# Pediatric Emergency ABCs and More*

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## AIRWAY

### Airway Equipment

| ZONE | 3 kg | 4 kg | 5 kg | PIN | RED | PUR | YEL | WHI | BLU | ORG | GRN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (kg) | 3 | 4 | 5 | 6-7 | 8-9 | 10-11 | 12-14 | 15-18 | 19-23 | 24-29 | 30-36 |
| ET Tube (mm) | 3.5 unc/ 3.0 cuff | 3.5 unc/ 3.0cuff | 3.5 unc/ 3.0 cuff | 3.5 unc/ 3.0 cuff | 3.5 unc/ 3.0 cuff | 4.0 unc/ 3.5 cuff | 4.5 unc/ 4.0 cuff | 5.0 unc/ 4.5 cuff | 5.5 unc/ 5.0 cuff | 5.5 cuff | 6.0 cuff |
| Lip-Tip (cm) | 9-9.5 | 9.5-10 | 10-10.5 | 10-10.5 | 10.5-11 | 11-12 | 12.5-13.5 | 14-15 | 15.5-16.5 | 17-18 | 18.5-19.5 |
| Suction | 8F | 8F | 8F | 8F | 8F | 8-10F | 10F | 10F | 10F | 10F | 12F |
| L-Scope blade | 1 St. | 1 St. | 1 St. | 1 St. | 1 St. | 1 St. | 2 St./Cvd. | 2 St./Cvd | 2 St./Cvd | 2-3 St./Cvd. | 2-3 St./Cvd. |
| Stylet | 6F | 6F | 6F | 6F | 6 | 6F | 10F | 10F | 10F | 14F | 14F |
| Oral Airway | 50mm | 50mm | 50mm | 50mm | 50mm | 60mm | 60mm | 60mm | 70mm | 80mm | 80mm |
| NP Airway | 14F | 14F | 14F | 14F | 14F | 18F | 20F | 22F | 24F | 26F | 26F |
| BVM (min vol mLs) | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450-750 | 750-1000 | 750-1000 | 1000 |
| LMA | 1 | 1 | 1 | 1.5 | 1.5 | 2 | 2 | 2 | 2-2.5 | 2.5 | 3 |

*Unc* = uncuffed

### AGE ESTIMATION CHART

| COLOR | WEIGHT | AGE |
|---|---|---|
| GREY | 3-5 kg | < 3 mo |
| PINK | 6-7 kg | 3-5 mo |
| RED | 8-9 kg | 6-11 mo |
| PURPLE | 10-11 kg | 12-24 mo |
| YELLOW | 12-14 kg | 2 yrs |
| WHITE | 15-18 kg | 3-4 yrs |
| BLUE | 19-23 kg | 5-6 yrs |
| ORANGE | 24-29 kg | 7-9 yrs |
| GREEN | 30-36 kg | 10-11 yrs |

### RSI MEDICATIONS

| ZONE | 3 kg | 4 kg | 5 kg | PINK | RED | PUR | YEL | WHI | BLU | ORG | GRN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (kg) | 3 | 4 | 5 | 6-7 | 8-9 | 10-11 | 12-14 | 15-18 | 19-23 | 24-29 | 30-36 |
| **PRE** | | | | | | | | | | | |
| Atropine | 0.06mg | 0.08mg | 0.1mg | 0.13mg | 0.17mg | 0.2mg | N/A | N/A | N/A | N/A | N/A |
| **INDUCTION** | | | | | | | | | | | |
| Etomidate | 0.9mg | 1.2mg | 1.5mg | 2mg | 2.5mg | 3.2mg | 4mg | 5mg | 6.3mg | 8mg | 10mg |
| Ketamine | 6mg | 8mg | 10mg | 13mg | 17mg | 20mg | 26mg | 33mg | 42mg | 53mg | 66mg |
| Propofol | 9mg | 12mg | 15mg | 20mg | 25mg | 32mg | 40mg | 50mg | 63mg | 80mg | 100mg |
| **PARALYSIS** | | | | | | | | | | | |
| Succinylcholine | 6mg | 8mg | 10mg | 13mg | 17mg | 20mg | 26mg | 33mg | 40mg | 53mg | 66mg |
| Rocuronium | 3mg | 4mg | 5mg | 7mg | 9mg | 10mg | 13mg | 17mg | 21mg | 27mg | 33mg |
| **MAINTENANCE** | | | | | | | | | | | |
| Vecuronium | 0.3mg | 0.4mg | 0.5mg | 0.7mg | 0.9mg | 1mg | 1.3mg | 1.7mg | 2.1mg | 2.7mg | 3.3mg |
| Lorazepam | 0.15mg | 0.2mg | 0.25mg | 0.3mg | 0.4mg | 0.5mg | 0.6mg | 0.8mg | 1mg | 1.3mg | 1.6mg |

### Airway Differences

| | Infants | Adults |
|---|---|---|
| Head | Large prominent occiput—flexed neck | Flat occiput |
| Tongue | Relatively larger | Relatively smaller |
| Epiglottis | Omega sign or "U" shape | Flat, flexible |
| Vocal Cords | Short, concave | Perpendicular to trachea |
| Smallest Diameter | Cricoid ring, below cords | Vocal cords |
| Cartilage | Soft | Firm |
| Secretions | Increased | Normal |
| Main Breathing Orifice | Preferential nose breathers | Either, mainly mouth |

