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, the most frequent Prehospital complaints are trauma, altered mental status (especially seizures), respiratory distress, and toxicologic emergencies. Cardiac arrest represents between 2 – 5% of all pediatric field calls.

This document defines "children" or "pediatric" patients as less than 18 years for medical conditions, and less than 14 years for trauma, although physically mature medical patients over 14 years may be treated in some instances as adults. Other terms include "newborns" (under 24 hours), "neonates" (under 28 days) and "infants" (under 12 months).

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

2) 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. There are frequent errors in paramedic field weight estimations, and this method of drug dose calculation is therefore subject to inaccuracies and possible undertreatment or overtreatment. ***Length-based calculations for drug delivery are more accurate and are preferable in children under age 5 years, when derived from a validated length-based resuscitation tool (e.g., the "First Five Minutes" or "Broselow" tape).*** The Appendix provides a chart of estimated weights in kilograms for children 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 (i.e., 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 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 transported by ambulance is an appropriate and important concern. Intravenous morphine sulfate (MS) 0.1 mg/kg (0.05 mg/kg for <6 months) is the preferred agent. Prehospital narcotic analgesia for children has never been studied for efficacy and safety. MS 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 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) then rate of 20 breaths/min 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 120/minute for infant, 100/minute for older infants and children with 5:1 compression:ventilation ratio. Depths are ½ - 1 inch for infant and 1 – 1 ½ inch for child.

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APPENDIX

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)