Children's Hospital Colorado

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Pediatric Emergency Guidelines

Vital Signs and Equipment

Age	Weight	HR range	HR ave./ min.	Resp. rate range breaths/min.	BP (sys) range (mmHg)	NG (Fr)	*ET Tube size (mm)	Chest tube (Fr)	Laryngoscopy blade (Miller)	Foley (Fr)
Premie or <3 kg	<3kg	120-160	140	40-60	40-60	5-8	2.5-3.0 (uncuffed)	8-10	0	5
Term newborn 1-7 days	3 kg	90-165	125	40-60	60-80	5-8 5	3.0 (uncuffed)	10-12	1	5
1 wk - 3 wks	3 kg	105-180	150	40-60	60-80	8 5	3.0 (uncuffed)	10-12	1	5
1 month	4 kg	120-180	150	40-60	65-95	8	3.0 (uncuffed)	10-12	1	5-8
6 mos.	8 kg	110-185	140	25-40	65-105	8	3.5 (uncuffed)	12-16	1	5-8
12 mos.	10 kg	110-170	135	20-30	70-110	10-12	4.0 (uncuffed)	14-24	1-2	8-10
2 yrs.	12 kg	90-150	120	20-30	70-110	10-14	4.0 (cuffed)	14-24	1-2	8-10
3 yrs.	14 kg	75-135	110	20-30	80-110	10-14	4.0 (cuffed)	16-28	0 2	10
4 yrs.	16 kg	75-135	110	20-30	80-110	10-14	4.5 (cuffed)	16-28	2	10
5 yrs.	18 kg	65-135	100	20-30	80-110	10-14	4.5 (cuffed)	20-32	2	10
6 yrs.	20 kg	60-130	90	12-25	90-115	12-14	5.0 (cuffed)	20-32	2	10
8 yrs.	26 kg	60-120	90	12-25	90-115	12-14	5.5 (cuffed)	20-32	2-3	10
10 yrs.	32 kg	60-120	90	12-25	95-120	14-16	6.0 (cuffed)	28-38	2-3	10-12
12 yrs.	42 kg	60-120	85	12-25	95-120	14-16	6.5 (cuffed)	28-38	2-3	10-12
14 yrs.	50 kg	60-120	85	12-18	100-130	16+	7.0 (cuffed)	32-42	3	14

Fluid Resuscitation

1. Fluids (NS, LR) 20 mL/kg IV or IO. Reassess and repeat until perfusion improves (max 80 mL/kg)
2. If treating traumatic shock, consider blood after 40mL/kg

Cardiac Resuscitation

Medications	Newborn (3 kg)	2 months (5 kg)	1 year (10 kg)	3 years (15 kg)	6 years (20 kg)	8 years (25 kg)	9 years (30 kg)	10 years (35 kg)	12 years (40 kg)	13 years (45 kg)	14 years (50 kg)
Epinephrine - Bradycardia (symptomatic)/ Pulseless Arrest IV/IO: 0.01mg/kg (0.1 mg/mL) = 0.1mL/kg may repeat every 3-5 min	0.03mg = 0.3mL	0.05mg = 0.5mL	0.1mg = 1mL	0.15mg = 1.5mL	0.2mg = 2mL	0.25mg = 2.5mL	0.3mg = 3mL	0.35mg = 3.5mL	0.4mg = 4mL	0.45mg = 4.5mL	0.5mg = 5mL
Atropine 0.02 mg/kg IV, IO, (min 0.1 mg, max single dose 0.5 mg child, 1 mg adolescent) may repeat once Based on 0.1 mg/mL concentration	0.1mg = 1mL	0.1mg = 1mL	0.2mg = 2mL	0.3mg = 3mL	0.4mg = 4mL	0.5mg = 5mL	0.5mg = 5mL	0.5mg = 5mL	0.5mg = 5mL	0.5mg = 5mL	0.5mg = 5mL
Amiodarone Pulseless VF/VT 5 mg/kg IV push, max 300 mg	15mg = 0.3mL	25 mg = 0.5mL	50mg = 1mL	75mg = 1.5mL	100mg = 2mL	125mg = 2.5mL	150mg = 3mL	175mg = 3.5mL	200mg = 4mL	225mg = 4.5mL	250mg = 5mL

