEDIUM or LOW level facilities to care for perinatal, neonatal, and pediatric patients, whether by keeping patients that they would normally send on to a higher level of care or by accepting patients that are being sent to them in order to decompress a higher level facility.

An example is the “Escape Project: Enhancing Surge Capacity and Partnership Effort” from UC Davis.<sup>23</sup> UC Davis’s program, called “Enhancing Surge Capacity and Partnership Effort” (ESCAPE) addresses the challenging subject of healthcare surge capacity—the ability of the healthcare system to rapidly expand to accommodate an influx of critically ill or injured patients.

Key aspects of ESCAPE include:

- Refining the crisis standard of care across a large geographic region to maximize population health outcomes (rather than the focus being on the individual patient, the focus is on the population and doing the most good for the greatest number of people). Refining the crisis standard of care for surge events seeks to improve population-based healthcare outcomes in a disaster by providing equal, ethical, and coordinated care across the region. When an area becomes saturated with additional patients due to an event, healthcare organizations within the involved area, as well as those in adjacent areas, may need to provide care in a different way. There may not be enough supplies, people, or space in existing healthcare facilities to accommodate patients while practicing care as usual. In order to

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<sup>23</sup> ESCAPE Telemedicine for Healthcare Facilities/Alternate Care Sites

maximize population outcomes, we will create a set of operational patient care standards that will be applied equally and uniformly throughout the partnership and region with the assistance of telemedicine. These standards will be in the areas of adult critical care, pediatric critical care, trauma, burns, and acute mental health care. This aspect of the project draws on the expertise of practicing clinicians and healthcare disaster specialists, using evidence-based medicine where available, to define a tiered standard of care system. This will allow resources to be maximized across the region for the best possible population outcomes.

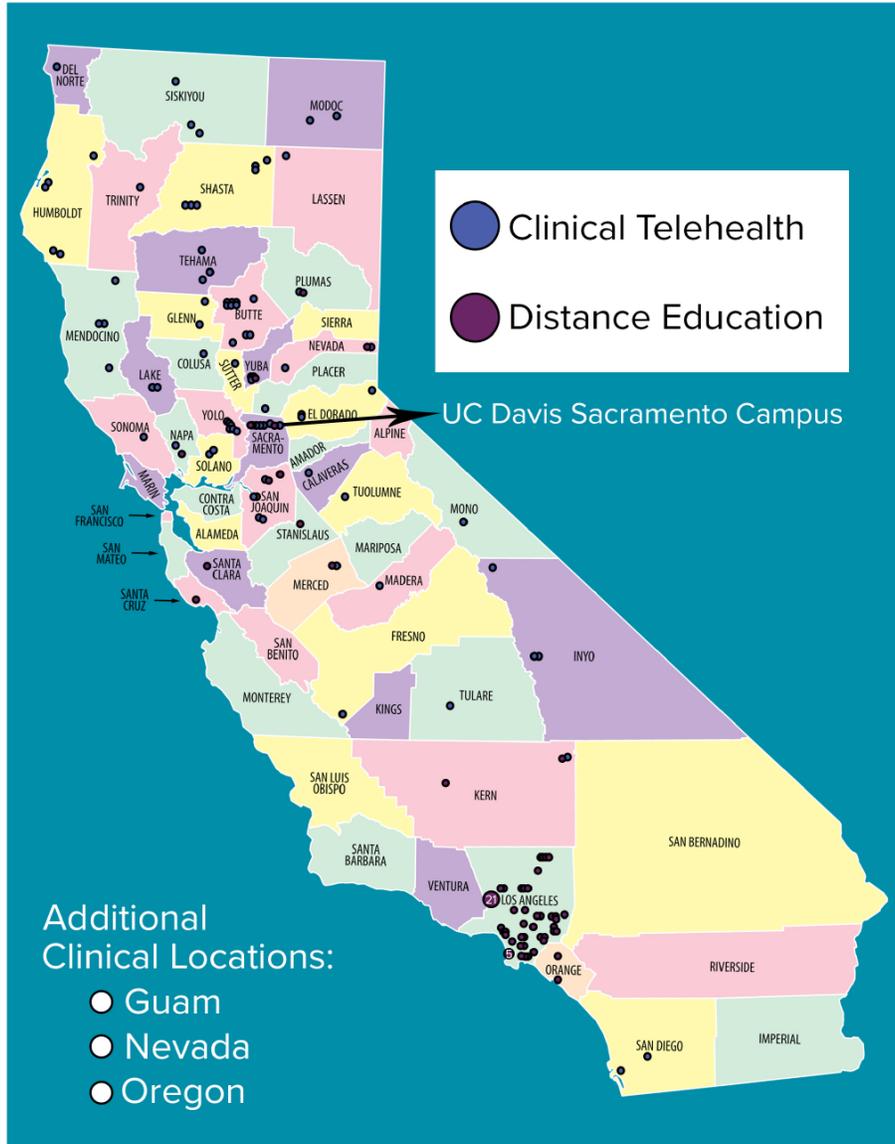
- Using technology to extend resources (people, equipment and supplies) through the use of telemedicine and Radio Frequency Identification (RFID) tracking. The second concept, using technology to bridge the healthcare gaps that would be intensified by a surge situation, draws on UC Davis's innovative telemedicine program, which began in 1992. Currently, the program provides more than 40 specialty healthcare services remotely to over 85 predominantly rural sites in California both North and East of Sacramento. With its academic medical center in Sacramento, UC Davis provides direct clinical care using a variety of innovative telehealth applications, including video-based consultations, 'store-and-forward' services such as radiology, critical care advice and guidance, interpretation services, quality assurance in sexual assault exams, and home-health monitoring. Healthcare providers in counties throughout this region often take advantage of the wide array of specialists that can be reached for consultation via telemedicine through the use of tailored video conferencing equipment in the exam or treatment room. Telemedicine has not previously been used to increase care options in a healthcare surge event; however, expanded to additional hospitals and other types of healthcare providers, this capability could vastly improve both specialty care and the quality of medicine practiced by licensed medical professionals who might be called upon to practice outside their scope. <sup>24</sup>