## BREATHING

### Ventilator Settings

| Zone | 3 kg | 4 kg | 5 kg | PINK | RED | PUR | YEL | WHI | BLU | ORG | GRN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tidal Vol. (mL) | 20-30 | 24-40 | 30-50 | 40-65 | 50-85 | 65-105 | 80-130 | 100-165 | 125-210 | 160-265 | 200-330 |
| Ventilator Rate (BPM) | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 15-25 | 15-25 | 15-25 | 12-20 | 12-20 | 12-20 |
| Insp. Time (sec) | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 |
| PEEP | 3-5 cm; Avoid peak pressures >40 or mean >30 | | | | | | | | | | |
| PIP | Start at 16, avg. 20-30 cm, increase by increments of 2 until appropriate minute ventilation | | | | | | | | | | |

### Mechanical Ventilation Considerations

| Support Modes– *spontaneous breathing* | Control Modes– *all breaths controlled* |
|---|---|
| **Pressure Support**: Fixed pressure; variable volume w/every sensed breath. | **PRVC:** (*Pressure Regulated Volume Control):* Tidal volume set; delivered w/ a decelerating flow pattern to try to keep peak pressure under a set limit. |
| **Volume Support**: Fixed TV; pressure variable w/every senses breath-based on proximity to goal vol. | **Pressure Control**: Set pressure over PEEP for each breath. |
| **CPAP**: (*Continuous Positive Airway Pressure)* The ventilator always maintains pressure in the circuit; patient takes breath —> ventilator increases flow. | **Volume Control**: Set TV delivered at constant flow rate—Seldom used. |
| **NAVA:** (*Neurally Adjusted Ventilatory Assist)* Support varies depending on sensed diaphragmatic effort. | **SIMV**: (*Synchronized Intermittent Mandatory ventilation):* A hybrid between Control and Support. A portion of the breaths (the SIMV breaths) are controlled, the remaining spontaneous breaths are supported. SIMV can be done w/ any type of breath (PRVC, PC or VC). |
| **Non-invasive Ventilation:** (Bipap™) Can have different inspiratory & expiratory pressures, or straight CPAP. | |

### Normal Pediatric Respiratory Rates

| Age | Rate (breaths per minute) |
|---|---|
| Infant (birth–1yr) | 30–60 |
| Toddler (1–3yrs) | 24–40 |
| Preschooler (3–6yrs) | 22–34 |
| School-age (6–12yrs) | 18–30 |
| Adolescent (12–18yrs) | 12–16 |

### Chest Tube Sizes

| Weight (kg) | Pneumothorax/Transudate | Exudate | Pigtail 5F-12F |
|---|---|---|---|
| <3 | 8-10 | 10-12 | 8.5 |
| 3-8 | 10-12 | 12-16 | 8.5 |
| 8-15 | 12-16 | 16-20 | 10-12 |
| 16-40 | 16-20 | 20-28 | 12-14 |
| >40 | 20-24 | 28-36 | 12-14 |

### Airway DOPE Mnemonic

| |
|---|
| **D**islodged tube |
| **O**bstructed tube |
| **P**neumothorax |
| **E**quipment failure |

## CIRCULATION

### Initial Maintenance Fluid Rates

| Bodyweight (kg) | Maintenance Rate |
|---|---|
| 0-10 | 4 mL/kg/hr |
| 11-20 | 40 mL/ + 2 mL/kg/hr for each kg over 10 kg |
| 21-70 | 60 mL/ + 1 mL/kg/hr for each kg over 20 kg |

