

EMS AIRCRAFT

Purpose

- To provide policy for integrating dispatch and utilization of aircraft into the Marin County EMS system as a specialized resource for prehospital response, transport, and care of patients. Aircraft utilization provides a valuable adjunct to the Marin County EMS System by minimizing the time to definitive care in prescribed circumstances.

Related Policies

- Emergency Medical Dispatch Policy, 4200
- Prehospital/Hospital Contact Policy, 7001
- Trauma Triage and Destination Guideline Policy, 4613

Authority

- California Administrative Code, Title 22, Divisions 2.5 and 9

Applicability

All aircraft providing prehospital patient transport within the Marin County EMS System must be authorized by the EMS agency in their county of origin, or by the EMS Authority, or by a United States Government agency

Policy

- A. The patient's condition, available ground resources, incident location in relation to receiving facility and call circumstances will be evaluated by caregivers in the field to determine if air transport is appropriate.
- B. The type of aircraft to be requested will be determined by the Incident Commander and/or the County Communications Center based on provider availability, response time criteria and nature of the service needed. See Appendix A.

Procedure for Aircraft Dispatch

- A. Aircraft will be dispatched simultaneously with ground units for specific circumstances as follows:
 - Area of the call is inaccessible to ground unit(s) or ground access is compromised;
 - Air assistance may be needed with rescue activities; or
 - Ground transport time to the hospital is > 30 minutes and the applicable Emergency Medical Dispatch Protocol (policy #4200, Appendix A) recommends simultaneous dispatch
 - Reported traumatic injury and Level III Trauma Center is on trauma diversion.
- B. Aircraft Dispatch may also occur in the following manner:
 - Upon request of the responding unit while en route to the scene.
 - Upon request of on-scene personnel following patient assessment

Procedure for Aircraft Use

- A. Consider use of an EMS aircraft where:
- A patient meets Trauma Triage Tool anatomic or physiologic criteria and the time closest facility is a Level II Trauma Center
 - Ground transport time is greater than 30 minutes
- B. Procedural Considerations
- EMS aircraft should not transport patients in cardiac arrest. Aircraft crew shall have discretion to transport patients receiving CPR in certain situations (refractory VF, unsafe scene conditions, hypothermia, etc)
 - Marin County Communications Center will notify law enforcement and fire agencies with jurisdiction over the landing zone
- C. Medical Control
- Treatment decisions will be made according to medical control policies and procedures governing the provider agency having responsibility for care

General and Related Procedures

- A. Marin County personnel may accompany a patient in an EMS aircraft during transport if all the following conditions are met:
- Personnel have been providing care for the patient prior to arrival of the aircraft
 - EMS aircraft crew will complete a PCR as required by policy/procedure within their county of origin and forward a copy to Marin County EMS Agency
- B. Patient care reports will be kept as follows:
- Marin County personnel will complete a Marin County PCR as per policy/procedure, and when known, forward it to the receiving hospital
 - EMS aircraft crew will complete a PCR as required by policy/procedure within their county of origin, and forward a copy to Marin County EMS Agency
- C. The following times, when available, will be relayed to and reordered by Marin County Communications Center:
- ETA at time of original dispatch request
 - When airborne, en route to scene
 - Arrival at scene
 - Destination hospital
 - Arrival at receiving hospital
- D. As part of the Quality Improvement Program, the EMS Agency will review all aircraft dispatches
- E. Aircraft may be utilized by acute care hospitals for interfacility transfers
- Hospitals will contact EMS aircraft providers directly
 - The hospital requesting an EMS aircraft will notify the Marin County Communications Center of aircraft activity so fire and law enforcement agencies can be notified of the probably aircraft landing site
 - Hospitals shall notify the Marin County EMS Agency of interfacility transfers by EMS aircraft on an annual basis

APPENDIX A

Provider List and Classification Definitions

| Provider Name | Classification | Function | Staffing | Location |
|---|-------------------------------------|---------------------------------------|---|-----------------------|
| Stanford University Hospital Helicopter (LIFEFLIGHT) | Air Ambulance | Medical | Pilot Flight Nurses (2) | Palo Alto |
| California Shock/Trauma Air Rescue (CALSTAR) | Air Ambulance | Medical | Pilot Critical Care Nurses (2) | Concord |
| Redwood Empire Air Care Helicopter (REACH) | Air Ambulance | Medical | Pilot Critical Care Nurse Paramedic | Santa Rosa |
| Global Medical Response- REACH (CON AIR 2) | Air Ambulance | Medical | Pilot Flight Nurse Paramedic | Concord |
| Global Medical Response- REACH (CON AIR 1) | Air Ambulance Type 3 Fire Copter | Medical Fire | Pilot Flight Nurse Paramedic Fire Captain (seasonal) | Concord |
| Sonoma County Sheriff's Department Helicopter (Henry 1) | ALS Rescue | Law Long-line Rescue Medical | Pilot Paramedic EMT | Santa Rosa |
| California Highway Patrol Helicopter (H-30) | ALS Rescue | Law Medical | Pilot Paramedic | Napa |
| U.S. Coast Guard Helicopter | Auxiliary | Long-line Rescue Water Rescue | Pilot (2) EMT Rescue Swimmer | San Francisco Airport |

Classification Definitions

- A. **Air Ambulance** means any aircraft specifically constructed, modified, or equipped and used for the primary purpose of responding to emergency calls and transporting critically ill or injured patients whose medical flight crew has at a minimum two attendants certified or licensed in advanced life support
- B. **Rescue Craft** means an aircraft whose usual function is not prehospital emergency medical transport but which may be utilized for prehospital emergency patient transport when use of an air or ground ambulance is inappropriate or unavailable

- C. **ALS Rescue Aircraft** means a rescue aircraft that is equipped to provide ALS service, staffed with a minimum of one ALS medical flight crew member
- D. **Air Rescue Service** means an air service used for emergencies including search and rescue
- E. **BLS Rescue Service** means a rescue aircraft whose medical crew has, at a minimum, on attendant certifies as an EMT-1
- F. **Auxiliary Aircraft** is a rescue aircraft which does not have a medical flight crew or whose flight crew does not meet the minimum requirements of a BLS Rescue Aircraft

EMS DISTRIBUTION OF NALOXONE KITS

Purpose

- To oversee the “leave behind” Narcan program which allows emergency medical responders to distribute “leave behind” Naloxone (Narcan) kits on the scene of an overdose or perceived overdose

Policy

- A. EMS logistics staff will receive naloxone kits intended for laypersons use, as they are available from external suppliers
- B. Naloxone kits will be distributed to EMS providers in a manner similar to current supply chain procedures
- C. EMS providers will distribute “leave behind” Narcan kits at the scene of an overdose, or upon their discretion, will give a naloxone kit to any person encountered on an EMS call that is at risk of experiencing an opiate overdose (e.g. a current opiate overdose patient who refuses transport) or any person in position to assist a person at risk of opiate overdose.
- D. Shall not give naloxone to patients or bystanders from the regular EMS patient care supply
- E. Resupply provider’s naloxone kits, as stock is available, via usual supply chain procedures. It may be the case that no resupply is available; layperson naloxone kits are not a required in-service medication

PEDIATRIC INTRAOSSEOUS INFUSION PROCEDURE

Indications

- Patient in extremis, cardiac arrest, profound hypovolemia, or sepsis and in need of immediate delivery of medications/fluids and immediate IV access is not possible within 90 seconds

