

# Marin County EMS Agency EMERGENCY MEDICAL SERVICES FOR CHILDREN

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*“Excellent Care – Every Patient, Every Time”*

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

## ***Goals and Objectives***

The primary goal of Marin County’s EMS for Children (EMSC) Plan is to develop a program focusing on reducing pediatric disability and death and to ensure that all children – no matter where they live, attend school, or travel – receive the best care possible in any emergency situation. Should an emergency or disaster occur, our goal is to ensure that emergency personnel are properly trained in pediatrics; that ambulances and emergency departments have the equipment, supplies, and medications needed to treat children of all sizes; and that well-defined pediatric treatment protocols and procedures are in place.

To deliver the best possible pediatric care, we must routinely evaluate and re-evaluate our training and knowledge and identify our strengths and weaknesses using relevant and measurable indicators. By doing so, we can systematically evaluate and improve our key processes and foster our organizational learning and knowledge sharing.

The Marin County EMS for Children Plan has been written in accordance with Title 22, Division 9, Chapter 14 of the California Code of Regulations.

## ***EMSC Program – Hospital and Prehospital Information***

Marin County has three acute care receiving hospitals to serve our community – MarinHealth Medical Center, Kaiser Permanente San Rafael Medical Center, and Novato Community Hospital. Two of these facilities – MarinHealth Medical Center and Kaiser Permanente San Rafael - were designated by the Marin County EMS Agency in 2019 as Pediatric Receiving Centers.

Marin County, with a population of just over 260,000 residents, has the oldest population in the Bay Area with an average age of 46.8 years. Only 3.4% of all EMS transports are those who are less than 18 years of age. In 2020, 412 pediatric patients were transported via EMS: 217 with traumatic injuries, 145 with medical complaints, and 50 with “unknown” reasons. With the limited exposure to pediatric patients and the rarely encountered seriously ill or injured patient, it is critical to continuously prepare our personnel to effectively manage this population by being prepared, organized, and knowledgeable to take care of any emergency situation that may arise.

### **Marin County Pediatric Receiving Centers**

California State Regulations define a Pediatric Receiving Center (PedRC) as a licensed general acute care hospital with, at a minimum, a permit for standby, basic, or comprehensive emergency services that has been formally designated as one of four types of PedRCs pursuant to sections 100450.218 through 100450.222, by the local EMS agency for its role in an EMS system.

MarinHealth Medical Center (Advanced Pediatric Receiving Center and ACS Verified Level III Trauma Center) and Kaiser Permanente San Rafael (General Pediatric Receiving Center) provide exceptional care to our pediatric population. Each PedRC has a robust pediatric care committee and clinical team that includes board-certified pediatricians, board certified emergency medicine physicians, registered nurses (all with PALS certification and many with ENPC certification), respiratory therapists (all with PALS certification), pharmacists, and additional ancillary staff trained to provide specialized pediatric care. Pediatric intensivists are available 24/7 via telehealth. Additionally, MarinHealth Medical Center employs a full time Child Life Specialist who works with children and their families to help them cope with the challenges of hospitalization, illness, and injury.

For children who are critically ill or who require specialty care, both PedRCs have established agreements with Comprehensive Pediatric Receiving Centers to ensure that every ill or injured child can be transported to receive the best care possible.

#### Prehospital Providers

Marin County emergency medical services are provided by our fire department-based system with private providers utilized as a backup. The EMS Agency Medical Director and EMS Agency EMSC Program Manager oversee the system and collaborate with individual prehospital care providers. All fire departments and private providers have medical directors, educators, and liaisons responsible for overseeing their individual organizations and report to the Marin County EMS Agency biannually and as requested. Prehospital pediatric care is supported by written [policies](#), protocols, pediatric [specific equipment](#), and on-line medical control whenever needed.

#### ***EMSC – Plan***

Marin County EMS Agency began its pursuit of official EMSC status in mid-2019. Our first joint meeting with stakeholders to discuss our goals and objectives and assess our needs was February 2020. Shortly thereafter, our advancement to have an EMSC program was halted by the coronavirus pandemic. Fortunately, both PedRCs had made major advancements in pediatric care as their facilities sought and obtained status as Emergency Departments Approved for Pediatrics. The system is overseen by the EMS Agency Administrator, the EMS Agency Medical Director, and the EMS Agency EMSC Program Manager collaborating with our prehospital stakeholders (fire departments and private ambulance companies) and our two PedRCs. More detailed information regarding our system data as well as the list of names and titles of the EMS Agency personnel and PedRCs are listed in Exhibit A.