**Ex**: Maintenance rate for a 15 kg child
40 + 10 (5 kg x 2) = 50 mL/hr
(or see weight/length-based dosing system)

### Pediatric ECG Values

| Age | Heart Rate (bpm) | QRS Axis (degrees) | PR interval (sec) | QRS Duration (sec) | R V1 mm | S V1 mm | R V6 mm | S V6 mm | SV1-RV6 mm |
|---|---|---|---|---|---|---|---|---|---|
| <1 day | 94-155 (122) | 58-168 (+135) | 0.08-0.16 (0.11) | 0.03-0.07 (0.05) | 5-27 (14) | 0.5-23 (9) | 0-12 (5) | 0.2-10 (4) | 2-27 (13) |
| 1-3 days | 91-158 (124) | 65-171 (+134) | 0.08-0.14 (0.11) | 0.03-0.07 (0.05) | 5-27 (15) | 0.5-21 (10) | 0.1-12 (5) | 0.2-10 (3) | 2-28 (14) |
| 3-7 days | 90-166 (128) | 76-168 (+133) | 0.07-0.14 (0.10) | 0.03-0.07 (0.05) | 3-25 (13) | 0.5-17 (7) | 0.5-12 (5) | 0.4-10 (4) | 2-25 (12) |
| 7-30 days | 106-182 (148) | 65-159 (+110) | 0.07-0.14 (0.10) | 0.03-0.08 (0.05) | 3-22 (11) | 0.5-14 (14) | 3-17 (8) | 0.2-10 (3) | 3-22 (12) |
| 1-3 mo | 120-179 (149) | 31-115 (+75) | 0.07-0.13 (0.10) | 0.03-0.08 (0.05) | 3-19 (10) | 0.5-13 (5) | 5-22 (12) | 0.3-7 (3) | 6-29 (17) |
| 3-6 mo | 105-185 (142) | 7-105 (+60) | 0.07-0.15 (0.11) | 0.03-0.08 (0.05) | 3-20 (10) | 0.5-17 (6) | 6-23 (14) | 0.2-10 (3) | 7-35 (19) |
| 6-12 mo | 107-168 (132) | 7-98 (+54) | 0.07-0.15 (0.11) | 0.03-0.08 (0.05) | 2-20 (9) | 0.5-18 (7) | 6-23 (13) | 0.2-8 (2) | 7-33 (19) |
| 1-3 yrs | 90-151 (119) | 8-100 (+55) | 0.08-0.15 (0.11) | 0.04-0.08 (0.06) | 3-18 (9) | 1-21 (9) | 6-23 (14) | 0.1-7 (2) | 7-38 (22) |
| 3-5 yrs | 73-137 (108) | 7-104 (+55) | 0.09-0.16 (0.12) | 0.04-0.08 (0.06) | 2-18 (8) | 2-22 (10) | 9-25 (15) | 0.1-6 (2) | 13-42 (25) |
| 5-8 yrs | 65-133 (100) | 10-140 (+66) | 0.09-0.16 (0.12) | 0.04-0.08 (0.06) | 1-13 (7) | 3-24 (12) | 9-27 (17) | 0.1-4 (1) | 13-47 (28) |
| 8-12 yrs | 63-129 (92) | 9-115 (+61) | 0.09-0.16 (0.13) | 0.04-0.09 (0.06) | 0.5-10 (6) | 3-26 (12) | 10-26 (17) | 0-4 (1) | 15-45 (28) |
| 12-16 yrs | 66-120 (86) | 11-133 (+58) | 0.09-0.18 (0.14) | 0.04-0.09 (0.07) | 0.5-10 (5) | 3-22 (11) | 7-23 (15) | 0-4 (1) | 11-42 (25) |

### Cardiac Arrest Medications

| | |
|---|---|
| Dopamine Drip | 2-20 mcg/kg/minute |
| Epinephrine | 0.01 **mg/kg** *OR* 0.1 **mL/kg** of 1:10,000 concentration q 3-5 min |
| Epinephrine Drip | 0.1-2 mcg/kg/minute |

### Pediatric Arrhythmia Management

| | |
|---|---|
| Defibrillation | 1st shock 2 J/kg, 2nd shock 4 J/kg, subsequent shocks >/=4 J/kg, max 10 J/kg or adult max dose |
| SVT | Start at 0.5-1 J/kg, if not effective, increase to 2 J/kg |
| QTc = QT (sec)/√RR(sec) = 0.xyz(sec) = xyz (milli sec) | |

### Blood Transfusion Formula ( 1 unit pRBC's ≈ 250-300 ml's)

Vol to be transfused (mls) = Patient Weight (kg) x Aimed for increment of Hb (g/dl) x 5

Or 10-20 ml/kg for hemorrhagic shock

### Pediatric Blood Pressure

*Hypotension = <70 + (age in years x 2)*

| Normal BP Ranges | Systolic (mm Hg) | Diastolic (mm Hg) | Mean Arterial (mm Hg) |
|---|---|---|---|
| Birth (12hr-<1000g) | 39-59 | 16-36 | 28-42 |
| Birth (12hr, 3kg) | 60-76 | 31-45 | 48-57 |
| Neonate (96hr) | 67-84 | 35-53 | 45-60 |
| Infant (1-12m) | 72-104 | 37-56 | 50-62 |
| Toddler (1-2yr) | 86-106 | 42-63 | 49-62 |
| Preschooler (3-5yr) | 89-112 | 46-72 | 58-69 |
| School-aged child (6-7yr) | 97-115 | 57-76 | 66-72 |
| Pre-adolescent (10-12yr) | 102-120 | 61-80 | 71-79 |
| Adolescent (13-15yr) | 110-131 | 64-83 | 73-84 |

### AVPU

| | |
|---|---|
| A | **A**wake |
| V | Responds to **V**erbal Stimulation |
| P | Responds to **P**ainful stimulation |
| U | **U**nresponsive |

### Celsius to Fahrenheit Conversion Chart

| CELSIUS (°C) | FAHRENHEIT (°F) | CELSIUS (°C) | FAHRENHEIT (°F) |
|---|---|---|---|
| 26 | 78.8 | 35 | 95 |
| 27 | 80.6 | 36 | 96.8 |
| 28 | 82.4 | 37 | 98.6 |
| 29 | 84.2 | 38 | 100.4 |
| 30 | 86 | 39 | 102.2 |
| 31 | 87.8 | 40 | 104 |
| 32 | 89.6 | 41 | 105.8 |
| 33 | 91.4 | 42 | 107.6 |
| 34 | 93.2 | 43 | 109.4 |