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# UC Davis Telehealth Services



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## **Mobile Pediatric Emergency Response Team (MPERT)**

In response to Hurricane Katrina, Baylor College of Medicine and Texas Children's Hospital responded and developed a MPERT. Involved departments included but were not limited to family and community medicine, pediatrics, internal medicine, radiology, and OB/GYN.

San Diego is the only location in California with a similar program.<sup>25</sup>

### **Recommendations from Texas Children's Hospital and the Astrodome:**

#### Preparation:

- Although officials had prepared in advance for this event (hurricane and evacuation), a lack of pediatric provider involvement was associated with woefully inadequate strategies for providing emergency medical care for thousands of children and adolescents.
- Members of Houston's medical community realized that the overall number of evacuees seeking emergent medical care would be considerably higher than anticipated. Unless alternative locations for providing that care were created, the most likely destination for evacuees seeking medical care would be the local hospital EDs, many of which were already near capacity and unlikely to manage a surge. Preparing for the arrival of those patients would require every facet of the regional medical establishment to be involved.
- The primary goal in an event that creates a surge in ED and outpatient visits is to triage and direct patients to appropriate locations and reserve the ED for the most acutely ill/injured.
- County disaster planners shared and participated in the same agenda as that of the local tertiary pediatric care hospital leadership.

#### Arrival:

- Patients arrived by bus, and many were triaged by physicians and EMS personnel on the bus – however, many exited the buses without triage. They were triaged to 3 places: well to the shelter, those needing urgent but not emergent medical attention sent to the first aid station, set up to handle minor medical issues and if needed triage patients to the clinic,

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<sup>25</sup> For more details on deployment strategies, contact: Candy Schoenheit, RN, BSN, PHN, MICN, EMS Trauma Coordinator, EMSC Coordinator, [Candy.Schoenheit@sdcountyca.ca.gov](mailto:Candy.Schoenheit@sdcountyca.ca.gov)

and third, those requiring emergent care, transported by ambulance to hospitals designated by dispatch.

- Children arriving by private conveyances were seeking care independently at the hospital

#### Facility:

- A 100,000 square foot space in an arena was designated for the clinic. The clinic was constructed in 12 hours using available display curtains and Red Cross cots in place of examination tables. The hospital district was assigned to manage the administrative concerns and medical care using volunteers and nurses from the district. Staffing was organized through a college of medicine department of family and community medicine, pediatrics, internal medicine, radiology, obstetrics/gynecology, and others. Calls for volunteers were issued from the administrative offices.
- The pediatric clinic, named the MPERT, was fashioned after the hospital ED, with facilities, staff, space, administration, communications, processes and procedures.
- All evacuees given access to showers and clean clothing
- Separate facilities for staff
- Need for a pharmacy with child-centered medications especially for common illness such as asthma, Otitis media

#### Staffing:

- The clinic was overwhelmed – staffed by ED physicians, retired pediatricians, and a call for additional staff was sent out through the AAP.
- ICS structure was set up, Medical Director met with others in twice daily meetings
- 24/7 coverage physicians and nurses, clerks, environmental services, office managers/administrators, lab techs, and runners
- Clinic was staffed with general pediatricians for direct patient care and relied heavily on ED physicians for triage and medical direction.
- An experienced Charge Nurse with the authority and autonomy necessary to make spontaneous executive decisions is essential for optimal patient flow. His/her main priority is process management.
- Ideally, MD and nursing directors will be trained and experienced in pediatric emergency medicine, MD associated with the local EMS system, aware of policy and procedures
- Identification and credentialing of staff
  - from Texas, already by the hospitals
  - from out-of-state, temporary licensure – a pathway created by the state, especially those who came from the affected area.