Procedure Preparation

- Position and stabilize insertion leg
- Locate primary site 1-2cm distal to tibial tuberosity and 1-2cm medial
- Continuously following aseptic technique, prepare insertion site and allow to dry via air or gauze

Equipment

- Intraosseous infusion needle and/or mechanical insertion device
- Chlorhexidine with alcohol solution
- Sterile gauze pads
- Saline lock
- IV **NS** solution and tubing with 3-way stopcock
- Supplies to secure infusion
- Pressure bag
- **Lidocaine 2%** (preservative free)

Automatic IO Device

- Insert needle through skin at 90° angle until bone contact
- Rotate applying gentle, steady pressure, letting the driver do the work
- Stop when a change of resistance is felt
- Stabilize hub and remove stylet
- Attach primed saline lock, aspirate to confirm placement
- Flush with 5ml **NS**

Manual IO Needle

- Choose desired depth of injection according to manufacturer's instructions
- Insert needle at 90° angle and advance according to manufacturer's instructions
- Stabilize hub and remove stylet
- Attach primed saline lock, aspirate to confirm placement
- Flush with 5ml **NS**

If patient >3kg and awake and/or responsive to pain

- **Lidocaine 2%** (preservative free) 0.5mg/kg slowly
 - **MR x1 1/2 initial dose**
 - **Max dose:** 40mg
- Wait 30-60 seconds before fluid infusion

If resistance is met

- Remove needle, apply pressure to site and attempt at secondary site

Critical Information

- Absolute contraindications:
 - Recent fracture of involved bone (less than 6 weeks)
 - Vascular disruption proximal to insertion site
 - Inability to locate landmarks
- Relative contraindications:
 - Infection or burn overlying the site
 - Congenital deformities of the bone
 - Metabolic bone disease

- Stabilize as recommended by manufacturer
- Attach pre-flooded IV tubing
- Administer fluid boluses via syringe utilizing the 3-way stopcock

ADULT INTRAOSSEOUS PROCEDURE

Indications

- Patient in extremis, cardiac arrest, profound hypovolemia, or sepsis and in need of immediate delivery of medications/fluids and immediate IV access is not possible

Procedure Preparation

- Position and stabilize insertion site
- Continuously following aseptic technique, prepare insertion site with antiseptic solution and allow to dry via air or gauze pad



Procedure

- Insert IO needle according to manufacturer's directions
- Confirm placement
- Attach primed extension set and flush with 10ml **NS**



If patient awake and/or responsive to pain

- **Lidocaine 2% (preservative free)** 20-40mg over 30-60 seconds
- Wait 30-60 seconds before fluid infusion
- **MR in 15 min** if needed



If resistance is met

- Remove needle, apply pressure to site and attempt at secondary site



- Stabilize as recommended by manufacturer
- Attach pre-flooded IV tubing with pressure bag for infusion
- Monitor insertion site and patient condition

Equipment

- Intraosseous infusion needle and/or mechanical insertion device
- Chlorhexidine with alcohol swab or ampule
 - If patient has allergy to Chlorhexidine, use alcohol swab only
- Sterile gauze pads
- 10ml **NS** syringe
- IV **NS** solution and tubing with 3-way stopcock
- Supplies to secure infusion
- Pressure bag
- **Lidocaine 2%** (preservative free)

Critical Information

- Absolute contraindications:
 - Recent fracture of involved bone (less than 6 weeks)
 - Vascular disruption proximal to insertion site
 - Inability to locate landmarks
- Relative contraindications:
 - Infection or burn overlying the site
 - Congenital deformities of the bone
 - Metabolic bone disease

ORAL ENDOTRACHEAL INTUBATION PROCEDURE

Indications

- Severe ventilatory compromise where the airway cannot be adequately maintained by BLS techniques

Procedure preparation

- Open airway and pre-oxygenate with BVM for 1-3 minutes with 100% O2
 - Avoid hyperventilation in cardiac arrest
- Select proper sized ETT and insert stylet
- Select proper sized laryngoscope blade and visualize larynx
- Suction as needed



Procedure

- Provide continuous high flow oxygen during procedure, if possible
- Under direct visualization, insert ETT 2-3cm past the cords.
 - Each attempt should not exceed 30 seconds, hyperventilating between attempts
- Remove stylet and inflate cuff



- Verify placement using all of the following:
 - Rise and fall of chest
 - Absence of epigastric sounds
 - Bilateral breath sounds
 - Presence of condensation in the tube
 - EDD or colorimetric CO2 device
 - Capnometry/capnography
- Secure the tube. Consider spinal immobilization to prevent extubation
- Reassess tube placement after each movement.
- If any doubt about placement, confirm by capnography or direct visualization

Equipment

- Battery powered laryngoscope handle and blades, extra batteries and bulbs
- Video Laryngoscope (if available)
- McGill forceps
- Cuffed endotracheal tubes
- ETTI
- Lubricating jelly
- Disposable stylets
- Suction
- Pulse oximetry
- End Tidal CO2 detector
- Esophageal Detector Device (EDD)
- Colorimetric CO2 device
- Capnometer or capnography

SPECIAL CONSIDERATIONS

- Defibrillation should precede intubation in VF/pulseless VT
- Consider use of ETTI if difficult intubation
- If unsuccessful after 1 attempt, may attempt King tube or iGel x1. If unsuccessful with King tube or iGel, then manage with BLS airway

Critical Information

- Absolute contraindications:
 - Patient fits on length based tape
 - Epiglottitis
- Relative contraindications:
 - Spontaneous respirations are present
 - Responsive patient with intact gag reflex
 - Suspected opiate overdose
 - Profound hypoglycemia

ENDOTRACHEAL TUBE INTRODUCER (ETTI) PROCEDURE

Indications

- Airway structure or condition which prevents adequate visualization by standard tools of endotracheal intubation. May include:
 - Patients with Grade II through IV laryngeal views (Cormack-Lehane grade)
 - Patients with airway edema regardless of laryngeal view

- Perform laryngoscopy and obtain the best possible laryngeal view
- Holding the ETTI in your right hand and the angled tip pointing upward, gently advance the ETTI anteriorly (under the epiglottis) to the glottic opening (cords)

Equipment

- Intubation supplies
- ETT Introducer

- Gently advance the ETTI until resistance is encountered at the carina
 - NEVER force the ETTI, pharyngeal/tracheal perforation may be caused
 - If no resistance is encountered and the entire length of the ETTI is inserted, the device is in the esophagus
- The ETTI is correctly placed when you see the device going through the cords, when the ratcheting of the tip on the trachea, an/or when resistance is met while advancing the device

SPECIAL CONSIDERATIONS

- Use the confirmation methods standard for endotracheal intubation to verify placement of the ETT prior to and after initiating ventilation

- Once positioned, withdraw the ETTI until the 37cm black line mark is aligned with the lip and advance an ETT over the ETTI and into the trachea
 - If resistance is encountered while advancing the ETT, withdraw the ETT slightly, rotate 90° and reattempt
- Once ETT is in position, inflate cuff, then while holding the tube, remove the ETTI through the ETT
- Confirm tracheal placement

Critical Information

- Contraindications:
 - Patient fits on length based tape
 - ETT smaller than 6.0

I-GEL AIRWAY PROCEDURE

Indications

- When ventilation cannot be adequately maintained by BLS techniques, intubation is anticipated to be difficult, or intubation is unsuccessful after one attempt

