PEDIATRIC EMERGENCIES

INTERPRETATION OF PEDIATRIC PROTOCOLS AND BASIC PRINCIPLES

The following treatment protocols address the most common illness and injury conditions of childhood. Among ambulance-transported children/minors, the most frequent pre-hospital complaints are trauma, altered mental status (especially seizures), respiratory distress, and toxicological emergencies. Cardiac arrest is the least common pediatric pre-hospital call.

This document defines "children/minor" or "pediatric" patients as less than 15 years for medical conditions and trauma, although physically mature medical patients less than 15 years may be treated in some instances as adults. Other terms include "newborns" (less than 24 hours), "neonates" (less than 28 days) and "infants" (less than 12 months). Pediatric medical patients must be transported to an Emergency Department Approved for Pediatrics (EDAP) facility as stated in Policy 7300.

The protocols are adapted from the Pediatric Prehospital Protocols developed by the Prehospital Treatment Protocol Subcommittee of the Emergency Medical Services for Children (EMSC) Project of the California EMS Authority.

INTERPRETING THE PROTOCOLS

1). Basic Life Support (BLS) interventions are outlined in the upper left-hand box of each protocol. These interventions are appropriate for all levels of EMS providers.

2) Advanced Life Support (ALS) interventions are outlined in the lower boxes. Within the ALS boxes, the protocols are logically divided internally into one or more treatment pathways, based on key aspects of patient assessment.

3) Special considerations for pediatric care are described in the box on the right side of the protocols. Special considerations provide more detailed information about specific elements in the treatment protocols.

4) All drug doses are weight-based and given per kilogram. Estimating weight for drug dose calculation is inaccurate and places the patient at risk for under treatment or overtreatment. ***Length-based calculations for drug delivery are more accurate and are preferable in children/minors under age 5 years, when derived from a validated length-based resuscitation tool (e.g., the "First Five Minutes" or "Broselow" tape).*** The Attachment A provides a chart of estimated weights in kilograms for children/minors according to age. The chart also lists age-adjusted vital signs and endotracheal tube sizes.

5) Some critical patients (e.g., multiple system trauma) require rapid hospital transport with minimal on-line communication, and minimal field interventions (e.g., airway and breathing support on scene, with IV attempts enroute). On the other hand, other patients with medical conditions (e.g., status epilepticus, or cardiac arrest) may be appropriately managed in the field prior to ambulance transport.

6) Individual presentations may vary because of age-related changes in signs and symptoms, and because of the normal spectrum of acuity of illness and injury. These protocols are not intended to address every permutation or rare situation, and are not intended to replace good clinical judgment.

7) ALS interventions in children/minors should ordinarily be minimized, and applied only for appropriate indications. IVs must be used cautiously in children, after carefully weighing the benefits of vascular access against the pain, psychological distress and cost of the procedure.

8) Control of pain in children/minors transported by ambulance is an appropriate and important concern. Intravenous Morphine Sulfate (MS) 0.1 mg/kg IV (0.05 mg/kg IV for <6 months) is the preferred agent OR Fentanyl 1mcg/kg slow IV/IO over 1-2 minutes q5min to max dose of 2mcg/kg. Prehospital narcotic analgesia for children has never been studied for efficacy and safety. MS or Fentanyl should be used IV in children with painful conditions (e.g., burns, distal fractures) when there is no reasonable possibility of hypovolemia or occult hemorrhage. MS or Fentanyl should ordinarily only be administered after on-line radio communications with a base hospital.

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FIELD PRIMARY SURVEY

PEDIATRIC PRIMARY SURVEY	SPECIAL CONSIDERATIONS
1. Establish level of responsiveness. 2. Evaluate airway and protective airway reflexes. [2] 3. Basic airway/spinal immobilization PRN. [3] [4] 4. Oxygen PRN. [5] 5. Assist ventilation PRN. [6][7] 6. Stop hemorrhage. Evaluate and support circulation. [8][9] 7. Do environmental assessment including consideration of intentional injury. [1] 8. Determine appropriate treatment protocol.	[1] Determine scene safety. [2] Identify signs of airway obstruction and respiratory distress, including: Cyanosis, Intercostal retractions, Stridor Absent Breath Sounds, Drooling, Bradycardia Nasal Flaring, Apnea or Bradypnea, Choking Tachypnea, Grunting [3] Clear airway using suction, jaw thrust and chin lift (and/or head tilt if no suspected spinal trauma). Consider placement of oropharyngeal airway if child unconscious. [4] If cervical spine trauma suspected, immobilize spine with cervical immobilization device. Infants and young children may require under-shoulder support to achieve neutral cervical spine position. [5] Use nasopharyngeal or oropharyngeal airway, mask, or oxygen by blow-by, as tolerated, with child in position of comfort. [6] Use chest rise as indicator of adequate ventilation. If chest rise is inadequate, consider: Repositioning the airway, Foreign body in airway Inadequate bag volume or activated pop-off valve. [7] Rescue breathing includes two initial slow breaths (1-1/2 sec) at a rate of 20 breaths per minute for infant or child. [8] Assess perfusion using: Heart rate, Mental Status, Skin Signs Capillary refill, Blood Pressure, Quality of Pulse [9] Compression rate is at least 100 per minute with 30:2 compression ratio for one person and 15:2 compression ratio for two person. Depths are about 1 ½ inches for infants and about 2 inches for children.

PEDIATRIC EMERGENCIES

ATTACHMENT A
WEIGHTS IN KILOGRAMS, AGE-ADJUSTED VITAL SIGNS, & ET TUBE SIZES FOR CHILDREN

AGE	MEAN WEIGHT in KG	MINIMUM SYSTOLIC BP	NORMAL HEART RATE	NORMAL RESP. RATE	ET TUBE SIZE
Premature	<2.5	40	120-170	40-60	2.5 – 3.0
Term	3.5	60	100-170	40-60	3.0 – 3.5
3 months	6.0	60	100-170	30-50	3.5
6 months	8.0	60	100-170	30-50	4.0
1 year	10	72	100-170	30-40	4.0
2 years	13	74	100-160	20-30	4.5
4 years	15	78	80-130	20	5.0
6 years	20	82	70-115	16	5.5
8 years	25	86	70-110	16	6.0
10 years	30	90	60-105	16	6.5
12 years	40	94	60-100	16	7.0

SYSTOLIC BLOOD PRESSURE = 70 + 2 X (age in years)