

	COUNTY OF SACRAMENTO EMERGENCY MEDICAL SERVICES AGENCY	Document #	9016.12
	<u>PROGRAM DOCUMENT:</u>	Initial Date:	06/23/94
	PEDIATRIC	Last Approval Date:	11/01/15
	Pediatric Parameters	Effective Date:	11/01/18
		Next Review Date:	05/01/2-

EMS Medical Director

EMS Administrator

Purpose:

- A. To serve as a guideline for EMT's and Paramedics when assessing pediatric vital signs and other parameters.

Authority:

- A. California Health and Safety Code, Division 2.5
- B. California Code of Regulations, Title 22, Division 9

Guidelines:

- A. Unless otherwise stated, pediatric protocols will apply to patient's ≤ 14 years of age or those whose weight is ≤ 36 kg as determined by a length-based resuscitation tape. If the patient's age is not known, then pediatric protocols will apply until there are physical signs that the patient has reached puberty/adolescence as indicated by armpit hair in boys and breast development in girls. Patients who are known to be less than 15 years of age but whose weight exceeds 36 kg may still be considered pediatric patients given their chronological age; however weights will then need to be estimated and adult dosages should be used.
- B. Normal vital signs vary with age. Note that the younger the child, the faster the normal heart rate and the lower the normal blood pressure. After about 12 years of age, normal vital signs approach adult levels.
- C. Hypotension, a late and ominous sign of shock, means that cardiorespiratory arrest is imminent. A child may lose 25% of his/her circulating blood volume before becoming hypotensive. The signs and symptoms of shock are much more sensitive than blood pressure for children.
- D. For age group not represented in the table, normal vital signs should fall between the values for the group above and the group below.
- E. **The Handtevy system**, A Broselow™ Pediatric Emergency tape or equivalent weight-based reference tool is ~~height~~ **highly** recommended as an aid to determining the patient's weight and proper drug doses and equipment sizes.

Age	Weight (kg)	Heart Rate (bpm)	Respiratory Rate (bpm)	Systolic BP (mmHg)	ET Tube Internal Diameter	ET Tube Approx. Depth of Insertion	Laryngoscope Blade #
premature	< 3	100 - 190	40 - 60	Difficult to measure	2.5	7	0 Straight
neonate	3 - 4	90 - 190	30 - 60	50 - 70	3.5	9	1 Straight
6 months	5 - 7	80 - 180	25 - 40	60 - 110	3.5	11	
1 year	10	80 - 150	20 - 40	70 - 110	4.0	12	1 Straight
3 - 4 years	15	80 - 140	20 - 30	80 - 115	5.0	16	2 Straight
5 - 6 years	20	70 - 120	20 - 25	80 - 115	5.5-6.0	16	
7 - 8 years	25	70 - 110	20 - 25	85 - 120	5.5-6.0	18	
11 - 12 years	35	60 - 110	15 - 20	95 - 135	5.5-7.0	20	2-3

Source: American Heart Association

Use uncuffed ET tubes for ages <8 (ET tubes with I.D. of <6)

Alternative formulas for estimating parameters

Blood Pressure:

- Mean Systolic Blood Pressure can also be estimated by: $80 + (2 \times \text{Age, in years})$
- Lower limits of Systolic Blood Pressure can be estimated by: $70 + (2 \times \text{Age, in years})$

Weight:

- $(2 \times \text{Age, in years}) + 8 = \text{Weight (Kg)}$
- Pounds/kilogram conversion: $\text{Weight (lbs.)} \div 2.2 = \text{Weight (kg)}$

Airway equipment – Endotracheal (ET) tube size can also be estimated by either of the following:

- Diameter of the child's nostril (nares)
- Diameter of the child's little finger nail
- The formula $(\text{age} + 16) \div 4$

ET Tube insertion depth (from level of lip):

- $\text{Age in years} / 2 + 12$
- $\text{Tube size (mm i.d.)} \times 3$