Cardiac Medications: Antiarrhythmics

Adenosine IV/IO
Indication: Supraventricular tachycardia (stable)
Dose: 0.1 mg/kg rapid IV push, then 5 ml saline flush
Repeat q2min × 2 doses: 0.2 mg/kg, 0.3 mg/kg (max 12 mg)

Amiodarone IV/IO
Indication: Pulseless VT/Vfib, stable ventricular tachycardia,
Dose: 5 mg/kg rapid IV push, or over 20–60 min (stable tachycardia) up to 15 mg/kg (max 300 mg/dose)

Lidocaine IV/IO
Indication: 2nd line for pulseless VT/Vfib
Dose: 1 mg/kg IV slowly, repeat 0.5 mg/kg q5–10min up to 3 mg/kg total dose

Magnesium Sulfate IV/IO
Indication: Torsades des Pointes
Dose: 25–50 mg/kg (max 2g) slow IV push, or over 15 min if stable

Cardiac Medications: Vasoactive and Inotropic

Epinephrine IV/IO (potent inotropic, vasoconstrictor)
0.01–1mcg/kg/min

Push Dose Epinephrine IV/IO
Indication: Fluid refractory hypotension, peri-intubation hypotension and bradycardia
Dose: Push 1 cc (Add normal saline to 0.01 mg/kg epinephrine to make total of 10 cc synringe) every 2 min PRN

Norepinephrine IV/IO (potent vasoconstrictor, inotrope)
0.05–1mcg/kg/min

If considering milrinone, dobutamine, phenylephrine, nitroprusside or vasopressin, please call referral line for PICU consultation.

Cardiac Medications: Other

Prostaglandin E (Alprostadil)
0.05–0.1 mcg/kg/min (monitor for apnea)
Indication: Ductal dependent lesion in neonate (e.g. hypoplastic left heart, critical coarctation, etc.)

Airway Equipment and Vital Signs

50%ile except BP 3× tube size = cm @ lip

Age	Wt (kg)	Cuffed ETT ID (mm) [1]	DL Blade (Straight or Curved)	Glidescope AVL: GVL	Length (cm) Tip to Tip	NG Tube	LMA	RR (Avg/Min)	HR [2]	Minimum Sys BP
Neonate	<1	2.5	0	GVL 0	7	5	1	<60	145	52
Neonate	1–2	3.0	0	GVL 0	8	5	1	<60	145	52
Neonate	2–4	3.5	0–1	GVL 1	9	5	1	<60	135	60
1–6 mo	4–6	3.5–4.0	1	GVL 2	12	8	1–1.5	24–30	130	70
6 mo–1 yr	6–10	3.5–4.0	1	GVL 2	13	8	1.5	24–30	130	70
1–2 yr	10–12	4.0	1	GVL 2.5	14	10	2	20–24	130	72–74
2–3 yr	12–14	4.5	1–2	GVL 2.5	15	10	2	20–24	120	74–76
4–5 yr	16–20	5.0	2	GVL 2.5	16	12	2	20–24	100	78–82
6–7 yr	23–28	5.0–5.5	2s (2c)	GVL 2.5	16	12	2.5	12–20	100	82–84
8–9 yr	31–34	5.5–6.0	2–3s (3c)	GVL 3	17	12	3	12–20	85	86–88
10–11 yr	37–40	6.0–6.5	2–3s (3c)	GVL 3	18	14	3	12–20	75	>90
12–13 yr	43–46	6.5–7.0	2–3s (3c)	GVL 3	18	14	3	12–20	75	>90
>14 yr	>50	7.0–8.0	2–3s (3c)	GVL 3	20–22	18	4	10–14	70	>90

1. Use cuffed tubes when available.
2. Consider SVT if HR >220 for infants and >180 for children.

⚠ Please be advised that it is the responsibility of the patient, along with their parent/guardian(s) and attending physician(s), to evaluate all available treatment options in the context of clinical presentation and symptoms reported prior to making any health decisions.

OHSU Doernbecher Pediatric Emergency Department and Observation Open 24/7

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Pediatric Emergency Management Guide

2024, 7th Edition

For transfers, consultation or to admit a patient, call 503-494-7000

Cardiac Arrest

- C-A-B: Compression (Ratio 15:2 for 2 rescuer CPR)
- With advanced airway, give 1 breath every 2–3 sec.
- Oxygen 100%
- Place IO

Rapid Sequence Intubation

Indication: Urgent need to control airway, unknown NPO status, or recent meal.