Upon activation of EMS, injured or ill pediatric patients are identified by our Marin County Sheriff's Communication Center dispatchers who utilize the Medical Priority Dispatch System. Dispatcher-assisted care is immediately rendered while field

personnel are enroute. with the overall goal being to improve patient outcomes by reducing disability and death.

Prehospital personnel utilize Marin County EMS Agency policies and procedures to initiate treatment, assess stability, and determine the most appropriate destination. Due to the geography of our county and potential for lengthy ground transports – particularly from West Marin - prehospital responders may utilize local air ambulances (e.g., REACH, CHP). Marin County does not have an approved helipad at any of our facilities. Instead, pediatric patients are flown out of Marin to Advanced and Comprehensive Pediatric Receiving Centers in nearby counties.

To expedite care, EMS personnel notify the emergency department as soon as possible of an incoming pediatric patient. Communication includes their unit number and transport code, age and gender of the patient, chief complaint of the illness or injury (including mechanism), treatments, vital signs and estimated time of arrival. Additionally, all pediatric patients transported via Advanced Life Support are measured with a color-coded length-based tape, the corresponding colored band is applied, and the color is reported to the receiving facility prior to the patient's arrival. This allows enhanced preparation for the emergency department team.

Currently, Marin County has not made destination changes to *only* transport pediatric patients to our designated Pediatric Receiving Centers. For medical and minor injury complaints, patients may be transported to any one of our three acute care facilities. Any injured pediatric patient with anatomic or physiologic findings based on the Marin County Trauma Triage Tool are transported to Oakland Children's Hospital if the estimated time of arrival (ETA) is 30 minutes or less. Otherwise, the patient is transported to the Level III Trauma Center at MarinHealth Medical Center. For pediatric patients meeting mechanism of injury or additional factors criteria, prehospital personnel will transport to the Level III Trauma Center. Should a severely injured child arrive at Kaiser San Rafael or Novato Community Hospital, Marin has a [trauma re-triage procedure](#) to expedite transfer of care to the appropriate trauma facility.

As an Advanced Pediatric Receiving Center, MarinHealth Medical Center is a licensed provider for Neonatal Intensive Care. However, neither MarinHealth nor Kaiser has pediatric intensive care capabilities. All critical care and behavioral health care pediatric patients are treated, stabilized, and transferred to Comprehensive Pediatric Receiving Centers and behavioral health facilities that our County hospitals have transfer agreements with. Specialty care is available either on site or via telehealth 24/7.

## ***EMSC – Data Management and Quality Improvement***

Both prehospital and hospital programs have several components to ensure a high level of quality care. These include:

- Structure
- Data collection and reporting (audits, benchmarking, etc.)
- Evaluation of EMS system indicators
- Action to improve
- Training and education
- Definition of a problem
- Re-evaluation and iterative feedback

The Marin County EMS Agency Pediatric Receiving Center (PedRC) Committee will meet biannually (and more frequently as we build our program) to review performance data, identify areas in need of improvement, and carry out and monitor improvement efforts. Attendees include the PedRC Medical Directors, PedRC Program Managers, EMS Agency personnel, and EMS stakeholders (fire and private providers). EMS data is collected via our electronic medical record keeping program, ImageTrend. The PedRC Program Managers collect hospital data - vetted through their internal processes - and in coordination with the EMS Agency share aggregate data with committee members. All such records that include Protected Health Information (PHI) as defined by the Health Insurance Portability and Accountability Act (HIPAA) are handled confidentially per the statute. If at any time a hospital or the EMS Agency identifies a need for improvement, an EMS Event Reporting Form may be generated, and a performance improvement action plan will be developed by the EMS Medical Director and/or PedRC Committee recommendations.

Data elements collected include the following:

1. Baseline data from pediatric ambulance transports, including, but not limited to:
  - a. Arrival time/date to the emergency department
  - b. Date of birth
  - c. Mode of arrival
  - d. Gender
  - e. Primary impression.
2. Basic outcomes for EMS quality improvement activities, including but not limited to:
  - a. Admitting hospital name, if applicable
  - b. Discharge or transfer diagnosis
  - c. Time and date of discharge or transfer from the Emergency Department
  - d. Disposition from the Emergency Department
  - e. External cause of injury
  - f. Injury location
  - g. Residence zip code

## ***EMSC – Injury and Illness Prevention Planning***

Although our EMS Agency has not previously formalized an EMSC Program, for several years we have promoted and formally addressed pediatric injury and illness prevention activities via prehospital, hospital, and public education.