Pre-procedure

- Open airway and pre-oxygenate with BVM for 1-3 min with 100% O2. Avoid hyperventilation in cardiac arrest
- Apply water soluble lubricant to the back, sides and front of the cuff. Ensure no lubricant remains in the bowl of the cuff
- Position the head into the “sniffing” position or neutral position if trauma is suspected
- Remove dentures before inserting tube



Procedure

- With the cuff opening facing the patient’s chin, glide the device downwards and backwards along the hard palate with a continuous but gentle push until definitive resistance is felt. The incisor teeth should be resting on the integral bite block
- Attach bag-valve to I-gel Airway
- Verify placement using all of the following
 - Rise and fall of chest
 - Bilateral breath sounds
 - Capnometry/capnography or colorimetric device
- Secure the tube with provided strap or commercial tube holder

Equipment

- i-gel or i-gelO2 airway device
- Water soluble lubricant
- Portable suction device
- Capnometry/capnography or colorimetric device
- Stethoscope

I-gel Sizing

| Size | Patient Size | Color | Patient weight |
|------|--------------|--------|----------------|
| 3 | Small adult | Yellow | 30-60kg |
| 4 | Medium adult | Green | 50-90kg |
| 5 | Large adult | Orange | 90+kg |

SPECIAL CONSIDERATIONS

- If there is any doubt about the proper placement of the i-gel airway, remove device; ventilate the patient with BVM for 30 seconds and repeat sequence of steps
- If unsuccessful on second attempt, resume BLS airway management
- If an excessive air leak during ventilation is noticed, use one or all of the following:
 - Hand ventilate the patient with gentle and slow squeezing of the reservoir bag
 - Limit estimated tidal volume to no more than 5ml/kg
 - If all of the above fail then change to one size larger I-gel

Critical Information

- **Contraindications:**
 - Responsive patient with an intact gag reflex
 - Patient with known esophageal disease
 - Tracheal stoma
 - Patient fits on length based tape
- **Relative Contraindication:**
 - Patients who have ingested caustic substances or have severe airway burns

KING AIRWAY PROCEDURE

Indications

- When ventilation cannot be adequately maintained by BLS techniques, intubation is anticipated to be difficult, or intubation is unsuccessful after one attempt

Pre-procedure

- Open airway and pre-oxygenate with BVM for 1-3 min with 100% O₂. Avoid hyperventilation in cardiac arrest
- Test cuff according to manufacturer’s instructions
- Apply water soluble lubricant to distal end of the tube
- Position the head into the “sniffing” position or neutral position if trauma is suspected
- Remove dentures before placing tube to prevent laceration of the cuffs



Procedure

- Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums
- Inflate cuffs based on size of tube
- Attach bag-valve to King Airway
- If necessary, withdraw airway until ventilation is easy and free flowing the
- Verify placement using all of the following
 - Rise and fall of chest
 - Bilateral breath sounds
 - Capnometry/capnography or colorimetric device
- Secure the tube with tape or commercial tube holder, noting depth marking on tube

Equipment

- King Airway
- Syringe
- Water soluble lubricant
- Portable suction device
- Capnometry/capnography or Colorimetric device
- Stethoscope

King Tube Sizing

| Size | Patient Criteria | Color | Inflation Volume |
|------|------------------|--------|------------------|
| 3 | 4-5ft | Yellow | 45-60ml |
| 4 | 5-6ft | Red | 60-80ml |
| 5 | >6ft | Purple | 70-90ml |

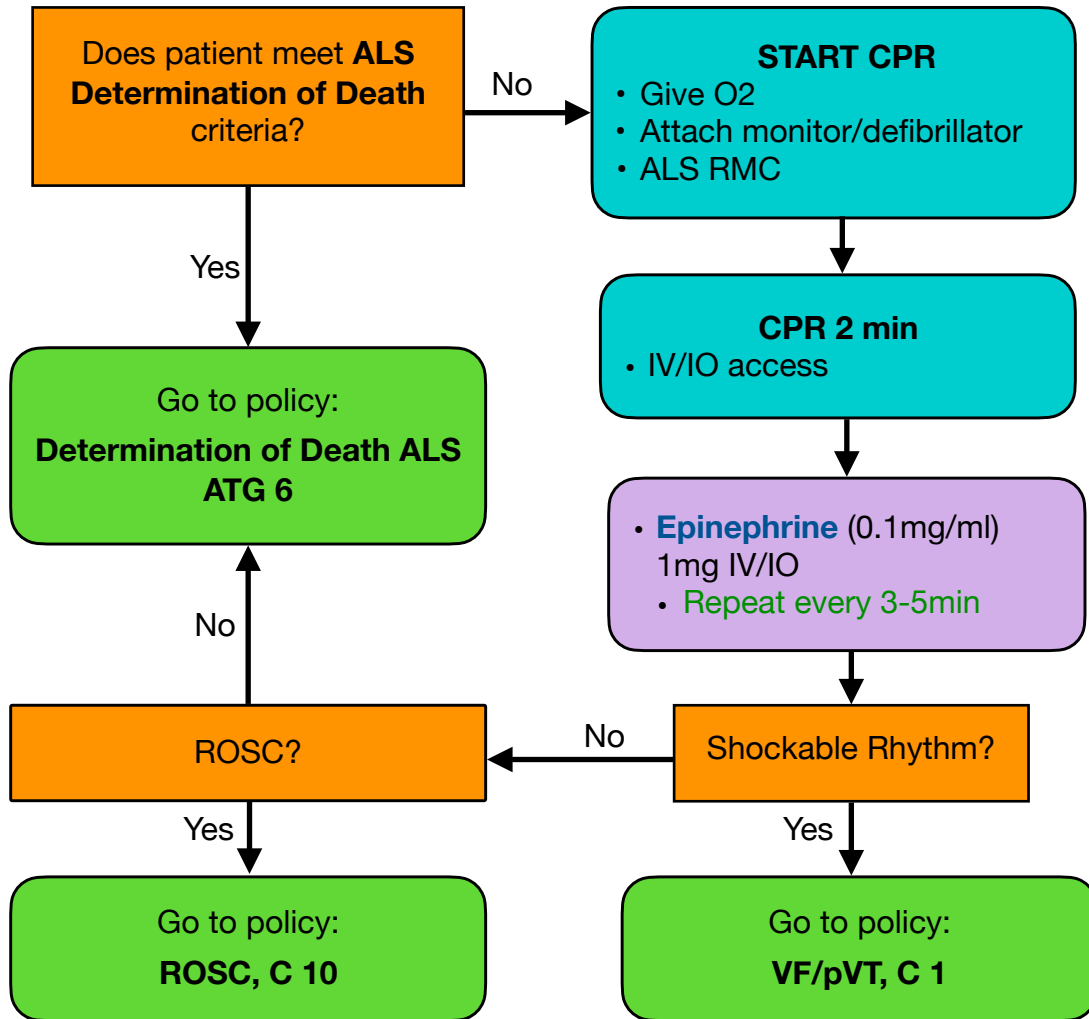
SPECIAL CONSIDERATIONS

- If there is any doubt about the proper placement of the King Airway, deflate the cuffs and remove device; ventilate the patient with BVM for 30 seconds and repeat sequence of steps
- If unsuccessful on second attempt, resume BLS airway management

Critical Information

- Contraindications:
 - Responsive patient with an intact gag reflex
 - Patient with known esophageal disease
 - Patients who have ingested caustic substances
 - Tracheal stoma
 - Patient fits on length based tape