- Rogue clinics and medical staff were an issue. Security, badges, and single-site check-in was necessary.
- Staff from DHV, MRC, CAL-MAT, DMAT, need to be integrated.
- A plan for spontaneous unaffiliated volunteers (SUVs) is necessary.
- An orientation manual is helpful.
- Embrace and support all staff!
- Guaranteed staffing is a priority – should not depend on volunteers. Use the tertiary pediatric care hospital staff, scheduling handled by managers that normally do that. Allocation of physician and nurse resources should be based on experience, subspecialty training, and the inherent, recognizable expertise for disaster management.
- Cooperation with command is essential - appropriate balance between allowing for risky innovation decisions while maintaining a strict command structure – private, non-profit, local, state, and federal agencies all charged with the same mission.
- Centrally located functional communication device (cell or other) with a means to access essential staff and services is crucial to the successful implementation.
- EMS on site must be able to communicate and work well with all.
- Medical control of the clinic delegated to the experts in pediatric emergency care.

#### Medical Conditions:

- It housed a pharmacy, medical control command center, central supply, food services. No patients with special needs presented to the clinic with their chronic medications or prescriptions. State waived require for physician prescription and allowed pharmacists to fill certain prescriptions.
- Registration was too cumbersome – pediatric patients were plucked from the crowd and given hydration and emergent care without paperwork in many cases. The most common complaints were injuries, asthma, rashes, and psychological problems. Many children arrived unaccompanied by family members. Children with chronic diseases that required more aggressive treatment regimens and those requiring more complex social or psychological support were transported from the clinic to the hospital. Psychiatry and social services must be made available early.
- Larger numbers of children with chronic outpatient needs have to be managed and may be done outside of formal government relationships – corporate, pre-existing relationships/MOUs (for example, critical treatment for pediatric cancer patients, displaced children receiving routine chemotherapy). Similar experiences have been reported with children with other special health care needs, including those under the care of

endocrinologists, pulmonologists, neurologists, cardiologists, specialist surgeons, psychiatrists, and others.

Infection Control:

- Diarrhea – a 25 bed isolation/observation area was created
- CDC dealt with Infection Control

Identification:

- Early Identification of evacuees is essential, especially since separation of families is unavoidable.

Links:

- Access to local or regional tertiary pediatric care resources should be arranged in advance. The provider supplying these resources must control their distribution. – control the organization, preparation, training, deployment, and operation of the MPERT. MPERT must be able to mobilize rapidly – facilities and access pre-determined

Closing:

- Exit strategy – when the cost of running the clinic exceeds the cost of referring patients to the hospital ED, close.

## **Emergency Credentialing**

Licensing, credentialing, and reimbursement issues present real and perceived barriers for displaced physicians in other states, as well as those who volunteer in affected regions but have come from other states.

It is recommended that there be a system in which a referring provider (hospitalist, intensivist, neonatologist, pediatrician, obstetrician, nurse practitioner) and staff be able to receive temporary hospital privileges and continue to take care of his or her patients in the receiving facility. Providers may be displaced to the same communities in which his or her patients are transported.

The Joint Commission (JC) has instituted clear disaster privilege protocols. CMS and JC have automatic triggers for emergency privileges. Medical staff bylaws may contain specific policy and procedures.

Disaster Healthcare Volunteers (DHV) and Medical Reserve Corp (MRC) personnel can be credentialed through organization HR or the Medical Staff Office as per protocol.

Schools of nursing, medicine, PH, pharmacy, RT etc. can provide documentation of the identity of their students.

CAL-MAT, DMAT, and FMS have their own systems for credentialing.

### **Patient Tracking**

Refer to the California Patient Movement Plan, page 65: California Unified Patient Tracking System (CUPTS)

Refer to Newborn Screening Contingency Plan – see Appendix under “Plans”

### **Family Reunification**

Local emergency management, hospitals, ARC, social services, hospitals, clinics and EMS providers all need to be involved in planning and implementation of elements of patient tracking and family reunification plans. This requires a system of communications and the ability to follow the course and location of all the transfers. Each LEMSA has patient identification policies.

When possible, obtain consent from the parents to move the patient. Legally, a patient cannot be moved without the permission of the parent until the government has proclaimed (authority from Local Health Officer or Governor) or declared (authority from the President) a disaster.

Methods must be established for families to find out promptly (e.g., telephone hotline) where the individual has been transported to and programs must be set up that could address the special needs of particular populations because of language limitations (e.g., Latino, Vietnamese) or other barriers.

Resources (See Appendix C):

- AAP Family Reunification Following Disasters: A Planning Tool for Health Care Facilities
- National Center Missing and Exploited Children – 1-888-544-5475

### **Special Needs Children**

The need to perform intrastate and/or interstate large-scale transfers of children with special health care needs was necessary in the aftermath of Hurricane Katrina.

