



METHODIST AirCare

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Air Medical Services



Methodist
CHILDREN'S
TRANSPORT



Methodist Children's Hospital and
Women's Services San Antonio, Texas



Pediatric Reference Guide

Assessment/Vital Signs

Heart Rate (beats/min.)

Age	Awake Rate	Sleeping Rate
<3 months	85 - 205	80 - 160
3 mos. - 2 yrs.	100 - 190	75 - 160
2 - 10 yrs.	60 - 120	60 - 90
>10 yrs.	60 - 100	50 - 90

Respiratory Rate (breaths/min.)

Age	Rate
<1 mo.	30 - 60
1 mo. - 2 yrs.	24 - 40
2 - 8 yrs.	20 - 30
>8 yrs.	16 - 20

Blood Pressure

Age	Systolic	Diastolic
<1 mo.	55 - 90 mmHg	26 - 55 mmHg
1 mo. - 2 yrs.	70 - 110 mmHg	<80
2 - 10 yrs.	Typical: 90+ (child's age in yrs. x 2)	<85
2 - 10 yrs.	Lower Limits: 70+ (child's age in yrs. x 2)	<85
>10 yrs.	Lower Range of Normal: 90 mmHg	<85

Minimum Urine Output

Infant	1 - 2 ml/kg/hr
Children & Adolescent	0.5 - 1 ml/kg/hr

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Maintenance IV Fluids

Age	Fluid
<28 days	D10
>28 days	D5 ½ NS

Maintenance Fluids

Weight	Requirement Per 24 hrs.
0 - 10 kg	100 ml/kg
11 - 20 kg	1000 ml for 1st 10 kg + 50 ml/kg for ea. kg over 10
>21 kg	1500 ml for 1st 20 kg + 20 ml/kg for ea. kg over 20

Oral Requirement Per Hour	
4 ml/kg/hr for 1st 10 kg	
2 ml/kg/hr for 2nd 10 kg	
1 ml/kg/hr for every kg >20 kg	

Carbohydrate/Restore Serum Glucose

D10	(0.10g/ml) 2 ml/kg IV or IO for neonates
D25	(0.25 g/ml) 2 ml/kg IV or IO for pediatrics

Treat Blood Glucose ≤ 40 mg/dl for neonates
Treat Blood Glucose <60 mg/dl for pediatrics

Carcillo JA: Task Force Members, Fields AI. Clinical practice parameters for hemodynamic support of pediatric and neonatal patients in septic shock. Crit Care Med 30(6):1-13, 2002.

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Airway

RSI (Rapid Sequence Induction)

Facilitated Intubation

1. Hyperoxygenate
2. Lidocaine 1 mg/kg (*only for pts. w/ suspected head injuries or increased ICP*)
3. Atropine 0.02 mg/kg (*min. dose 0.1 mg for all pts. <8 yrs. or 9 - 13 yrs. w/HR <120 bpm*)
4. Etomidate 0.3 mg/kg (*Reduce to 0.2 mg/kg for pts. w/ liver disease*)
5. Intubate & confirm ETT placement
6. Norcuron 0.1 mg/kg (*post ETT placement; max. 10 mg*)
7. Versed 0.1 mg/kg (*max. 5.0 mg*)
8. Morphine 0.1 mg/kg (*max. 10 mg*)

*Average Weights — Endotracheal Tube Sizes

Age	Avg. Wt. Range	ETT Size
Infant	8.0 - 9.0 kg	3.5
Toddler	10.0 - 11.0 kg	4.0
Small Child	12.0 - 14.0 kg	4.5
Child	15.0 - 18.0 kg	5.0
Child	19.0 - 22.0 kg	5.5
Large Child	24.0 - 28.0 kg	6.0
Adult	30.0 - 36.0 kg	6.5