**Conversion Equation:**
°C x 1.8 + 32 = °F OR °F – 32 /1.8 = °C

### ABUSE: *TEN 4 FACES P*

*Any* bruising to the:

**T**orso, **E**ars, or **N**eck | 4 yrs or under

**F**renulum, **A**ngle of jaw, **C**heek, **E**yelid, **S**clera

**P**attern

Or **ANY** bruising *4 months or under*

**is a significant indicator of child abuse.**

## DISABILITY/ENVIRONMENT

### PEDIATRIC GLASGOW COMA SCALE (PGCS)

| | < 1 YEAR | > 1 YEAR | | SCORE |
|---|---|---|---|---|
| EYE OPENING | Spontaneously | Spontaneously | | 4 |
| | To shout | To verbal command | | 3 |
| | To pain | To pain | | 2 |
| | No response | No response | | 1 |
| MOTOR RESPONSE | Spontaneous | Obeys | | 6 |
| | Localizes pain | Localizes pain | | 5 |
| | Flexion-withdrawal | Flexion-withdrawal | | 4 |
| | Flexion-abnormal (decorticate rigidity) | Flexion-abnormal (decorticate rigidity) | | 3 |
| | Extension (decerebrate rigidity) | Extension (decerebrate rigidity) | | 2 |
| | No response | No response | | 1 |
| | 0-23 MONTHS | 2-5 YEARS | >5 YEARS | |
| VERBAL RESPONSE | Smiles/coos appropriately | Appropriate words/phrases | Oriented | 5 |
| | Cries and is consolable | Inappropriate words | Disoriented/confused | 4 |
| | Persistent inappropriate crying and/or screaming | Persistent cries and screams | Inappropriate words | 3 |
| | Grunts, agitated, and restless | Grunts | Incomprehensible sounds | 2 |
| | No response | No response | No response | 1 |
| TOTAL PEDIATRIC GLASGOW COMA SCORE (3-15): | | | | |

### Burn Resuscitation Fluid Rates/Target Urine Output By Type & Age

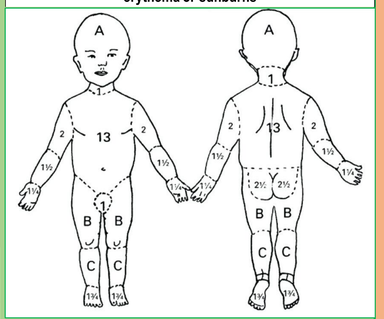
| Category of Burn | Age/weight | Adjusted Fluid Rates | Urine Output |
|---|---|---|---|
| Flame or Scald | Adults/Child (≥14yo) | 2ml LR x kg x % TBSA | 0.5ml/kg/hr 30-50ml/hr |
| | Child <14yo | 3ml LR x kg x % TBSA | 1ml/kg/hr |
| | Infants and young child (≤30kg) | 2ml LR x kg x % TBSA + sugar containing solution at maintenance rate | 1ml/kg/hr |
| Electrical | ALL AGES | 4ml LR x kg x % TBSA until urine clears | 1-1.5ml/kg/hr until urine clears |

### Lund and Browder Burn Chart

| | Half of head (A) | Half of one thigh (B) | Half of one lower leg (C) |
|---|---|---|---|
| 0 yr | 9 1/2 | 2 3/4 | 2 1/2 |
| 1 yr | 8 1/2 | 3 1/4 | 2 1/2 |
| 5 yr | 6 1/2 | 4 | 2 3/4 |
| 10 yr | 5 1/2 | 4 1/4 | 3 |
| 15 yr | 4 1/2 | 4 1/4 | 3 1/4 |

**Relative percentage of body surface area (%BSA) affected by growth**

**Do not include Superficial (first-degree) burns such as erythema or sunburns**




### Seizure & ICP Medications for TBI

| |
|---|
| **3% Saline:** 5 ml/kg IV (MAX 500 mL/dose) |
| **Mannitol:** 1 g/kg IV (infuse with filter) |
| **Levetiracetam:** 40 mg/kg IV for seizure prophylaxis |
| **Lorazepam:** IV 0.1 mg/kg (MAX 4mg) |
| **Fosphenytoin:** 20 mg PE/kg IV (MAX 1500mg PE) |

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# Pediatric Emergency ABCs and More

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Updated 09/20/2024

*See selected medications below*
*Scan QR code for full guide*

## PAIN MANAGEMENT & SEDATION

*Do not exceed adult dosage*

### PAMI Pain Management & Dosing Guide™

Pain Assessment and Management Initiative

*Advancing innovation and safety in pain education, patient care and research*

**See disclaimer. Dosages and opioid conversions cannot account for differences in genetics and pharmacokinetics. Common available formulations included.*

PAMI materials are free to access and adaptable to your institution.
Contact: PAMI@jax.ufl.edu | 904-244-4986 | @ufpami