1. **Pre-oxygenate** Nasal cannula for apneic oxygenation
2. **Prepare atropine** 0.02 mg/kg IV/IM/IO (min-max 0.1–1 mg) for <6 months, administer for reflex bradycardia
3. **Sedation**
   - **Etomidate** (avoid in sepsis) 0.3 mg/kg IV/IO
   - **Ketamine** 1–2 mg/kg/dose IV/IO (or 3–5 mg/kg IM)
   - **Midazolam** (Versed) 0.2–0.3 mg/kg IV/IM/IO
4. **Paralytic**
   - **Rocuronium** 1 mg/kg IV/IO
   - **Succinylcholine** 1–2 mg/kg IV/IO or 2–4 mg/kg IM
   - Contraindication: malignant hyperthermia, neuromuscular disease, hyperkalemia
5. **Post-intubation medications**
   - **Midazolam** 0.05–0.1 mg/kg/dose IV/IO, max 6–10 mg, q30 minutes prn
   - **Fentanyl** 0.5–2 mcg/kg/dose IV/IO, max 50 mcg, q30 minutes prn
   - **Propofol** 25–100 mcg/kg/minute IV/IO
   - OR **bolus** 0.5–2 mg/kg q5 minutes prn

Cardiac Electricity

Defibrillation
Initial dose: 2J/kg
2nd dose: 4J/kg
3rd dose: 4–10J/kg

Cardioversion (Synchronized)
Initial energy: 0.5 J/kg
2nd dose: 1 J/kg.
Indication: Unstable SVT, VT (with pulse), a. fibrillation, a. flutter

Medications

Epinephrine
0.1 mg/ml (1:10,000): 0.1ml/kg (max 10ml)
IV/IO push q3–5 min
Indication: Bradycardia, asystole, hypotension

Calcium Gluconate
100 mg/kg (max 3 g) IV/IO over 5–10 min
Adult dose: 1–3g dose
Indication: Hypocalcemia, hyperkalemia

Atropine
0.02 mg/kg IV/IM/IO (minimum dose 0.1 mg), max dose 1 mg and repeat doses 0.04 mg/kg up to 3 mg
Indication: Bradycardia

Crystalloid (Normal Saline or Lactated Ringers)
20 ml/kg IV/IO
Indication: Volume expansion

Colloid (5% Albumin, pRBC)
10 ml/kg IV
Indication: Volume expansion

Glucose IV/IO
Neonates D10W: 5–10ml/ kg
Indication: CBG <40 mg/dl

Infants/Children D10W: 5–10ml/kg or D25W: 2–4ml/kg
Indication: CBG <60 mg/dl

Adults D50W: 25–50ml/ kg
Indication: CBG <60 mg/dl

OHSU DOERNBECHER CHILDREN'S Hospital

IN

CM

Adrenal Insufficiency

Febrile or vomiting illness and tolerating PO 3× patient's oral dose of glucocorticoid
Severe illness or not tolerating PO Hydrocortisone IV/IM:
- Weight-based: 2–3 mg/kg (max 100 mg)
- Age-based: 0–3 yr: 25 mg; >3–12 yr: 50 mg; >12 yr: 100 mg

Allergic Reactions

Cetirizine PREFERRED
6 mo–2 yr: 2.5 mg; 2–5 yr: 2.5–5 mg; 5 yr and older: 5–10 mg
Epinephrine 1 mg/ml (1:1000): 0.01 ml/kg (max 0.5 ml)
IM in thigh q5min
Diphenhydramine 1 mg/kg (max 50 mg) IV/IM/PO
Dexamethasone (Decadron) 0.5 mg/kg IV/IM/PO, max 10 mg