Glasgow Coma Scale

Function	Response	Point Scale
Eye opening	Spontaneous	4
	To speech	3
	To pain	2
	None	1
Best motor response	Spontaneous	6
	Localized pain	5
	Withdraws to pain	4
	Flexion to pain	3
	Extension to pain	2
	No response	1
Best verbal response Age > 2 years:	Oriented, appropriate	5
	Confused	4
	Inappropriate words, persistent cry	3
	Incomprehensible sounds	2
	No response	1
Best response to auditory/visual stimulus Age < 2 years:	Social smile, orients to sounds, follows objects, coos, babbles	5
	Cries, consolable, irritable	4
	Cries to pain	3
	Moans to pain	2
	No response	1
TOTAL SCORE RANGE = 3 - 15		

Medication Infusions

Medication	Dosing	Concentrations
Amiodarone	5 mg/kg bolus over 60 min IV, max dose 150 mg, then 5-15 mcg/kg/min infusion (max 1 mg/min)	Dilute vial in D5 to 2 mg/mL
Dobutamine	5-20 mcg/kg/min IV	Dilute vial in D5 or NS to a max concentration of 4 mg/mL
Dopamine	5-20 mcg/kg/min IV	Dilute vial in D5 or NS to a max concentration of 3.2 mg/mL
Epinephrine	0.1-1 mcg/kg/min IV	Dilute vial in D5 or NS to a max concentration of 20 mcg/mL
Milrinone	50 mcg/kg blous over 15 min IV, then 0.2-1 mcg/kg/min infusion	Dilute vial in D5 or NS to 200 mcg/mL
Nitroprusside	0.5-6 mcg/kg/min	Dilute vial in D5 to 0.5 mg/mL, protect from light
Norepinephrine	0.05-2 mcg/kg/min IV	Dilute vial in D5 or NS to 32 mcg/mL
Prostaglandin E (PGE, Alprostadil)	0.025-0.1 mcg/kg/min IV (consider intubation for apnea)	Dilute vial in D5 or NS to a max concentration of 20 mcg/mL

Pediatric Emergencies

Adrenal Crisis
Hydrocortisone - (0 – < 3yrs) 25 mg, (>/3 yrs – 12 yrs) 50 mg, (>/ 12 yrs) 100 mg

Analgesia
Morphine - 0.05 - 0.1 mg/kg IV, IM (max 5 mg)
Fentanyl - 1 mcg/kg IV (slow push), 2 mcg/kg IN (max 100 mcg)
Ketoralac (Toradol) - (>2 yr) 0.5 mg/kg IV, IM (max 30 mg)
Ketamine - 0.1-0.3 mg/kg IV (slow push, max 20 mg)

Sedation
Midazolam (Versed) -
IV, IM 0.1 mg/kg (max 5 mg)
IN 0.3 mg/kg (max. 10 mg) - use injection solution
P0, PR 0.5 mg/kg (max 10 mg) -
Ketamine - 1-2 mg/kg IV (max 100 mg) or 2-4 mg/kg IM (max 300 mg)

Anaphylaxis
Epinephrine (1 mg/mL) - 0.01mg/kg (0.01 mL/kg) IM (max 0.5 mg)
Diphenhydramine (Benadryl) - 1 mg/kg IV, IM (max 50 mg)
Famotidine - 0.5 mg/kg (max 20 mg/dose)
Steroids: **Methylprednisolone (Solumedrol) -** 2mg/kg IV (max 125mg)
Dexamethasone (Decadron) - 0.3-0.6 mg/kg PO, IM (max 16 mg)
Prednisone/prednisolone - PO 2 mg/kg (max 60 mg)

Arrhythmias
Amiodarone - VT with pulse 5mg/kg (max 150mg IV over 60 min), needs to be diluted if the patient has a pulse, (2 mg/mL in D5 only)
Adenosine - 1st dose: 0.1 mg/kg IV, IO rapid push, (max 6 mg). 2nd dose: 0.2 mg/kg IV, IO rapid push, (max 12 mg).
Lidocaine - 1 mg/kg (max 100 mg)
Propranolol - 0.01-0.1 mg/kg IV (max 1 mg), administer undiluted over 10 min
Procainamide - 3 mg/kg IV loading dose over 5 min (max 100 mg), then 20-80 mcg/kg/min infusion (dilute in D5 to 4 mg/mL)

Asthma
Nebulizations: Albuterol - (< 20 kg) 2.5 mg, (>/ 20 kg) 5 mg, if using 5 mg/mL, dilute in 2 mL of NS
Ipratropium (with Albuterol) - child: 250 mcg, adolescent: 500 mcg
Continuous Albuterol - (< 20 kg) 7.5 mg/hr, (>/ 20 kg) 10 mg/hr
PO: **Dexamethasone -** 0.6 mg/kg (max 16 mg)
Prednisone - 2 mg/kg (max 80 mg)
IM: **Epinephrine -** (1 mg/mL) 0.01 mg/kg (0.01 mL/kg) (max 0.5 mg/dose)
SC: **Terbutaline -** 0.01 mg/kg/dose (max 0.3 mg/dose)
IVs: **Solumedrol -** 2 mg/kg IV initial dose (max 80 mg/dose)
Mag Sulfate - 40 mg/kg infuse over 30 minutes (max 2 g)
Terbutaline IV - 10 mcg/kg load over 10 minutes; infusion: 0.4-6 mcg/kg/minute