1. Since 2010, we have provided free public education on [Hands-Only CPR](#) and [Stop the Bleed](#), working closely with the Marin County Office of Education and bringing this education and needed tools directly to our schools (grades 5-12).
2. In 2019, several of our PedRC committee members became trainers for the [Impact Teen Driving](#) Program. Unfortunately, the coronavirus pandemic halted our efforts as we were ramping up to bring more of this education to our community. Still, [some of our schools](#) did begin the training and soon we hope to become more engaged with this effort.
3. [Community Health and Prevention](#) is an important aspect of injury and illness prevention. Our EMS partners have formalized several plans to improve the health of our youth via programs such as oral health, nutrition wellness, and substance use prevention. One such program is [Concussion Smart Marin](#), in which committee members meet every other month to update concussion guidelines for Marin hospitals and providers with a goal of ensuring consistent practice measures/protocols for those providing care.
4. The Trauma Center at MarinHealth Medical Center recently introduced a helmet safety program, assisting in providing helmets to those who cannot afford them as well as those who present without one. Helmets are free and range in size from toddler (2-4 years of age) to a large teen/adult size.
5. Noting an inconsistency in how pediatric patients were transported in our county via ambulance, the Marin County EMS Agency's Policy and Procedure committee (led by one of our fire department paramedic educators) researched, developed education, and implemented a [policy](#) mandating restraining devices (e.g. car seats or child restraint systems) specifically for ambulance stretcher use.
6. Adding onto safe pediatric transportation, we support and work with our local California Highway Patrol office who provide education and free safety [inspections for child safety seats](#).
7. Working in partnership with [Project ChildSafe](#) - a national firearms safety education program – several of our law enforcement agencies implemented educational programs on firearm safety and responsible gun storage and provide free firearm safety kits to our residents.
8. The Marin County DUCKS Program, a movement to save lives by educating students on the signs and symptoms of an acute stroke, was implemented by personnel from MarinHealth Medical Center and AHA/ASA. The program was presented to nine local elementary schools and over 10,000 community members (including students and staff) were educated in B.E.F.A.S.T. stroke symptom recognition.

9. Many of our prehospital personnel educators are TNCC, ACLS, and PALS certified instructors and provide training and education to their departments. Additional weekly and monthly education is done via newsletters, medical director lead training, and guest pediatrician lectures.

As the LEMSA, our agency provides oversight and system integration for Pediatric Receiving Center Quality Improvement activities including:

- Creating a Pediatric Receiving Center designation plan, to include specialized pediatric care, for approval by the LEMSA
- Developing or revising specific pediatric policies, procedures, and protocols
- Receiving and distributing EMS Notification Forms pertaining to pediatric care
- Reviewing performance improvement plans for issues identified by CQIP
- Producing and distributing pediatric data reports
- Reviewing annual CQIP updates from designated PedRCs and EMS service providers
- Scheduling and staffing EMS stakeholder PedRC meetings
- Establishing future goals and objectives using evidence-based practice and with our stakeholders' input, we will:
  1. Support and promote our existing illness and injury prevention programs
  2. Support the Trauma Center's internal Trauma Triage Tool addition using the ESCAPE module for assessing Non-Accidental Trauma (NAT)
  3. Focus on CQI for ensuring appropriateness and accuracy of prehospital pediatric medications.

Effectiveness of the EMSC Program can be directly related to the effectiveness of training received by all constituents. Administrative and medical oversight is heavily involved at all training levels. Our EMS system consists of six fire service-based providers, all of which have full-time medical directors. Prehospital education on pediatric care, guided by data and our process improvement activities, is provided on an on-going and as needed basis throughout the year.

