



Pediatric Pocket Reference Card

Original concept and data compilation by Daniel J. Woodward, MD, Oregon Health & Science University. Edited and adapted for UCSF by Tina Dong, MD and Marla Ferschl, MD

Peds E1	2-0442	Adult E1	2-0447	Call Resident	2-0450
OR front desk	6-1018	Peds Preop	6-1020	Peds PACU	6-1035
MRI	6-1071	iMRI	6-0466	Blood Bank	6-1404
ICN	3-1565	PICU	3-1352	Peds CICU	3-1955
TCUP	4-4089	Med-Surg (5)	3-1921	Heme-Onc (6)	3-1631

OR ## = 2 - 98## Prefixes : 353-xxxx 514-xxxx 476-xxxx 502-xxxx

NORMAL HEMODYNAMIC INDICES

	Wt range (10-90th %)	HR	SBP	MAP	RR
Preterm		120-170	40-60	30s	50-60
0-3 months	2.5-7.5	100-150	65-85	45-60	30-60
3-6 months	4.8-9.5	90-120	70-90	50-60s	24-30
6-12 months	6.5-12.5	80-120	80-100	60s	22-26
1-3 years	8.75-17	70-110	70-100	50-60s	18-24
3-6 y	15.5-25	65-110	80-110	55-70	16-22
6-12 y	17-55	60-95	80-120	60-80	12-20
>12 y	30-86	55-85	90-130	70-80s	10-16

For preterm + term newborns: MAP = # of weeks PCA Ex: By DOL 5, MAP = # weeks PCA + 5

Simple formulae to predict weight from age: < 8years: weight (kg) = 2 x age + 9 >= 8 years: weight (kg) = 3 x age

PEDIATRIC AIRWAY EQUIPMENT

Age	Weight (kg)	ETT	ETT @ lips (cm)	Laryngoscope blade	LMA	Mask	Oral Airway
Neonate	<1	2.5u	7cm	Miller 0	1	neonate	30
Neonate	1-2	3.0u	8cm	Miller 0	1	neonate	30
Neonate	2-3	3c/3.5u	9cm	Miller 0-1	1	neonate	30
Neonate	>3	3c/3.5u	10cm	Miller 0-1	1	infant	40
1-6 mo	4-6	3c/3.5	12cm	Miller 1/Wis 1.5	1-1.5	infant	40
6mo-1y	6-10	3.5c/4u	13cm	Wis 1.5	1.5	toddler	50
1-2y	10-12	4-4.5c	14cm	Wis 1.5	2	toddler	60
2-4y	12-16	4.5c	15cm	Wis 1.5/Mac 2	2	child/bubble gum	60
4-6y	16-20	4.5-5c	16cm	Miller 2/Mac 2	2	bubble gum	60-70
6-8y	20-30	5-5.5c	17cm	Miller 2/Mac 2	2.5	bubble gum	70-80
9-12y	30-45	5.5-6c	18cm	Miller/Mac 2-3	3	small adult	80
>14y	>50	6.5-7c	20-22	Miller/Mac 2-3	4	med/large adult	80-90

ETT Size = (Age/4) + 4 or size of 5th finger **ETT Depth** = 3 x ETT size or Age + 11 cm at lip

Neonatal Rules: The Neonatal "1-2-3 / 7-8-9" Rule

MAINTENANCE FLUID REQUIREMENTS

"4-2-1" Rule: Hourly fluid maintenance rate
 4 mL/kg/hr for each kg up to 10 kg
 + 2 mL/kg/hr for each additional kg up to 20 kg
 + 1 mL/kg/hr for each additional kg above 20 kg
 Replace the 1st 1/2 of the pre-op volume deficit (hourly maintenance IVF x hrs NPO + bowel prep) over the 1st hour of surgery
 Replace the 2nd 1/2 of deficit over the remainder of the procedure
 Fluid boluses: 10-15 mL/kg/bolus for hypovolemic patients