Hyperglycemia / Hypoglycemia
Insulin drip in DKA - regular insulin - 0.1 units/kg/hr IV drip
Glucagon - (< 20 kg) 0.5 mg, (>/= 20 kg) 1 mg IM
Glucose - Newborn to 1 mo - D10W 2-4 mL/kg IV bolus;
>1 mo - D10W 5mL/kg IV bolus (max 150 mL)

Increased ICP
Mannitol - 1 gm/kg IV, administer through 0.22 micron filter over 30 min
3% NaCl - 5 mL/kg initial dose (max 234 mL/dose) over 15 min

Rapid Sequence Intubation
Pre-meds (circumstantial)
Atropine - 0.02 mg/kg IV (max single dose 0.5 mg child, 1 mg adolescent)
Lidocaine - 1 mg/kg IV - head injury (max 50 mg)
Sedation/Induction
Ketamine - 2 mg/kg IV (max 100 g)
Etomidate - 0.5 mg/kg IV (max 20 mg)
Midazolam - 0.1 mg/kg IV (max 10 mg)
Paralytic **Sedate before administering
Succinylcholine - 1 mg/kg IV short acting/depolarizing
Rocuronium - 1 mg/kg IV short acting
Vecuronium - 0.1 mg/kg IV intermediate acting (>7 weeks of age)

Seizures
No IV Access
Midazolam (Versed) - 0.15 mg/kg IM (max 10 mg)
Midazolam (Versed) - 0.3 mg/kg IN (max 10mg)
Divide dose between nostrils
Diazepam (Valium) PR - use injectable solution for PR administration
1-5 yrs: 0.5mg/kg (max 20 mg)
6-11 yrs: 0.3 mg/kg (max 20 mg)
≥12 yrs: 0.2 mg/kg (max 20 mg)

IV Access
Lorazepam (Ativan) - 0.1 mg/kg IV (max 4 mg)
Midazolam (Versed) - 0.1 mg/kg IV (max 10 mg)
Diazepam (Valium) - 0.2 mg/kg IV (max 10 mg)

Second Line
Levetiracetam (Keppra) - 60 mg/kg (max 4500 mg) over 15 minutes
Fosphenytoin (PE = phenytoin equivalent) -
20 mg PE/kg IV (max 1500 mg PE) over 15 minutes
Dilute to 25 mg/mL in NS or D5W

Septic Shock: Infection + (Hypotension or Altered Mental Status/Poor Perfusion)
1. IV or IO x 2
2. Rapid NS or LR boluses of 20 mL/kg (via push-pull, pressure bag or infuser)
3. Reassess and administer additional boluses until perfusion improved (max. 80 mL/kg)
4. Antibiotics within 1 hour – for most patients, the following are appropriate:
   - Ceftriaxone 100 mg/kg (max 2000 mg)
   -OR- Cefepime 50 mg/kg (max 2000 mg) in immunocompromised/central line
   - Vancomycin 20 mg/kg (max 1500 mg) infuse over 60 min
5. For persistent hypotension despite fluid resuscitation, titrate
   - Norepinephrine 0.05-2 mcg/kg/min (dilute in D5 or NS to 32 mcg/mL)
   - Epinephrine 0.1-1 mcg/kg/min (dilute in D5 or NS to 20 mcg/mL)
   - Dopamine 5-20 mcg/kg/min (only if epinephrine and/or norepinephrine are unavailable)
6. Hydrocortisone in patients with adrenal insufficiency (0 – < 3 yrs) 25 mg, (>/3 – 12 yrs) 50 mg, (>/12 yrs) 100 mg

Upper Airway Obstruction - (Croup)
Racemic epinephrine - 0.5 mL in 3 mL NS by nebulizer
L - epinephrine - 1:1000 solution - 0.5 ml/kg by nebulizer (max 5ml)
Decadron - 0.3-0.6 mg/kg P0, IM (max 16 mg)

✓ Dextrose: Rule of 50s

	0.5 g/kg
D50 (central access only)	1mL/kg
D25 *To make:* discard 25 mL D50 and add 25 mL NS	2mL/kg
D10 *To make*: discard 40 mL D50 and add 40 mL NS	5mL/kg

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