ASYSTOLE/PEA



CRITICAL INFORMATION

- Immediate determination of death can be made if patient meets **Determination of Death ALS ATG 6** criteria
- If hyperkalemia is suspected in renal dialysis patients, administer 1 gram of 10% **Calcium Chloride** IV/IO and 50mEq of **Sodium Bicarbonate** IV/IO

SPECIAL CONSIDERATION

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen Ion (Acidosis)
- Hypo/Hyperkalemia
- Hypothermia
- Tension Pneumothorax
- Tamponade (cardiac)
- Toxins
- Thrombus
- Trauma

SPINAL MOTION RESTRICTION (SMR)

Indication

- Any patient identified by Marin County's Spinal Injury Assessment (GPC 13a) to warrant full or modified SMR. The spinal injury assessment should be performed prior to application of SMR. SMR describes the procedure used to care for patients with possible unstable spinal injuries

Full SMR

(Cervical collar with full-length vacuum spring or rigid device with lateral immobilization and straps)

- Indications:
 - Patients with obvious acute neurologic deficit (paralysis or weakness)
 - Priapism or suspected spinal shock
- Procedure:
 - **Assess motor/sensory function before and after SMR application**
 - regularly reassess and document motor/sensory function (include finger abduction, wrist/finger extension, plantar/dorsal flexion and sharp/dull exam if possible) following application of SMR
 - **Remove athletic equipment (if applicable)**
 - **Apply rigid cervical collar**
 - Cervical collar may be omitted for patients with isolated lumbar and/or lower thoracic spine tenderness
 - If needed, **extricate patient** limiting movement of the spine
 - **Apply adequate padding** on backboards or use vacuum mattress to prevent tissue ischemia and increase comfort
 - Secure patient to device
 - **Consider the use of SpO₂ and EtCO₂** to monitor respiratory function

Modified SMR

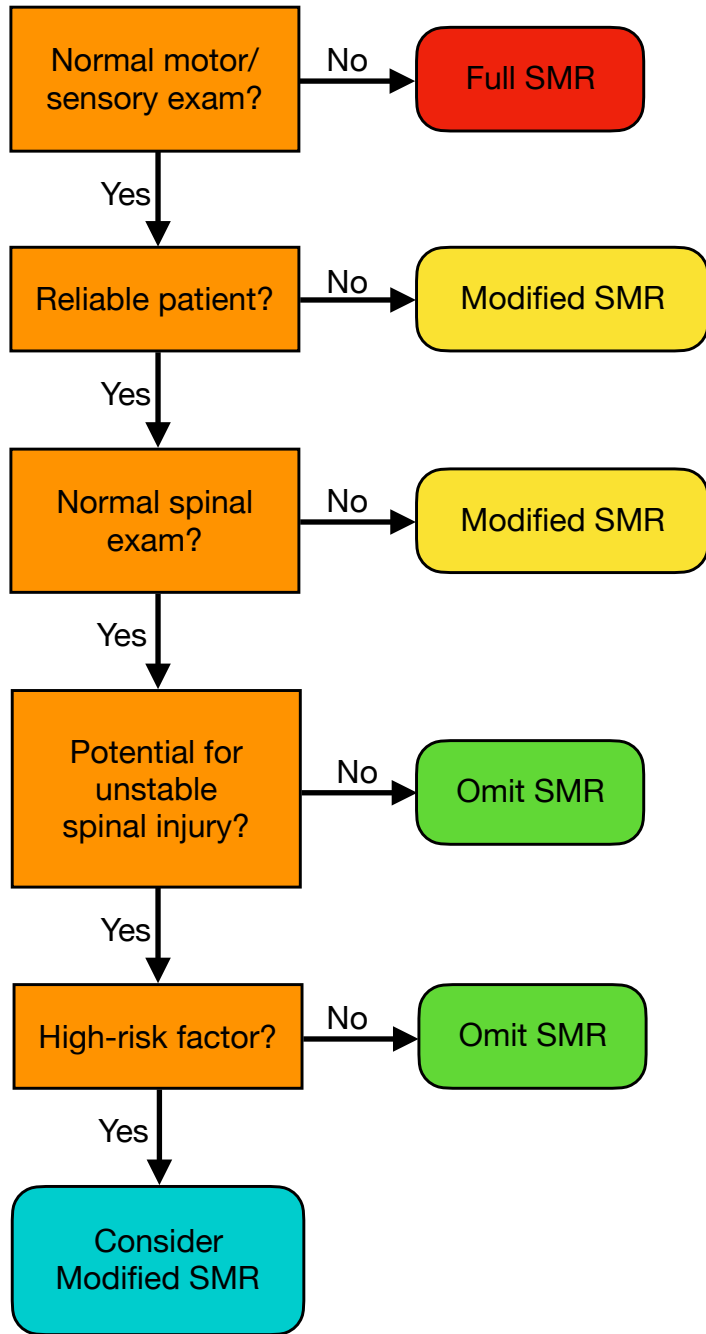
(May include any of the following: rigid cervical collar alone; self limiting motion; padding to limit movement; KED; or 1/2 length vacuum splint)

- Indications:
 - Patients who do not meet criteria for full SMR, but who are at high risk due to blunt trauma mechanism
 - Ambulatory/self-extricated patients who have mid-line neck pain and/or tenderness
- Procedure:
 - **Use the least invasive methods/tools available** which minimize patient discomfort and respiratory compromise
 - Least invasive examples: Lateral, semi-fowler's or fowler's position with cervical collar only; pillows; vacuum splint or gurney mattress; child's car seat
 - **Hard backboards should only be used when absolutely necessary** (e.g. patient transfer)
 - Consider pull sheets, other flexible devices (e.g. flat stretchers), or scoops and scoop-like devices
 - **Provide manual stabilization** restricting gross motion.
 - **Alert and cooperative patients** may be allowed to self-limit motion if appropriate with or without cervical collar
 - **Self-extrication** is allowable for patients meeting criteria for modified SMR

SPECIAL CONSIDERATIONS

- Full SMR is not benign; it can lead to pain, respiratory compromise, skin breakdown and contribute to cerebral hypo perfusion in patients with stroke or head injury
- **Routine use of SMR should be avoided.** Its use should be reserved for patients with confirmatory physical findings or high clinical suspicion of unstable spinal fracture
- **SMR is not indicated in patients with isolated penetrating trauma**
- Use SMR with caution with patients presenting with **dyspnea** and position appropriately
- If patient experiences negative effects of SMR methods used, alternative measures should be implemented as soon as possible
- **Pregnant patients >20 weeks:** should be positioned on the left side, immobilized as appropriate, supporting fetus
- **Combative patients:** Avoid methods that provoke increased spinal movement and/or combativeness
- **Athletic Equipment:** (football helmet and shoulder pads; lacrosse helmet and shoulder pads; baseball/softball helmet)
 - In event of suspected spine injury during participation in equipment-intensive sport, removal of equipment is strongly recommended prior to application of SMR
 - Equipment should be removed by the rescuers most familiar with the equipment (I.e. Athletic Trainers when present)
 - Removal of helmet and/or shoulder pads provides early access to the patient's airway/chest
- **Pediatric patients**
 - Consider the use of SpO₂ and EtCO₂ to monitor respiratory function
 - Consider use of padded pediatric motion restricting board
 - Avoid methods that provoke increased spinal movement
 - If choosing to apply SMR to patient in car seat, ensure that proper assessment of patient posterior is performed
 - Car seats:
 - Infants or children restrained in a front or rear-facing car seat (excludes booster seats) may be immobilized and extricated in the car seat. The infant or child may remain in the car seat if the immobilization is secure and his/her condition allows (no signs of respiratory distress or shock)
 - Children restrained in a booster seat (with or without a back) need to be extricated and immobilized following standard SMR procedures