GLUCOSE REQUIREMENTS FOR NEONATES AND INFANTS

Normal blood glucose for newborns 40-60 mg/dL. Typical newborn basal glucose requirement is 5-8 mg/kg/min. (D10 at 1 mL/hr = 1.67 mg/kg/min of dextrose). Start at D10 1/4 NS at 3 mL/kg/hr which approximates hourly maintenance rate, leaving them slightly dry to administer IV meds.
 Consider intraop glucose administration to NPO infants under 6 months of age, especially for long procedures. Recommended for infants with:
 Prematurity/SGA Already on TPN or glucose (D10)
 Suspected inborn errors of metabolism Sepsis
 Mitochondrial myopathies Born to diabetic mothers

BLOOD PRODUCT TRANSFUSION GUIDELINES

pRBC 10-15 mL/kg should raise Hgb 2-3 g/dL, Hct by 6-9%
 For > 20 mL/kg transfusion or cardiac cases, request < 5 day old or washed RBCs

FFP 10-15 mL/kg should raise factor levels 15-20%

Platelets 10-15 mL/kg should raise platelet count by 30-50,000

Cryoprecipitate: 1-2 units/kg should increase fibrinogen level to 60-100 mg/dL

DDAVP 0.1-0.3 mcg/kg given 30 min prior to procedure

Criteria for irradiated blood: prematurity, fetus in utero, bone marrow transplant recipient, critically ill child, patient with decreased cellular immunity, patient receive chemo that results in severe immune suppression

EPIDURAL INFUSION RATES & DOSAGES

Neonates (< 6 months) bupivacaine/ropivacaine max dose = 0.2 mg/kg/kr
 Children (> 6 months) bupivacaine/ropivacaine max dose = 0.3-0.4 mg/kg/hr
 Hydromorphone infusion: 20 mcg/mL, hourly rate 3 mcg/kg/hr; max 5 mcg/kg/hr
 Test dose 0.1 mL/kg (1:200000 epi)
 Single shot caudal local anesthetic: 1 mL/kg 0.25% ropiv/bupivacaine; max 20 mL
 Single shot caudal opioids: morphine 50 mcg/kg or hydromorphone 5-10 mcg/kg

Local Anesthetic Systemic Toxicity Treatment: 1.5 mL/kg 20% Intralipid followed by continuous infusion 0.25 mL/kg/min up to 0.5 mL/kg/min until hemodynamics restored
 Reduced doses of epinephrine < 1 mcg/kg for hypotension
 Start CPR/PALS
 Avoid vasopressin, calcium channel blockers, beta blockers

ESTIMATED BLOOD VOLUME LOCAL ANESTHETIC MAX DOSE

	90-100 ml/kg		Plain (mg/kg)	With epi 1:200,000 (mg/kg)
Premature	90-100 ml/kg			
Term neonate	80-90 ml/kg			
Infant 3 months - 1 year	70-80 ml/kg	Lidocaine	5	7
Child > 1 year	70 ml/kg	Bupivacaine	2.5	3
		Ropivacaine	2.5	3

RESUSCITATION

Defibrillation vfib and pulseless vtach 2 Joules/kg ASYNCHRONOUS repeat up to 4 Joules/kg	Synchronous Cardioversion unstable SVT, vtach, a fib/flutter 0.5 Joules/kg SYNCHRONOUS repeat up to 2 Joules/kg
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Epinephrine	1 mcg/kg to treat hypotension/bronchospasm 10 ug/kg IV for cardiac arrest
Atropine	20 mcg/kg IV (for symptomatic bradycardia or pre-treatment) max dose 1 mg for child and 2mg for adolescent
Bicarbonate	1-2 mEq/kg IV to be guided by blood gas analysis
Calcium Chloride	10-20 mg/kg IV (0.1-0.2 mL/kg of a 10% solution)
Adenosine	first dose: 100 mcg/kg rapid IV push and flush (max 6 mg) second dose: 200 ug/kg (max 12 mg)
Magnesium	25-50 mg/kg IV for Torsades de Pointes (max 2 g)
Amiodarone	5 mg/kg IV, max 300mg for vfib and/or vtach
Procainamide	5-15 mg/kg IV loading dose over 30-60 min, then 20-80 ug/kg/min infusion