Updated 05/28/2024

### Opioid Prescribing and Equianalgesic Chart

***Weigh risk/benefit in special populations (renal/hepatic impairment, pregnancy, and lactation)***

| Generic (Brand) All CII except Tramadol | Onset (O) and Duration (D) | | Approximate Equianalgesic Dose* | | Recommended STARTING dose for ADULTS | | Recommended STARTING dose for CHILDREN (> 6 mo) † | |
|---|---|---|---|---|---|---|---|---|
| | Oral | IV | Oral | IV | Oral | IV | Oral | IV |
| **Fentanyl (Sublimaze®)** | — | O: <1 min D: 30-60 min | — | 150 mcg (0.15 mg) | — | 50 mcg q 1-2 h | — | 1-2 mcg/kg q 1-2 h (max 50 mcg/dose) |
| **Hydrocodone/APAP 325 mg** (5, 7.5, 10 mg tablets) (7.5 mg/325 mg per 15 mL) | O: 30-60 min D: 4-6 h | — | 25 mg | — | 5-10 mg q 4-6 h | — | ≥ 2 yo: 0.1-0.15 mg/kg Hydrocodone q 4-6 h | — |
| **Hydromorphone (Dilaudid®)** (2, 4, 8 mg tablets) | O: 30 min D: 3-4 h | O: 5 min D: 3-4 h | 5 mg | 2 mg | 2-4 mg q 4-6 h | 0.2-1 mg q 2-3 h | 0.06 mg/kg q 4-6 h | 0.015 mg/kg q 2-4 h |
| **Morphine (MSIR®)** (15, 30 mg, 10 mg/5 mL) | O: 30-60 min D: 3-5 h | O: 5-10 min D: 3-5 h | 25 mg | 10 mg | 5-10 mg q 4-6 h | 2-4 mg q 2-4 h | 0.3 mg/kg q 4 h | 0.1 mg/kg q 2-4 h |

### Non-opioid Analgesics*†

| Generic (Brand) | Adult | Pediatric (<12 yo) |
|---|---|---|
| **Acetaminophen (Tylenol®)** | 325-650 mg PO q 4-6 h. Max: 4 g/day | 15 mg/kg PO q 4-6 h. Max: 75 mg/kg/day |
| **Acetaminophen IV** *Use only if not tolerating PO* | 1 g IV q 6 h prn pain or 650 mg q 4 h Max: 4 g/day | <50 kg: 15 mg/kg IV q 6 h or 12.5 mg/kg IV q 4 h Max: 75 mg/kg/day |
| **Ibuprofen (Motrin®)** | 400-800 mg PO q 6 to 8 h. Max: 3200 mg/day | 10 mg/kg PO q 6 to 8 h. Max: 40 mg/kg/day or 2400 mg/day |
| **Ketorolac (Toradol®)** | 15 mg IV or 15-30 mg IM q 6 h Max: 120 mg/day x 5 day | 0.5 mg/kg IV/IM q 6 h up to 72 h Max: 30 mg/dose IM, 15 mg/dose IV |

*Avoid NSAIDs in renal/hepatic impairment, PUD, CHF, < 6 mo of age, >20 wks pregnant.
Give with food. For pediatrics, do not exceed adult dosage.

### Procedural Sedation and Analgesia Medications

| Generic (Brand) | Adult | Pediatric | Comments |
|---|---|---|---|
| **Dexmedetomidine (Precedex®)** | IV 1 mcg/kg loading dose (over 10 min) followed by 0.5 to 2 mcg/kg/h continuous infusion. Use 0.5 mcg/kg for geriatric patients. | IV 0.5–2 mcg/kg loading dose (over 10 min) followed by 0.5 to 2 mcg/kg/h continuous infusion IN 2-3 mcg/kg | Risk of bradycardia, hypotension, especially with loading dose or rapid infusions, apnea, bronchospasm, respiratory depression |
| **Etomidate (Amidate®)** | IV 0.1 - 0.2mg/kg; additional doses 0.05mg/kg | | Risk of myoclonus (premedication w/ benzo or opioid can decrease), pain with injection, nausea and vomiting, risk of adrenal suppression. Provides no analgesia. |
| **Fentanyl** | IV 0.5-1 mcg/kg (slow push) | 1-3 yo: 2 mcg/kg; 3-12 yo: 1-2 mcg/kg | **100 times more potent than morphine.** Rapid bolus infusion may lead to chest wall rigidity. Reduce dosing when combined with benzodiazepines and in elderly. Preferred agent due to rapid onset and short duration. |
| **Ketamine (Ketalar®)** | IV 0.5-1 mg/kg (slow push) IM 4-5 mg/kg | >3 mo: IV 1-2 mg/kg; additional doses 0.5 mg/kg; IV q 10-15 min prn; IM 4 - 5 mg/kg | Small risk of laryngospasm increases with active asthma, URI and procedures involving posterior pharynx. Vomiting is common, consider pre-treatment with anti-emetic. Not recommended in patients <3 mo. |
| **Ketamine + Propofol** | — | IV ketamine 0.75 mg/kg + propofol 0.75 mg/kg. Additional doses: ketamine 0.5 mg/kg, propofol 0.5-1 mg/kg | See Ketamine and Propofol comments. Recommend against mixing propofol + ketamine in the same syringe. |
| **Midazolam (Versed®)*** | IV 0.05-0.1 mg/kg IV slow push over 1-2 min | IV 0.05-0.1 mg/kg IN 0.2-0.3 mg/kg (IN max 10 mg) | Initial max dose 2 mg. Max total dose in >60 yo is 0.1 mg/kg. Decrease dose by 33-50% when given with opioid. |
| **Morphine** | IV 0.05-0.1 mg/kg or 5-10 mg | IV 0.1-0.2 mg/kg, titrated to effect | Monitor mental status, hemodynamics, and histamine release. Requires longer recovery time than fentanyl. Difficult to titrate during procedural sedation due to slower onset and longer duration of action. Reduce dosing when combined with benzodiazepines (combination increases risk of respiratory compromise). |
| **Propofol (Diprivan®)*** | IV 0.5-1 mg/kg slow push (1-2 min); Additional doses 0.25-0.5 mg/kg over 1-3 min | IV 1 mg/kg slow push (1-2 min); Additional doses 0.5 mg/kg | Risk of apnea, hypoventilation, respiratory depression, rapid changes in sedative depth, hypotension. Provides no analgesia. |