SPINAL INJURY ASSESSMENT



CRITICAL INFORMATION

- See GPC 13, Spinal Motion Immobilization for full and modified SMR procedure, and pediatric/pregnancy considerations
- **Motor exam:**
 - Wrist/finger extension
 - Finger abduction
 - Plantar and dorsiflexion of both feet
- **Sensory exam:**
 - Check for abnormal sensation in all extremities
- **Unreliable patient:**
 - ALOC
 - Alcohol or drug impairment
 - Distracting injury
 - Language barrier
- **Spinal assessment:**
 - Palpate entire spine for pain, step off, and swelling
- **High-risk factors:**
 - Age ≥65 years
 - Meets trauma mechanism of injury
 - Axial load to the head

PEDIATRIC PATIENT TRANSPORT

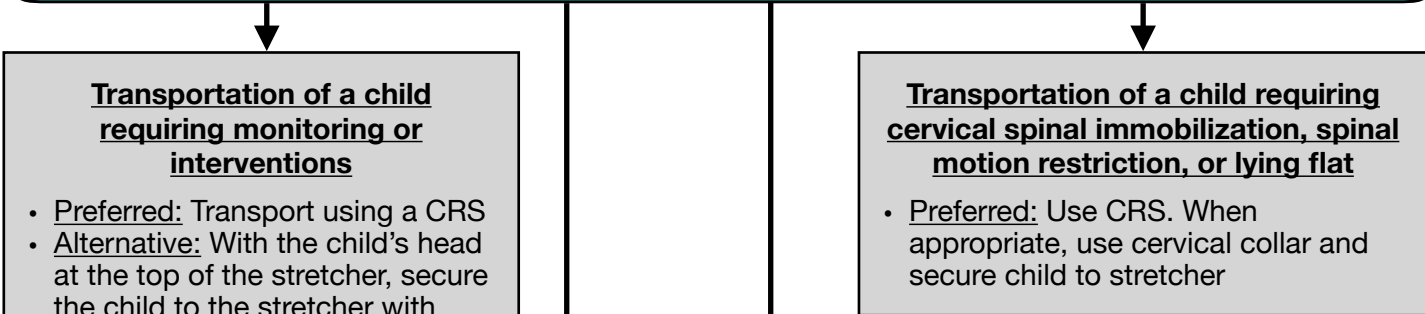
Purpose

- To provide guidance regarding the safe transport of the pediatric patient in an ambulance

General Information

- Under normal circumstances, transportation of a child in any of the following ways is not permissible:
 - Unrestrained
 - On a parent/caregiver’s lap or held in their arms
 - Using only horizontal stretcher straps if the child cannot be properly restrained according to the stretcher manufacturer’s specifications for proper restraint of patients
 - On the bench seat or any seat perpendicular to the forward motion of the vehicle
- “Car seat” refers to a size appropriate car seat which has rear and/or forward facing belt paths and which have been secured appropriately
- “CRS” refers to a child restraint system designed specifically for ambulance stretcher use and which has been properly secured

- The child’s age and weight shall be considered when utilizing an appropriate restraint system
- Use of child’s own car seat can be considered for the following (children <2 years must be rear facing):
 - No other restraint systems are available
 - Minor vehicle crash (ie: “fender bender”)
- The child shall be secured by the harness within the seat at all times. Whenever possible, procedures should be performed around the harness straps



Transportation of a child requiring monitoring or interventions

- Preferred: Transport using a CRS
- Alternative: With the child’s head at the top of the stretcher, secure the child to the stretcher with three horizontal straps and one vertical strap across each shoulder

Transportation of a child requiring cervical spinal immobilization, spinal motion restriction, or lying flat

- Preferred: Use CRS. When appropriate, use cervical collar and secure child to stretcher

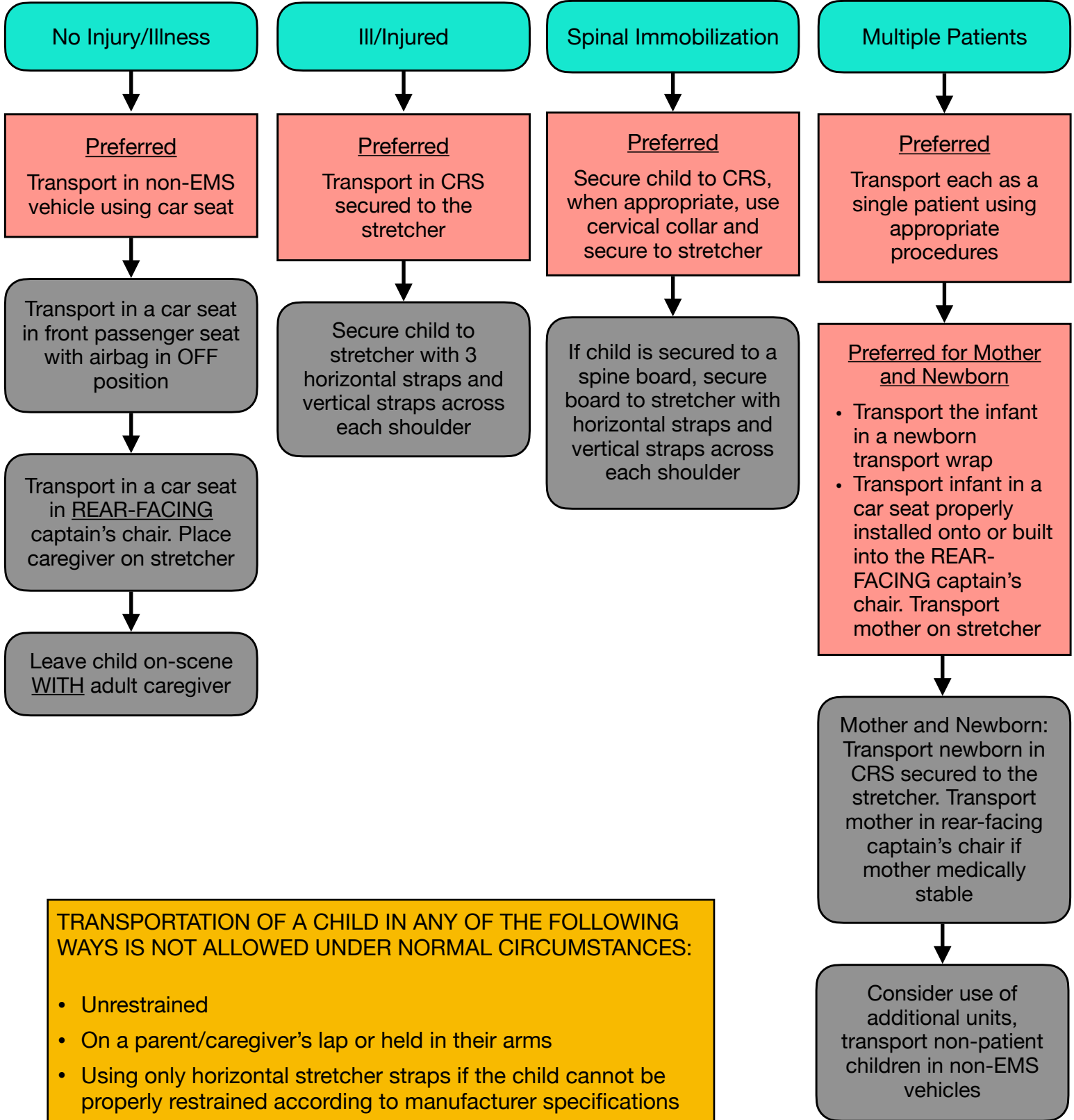
Transportation of a child or children requiring transport as part of a multiple patient transport (newborn with mother, multiple children, etc)