ANAPHYLAXIS

Oxygen	Ventilate with 100% O2
Epinephrine	10 mcg/kg IM, max 300 ug 1 mcg/kg IV, repeat with increasing doses every 3-5 min PRN, may need continuous infusion 0.02-0.2 mcg/kg/min
Fluid bolus	20 mg/kg isotonic fluids, repeat as necessary
Albuterol	10 puffs if bronchospasm present
Hydrocortisone	2-3 mg/kg IV
Diphenhydramine	1-2 mg/kg IV, max 50 mg
Ranitidine	1.5 mg/kg IV, max 50 mg

MALIGNANT HYPERTHERMIA MH Hotline - 1-800-MH-HYPER

Signs: increased EtCO2, muscle rigidity, cardiac arrest, arrhythmias, hyperthermia, acidosis, myoglobinuria
 1. Call for help
 2. Stop all triggering anesthetics, convert to TIVA, exchange anesthesia machine
 3. Dantrolene 2.5 mg/kg IV (mix with sterile H2O)
 4. Hyperventilate with 100% O2 to normalize EtCO2 (2-4x patient's minute ventilation)
 5. Treat hyperkalemia
 6. Avoid calcium channel blockers for dysrhythmias
 7. Cool patient: NG lavage with cold water, apply ice externally, infuse cold saline IV
 8. Arterial line: ABG, lytes, Ca++, CPK, AST/ALT, CK, myoglobin
 9. Sodium bicarbonate 1-2 mEq/kg max 50 mEq to maintain pH > 7.2
 10. Maintain 2 mL/kg/hr urine output (with diuretics if necessary)

HYPERKALEMIA TREATMENT

Signs: Peaked T waves, Wide QRS, Cardiac Arrest
Risk factors: ARF/CRF, Transfusion, Burns, Trauma, GI bleeds, hemolysis
 Calcium chloride 5-10 mg/kg IV until NSR
 Hyperventilation
 Sodium bicarb 1 mEq/kg/dose IV
 D50 1 mL/kg + insulin 0.2 U/kg IV
 Albuterol 5-20 mg via nebulizer
 Furosemide 1 mg/kg IV PRN
 Kayexalate 1-2 g/kg PO/PR

ENDOCARDITIS PROPHYLAXIS GUIDELINES AHA 2007

At risk conditions

1. Presence of prosthetic valve or prosthetic material used for cardiac valve repair
2. A history of endocarditis
3. A heart transplant with abnormal heart valve function
4. Congenital heart disease: Uncorrected or palliated cyanotic CHD, completely repaired CHD with prosthetic material or device during the first 6 months after repair procedure, repaired CHD with residual defects adjacent to prosthetic patch or device

Procedures requiring prophylaxis in at risk patients

1. Dental procedures involving manipulation of gingival tissue or perforation of oral mucosa
2. Invasive procedure of respiratory tract involving incision or biopsy of respiratory mucosa
3. GI or GU procedures involving contaminated or dirty/infected tissue or in patients septic due to GI or GU infection
4. Procedure involving infected skin or musculoskeletal tissue

Route	Antibiotic Dose
Oral	Amoxicillin 50 mg/kg PO max 2g
IV (unable to take oral)	Ampicillin 50 mg/kg IV/IM max 2g or Cefazolin 50 mg/kg IV/IM max 1g or Ceftriaxone 50 mg/kg IV/IM max 2g
Allergic to penicillin	Clindamycin 20 mg/kg IV/PO max 600 mg or * Cephalosporins not recommended for PCN anaphylaxis due to cross-reactivity
MRSA+	Vancomycin 20 mg/kg IV max 1g

ANTIBIOTICS

Antibiotic	Pediatric Dosing	Adult Dosing	Dose Freq
Ampicillin	25-50 mg/kg	2 g	Q2H
Ampicillin/Sulbactam (Unasyn)	25-37.5 mg/kg	3 g	Q2H
Cefotaxime	50 mg/kg	1 g	Q3H
Cefazolin (Ancef)	25-50 mg/kg	2 g, 3 g for > 120kg	Q4H
Ceftriaxone (Rocephin)	50-75 mg/kg	2 g	Q12-24H
Clindamycin (Cleocin)	10 mg/kg	900mg	Q6H
Gentamicin	2-2.5 mg/kg	5 mg/kg based on IBW	Q8H
Metronidazole (Flagyl)	7.5 mg/kg	500 mg	Q6H
Nafcillin	25-50 mg/kg	2 g	Q6H
Piperacillin/Tazobactam (Zosyn)	37.5-75 mg/kg	3.375 g	Q2H
Vancomycin	10-15 mg/kg	1 g, 1.5 g for > 80kg	