Pediatric Surge Planning remains an area we continue to discuss and revise with our Healthcare Preparedness Program (HPP). Included in our planning is the Marin County Public Health Officer and Deputy Public Health Officer, EMS Agency (including the Medical Director), Public Health Preparedness, HHS Epidemiology Program, Sheriff's Office of Emergency Services, the Coroner (as related to family reunification), and our three acute care hospitals. This plan is an Annex to our Healthcare Preparedness Program (HPP) Response Plan Summary Document, which references the Marin County Response Plans that provides a summary of the Marin County Medical Health Operational Area Coordinator (MHOAC) Program plans and procedures that would be activated to support the healthcare facility response in an emergency. Additional information and guidance is also obtained from the EMS Field Guide.

## Exhibit A

PEDIATRIC (< 18 Y.O.) TRANSPORTS BY DESTINATION, 2020	
Destination	TOTAL
MarinHealth Medical Center	254
Kaiser Permanente, San Rafael	89
Novato Community Hospital	48
CPMC-Van Ness	4
Kaiser Permanente, Santa Rosa	4
UCSF Benioff Children's Hospital	4
Children's Hospital And Research Center Oakland	2
Kaiser Permanente, Richmond	2
Petaluma Valley Hospital	1
UCSF MEDICAL CENTER AT MISSION BAY	1
<b>TOTAL</b>	<b>409</b>

TRANSPORTED PEDI PTS BY AGE, 2020				
Age	Number	Percent		
1	39	9.38%		
2	20	4.81%		
3	14	3.37%		
4	9	2.16%		
5	19	4.57%		
6	5	1.20%		
7	9	2.16%		
8	10	2.40%		
9	12	2.88%		
10	11	2.64%		
11	18	4.33%		
12	20	4.81%		
13	33	7.93%		
14	44	10.58%	<b>TRANSPORTED TYPE PEDI PT. 2020</b>	
15	40	9.62%	MEDICAL	145
16	53	12.74%	TRAUMA	217
17	60	14.42%	UNK	50

### **EMS AGENCY EMSC PERSONNEL**

Name	Title
Chris LeBaudour	EMS Administrator
Dustin Ballard, MD; Devin Tsai, MD	EMS Medical Directors
Karrie Groves, RN	EMSC Program Manager
Troy Peterson	EMS Specialist / ImageTrend Manager
Christian Lombard	EMS Specialist

### **MARIN COUNTY LOCAL AND TRANSFER FACILITIES**

Facility Name	Designation	LEMSA PedRC Agreement Exp. Date	PedRC Medical Director	PedRC Program Manager
<a href="#">Kaiser Permanente San Rafael Medical Center</a>	General Pediatric Receiving Center	1/31/2022	Kristen Swann, MD	Katherine Wickes, RN
<a href="#">MarinHealth Medical Center</a>	Advanced Pediatric Receiving Center	1/31/2022	David Hoffman, MD	Adrian McNally, RN
<a href="#">Novato Community Hospital</a>	Basic Emergency Services	NA	NA	NA
<a href="#">UCSF Benioff Children's Hospital San Francisco</a>	Comprehensive Pediatric Receiving Center			
<a href="#">UCSF Benioff Children's Hospital Oakland</a>	Comprehensive Pediatric Receiving Center			
<a href="#">Lucile Packard Children's Hospital, Stanford</a>	Comprehensive Pediatric Receiving Center			

<a href="#">UCSF Benioff Children's Hospital San Francisco</a> <a href="#">Lucile Packard Children's Hospital, Stanford</a>	Pediatric Rehabilitation Facilities			
<a href="#">Kaiser Permanente San Francisco</a>	General Pediatric Receiving Center			
<a href="#">Kaiser Permanente Santa Rosa</a>	Advanced Pediatric Receiving Center			
<a href="#">Kaiser Permanente Oakland</a>	Comprehensive Pediatric Receiving Center			
<a href="#">Kaiser Permanente Vallejo</a>	Inpatient Pediatric Rehab (age≥14yrs)			

<i>EMS Prehospital and IFT Care Providers</i>	<i>Paramedic Service Area</i>
Novato Fire Protection District	A
San Rafael Fire Department	B
Ross Valley Paramedic Authority	C
Marin County Fire Department	E
Central Marin Fire Department	C
Southern Marin Emergency Medical Paramedic System	D
NorCal Ambulance	All*
Falcon Ambulance	All
American Medical Response	All
LifeWest Ambulance	All

*\*May provide back-up ALS services upon request to all zones*

In addition to the above, prehospital care providers include:

- Dispatchers
- Air ambulance personnel
- Law enforcement personnel