- Preferred: If possible, transport each as a single child according to guidance above. Additional resources may be necessary
- Preferred for mother and newborn: Transport the newborn in a newborn transport wrap (i.e., Aegis Neonate wrap)
 - Transport newborn in a car seat properly installed onto or built into the rear-facing EMS provider captain’s chair, facing the rear of the ambulance.
- Even with childbirth in the field, make every attempt to transport the infant in a car seat or CRS
- Alternative for mother and newborn: Transport the newborn in a CRS secured appropriately to stretcher. Transport mother in rear-facing EMS provider captain’s chair if mother is medically stable. Consider the use of additional units to accomplish safe transport

Transportation of a child who is not a patient

- Consider delaying transport until additional vehicles are available if it will not compromise other patient care or transport
- Preferred: Transport child in a vehicle other than an ambulance using a car seat
- Alternative: Transport child using a car seat in the front passenger seat of the ambulance with the airbags off OR transport in a car seat properly installed or built into rear-facing EMS provider captain’s chair

PEDIATRIC PATIENT TRANSPORT FLOWCHART



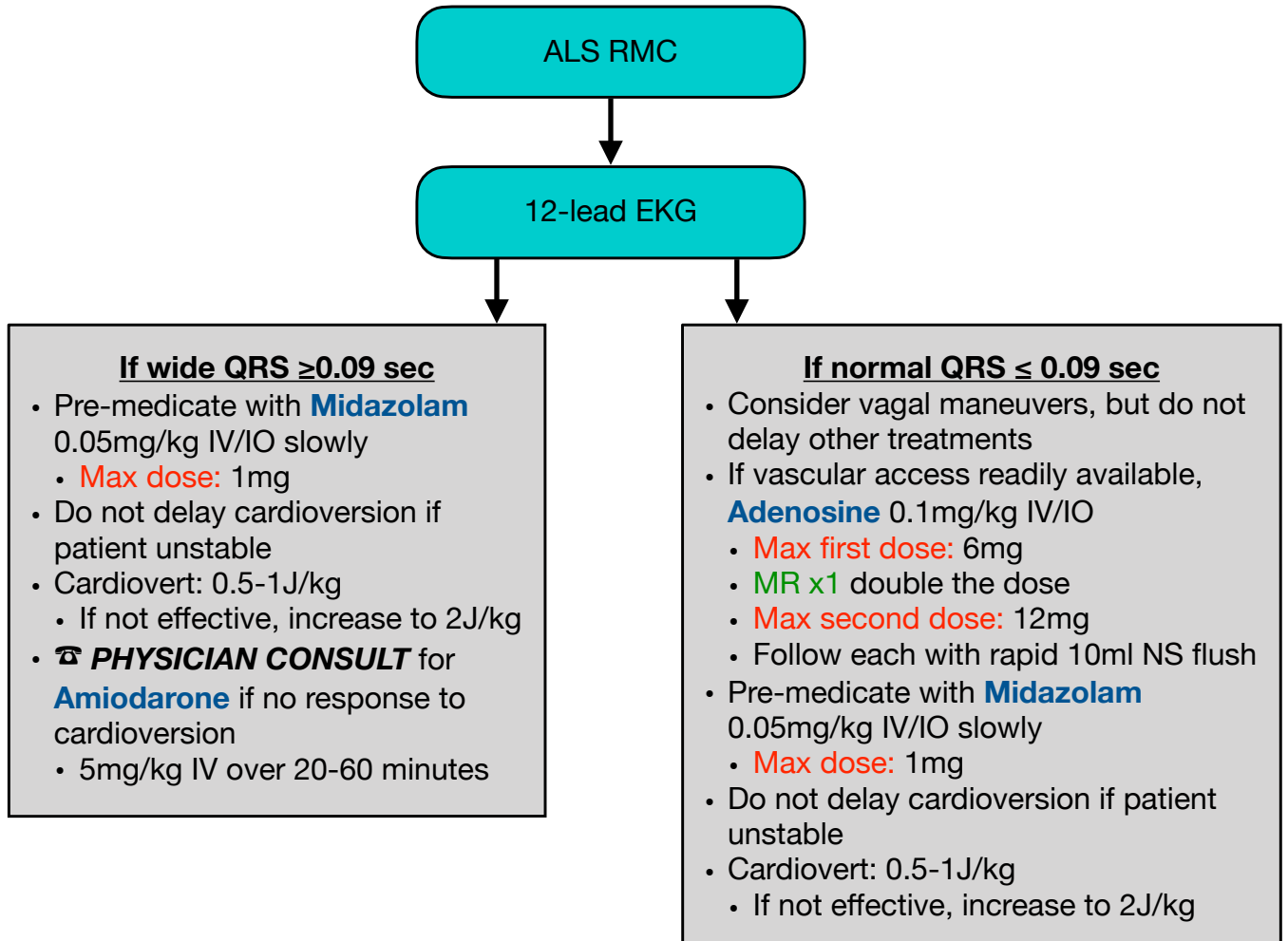
TRANSPORTATION OF A CHILD IN ANY OF THE FOLLOWING WAYS IS NOT ALLOWED UNDER NORMAL CIRCUMSTANCES:

- Unrestrained
- On a parent/caregiver's lap or held in their arms
- Using only horizontal stretcher straps if the child cannot be properly restrained according to manufacturer specifications
- On the bench seat or any seat perpendicular to the forward motion of the vehicle

PEDIATRIC TACHYCARDIA

Indications

- Rapid heart rate (infant HR >220 bpm; child HR >180 bpm) with pulse and poor perfusion