Response plans for children in disasters need to include resources and preparations for children with disabilities and special health care needs, such as those with wheelchairs or ventilators. Special needs children are an issue because of needs for other supplies (gastrostomy tubes, tracheostomies, urinary catheters, peritoneal dialysis catheters), transport (wheelchairs), and specialty care needs. Because of the limited availability of pediatric resources in any given area to care for children with special health care needs,

the need for transfer capability of children with special needs out of a disaster area is heightened. This may involve the performance of large-scale interstate transfer of children with special healthcare needs.

Multi-cultural and multi-lingual resources must be provided. There needs to be sufficient interpretation and translation support for non-English speaking children and culturally appropriate means for children to express themselves. Census data will provide the information necessary to identify the presence of specific ethnic and racial groups.

Historically, in major disasters, children with disabilities suffered increased morbidity and mortality due to a lack of general preparedness and community coordination with EMS and hospitals, such as lack of necessary equipment, staffing, and instructions for community coordination.

Disasters, such as bioterrorist attacks or major natural disasters, are likely to cause the displacement of many children from their homes for an extended period of time. Displaced children are disconnected from their communities, caregivers, and the support of friends and neighbors. There will likely be disruption in access to prescription medications, physical therapy, durable medical equipment, and medical records. As a result, displaced persons, especially those with pre-existing severe health care conditions, are more vulnerable to medical consequences including health crises than those without pre-existing medical conditions. Preparedness plans often focus on injuries or illness due to direct impact of an event and may overlook the medical needs of those with chronic conditions that existed before the occurrence of an event. Understanding and accurately estimating medical care requirements of the pediatric population with pre-existing medical conditions is critically important for preparedness planning and emergency response. If this is not done, it is anticipated that patients who were previously stable and cared for at home will suffer medical crises when their support network is disrupted and significantly add to the surge burden being presented to EDs and hospitals.<sup>26</sup>

#### Summary of Data on Special Needs Children:

- Prevalence of special health care needs among children in California is 15%, ranging by county from 14-19% (31.9% for African Americans, 13.2% for Hispanics/Latinos, 18.3% for whites).
- In 2014, almost 200,000 children were enrolled in California Children's Services (CCS), an increase of 35% since 2009

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<sup>26</sup> A summary of data is available at <https://www.kidsdata.org/topic/14/characteristics-of-children-with-special-needs/summary>

- Three percent of children have at least one major disability (with a range per county from 1.8-9%), defined as difficulty with vision, hearing, walking, cognition, and/or self-care.<sup>27</sup>

## **Training/Exercises**

Disaster preparedness consist of a Hazard Vulnerability Assessment (HVA) and assessment of the capacity/capability of a region, ensuring that the proper supplies and resources are available, planning the steps involved in a response, and educating potentially involved providers. This includes community providers (clinics, offices), pre-hospital providers (EMS) and hospital staff. Since we are preparing for low frequency/high impact events, education needs to also involve leadership at the highest level who have the knowledge and authority to quickly commit organizational resources to achieve the mission of saving lives. This Perinatal, Neonatal, and Pediatric Surge Annex will be “socialized” through baseline and just-in-time training resources to be developed by CDPH and EMSA.

The Joint Commission requires at least two activations of the Emergency Operations Plan (EOP) per year, either through exercises or actual events. Exercises provide opportunities for medical staff leadership and staff to review their roles and responsibilities under the EOP and HICS, to test equipment that might be used in a disaster, and to test specific pediatric response plans as they apply to the exercise scenario. (See Appendix for exercise resources.)

Pre-event exercises are an important part of surge preparedness. Small drills and tabletop exercises should be performed with staff to practice and test policies and protocols. Larger scale exercises focused on Pediatric Surge should be performed as part of the state’s regular schedule of exercises. The value of practice is immeasurable. Experienced observers and evaluators should be included, with after action reporting and improvement plans to address identified gaps.

## **Communication**

Communication is critical to an efficient response to any incident. Both internal and external communication procedures and pathways need to be fully developed and exercised. Too often there is lack of familiarity with the communication equipment by staff who will be actually using it. Busy clinical staff may not participate in training and exercises due to other pressing clinical priorities.

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<sup>27</sup> Also see Los Angeles County Pediatric Surge Plan, Appendix J: Children with Access and Functional Needs, <http://file.lacounty.gov/SDSInter/dhs/206938 cms1 206938.pdf>

## **Supply Chains**

The organization must consider what items will be needed to adequately care for perinatal, neonatal, and pediatric patients. Plans must take into account that there will be a surge and that normal supply chains may be interrupted. Multiple institutions using the same vendor may have requests for the same types of supplies, quickly exhausting resources.