Disclaimer: Author not responsible for any errors. It remains the responsibility of the physician to evaluate the appropriateness of a particular therapy or intervention in the context of each clinical situation with consideration to their knowledge, skill and changes to the standard of practice since publication of this reference card.

MEDICATIONS	
ACETAMINOPHEN	PO/IV: 10-15 mg/kg PR: 40 mg/kg Max: 75 mg/kg/24 hour
ADENOSINE	0.1-0.2 mg/kg fast IV push with flush, may repeat 0.2 mg/kg IV after 2 minutes
ALBUTEROL	Nebulized: 2.5 mg in 3mL every 20 min or continuous
AMINOCAPROIC ACID	75 mg/kg (max 5 gram) dilute IV load and in CPB prime. 30-75 mg/kg/hr infusion
AMIODARONE	5 mg/kg IV load (max 150 mg) over 30 minutes then 5-10 mcg/kg/min
ATROPINE	IV: 10-20 mcg/kg IM/PO: 20-30 mcg/kg
BUPIVACAINE 0.25% (with 1:200,000 epi)	Caudal 1st dose: 0.5-1 mL/kg Repeat dose: 2/3 of initial dose q 90-120 minutes
CALCIUM CHLORIDE	5-10 mg/kg IV slowly Arrest: 10 mg/kg IV
CALCIUM GLUCONATE	30 mg/kg IV slowly
CISATRACURIUM	0.1-0.2 mg/kg IV for paralysis in 1-2 minutes, 20-40 minutes until reversible
DANTROLENE	see Malignant Hyperthermia algorithm
DESMOPRESSIN DDAVP	Hemophilia: 0.3 mcg/kg IV slowly Diabetes Insipidus: 1-2 mcg IV/SQ q 12 hours
DEMEDETOMIDINE	Infusion: 0.2-1 mcg/kg/hr IV Load: 0.2 -1 mcg/kg IV load (over 10 - 20 min)
DEXAMETHASONE	Airway edema: 0.25-0.5 mg/kg IV q6 hours ICP: 0.5-1.5 mg/kg IV PONV: 0.1 mg/kg IV
DEXTROSE (50%)	0.5 g/kg = 1 mL/kg of D50
DIPHENHYDRAMINE	0.5-1 mg/kg IV q 4-6 hours; Max 50 mg/dose
DOBUTAMINE	0.5-20 mcg/kg/min IV infusion
DOPAMINE	0.5-20 mcg/kg/min IV infusion
EPINEPHRINE	Arrest: 10 mcg/kg IV/ETT Vasopressor: 0.5-5 mcg/kg IV Infusion: 0.02 - 1 mcg/kg/min IV
EPHEDRINE	IV: 0.1-0.2 mg/kg prn hypotension/bradycardia
ESMOLOL	Bolus: 0.5 mg/kg IV PRN Infusion: 50-150 mcg/kg/min IV
ETOMIDATE	Induction: 0.2-0.3 mg/kg IV Maintenance: 5-20 mcg/kg/min IV infusion
FACTOR VIIa	90 mcg/kg q 2 hours until hemostasis achieved. Get hematology consult
FENTANYL	Analgesia: 0.5-1 mcg/kg IV, 1-2 mcg/kg intranasal Infusion: 1-5 mcg/kg/hr IV