SPECIAL CONSIDERATION

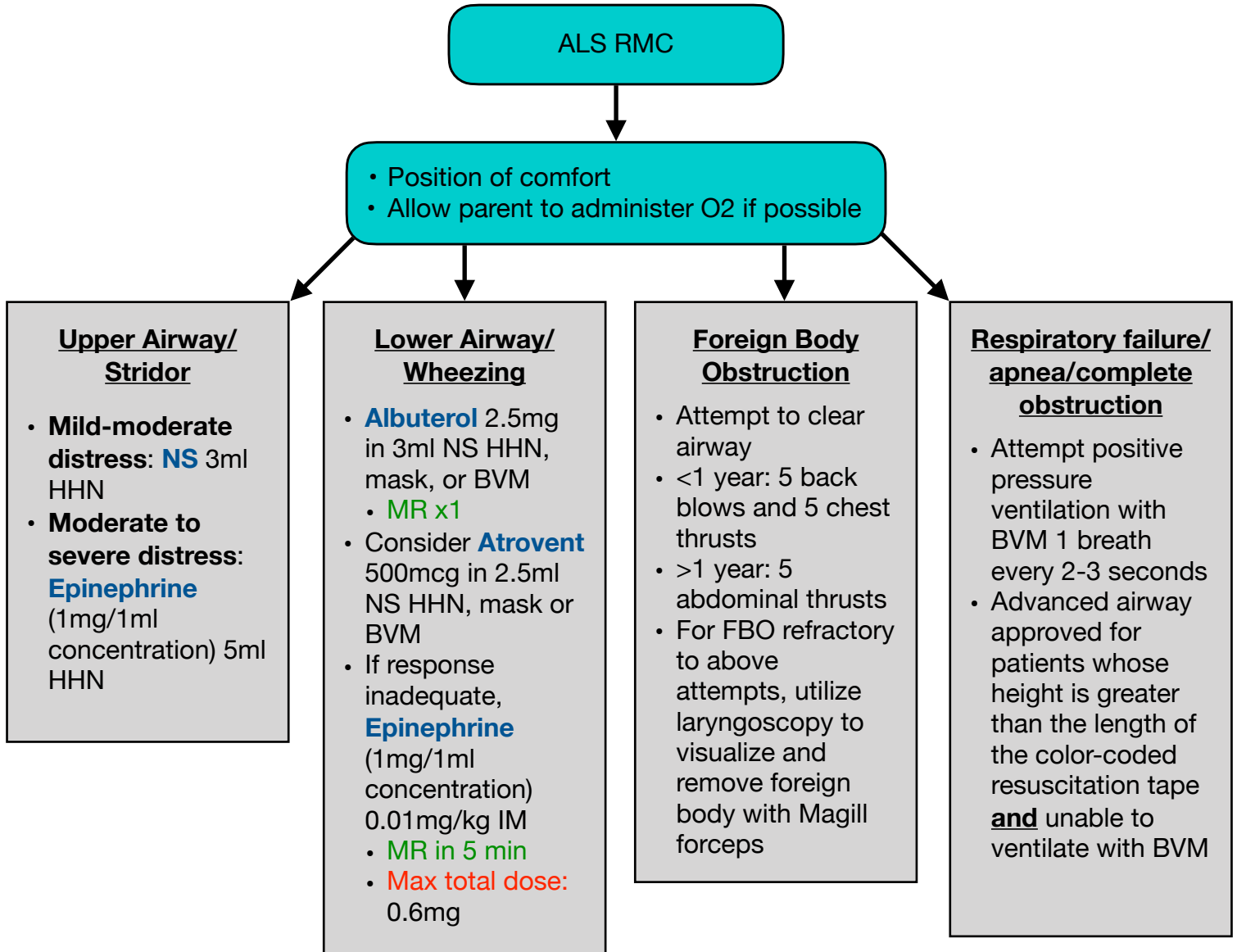
Reversible causes:

- Hypovolemia
- Hypoxia
- Hydrogen Ion (Acidosis)
- Hypo/Hyperkalemia
- Hypothermia
- Tension Pneumothorax
- Tamponade (cardiac)
- Toxins
- Thrombus
- Trauma

PEDIATRIC RESPIRATORY DISTRESS

Indications

- Patient exhibits any of the following:
 - Wheezing
 - Stridor
 - Grunting
 - Nasal flaring
 - Apnea



SPECIAL CONSIDERATION

- Assess key history factors: recent hospitalizations, asthma, allergies, croup, and medication usage

PEDIATRIC MEDICATIONS

| DRUG | CONCENTRATION | STANDARD DOSE |
|-------------------------------|---|---|
| Adenosine | 6mg/2ml (3mg/ml) | 0.1mg/kg rapid IV/IO push, followed by 5ml NS flush <i>Max first dose:</i> 6mg <i>Repeat:</i> x1 double the dose <i>Max second dose:</i> 12mg |
| Albuterol | 2.5mg/3ml NS | 2.5mg/3ml NS <i>Repeat:</i> x1 |
| Amiodarone | 150mg/3ml (50mg/ml) | <u>Pulseless Arrest:</u> 5mg/kg IV/IO, followed by or diluted in 20ml NS after 3rd shock <i>Max dose:</i> 300mg <u>Tachycardia with poor perfusion:</u> 5mg/kg IV/IO over 20-60 min |
| Atropine | <u>Preload:</u> 1mg/10ml (0.1mg/ml) <u>Vial:</u> 0.4mg/ml | <u>Bradycardia:</u> 0.02mg/kg IV/IO Minimum dose 0.1mg <i>Max single dose:</i> 0.5mg <i>Repeat:</i> x1 in 3-5 min <u>Organophosphate Poisoning:</u> 0.05mg/kg IV/IO <i>Repeat:</i> q5-10 min <i>Max dose:</i> 4mg or until relief of symptoms |
| Dextrose 10% | D10% | <u>3-7kg:</u> 2ml/kg IV/IO <u>≥8kg:</u> 5ml/kg IV/IO <i>Max dose:</i> 125ml |
| Diphenhydramine (Benadryl) | 50mg/ml | 1mg/kg IV/IO/IM <i>Max dose:</i> 50mg |
| Epinephrine | 1mg/10ml (0.1mg/ml) | <u>Cardiac Arrest:</u> 0.01mg/kg (0.1ml/kg) IV/IO <i>Repeat:</i> q3-5 min |
| Epinephrine | 1mg/ml EpiPen Jr ® 0.15mg | <u>Allergic Reaction:</u> 0.01mg/kg IM <i>Repeat:</i> x1 in 5 min <i>Max dose:</i> 0.6mg EpiPen Jr ®: repeat as needed in 5 min <u>Upper Airway/Stridor:</u> 5mg in 5ml via nebulizer |
| Fentanyl | 100mcg/2ml (50mcg/ml) | 1mcg/kg slow IV/IO/IM/IN <i>Repeat:</i> q5 min <i>Max dose:</i> 3mcg/kg For IN: divide dose evenly between nostrils |

PEDIATRIC MEDICATIONS

| DRUG | CONCENTRATION | STANDARD DOSE |
|----------------------------------|-------------------------------|---|
| Glucagon | 1mg/ml | 0.03mg/kg IM <i>Repeat:</i> x2 q15 min if no IV established <i>Max dose:</i> 1mg |
| Ipratropium (Atrovent) | 500mcg/2.5ml Unit dose | 500mcg/2.5ml Unit dose |
| Lidocaine 2% (preservative free) | 20mg/ml | 0.5mg/kg slowly <i>Repeat:</i> x1 half initial dose <i>Max dose:</i> 40mg |
| Midazolam (Versed) | 2mg/2ml (1mg/ml) 5mg/ml | <u>Cardioversion:</u> 0.05mg/kg slow IV/IO <i>Max dose:</i> 1mg <u>Seizure:</u> IV/IO: 0.05mg/kg slowly <i>Repeat:</i> x2 q15 min <i>Max single dose:</i> 1mg <i>Total max dose:</i> 5mg IM: 0.2mg/kg <i>Repeat:</i> x1 in 10 min if still seizing IN: 0.2mg/kg <i>Max dose:</i> 5mg For IN: divide dose evenly between nostrils |
| Morphine | 10mg/10ml (1mg/ml) 10mg/ml | <u>Pain Management:</u> 0.1mg/kg slow IV/IO/IM <i>Repeat:</i> x2 in 15 min (IV/IO), 30 min if IM <u>Burns:</u> 0.1mg/kg IV/IO/IM in incremental doses up to <i>max dose:</i> 0.3mg/kg |
| Naloxone (Narcan) | 2mg/2ml | 0.1mg/kg (0.25ml/kg) IV/IO/IM/IN <i>Repeat:</i> q5 min For IN: divide dose evenly between nostrils |
| Ondansetron (Zofran) | 4mg ODT 4mg/2ml (2mg/ml) | <u>Patients 12-18kg:</u> 2mg ODT (1/2 tab) or slow IV over 30 seconds <i>Repeat:</i> x1 in 10 min <u>Patients >18kg:</u> 4mg ODT (1 tab) or slow IV over 30 seconds <i>Repeat:</i> x1 in 10 min |
| Sodium Bicarbonate | 50mEq/50ml | 1mEq/kg IV/IO |