*No analgesic properties for Propofol and Midazolam.

### Patient Resources

Patient Education & Activity Book

Educational Brochures, Videos, OTC Topical & Oral Medications

Pediatric Pain & Fever Dosing Guide (Liquid)

### Topical and Transdermal Medications*

| Class | Formulations (Generic & OTC) | Indications | Recommended Dosing |
|---|---|---|---|
| **Lidocaine** (Available formulations influx due to supply chain issues) | 5% patch (Lidoderm®) | Post-herpetic neuralgia | Adults: q 12 h; max 3 patches at one time |
| | 4% patch (+/- menthol, OTC) | Musculoskeletal pain | Adults and children ≥ 12 yo: q 12 h |
| | 4% lotion, spray, etc. (OTC) | Burns, cuts, insect bites | ≥ 2 years: TID - QID |
| | 4% L.M.X.4® cream (OTC) Onset 30 min; Duration 60 min | Burns, cuts, insect bites, venipuncture, LP, abscess I & D | ≥ 2 years, up to 4 times per day. Apply in area <100 cm² if < 10 kg; < 600 cm² for 10-20 kg |
| | 2% gel/jelly 5% ointment | Catheter/NG tube insertion; stomatitis | — |
| | J-Tip™ with buffered lidocaine (https://jtip.com/) | IV starts: Onset 1-3 min | — |
| **Lidocaine combinations** (use gloves, EMLA-cover with occlusive dressing, LET-cover with cotton ball & tape) | EMLA® (2.5% Lidocaine 2.5% Prilocaine); Onset 60 min; Duration 3-4 h; Max appl. = 1 h if <3mo/5 kg; otherwise 4 h | Dermal analgesic of intact skin (abscess I & D, LP, etc.) | < 3 mo (< 5 kg): up to 1 g on 10 cm² area; 3-12 mo (> 5 kg): up to 2 g on 20 cm²; 1-6 yo (> 10 kg): up tp 10 g on 100 cm²; 7 yo - adult (> 20 kg): up to 20 g on 200 cm² |
| | LET (4% Lidocaine, 1:2,000 Epinephrine, 0.5% Tetracaine) gel or liquid; Onset 10 min; Duration 30-60 min | Wound repair (non-mucosal) | 3 mL (not to exceed maximal lidocaine dosage of 3-5 mg/kg) |
| **Vapocoolant** | Pain-Ease® | Cooling intact skin, mucus membranes and minor open wounds | Spray 4-10 sec from distance of 8-18 cm. Stop when skin turns white. **Use with caution in children < 4 yo** |

*Dosages are guidelines to avoid systemic toxicity in patients with normal intact skin and with normal renal and hepatic function. Use gloves to apply and/or wash hands after application. Use with caution in children and older adults with thin skin.

### Ketamine (Ketalar®)

| Indications | Starting Dose |
|---|---|
| **Procedural Sedation** | IV: **Adult** 0.5-1 mg/kg; **Pediatric** 1-2mg/kg; IM: 4- 5 mg/kg |
| **Sub-dissociative Analgesia^** | IV: 0.1 to 0.3 mg/kg IM: 0.5-1 mg/kg; IN: 0.5-1 mg/kg |

^ Administer IV over 10-15 minutes to minimize side effects. SQ dose same as IV. For IV-can dilute dose in 10 mL NS and administer as IV slow push over 5-10 min. Can also be given as a continuous infusion.

### Intranasal* and Nebulized Medications

| Generic | Dose | Max Dose | Comments |
|---|---|---|---|
| **Fentanyl** | IN: 1.5-2 mcg/kg q 1-2 h Neb: 1.5-4 mcg/kg | 4 mcg/kg or 100 mcg | Divide dose equally between each nostril |
| **Midazolam (5 mg/mL)** | IN: 0.3 mg/kg | 10 mg or 1 mL per nostril (total 2 mL) | Divide dose equally between each nostril |
| **Lidocaine** | Neb: 4% (40 mg/ mL) 100-200 mg or 2.5-5 mL | 4.5 mg/kg total or 300 mg | >5 mg/kg associated with serious toxicity |

*Use MOST concentrated form available with atomizer. Limit 1 mL/nare. Ketamine: see separate Ketamine table.