## **HIPAA**<sup>28</sup>

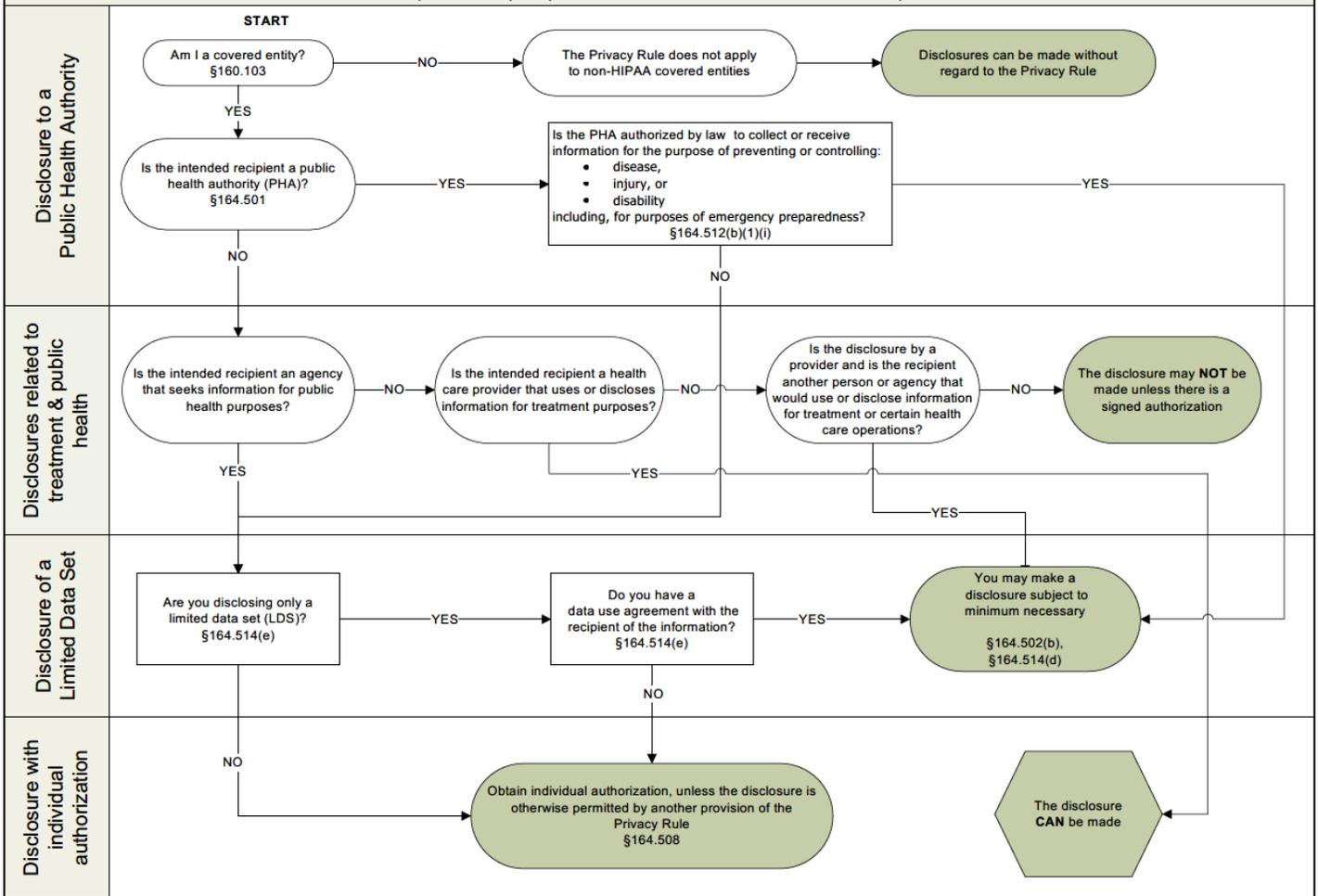
The Health Insurance Portability and Accountability Act of 1996 (HIPAA) Privacy Rule protects individually identifiable health information from unauthorized or impermissible uses and disclosures. The Rule is carefully designed to protect the privacy of health information, while allowing important health care communications to occur. This algorithm addresses the release of protected health information for planning or response activities in emergency situations.

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<sup>28</sup> <https://www.hhs.gov/hipaa/for-professionals/special-topics/emergency-preparedness/index.html>

# AT A GLANCE – May I disclose protected health information for public health emergency preparedness purposes?

(From the perspective of the source of the information)



## IV. Appendix

### **Collections of Resources**

Chung S, Foltin G, Schonfeld DJ, et al; American Academy of Pediatrics, Pediatric Disaster Preparedness and Response Topical Collection, Itasca, IL; American Academy of Pediatrics; 2019

<https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Children-and-Disasters/Pages/Pediatric-Terrorism-And-Disaster-Preparedness-Resource.aspx>

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ASPR TRACIE Topic Collection: Pediatric (log in required)

<https://asprtracie.hhs.gov/technical-resources/31/pediatric/27>

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Children in Disasters

[www.cdc.gov/childrenindisasters/](http://www.cdc.gov/childrenindisasters/)

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EMS for Children Innovation and Improvement Center (multiple toolkits)

<https://emscimprovement.center/>

<https://emscimprovement.center/education-and-resources/toolkits/pediatric-disaster-preparedness-toolbox/>