FUROSEMIDE	0.5-1 mg/kg/dose IV/IM q 6-12 hours
GLUCAGON	0.1 mg/kg IV; Max 1 mg
GLYCOPYRROLATE	NMB reversal: 0.01-0.15 mg/kg IV Antisialagogue: 0.05-0.2 mg IV/IM
HUMATE P	FVIII deficiency: 40-60 U/kg IV then 20-30 U/kg IV q8h (in severe disease with major surgery) vWF deficiency: 40-80 U/kg IV then 40-60 U/kg q8h (Types 2/3) or q24h (Type 1)
HYDROCORTISONE	Stress dose: 1-2 mg/kg IV then 150-250 mg/day (<1y = 25-150 mg/day) q6-8h
HYDROMORPHONE	IV: 5-10 mcg/kg IV PO/PR: 50-80 mcg/kg q3-6h prn
INTRALIPID	Local anesthetic toxicity: 1.5 mL/kg followed by infusion 0.25 mL/kg/min up to 0.5 mL/kg/min
KETAMINE	IV induction: 2-3 mg/kg IM (full) induction: 5-8 mg/kg PR induction: 5-10 mg/kg Preemptive analgesia: 4-12 mcg/kg/min
KETOROLAC	0.5-1 mg/kg IV/IM then 0.5 mg/kg q6h
LABETALOL	0.1 mg/kg IV increments q5-10min per BP
LIDOCAINE	1-1.5 mg/kg IV/ETT
MAGNESIUM	25-50 mg/kg/dose IV (watch hypotension)
MANNITOL	0.25-1 g/kg IV (typically) slowly Maintenance: 0.25-0.5g/kg IV q4-6h
METHADONE	0.05-0.1 mg/kg PO/IM/IV/SQ; t1/2 = 18-24 hours
METHOHEXITAL	IV induction: 1-3 mg/kg PR induction: 20-30 mg/kg
METHYLPREDNISOLONE	Asthma 2 mg/kg IV then 2 mg/kg/day / q4-6h
MILRINONE	Load: 25-50 mcg/kg IV over 15 min Maintenance: 0.25-1 mcg/kg/min IV
METOCLOPRAMIDE	0.1-0.15 mg/kg IV/PO q6h prn
MORPHINE	Analgesia: 0.05-0.1 mg/kg/dose IV/IM
NALOXONE	End case sleepy: 0.5-1 mcg/kg IV prn Opioid intoxication: 10 mcg/kg IV/IM/ETT
NEOSTIGMINE	30-70 mcg/kg IV; Max 5mg Add atropine 20 mcg/kg or glycopyrrolate 15 mcg/kg IV
NICARDIPINE	Adult loading dose: 5 mg IV over 5-10 min Infusion: 2.5-15 mg/hr or 0.5-5 mcg/kg/min (α t1/2 = 2-5 min, β t1/2 = 45 min)
NITROGLYCERINE	0.5-20 mcg/kg/min IV infusion
NITROPRUSSIDE	0.5-20 mcg/kg/min IV infusion
NOREPINEPHRINE	0.05-0.1 mcg/kg/min IV; Max = 2 mcg/kg/min
ONDANSETRON	PONV: 0.15 mg/kg IV; Max 4 mg