## COMMON PEDIATRIC PAIN SCALES


### FLACC SCALE

| | | 0 | 1 | 2 |
|---|---|---|---|---|
| 1 | FACE | No particular expression or smile | Occasional grimace or frown, withdrawn or disinterested | Frequent to constant frown, clenched jaw, quivering chin |
| 2 | LEGS | Normal position; relaxed | Uneasy, restless, tense | Kicking or legs drawn up |
| 3 | ACTIVITY | Lying quietly, normal position, easily moves | Squirming, shifting back and forth, tense | Arched, rigid or jerking |
| 4 | CRY | None (awake or asleep) | Moans or whimpers, occasional complaint | Crying steadily, scream or sobs, frequent complaints |
| 5 | CONSOLABILITY | Content, relaxed | Reassured by occasional touching, hugging or being spoken to, distractible | Difficult to console or comfort |

PAMI Pain Assessment and Management Initiative

## MISCELLANEOUS INFORMATION

### Weight (kg —> lbs)

| (kg) | (lbs) | (kg) | (lbs) |
|---|---|---|---|
| 0 | 0.0 | 37.5 | 82.7 |
| 2.5 | 5.5 | 40 | 88.2 |
| 5 | 11.0 | 42.5 | 93.7 |
| 7.5 | 16.5 | 45 | 99.2 |
| 10 | 22.0 | 47.5 | 104.7 |
| 12.5 | 27.6 | 50 | 110.2 |
| 15 | 33.1 | 52.5 | 115.7 |
| 17.5 | 38.6 | 55 | 121.3 |
| 20 | 44.1 | 57.5 | 126.8 |
| 22.5 | 49.6 | 60 | 132.3 |
| 25 | 55.1 | 62.5 | 137.8 |
| 27.5 | 60.6 | 70 | 154.3 |
| 30 | 66.1 | 72.5 | 159.8 |
| 32.5 | 71.7 | 75 | 165.3 |
| 35 | 77.2 | 77.5 | 170.9 |

1 kg = 2.20 lbs

### Death Communication Tips: GRIEV_ING*

**G-** gather the family/community; insure that all members are present or identify representatives,
· Gather your inner strength (who if not you?) and Gather your team- 2 minimum, Doctor, if possible.

**R-** resources; call for support resources available to assist the family/community with their grief or the disaster at hand, i.e. community, hospital, chaplain services, ministers, family, and friends. Create list of resources.

**I-** identify yourself, identify the deceased or injured patient by name, identify the situation, and identify the state of knowledge of the family relative to the events of the day. Identify that you are bringing bad news.

**E-** educate; briefly educate the family as to the events that have occurred, educate them about the current state of their loved one(s), educate others about how they can help and not create more chaos.

**V-** verify that their family member has died or other events/bad news. Be clear! Use the words dead or died, missing, etc. No jargon. Be honest.

**___** Space-give the family/community personal space and time for an emotional moment; allow the family time to absorb the information.
Stop talking. Family may scream, hit, etc. Protect yourself.

**I-** inquire; ask if there are any questions and answer them to the best of your ability. You don't have to be perfect. You may not have all the answers.

**N-** nuts and bolts; preparation; inquire about organ donation, funeral services, and personal belongings. Offer family opportunity to view the body/the site.

**G-** give them your card, hospital or community information. Offer to answer questions that may arise later. Return their call or establish a call center/resource.

*adapted from Hobgood, C. *The educational intervention "GRIEV_ING" improves the death notification skills of residents.* Acad Emerg Med. 2005 Apr;12(4):296-301.

### Arterial Line Catheter Size by Age/Weight

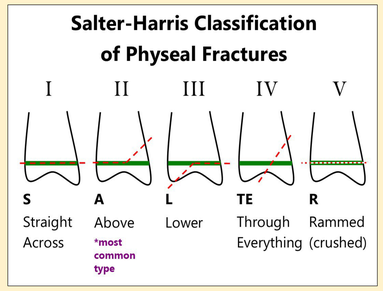
| Age | Weight (kg) | Gauge/French/Length |
|---|---|---|
| **Infant** | <10 kg | 24 G or 2.5 F; 2.5 cm |
| **Child** | 10 - 40 kg | 22 G or 2.5 F; 2.5 cm |
| **Adolescent** | >40 kg | 20 G |

### Central Venous Line Catheter Size by Age/Weight

| Age (years) | Weight (kg) | Catheter Gauge | French Gauge | Length (cm) |
|---|---|---|---|---|
| **< 1, newborn** | 4-8 | 24 | 3.0 | 5-12 |
| **<1** | 5-10 | 22 | 3.0-3.5 | 5-12 |
| **1-3** | 10-15 | 20 | 4.0 | 5-15 |
| **3-8** | 15-30 | 18-20 | 4.0-5.0 | 5-25 |
| **>8** | 30-70 | 16-20 | 5.0-8.0 | 5-30 |