Asthma

Albuterol Nebs 2.5–5 mg (0.15 mg/kg) inhaled q20 min × 3 doses, then q1 hr as needed
Albuterol/Ipratropium (Duoneb) 3 ml inhaled q20 min × 3 doses for moderate to severe asthma
Continuous Albuterol Nebs Weight-based dosage. 5 to <10 kg: 5 to 7.5 mg/hr; 10 to <20 kg: 10 mg/hr; >20 kg: 15 to 20 mg/hr titrate dosage up to 20 mg/hr. Continuous nebulization to be delivered through face mask.
Dexamethasone (Decadron) 0.6 mg/kg/dose IV/IM/PO, max 16 mg
Epinephrine 1 mg/ml (1:1000): 0.01 ml/kg (max 0.3ml) IM in thigh qSmin
Magnesium Sulfate 25–75 mg/kg (max 2 g) over 15 min (dilute to 40 mg/ml in NS)
Methylprednisolone (Solumedrol) 2 mg/kg IV/IO × 1 dose

Behavioral Agitation

Lorazepam
0.05 mg/kg (max 2 mg) PO/IM
Olanzapine
2.5–10 mg PO/IM

Separate parental Olanzapine and Benzodiazepine at least 1 hour apart due to the risk of respiratory depression

Croup

Racemic Epinephrine (nebulized)
0.25 ml × 2 doses as needed for stridor. If no racemic epi, may use L-epi. L-epinephrine: 0.5 ml/kg per dose (maximum of 5 ml) of a 1 mg/ml (1:1000) preservative-free solution
Dexamethasone (Decadron)
0.6 mg/kg/dose IV/IM/PO, max 16 mg

Diabetic Ketoacidosis

⚠ **Contact pediatric endocrinologist early**

Do not bolus Insulin or Bicarb Draw labs: Na, K, Phos, Mg, VBG, UA
Fluid Avoid excessive fluid — use isotonic fluid
Bolus NS 10–20 ml/kg
Maintenance at 1.5 times normal rate (only add K if K is less than 5 and making urine)
CBG>300: NS – + 20 meqKCl
CBG200–300: D5NS – + 20 meqKCl
CBG<200: D10NS – + 20 meqKCl

⚠ **If present, turn off insulin pump before starting insulin drip**

Insulin Drip 0.05–0.1 units/kg/hr
Watch for signs of cerebral edema (see "Increased ICP")

Fluids (IV/IO)

Bolus 20 ml/kg of dextrose free, isotonic fluid (NS/LR)
Maintenance Fluid Requirement Hourly rate use 4-2-1 rule D5NS + 20KCl (D5½NS + 20KCl in infants)
4 ml/kg for the 1st 10 kg +
2 ml/kg for the 2nd 10 kg +
1 ml/kg over 20 kg

Hyperkalemia PEAKED T-WAVES ON 12-LEAD

1. **First, stabilize myocardium**
   Calcium Gluconate 30 mg/kg IV (or Calcium Chloride 10 mg/kg if central line available)
2. **Second, treat hyperkalemia** Consider:
   Sodium Bicarbonate 1 m Eq/kg (max 50 mEq) IV
   Albuterol Nebulization 5–20 mg/hr
   Glucose 0.5 g/kg IV (max 25 g)
   with Insulin: Regular 0.1 units/kg IV (max 10 units)
   Furosemide 1 mg/kg IV may repeat for effect (Only if intact renal function and urine output)
   Kayexalate 1–2 g/kg (max 30 g) PO/PR

⚠ **If no urine output, arrange for urgent dialysis**

Hypertensive Emergencies

⚠ **Investigate etiology of hypertension**
(treating may be harmful in case of increased ICP)

Bolus
Labetalol (β and α blocker) 0.2–0.5 mg/kg/dose IV, up to 1 mg/kg/dose, max 20 mg; **Adults** initial 20 mg, may give 40–80 mg q10 min up to 300 mg total dose
Hydralazine 0.1–0.2 mg/kg IV initially; **Adults** 10–20 mg, up to 40 mg q4–6 hrs
Infusion
Esmolol (β blocker) 50–250 mcg/kg/min IV

Increased Intracranial Pressure

⚠ **Consult Neurosurgery early**

Prevent hypoxia or hypotension; allow permissive hypertension
Treat ICP
- **Positioning** HOB 30 deg, Head midline
- **Minimize brain metabolic rate** Aggressively treat fevers, seizures; consider sedation
- **Hyperosmolar therapy** 1st line Hypertonic Saline 3–6 ml/kg bolus over 10 min; 2nd line (if normotensive) Mannitol 0.25–1 g/kg bolus over 10 min
- **Maintain normoventilation** (EtCO2 30–35)

If...
- Signs of active herniation, consider acute hyperventilation (EtCO2 28–32) while making operative arrangements
- Brain tumor, consider decadron 1 mg/kg (max dose 10 mg)