OXYCODONE	PO: 0.1 mg/kg q3-6h PRN
PANCURONIUM	0.1 mg/kg IV for full paralysis in 3 min, 60-90 min until reversible (80% renal)
PHENOBARBITAL	Status epilepticus: 15-20 mg/kg SLOW IV then add 5 mg/kg q20h; Max 30 mg/kg IV
PHENYLEPHRINE	0.5-1 mcg/kg IV bolus PRN hypotension 0.1-0.5 mcg/kg/min IV infusion
PHENYTOIN	Loading dose: 15-20 mg/kg IV over 30 min (Do not exceed 0.5 mg/kg/min IV)
POTASSIUM	0.5-1 mEq/kg SLOW IV infusion
PROCHLORPERAZINE	0.1-0.15 mg/kg PO/IM/PR/IV q6-8h; Max 10 mg/dose
PROMETHAZINE	0.2-0.5 mg/kg IV/PO/PR/IM q6-8h PRN Max 25 mg/dose (Not for kids < 2 y)
PROPOFOL	Induction: 2-3 mg/kg (higher in children) Infusion 50-250 mcg/kg/min
RANITIDINE	IV: 1 mg/kg PO: 2 mg/kg (30 min pre-induction)
REMIFENTANIL	IV bolus: 0.5-1 mcg/kg IV IV infusion: 0.05-0.5 mcg/kg/min IV
ROCURONIUM	0.6-1.2 mg/kg IV for paralysis in 1-2 min 20-40 min until reversible (80% hepatic)
ROPIVACAINE	Caudal: 1st dose = 0.5-1 mL/kg Repeat dose: 2/3 of 1st dose q 90-120 min
SCOPOLAMINE	0.02 mg/kg IV; Max 0.4 mg
SODIUM BICARBONATE	1-2 mEq/kg IV
SUCCINYLCHOLINE	IV: 1-2 mg/kg for full paralysis in 30 sec; < 1 year: 2-3 mg/kg IM: 3-5 mg/kg; Max 5 mL at injection site Intraligular: 1-3 mg/kg
SUFENTANIL	Analgesia: 0.5-2 mcg/kg IV Typical: 10-20 mcg/kg total dose
SUGAMMADEX	Reversal of rocuronium/vecuronium 2 twitches on TOF: 2 mg/kg IV 1-2 twitches on PTC but none on TOF: 4 mg/kg IV Immediate reversal: 16 mg/kg IV
TERBUTALINE	5-10 mcg/kg IV q15 min (max 250 mcg)
THIOPENTAL	5-8 mg/kg IV (full induction)
TRANEXEMIC ACID	Craniosynostosis: 50 mg/kg load over 15 min followed by 5 mg/kg/hr (Goobie 2011) Spine surgery: 100 mg/kg load followed by 10 mg/kg/hr Cardiac surgery: Variable regimens
VASOPRESSIN	Adult VF/VT arrest: 40 U IV x 1 dose Peds infusion: 0.2-3 milliunits/kg/min IV Diabetes Insipidus: 0.5-10 milliunits/kg/hr
VECURONIUM	0.1 mg/kg IV for full paralysis in 2-3 min 30-45 min until full reversible (80% hepatic)

PREOPERATIVE SEDATIVES	
Diazepam (Valium)	PO 0.25-0.5 mg/kg Max 20mg IV: 0.1 mg/kg/dose
Ketamine	IM: 3-5 mg/kg with atropine 20 mcg/kg and PO: 4-6 mg/kg with Midazolam
Lorazepam (Ativan)	IV/IM/PO: 0.05 mg/kg/dose
Midazolam (Versed)	PO: 0.25-0.5 mg/kg Max = 20mg Rectal: 0.5-1.0 mg/kg diluted to 3mL saline Intranasal: 0.2-0.3 mg/kg (use nasal atomizer) IM: 0.25 mg/kg (be wary of injection site pain) IV: 0.05-0.1 mg/kg/dose to max of 0.25 mg/kg

DIFFICULT AIRWAY			NPO GUIDELINES (hr)	
Fiberoptic Scope	Smallest	Smallest LMA	Clears	2
Noodle 2.2 mm	2.5 ETT	1	Breast milk	4
Pediatric 2.8 mm	3.5-4.0	1	Formula, milk, light meals (cereals)	6
Adult 4.1 mm	5.5	1.5	Full meals	8

LMA	Largest ETT to fit through	OPIOID CONVERSION	
1	3.5 uncuffed		
1.5	4 uncuffed		
2	4.5 uncuffed		
2.5	5 uncuffed		
3	6 cuffed		
4	6 cuffed		
5	7 cuffed		

SINGLE LUNG VENTILATION					
Age (yrs)	ETT (mm)	BB (Fr)	Univent (mm)	DLT (Fr)	
0.5-1	3.5-4.0	5			Meperidine 75 mg Methadone ~5-10 Tramadol (Ultram) ~100 Sufentanil 0.5 mg Alfentanil 0.02 mg Remifentanil 0.1 mg
1-2	4.0-4.5	5			
2-6	4.5-5.5	5			
6-8	5.5-6	6	3.5		
8-10	6.0 c	6	4.5	26	
10-12	6.5 c	6	4.5	26-28	
12-14	6.5-7.0 c	7	6.0	32	
14-16	7.0 c	7	7.0	35	
16-18	7.0- 8.0 c	7-9		35	