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EMSA: EMS for Children

<https://emsa.ca.gov/ems-for-children/>

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Pediatric-Neonatal Disaster and Surge Network: Project Documents

<https://sites.google.com/site/pedineonetwork/documents>

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Pediatric Surge

<http://cdphready.org/category/preparedness-tools/pediatric-surge/>

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California Hospital Association: Pediatric Disaster Planning

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<https://www.calhospitalprepare.org/pediatrics-nicu>

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CDC: Planning Resources by Setting: Pediatric Offices and Hospitals

<https://www.cdc.gov/cpr/readiness/healthcare/pediatric.htm>

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CDC Children's Preparedness Unit

<https://www.cdc.gov/childrenindisasters/about-us.html>

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Healthcare Coalition Pediatric Surge Annex Template

<https://files.asprtracie.hhs.gov/documents/aspr-tracie-hcc-pediatric-surge-annex-template-final-508.pdf>

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Pediatric Readiness Resource Toolkit

<https://emscimprovement.center/domains/hospital-based-care/pediatric-readiness-project/readiness-toolkit/>

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WRAP-EM Crisis Standards of Care Template:

[https://wrap-em.org/images/2021/WRAP-EM\\_CSC\\_Template.pdf](https://wrap-em.org/images/2021/WRAP-EM_CSC_Template.pdf)

## **Plans**

California Patient Movement Plan November 2018

[https://emsa.ca.gov/wp-content/uploads/sites/71/2019/03/Patient-Movement-Plan\\_Final-3-6-19.pdf](https://emsa.ca.gov/wp-content/uploads/sites/71/2019/03/Patient-Movement-Plan_Final-3-6-19.pdf)

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California Public Health and Medical Operations Manual July 2011, and New/Revised Chapters and Forms March 2019

[https://www.cdph.ca.gov/Programs/EPO/Pages/Resource\\_Publications.aspx](https://www.cdph.ca.gov/Programs/EPO/Pages/Resource_Publications.aspx)

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Medical and Health Operational Area Coordinator Program Manual, December 2016

<https://www.cdph.ca.gov/Programs/CCLHO/CDPH%20Document%20Library/MedicalandHealthOperationalAreaCoordinationManual.pdf>

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State of California Emergency Plan, October 1, 2017

[https://www.caloes.ca.gov/PlanningPreparednessSite/Documents/California\\_State\\_Emergency\\_Plan\\_2017.pdf](https://www.caloes.ca.gov/PlanningPreparednessSite/Documents/California_State_Emergency_Plan_2017.pdf)

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Los Angeles County Medical and Health Operational Area Coordination Program – “Allocation of Scarce Resources Guide”, September 26, 2017

[http://file.lacounty.gov/SDSInter/dhs/1029477\\_AllocationofScarceResourcesGuide20170926-Signed.pdf](http://file.lacounty.gov/SDSInter/dhs/1029477_AllocationofScarceResourcesGuide20170926-Signed.pdf)

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Los Angeles County Pediatric Surge Plan, August 2016

[http://file.lacounty.gov/SDSInter/dhs/206938\\_cms1\\_206938.pdf](http://file.lacounty.gov/SDSInter/dhs/206938_cms1_206938.pdf)

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California Association of Neonatologists: Neonatal Disaster Preparedness Toolkit February 2015

[https://www.cpqcc.org/sites/default/files/pdf/toolkit/CAN\\_Neonatal%20Disaster%20Preparedness%20Toolkit\\_02.2015.pdf](https://www.cpqcc.org/sites/default/files/pdf/toolkit/CAN_Neonatal%20Disaster%20Preparedness%20Toolkit_02.2015.pdf)

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Contra Costa Health Services/EMSA: Pediatric/Neonatal Disaster and Medical Surge Plan and Preparedness Toolkit, May 2011

<https://www.emsaac.org/attachments/article/96/FINAL%20Master%20CoCo%20Pedi%20Disaster%20and%20Surge%20Prep%20-%20JL.pdf>

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Loma Linda University Children’s Hospital: Pediatric/Neonatal Disaster Reference Guide – “Bridging the Gap Between EMS and Hospital”

[https://www.calhospitalprepare.org/sites/main/files/file-attachments/pages\\_from\\_pediatricsurgeplanning.pdf](https://www.calhospitalprepare.org/sites/main/files/file-attachments/pages_from_pediatricsurgeplanning.pdf)

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Central Valley Regional Pediatric Disaster Surge Framework, December 2012

[https://www.calhospitalprepare.org/sites/main/files/file-attachments/12.6.12\\_final\\_cv\\_framework.pdf](https://www.calhospitalprepare.org/sites/main/files/file-attachments/12.6.12_final_cv_framework.pdf)

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Rady Children’s Hospital San Diego: Pediatric Surge Planning Train the Trainer

<https://www.calhospitalprepare.org/sites/main/files/file-attachments/pediatricsurgeplanningrchsdtttmaterials.pdf>

