

	<b>COUNTY OF SACRAMENTO</b> EMERGENCY MEDICAL SERVICES AGENCY	<b>Document #</b>	9016.14
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EMS Medical Director

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EMS Administrator

**Purpose:**

- A. To establish a guideline 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  $\leq 14$  years of age or those whose weight is  $\leq 36$  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  $\leq 14$  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. The Handtevy system, A Broselow™ Pediatric Emergency tape, or equivalent weight-based reference tool is highly recommended as an aid to determining the patient's weight, proper drug doses, and equipment sizes.

## General Vital Signs and Guidelines

Age	Heart Rate (beats/min)	Blood Pressure (mmHg)	Respiratory Rate (breaths/min)
Premature	110-170	SBP 55-75 DBP 35-45	40-70
0-3 months	110-160	SBP 65-85 DBP 45-55	35-55
3-6 months	110-160	SBP 70-90 DBP 50-65	30-45
6-12 months	90-160	SBP 80-100 DBP 55-65	22-38
1-3 years	80-150	SBP 90-105 DBP 55-70	22-30
3-6 years	70-120	SBP 95-110 DBP 60-75	20-24
6-12 years	60-110	SBP 100-120 DBP 60-75	16-22
> 12 years	60-100	SBP 110-135 DBP 65-85	12-20

### Alternative formulas for estimating parameters:

- A. Blood Pressure:
  1. Mean Systolic Blood Pressure can also be estimated by:  $90 + (2 \times \text{Age, in years})$
  2. Lower limits of Systolic Blood Pressure can be estimated by:  $70 + (2 \times \text{Age, in years})$
- B. Weight:
  1.  $(2 \times \text{Age, in years}) + 8 = \text{Weight (Kg)}$
  2. Pounds/kilogram conversion:  $\text{Weight (lbs.)} \div 2.2 = \text{Weight (kg)}$
- C. Airway equipment – Endotracheal (ET) tube size can also be estimated by either of the following:
  1. Diameter of the child's nostril (nares)
  2. Diameter of the child's little finger nail
  3. The formula  $(\text{age} + 16) \div 4$
- D. ET Tube insertion depth - from level of lip - for children  $\geq$  eight (8) years of age, unless age not known, and then only children who meet or exceed the GREEN length on Handtevy or Broselow length based tapes.
  1.  $\text{Age in years} / 2 + 12$
  2.  $\text{Tube size (mm i.d.)} = (\text{age in years} / 4) + 3.5$