### Pediatric Trauma Score

| Clinical Parameter | Parameter Category | Score | Clinical Parameter | Parameter Category | Score |
|---|---|---|---|---|---|
| **Weight (kg)** | ≥ 20 | 2 | **CNS** | Awake | 2 |
| | 10-20 | 1 | | Obtunded/LOC | 1 |
| | <10 | -1 | | Coma/decerebrate | -1 |
| **Airway** | Normal | 2 | **Open Wound** | None | 2 |
| | Maintainable | 1 | | Minor | 1 |
| | Unmaintable | -1 | | Major/penetrating | -1 |
| **SBP (mmHg)** | ≥90 | 2 | **Skeletal** | None | 2 |
| | 50-90 | 1 | | Closed fracture | 1 |
| | <50 | -1 | | Open/multiple | -1 |




### Normal WBC Values

| | White Blood Cells |
|---|---|
| Age | (x $10^3$/µL) |
| Birth | 9-30 |
| 1-3 days | 9-38 |
| 4-7 days | 5-21 |
| 7-14 days | 5-20 |
| 15-60 days | 5-20 |
| 2-5 months | 5.5-18 |
| 6 months-1yr | 6.0-17.5 |
| 1-3 years | 6.0-17.0 |
| 3-5 years | 5.5-15.5 |
| 6-10 years | 4.5-14.5 |
| 10-15 years | 4.5-13.5 |
| 15-20 years | 4.5-12.5 |

### Hemoglobin/Hematocrit Normal Pediatric Values

| Age | Hemoglobin (g/dL) | Hematocrit (%) |
|---|---|---|
| Term newborn | 18.0-21.5 | 51-68 |
| 1-3 days | 14.0-24.0 | 43-68 |
| 4-7 days | 14.3-22.3 | 42-62 |
| 7-14 days | 12.9-20.5 | 39-59 |
| 14-60 days | 10.7-17.3 | 33-51 |
| 2-5 months | 10.1-14.5 | 30-40 |
| 6 months-1yr | 10.0-13.2 | 30-39 |
| 1-2 years | 10.0-13.5 | 30-40 |
| 2-4 years | 10.5-14.5 | 32-42 |
| 5-7 years | 10.9-14.9 | 33-44 |
| 8-10 years | 10.9-14.9 | 33-44 |
| 10-15 years | 11.4-15.4 | 34-45 |

### Key Pediatric Lab Values

| Lab test | Age | Conventional Units | SI units |
|---|---|---|---|
| **ALT** | <12 mo | 13–45 U/L | 13–45 U/L |
| | 1–3 yr | 5–45 U/L | 5–45 U/L |
| | 4–6 yr | 10–25 U/L | 10–25 U/L |
| | 7–11 yr | 10–35 U/L | 10–35 U/L |
| | 12–13 yr | 10–30 U/L (female)<br>10–55 U/L (male) | 10–30 U/L<br>10–55 U/L |
| | >14 yr | 5–30 U/L (female)<br>10–45 U/L (male) | 5–30 U/L<br>10–45 U/L |
| **ALKALINE PHOSPHATASE** | Infant | 150–420 U/L | 150–420 U/L |
| | 2–10 yr | 100–320 U/L | 100–320 U/L |
| | Adolescent | 100–390 U/L | 100–390 U/L |
| | Adult | 30–120 U/L | 30–120 U/L |
| **AMMONIA** | Newborn | 90–150 mcg/dL | 64–107 µmol/L |
| | 0–2 wk | 79–129 mcg/dL | 56–92 µmol/L |
| | Infant/child | 29–70 mcg/dL | 21–50 µmol/L |
| | Adult | 15–45 mcg/dL | 11–32 µmol/L |
| **AMYLASE** | 0–14 days | 3–10 U/L | 3–10 U/L |
| | 15 days–13 wk | 2–22 U/L | 2–22 U/L |
| | 13 wk–1 yr | 3–50 U/L | 3–50 U/L |
| | >1 yr | 25–101 U/L | 25–101 U/L |
| **AST** | 0–10 days | 47–150 U/L | 47–150 U/L |
| | 10 days–24 mo | 9–80 U/L | 9–80 U/L |
| | >24 mo | 15–40 U/L | 15–40 U/L |
| **BICARBONATE** | Newborn | 17–24 mEq/L | 17–24 mmol/L |
| | Infant | 19–24 mEq/L | 19–24 mmol/L |
| | 2 mo–2 yr | 16–24 mEq/L | 16–24 mmol/L |
| | >2 yr | 22–26 mEq/L | 22–26 mmol/L |
| **GLUCOSE** | Preterm | 20–60 mg/dL | 1.1–3.3 mmol/L |
| | Newborn, <1 day | 40–60 mg/dL | 2.2–3.3 mmol/L |
| | Newborn, >1 day | 50–90 mg/dL | 2.8–5.0 mmol/L |
| | Child | 60–100 mg/dL | 3.3–5.5 mmol/L |
| | >16 yr | 70–105 mg/dL | 3.9–5.8 mmol/L |
| **CSF** | *Age* | *WBC Count/µL (median)* | *95th Percentile* |
| | 0–28 days | 0–12 (3) | 19 |
| | 29–56 days | 0–6 (2) | 9 |
| | Child | 0–7 | |