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Greater New York Hospital Association: Mass Casualty Incident Response Toolkit – Guidance for Hospitals to Prepare and Train for Mass Casualty Incidents

[https://www.gnyha.org/wp-content/uploads/2019/04/MCI\\_Toolkit\\_digital.pdf](https://www.gnyha.org/wp-content/uploads/2019/04/MCI_Toolkit_digital.pdf)

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Newborn Screening Contingency Plan:

<https://www.cdc.gov/ncbddd/documents/Screening-Contingency-Plan-Version-II.pdf>

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### **Reunification Resources**

AAP Reunification Toolkit: Family Reunification Following Disasters: A Toolkit for Health Care Facilities, July 2018

<https://www.aap.org/en-us/Documents/AAP-Reunification-Toolkit.pdf>

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Post Disaster Reunification of Children: A Nationwide Approach, FEMA, 2013

[https://www.fema.gov/media-library-data/1384376663394-eef4a1b4269de14faff40390e4e2f2d3/Post\\_Disaster\\_Reunification\\_of\\_Children\\_-\\_A\\_Nationwide\\_Approach.pdf](https://www.fema.gov/media-library-data/1384376663394-eef4a1b4269de14faff40390e4e2f2d3/Post_Disaster_Reunification_of_Children_-_A_Nationwide_Approach.pdf)

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Family Reunification Plan Template and Training Modules, Western Region Homeland Security Advisory Council

<https://wrhsac.org/projects-and-initiatives/family-reunification-plan-template/>

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WRAP-EM Hospital Reception Site Template:

[https://wrap-em.org/images/HUB/WRAP-EM\\_Hospital-Reception-Site-Planning-Template\\_Version\\_1b.docx](https://wrap-em.org/images/HUB/WRAP-EM_Hospital-Reception-Site-Planning-Template_Version_1b.docx)

## **Exercise Resources**

AAP: Pediatric and Public Health Preparedness Exercise Resource Kit

[https://www.aap.org/en-us/Documents/Tabletop\\_Exercise\\_Resource\\_Kit.pdf](https://www.aap.org/en-us/Documents/Tabletop_Exercise_Resource_Kit.pdf)

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Pediatric Medical Surge Exercise Evaluation Guide

[https://urldefense.proofpoint.com/v2/url?u=http-3A\\_www.cidrap.umn.edu\\_sites\\_default\\_files\\_public\\_php\\_26947\\_Exercise-2520Evaluation-2520Guide-2520Sample-2520-2D-2520Pediatric-2520Medical-2520Surge.doc&d=DwIFAg&c=RpR9LiQNIoGO8A8CMgA1NQ&r=M4dd6PEEcUJfOmHzoAF68thjTBNvkd\\_8ER8lcCzEAsQ&m=L2tu0oUoUuz189Nix531aMwqCFXSE1ZPYXrY\\_FXM6yA&s=fIE3SCrHYTapggg1cN4lq709m904-8xz3wGIKxL1dQc&e=](https://urldefense.proofpoint.com/v2/url?u=http-3A_www.cidrap.umn.edu_sites_default_files_public_php_26947_Exercise-2520Evaluation-2520Guide-2520Sample-2520-2D-2520Pediatric-2520Medical-2520Surge.doc&d=DwIFAg&c=RpR9LiQNIoGO8A8CMgA1NQ&r=M4dd6PEEcUJfOmHzoAF68thjTBNvkd_8ER8lcCzEAsQ&m=L2tu0oUoUuz189Nix531aMwqCFXSE1ZPYXrY_FXM6yA&s=fIE3SCrHYTapggg1cN4lq709m904-8xz3wGIKxL1dQc&e=)

## **Acronyms**

AAMS	Association of Air Medical Services
AAP	American Academy of Pediatrics
ACEP	American College of Emergency Physicians
ACGME	Accreditation Council for Graduate Medical Education
ACOG	American College of Obstetrics and Gynecology
ADAMS	Atlas and Database of Air Medical Services
AHRQ	Agency for Healthcare Research and Quality
ALS	Advanced Life Support
APDC	Arizona Pediatric Disaster Council
ARC	American Red Cross
ASPR	Assistant Secretary for Preparedness and Response
BLS	Basic Life Support
CA	California
CAFP	California Academy of Family Physicians
CAH	Critical Access Hospital
CAHF	California Association of Healthcare Facilities
CAL-MAT	California Medical Assistance Team
CBRNE	Chemical, Biological, Radiological, Nuclear, Explosive
CCHA	California Children's Hospital Association
CCS	California Children's Services
CCT	Critical Care Transport
CCU	Cardiac Care Unit
CDC	Centers for Disease Control
CDPH	California Department of Public Health
CFAN	Children with Functional and Access Needs
CFR	Case Fatality Rate
CHA	California Hospital Association
CMA	California Medical Association
CMS	Centers for Medicaid and Medicare Services
CNG (CANG)	California National Guard
COE	Center of Excellence
CPCA	California Primary Care Association
CPeTS	California Perinatal Transport System
CRIHB	California Rural Indian Health Board
CSHCN	Children with Special Healthcare Needs
CUPTS	California Unified Patient Tracking System
DHS	Department of Homeland Security
DHV	Disaster Healthcare Volunteers
DMAT	Disaster Medical Assistance Team
DOC	Department Operations Center
DOD	Department of Defense
DPAC	Disaster Preparedness Advisory Council
ECLS (ECMO)	Extra Corporeal Life Support (extracorporeal membrane oxygenation)