Approximate ETT Depth = 3 x size of ETT in cm

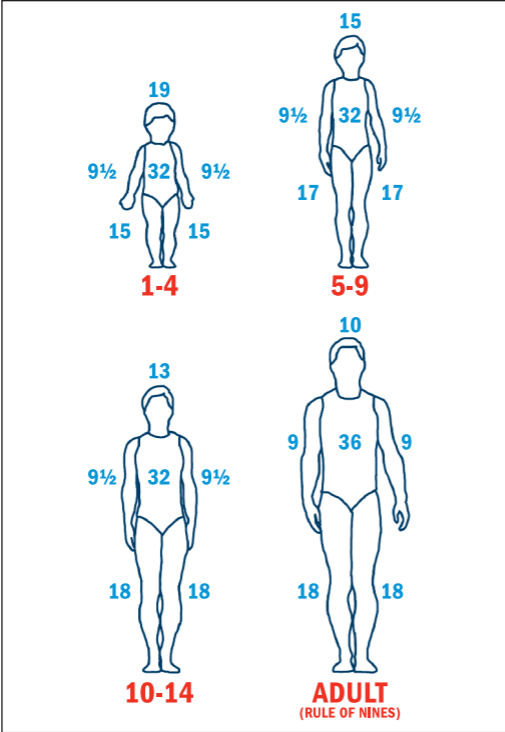
These pediatric dosage recommendations are guidelines only. Users not familiar with the indications, dose, or administration of a medication should consult an appropriate reference, specialist or pharmacist. Not responsible for typographical errors.

*Adapted from the 2002 Broselow Pediatric Resuscitation Tape with permission from Armstrong Medical Industries

Pediatric Parkland Formula

4 ml LR or NS x wt. in kg x % BSA Burn
1st 8 hrs. post burn = 1/2 of estimated volume
8-24 hrs. post burn = 1/2 of estimated volume

Body Proportions by Age



Source: American Burn Association. Advanced Burn Life Support (ABLS). Reprinted by permission.

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Breathing

Initial Ventilator Settings

Oxygen	100%
Tidal Volume	6 - 8 ml/kg
Inspiratory Time	0.5 - 1 second
Respiratory Rate	Infants 25 - 40 bpm Children 15 - 25 bpm
PEEP	3 - 5 cm H ₂ O
Pressure Support	Minimum 10 cm H ₂ O

Strategies for Mechanical Ventilation

To Increase PaO₂ or SpO₂

1. Increase the FI_O₂
2. Increase the Mean Airway Pressure:
 - a. Increase the PEEP
 - b. Increase the inspiratory time or change I:E towards 1:2
 - c. In pressure modes with high rates decrease the rate and consider increasing inspiratory time (*keep I:E ratio ≥ 1:2*)

To Decrease PaCO₂ or EtCO₂

1. Increase the Minute Ventilation:
 - a. Increase rate and/or V_t (*tidal volume*)
 - b. In pressure modes, increase the pressure (*PIP*)
2. Increase the expiratory time in pts. with Obstructive Airway Diseases:
 - a. Increase the expiratory time or change I:E ratio towards 1:4

Emergency Drugs

Chemical	mg/kg	ml/kg	Min./Max. Dose
Atropine 0.1 mg/ml	0.02 mg/kg	0.2 ml/kg	Min. dose 0.1 mg
CaCl 10% 100 mg/ml	20 mg/kg	0.2 ml/kg	Max. dose 1 gm/10 ml
Dextrose 25% 250 mg/ml	500 - 1000 mg/kg	2 - 4 ml/kg	—
Epinephrine 1:10,000 (0.1 mg/ml)	0.01 mg/kg	0.1 ml/kg	Max dose 0.1 mg/kg
Lidocaine 27% 20 mg/ml	1 mg/kg	0.05 ml/kg	—
Sodium Bicarbonate 8.4% 1.0 mEq/ml	1 mEq/kg	1 - 2 ml/kg	—

Cardiovascular

Epinephrine	<p>For non-life-sustaining rhythm: 0.01 mg/kg 1:10,000 (0.1 ml/kg) IV/IO q 3 - 5 min.</p> <p>For ETT administration: 0.1 mg/kg 1:1,000 (0.1 ml/kg) q 3 - 5 min.</p> <p>For hypotension refractory to fluid therapy consider: 0.01 mg/kg 1:1,000 IV/IO q 3 - 5 min.</p> <p>Consider an epinephrine infusion: 0.1 - 1 mcg/kg/min. for hypotension</p>
Dobutamine	2 - 20 mcg/kg/min.
Dopamine	2 - 20 mcg/kg/min.
Prostaglandin E1 (PGE1) (500 mcg/ml)	0.05 - 0.1 mcg/kg/min. to start (0.2 mcg/kg/min. max.) <i>Caution: Apnea, bradycardia, fever, flushing, hypotension, and seizures can occur.</i>