Ingestions/Toxicity

Poison Control Center 1-800-222-1222

Activated Charcoal 0.5–1 g/kg/dose PO/NG (without sorbitol) max dose 50–100g. Contraindication: depressed mental status, other aspiration risk, bowel obstruction.
Flumazenil (Romazicon) 0.01 mg/kg (max 0.2 mg) IV q1 min until max 0.05 mg/kg (or 1 mg) total dose Contraindicated in chronic benzodiazepine use or acute seizure
Naloxone (Narcan)
- Full reversal dose (for apneic patients or children whom opioid dependence is not suspected): 0.1 mg/kg IV (max dose 2 mg)
- Partial reversal dose: 0.04 mg IV q1 minutes prn until respiratory rate reaches 12 per minute.
- Clonidine toxicity (consult poison control): 0.4 mg to 2 mg IV

Pain Management and Anxiolysis

Analgesics
Fentanyl 1–2 mcg/kg/dose (max 50 mcg) IV (monitor for rigid chest symptoms in neonates) Intranasal: 1–3 mcg/kg/dose (max 50mcg per nostril)
Morphine 0.1–0.2 mg/kg/dose (max 8 mg per dose) IV/IM
Midazolam 0.05–0.1 mg/kg/dose (5 mg per dose) IV/IM, or 0.25–1 mg/kg/dose PO
Intranasal: 0.3–0.4 mg/kg/dose (max 10mg, 5mg per nostril)
Sweetease Use as needed in infants

Seizures

1. **First, attend to ABCs**
2. **Second, treat hypoglycemia**
3. **Third, treat seizures**

Infants/Children
FIRST LINE **Benzodiazepines** Administer × 2 doses prn
Lorazepam 0.05–0.1 mg/kg/dose (max 4 mg) IV/IM
Midazolam 0.2 mg/kg/dose (max 10 mg) IV/IM
Intranasal 0.4 mg/kg (max 10 mg)
Diazepam 0.1–0.2 mg/kg/dose (max 10 mg) IV
SECOND LINE **For benzodiazepine refractory seizures**
Levetiracetam (Keppra) 40–60mg/kg (max 4.5g) IV loading dose
Fosphenytoin 15–20 mg PE/kg IV loading dose over 10 minutes. May administer IM undiluted if no access.
Valproic Acid 20–40 mg/kg IV/IO over 10–20 min

Neonates
Phenobarbital 15–20 mg/kg IV loading dose (max rate 1 mg/kg/ min), then 5 mg/kg q15 min prn seizures

Sepsis

⚠ **Golden Hour = Early recognition**
⚠ **Goals for first 60 min of therapy:**
- Restore normal airway, oxygenation, and ventilation
- Restore circulation (CRT <2 sec, HR nl for age, BP >70 + 2×age years (<10yrs), etc.

⚠ **Early vascular access; Early antibiotics**
- Obtain rapid access (IO if IV access not successful with 2 attempts)
- Secure airway as indicated
- **Fluid Resus** 10 ml/kg neonates, 20 ml/kg infants/children NS or LR over 5–10 min, reassess after each bolus (may require up to 60 ml per kg wthin the first hour)

⚠ **Begin broad spectrum antibiotics** (ideally following blood cultures)

Neonates **Ampicillin** 50 mg/kg (less than 29 days) + **Gentamycin** 4–5 mg/kg,+/–**acyclovir** 20 mg/kg

Infants **Vancomycin** 15 mg/kg + **Ceftriaxone** 50 mg/kg

Healthy Children **Vancomycin** 15 mg/kg + **Ceftriaxone** 50 mg/kg

Chronically Ill / Immunosuppressed
Vancomycin 15 mg/kg + **Cefepime** 50 mg/kg
OR **Meropenem** 30 mg/kg; +/–**acyclovir** 20 mg/kg
Vasoactives Indicated if non-responsive to fluid at 60ml/kg, or patient develops rales/gallop/hepatomegaly
FIRST LINE **Epi** 0.05–0.15 mcg/kg/min (cold shock) or **Norepi** 0.01–1 mcg/kg/min (warm shock)
SECOND LINE **Vasopressin** 0.3 miliunits/kg/min:
hydrocortisone 2 mg/kg IV × 1