ED	Emergency Department
EDAP	Emergency Department Approved for Pediatrics
EEI	Essential Elements of Information
EHR	Electronic Health Record
EMS	Emergency Medical Services
EMSA	Emergency Medical Services Authority
EMSC	Emergency Medical Services for Children
EMSC-IIC	Emergency Medical Services for Children – Improvement and Innovation Center
EMT	Emergency Medical Technician
EMT-P	Paramedic
EMTALA	Emergency Medical Treatment and Labor Act
ENA	Emergency Nurses Association
EOC	Emergency Operations Center
EOM	California Public Health and Medical Emergency Operations Manual
EOP	Emergency Operations Plan
ESCAPE	Enhancing Surge Capacity and Partnership Effort
FCC	Federal Coordinating Center
FCO	Federal Center of Operations
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FQHC	Federally Qualified Health Center
GACH	General Acute Care Hospital
GI	gastrointestinal
GIS	Geographic Information System
Gy	Gray
H	HIGH
HCC	Hospital Command Center
HCC	Healthcare Coalition
HICS	Hospital Incident Command System
HIPAA	Health Insurance Portability and Accountability Act
HMO	Health Maintenance Organization
HPP	Hospital Preparedness Plan
HVA	Hazard Vulnerability Assessment
IC	Incident Command
ICS	Incident Command System
ICU	Intensive Care Unit
ID	Infectious Disease
ID	Identification
IED	Improvised Explosive Device
IHS-CA	Indian Health Service - California
IND	Improvised Nuclear Device
JC	Joint Commission

JFO	Joint Field Office
JPMT	Joint Patient Movement Team
km	kilometer
Kt	kiloton
L	LOW
L&D	Labor and Delivery
LEMSA	Local Emergency Medical Services Agency
LHD	Local Health Department
LOCATe	Levels of Care Assessment Tool
LTC	Long Term Care
LOS	Length of Stay
M	MEDIUM
MCI	Multi-casualty incident
MD	Medical Doctor
MHCC	Medical Health Coordination Center
MHOAC	Medical Health Operational Area Coordinator
MOA	Memorandum of Agreement
MOC	Medical Operations Center
MOU	Memorandum of Understanding
MPERT	Mobile Pediatric Emergency Response Team
MRC	Medical Reserve Corps
MSPDC	Mountain States Pediatric Disaster Coalition
NDMS	National Disaster Medical System
NEDARC	National EMSC Data Analysis Research Center
NICU	Newborn Intensive Care Unit
NIMS	National Incident Management System
OA	Operational Area
OB/GYN	Obstetrics/Gynecology
OES	Office of Emergency Services
OSPHD	Office of Statewide Health Planning and Development
PECC	Pediatric Emergency Care Coordinator
PEDSS	Pediatric Emergency Decision Support System
PH	Public Health
PHRU	Perinatal High-Risk Unity
PICU	Pediatric Intensive Care Unit
PIO	Public Information Officer
PMP	Patient Movement Plan
POD	Point of Dispensing
PRQC	Pediatric Research Quality Collaborative
PST	Pediatric Specialty Team
PTSD	Post-Traumatic Stress Disorder
RDD	Radiological Dispersal Device
RDMHS/C	Regional Disaster Medical Health Specialist/Coordinator
REOC	Regional Emergency Operations Center

RFID	Radio Frequency Identification
RHC	Rural Health Clinic
RN	Registered Nurse
S	SPECIALTY
SB	SPECIALTY - BURNS
SCCM	Society for Critical Care Medicine
SE	SPECIALTY - ECLS
SEMS	Standardized Emergency Management System
SEP	California State Emergency Plan
SME	Subject Matter Expert
SOC	State Operations Center
SP	SPECIALTY - PSYCHIATRIC
SR	SPECIALTY – RESPITE/LONG TERM CARE
ST	SPECIALTY - TRANSPLANT
SUV	spontaneous unaffiliated volunteers
TRACIE	Technical Research Assistance Center and Information Exchange
TRAIN®	Triage by Resource Allocation for IN-patients
UNIS	Utah Notification and Information System
USGS	United States Geological Survey
WHO	World Health Organization
WPPP	Western Pediatric Preparedness Partnership
WRAPEM	Western Region Alliance for Pediatric Emergency Management
WRBCC	Western Region Burn Coordination Center
WRBDC	Western Region Burn Disaster Consortium