Carbohydrate/Restore Serum Glucose

D10	(0.10g/ml) 2 ml/kg IV or IO for neonates
D25	(0.25 g/ml) 2 ml/kg IV or IO for pediatrics
<p><i>Treat Blood Glucose \leq 40 mg/dl for neonates</i></p> <p><i>Treat Blood Glucose $<$60 mg/dl for pediatrics</i></p>	

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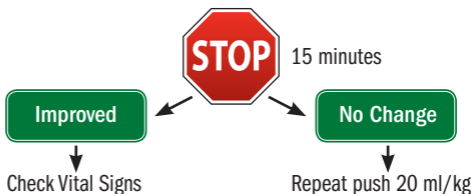
Circulation



Recognize decreased mental status, tachycardia, and bounding pulse.

Capillary refill → **>3 seconds**

Push 20 ml/Kg isotonic saline or colloid boluses up to 60 ml/Kg or more



Fluid Resuscitation

Signs and symptoms of Inadequate systemic perfusion:

Rapid infusion (<20 min.) 20 ml/kg of NS or LR IV/IO

Reassess: Continued signs and symptoms of inadequate systemic perfusion: Second rapid infusion 20 ml/kg of NS or LR IV/IO

Reassess: Continued signs and symptoms of inadequate systemic perfusion: Third rapid infusion 20 ml/kg of NS or LR IV/IO or 10 ml/kg of Packed RBCs, bolus

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2000 Handbook of Emergency Cardiovascular Care for Healthcare Providers; © 2000, American Heart Association.

Biederwolf, Debbie, RN, BSN, CCRN, RRT-NPS, Voyce, Cynthia, RRT-NPS, RN, MSN and Terrazas, Rebecca, RN Methodist Children's Hospital, San Antonio, Texas.

Compiled *Methodist AirCare Pediatric Reference Guide*.

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"Strategies for Mechanical Ventilation." *Methodist AirCare Pediatric Reference Guide*.

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Analgesics/Narcotics

Fentanyl	2-4 mcg/kg IV or IM
Morphine	0.1 mg/kg IV/IM

Antiemetic

Ondansetron Hydrochloride (Zofran)	>1 month: 0.1 mg/kg IV/IM, up to 4 mg, <i>may repeat initial dose x 1 in 20 minutes</i>
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Anticonvulsants/Sedatives

Lorazepam	0.1 mg/kg PO/IV to a max. of 2 mg/dose
Phenobarbital	10 - 20 mg/kg IV x 1, then 5 - 10 mg/kg IV q 15-30 min.; max. 30 mg/kg
Midazolam	0.1 mg/kg IV/IM

Antihistamines & Antagonists

Benadryl	1 mg/kg to a max. of 50 mg IV
Narcan	<5 yrs. (up to 20 kg) 0.1 mg/kg ≥ 5 yrs. (or >20 kg) 2 mg
Romazicon	10 mcg/kg IV with accum. dose of 1 mg or less

Bronchodilators/Airway (Acute Management)

Albuterol	<i>(For patients exhibiting bronchospasm)</i> 2.5 mg in 2 ml NS by nebulizer or 4 - 8 puffs by MDI with spacer
Epinephrine	0.01 ml/kg/dose (1:1,000) SQ (max. 0.5 mg)
Racemic Epinephrine	<i>(For patients exhibiting life-threatening airway obstruction due to post extubation, RSV, croup, and/or epiglottitis. Vasoconstriction may reduce swelling in the upper airway and beta effects on bronchial smooth muscle may relieve bronchospasm)</i> 0.5 ml in 2.0 ml NS by nebulizer
Solu-Medrol	1 mg/kg IV (max. 125 mg)

Mosby's Nursing Drug Reference, 2007.

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