| March 2022 | | MARIN COUNTY EMS PEDIATRIC DOSING GUIDE | | | | | | | | PTG 2A | |
|---|--|---|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | Gray | Pink | Red | Purple | Yellow | White | Blue | Orange | Green | |
| | | kg | 3 - 5 | 6 - 7 | 8 - 9 | 10 - 11 | 12 - 14 | 15 - 18 | 19 - 23 | 24 - 29 | 30 - 36 |
| | | lbs | 6 - 11 | 13 - 15 | 18 - 20 | 22 - 24 | 27 - 31 | 33 - 40 | 42 - 51 | 53 - 64 | 66 - 80 |
| NS Fluid Bolus | | | 40ml | 130ml | 170ml | 210ml | 260ml | 330ml | 420ml | 530ml | 660ml |
| Blade size for foreign body removal | | | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 3 |
| DEFIBRILLATION 2J/kg, 4J/kg | | 1st | 8J | 13J | 17J | 20J | 26J | 33J | 42J | 53J | 66J |
| | | 2nd | 16J | 26J | 34J | 40J | 52J | 66J | 84J | 106J | 132J |
| CARDIOVERSION 1J/kg, 2J/kg | | 1st | 4J | 7J | 9J | 10J | 13J | 17J | 21J | 26J | 33J |
| | | 2nd | 8J | 13J | 17J | 20J | 26J | 33J | 42J | 54J | 66J |
| ADENOSINE 0.1mg/kg RIVP w/ 10ml NS flush MR x1 double the dose Max 1st dose: 6mg, Max 2nd dose: 12mg Concentration: 6mg/2 ml (3 mg/ml) | | 1st | 0.4mg | 0.7mg | 0.9mg | 1mg | 1.3mg | 1.7mg | 2.1mg | 2.7mg | 3.3mg |
| | | | 0.14ml | 0.2ml | 0.3ml | 0.3ml | 0.4ml | 0.6ml | 0.7ml | 0.9ml | 1.1ml |
| | | 2nd | 0.8mg | 1.3mg | 1.7mg | 2.1mg | 2.6mg | 3.4mg | 4.2mg | 5.4mg | 6.6 mg |
| | | | 0.27ml | 0.4ml | 0.6ml | 0.7ml | 0.9ml | 1.1ml | 1.4ml | 1.8ml | 2.2ml |
| ALBUTEROL Unit dose vial via nebulizer MR x1 Concentration: 2.5mg/3ml | | | 2.5mg | 2.5mg | 2.5mg | 2.5mg | 2.5mg | 2.5mg | 2.5mg | 2.5mg | 2.5mg |
| | | | 3ml | 3ml | 3ml | 3ml | 3ml | 3ml | 3ml | 3ml | 3ml |
| AMIODARONE (Pulseless Arrest) 5mg/kg IV/IO followed by or diluted in 20ml NS flush after 3rd shock Max single dose: 300mg Concentration: 150mg/3ml (50mg/ml) | | | 20mg | 32mg | 42mg | 50mg | 65mg | 80mg | 105mg | 130mg | 165mg |
| | | | 0.4ml | 0.6ml | 0.8ml | 1ml | 1.3ml | 1.6ml | 2.1ml | 2.6ml | 3.3ml |
| ATROPINE (Bradycardia) 0.02mg/kg IV/IO MR x1 in 3-5 min Minimum single dose 0.1mg, Max single dose 0.5mg Concentration: 1mg/10 ml (0.1mg/ml) | | | 0.1mg | 0.1mg | 0.2mg | 0.2mg | 0.3mg | 0.3 mg | 0.4mg | 0.5mg | 0.5mg |
| | | | 1ml | 1ml | 2ml | 2ml | 3ml | 3ml | 4ml | 5ml | 5ml |
| ATROPINE (Organophosphate Poisoning) 0.05mg/kg IV/IO MR q5-10 min until symptoms resolve Concentration: (preload) 1mg/10ml (0.1mg/ml) Concentration: (multi-dose vial) 0.4mg/ml | | | 0.2mg | 0.3mg | 0.4mg | 0.5mg | 0.7mg | 0.8mg | 1mg | 1.3mg | 1.7mg |
| | | | 2ml | 3ml | 4ml | 5ml | 7ml | 8ml | 10ml | 13ml | 17ml |
| | | | 0.5ml | 0.8ml | 1.1ml | 1.3ml | 1.6ml | 2.1ml | 2.6ml | 3.3ml | 4.1ml |
| DEXTROSE 10% 3-7kg: 2ml/kg IV/IO, ≥8kg: 5ml/kg IV/IO Give over 10 minutes Max dose: 125ml | | | 8ml | 13ml | 42ml | 53ml | 65ml | 83ml | 105ml | 125ml | 125ml |
| DIPHENHYDRAMINE - Benadryl 1 mg/kg IM/IV/IO Max dose: 50mg Concentration: 50mg/ml | | | 4mg | 6.5mg | 8.5mg | 10.5mg | 13mg | 16.5mg | 21mg | 26mg | 33mg |
| | | | 0.08ml | 0.1ml | 0.2ml | 0.2ml | 0.3ml | 0.3ml | 0.4ml | 0.5ml | 0.7ml |
| EPINEPHRINE (Cardiac Arrest/Bradycardia) 0.01mg/kg IV/IO MR q3-5 min Concentration: 1mg/10 ml (0.1mg/ml) | | | 0.04mg | 0.07mg | 0.09mg | 0.1mg | 0.13mg | 0.17mg | 0.2mg | 0.26mg | 0.33mg |
| | | | 0.4ml | 0.7ml | 0.9ml | 1ml | 1.3ml | 1.7ml | 2ml | 2.6ml | 3.3ml |
| EPINEPHRINE (Allergic Reaction/Asthma) 0.01mg/kg IM MR x1 in 5 min Total max dose: 0.6mg Concentration: 1 mg/1 ml | | | 0.04mg | 0.07mg | 0.09mg | 0.1mg | 0.13mg | 0.17mg | 0.2mg | 0.26mg | 0.3mg |
| | | | 0.04ml | 0.07ml | 0.09ml | 0.1ml | 0.13ml | 0.17ml | 0.2ml | 0.26ml | 0.3ml |
| EPINEPHRINE (Upper Airway/Stridor) 5mg via nebulizer Concentration: 1 mg/1 ml | | | 5mg | 5mg | 5mg | 5mg | 5mg | 5mg | 5mg | 5mg | 5mg |
| | | | 5ml | 5ml | 5ml | 5ml | 5ml | 5ml | 5ml | 5ml | 5ml |

| March 2022 | | MARIN COUNTY EMS PEDIATRIC DOSING GUIDE | | | | | | | | PTG 2A | |
|---|--|---|--------|---------|---------|-------------|-------------|-----------|-----------|-----------|---------|
| | | Gray | Pink | Red | Purple | Yellow | White | Blue | Orange | Green | |
| WEIGHT | | kg | 3 - 5 | 6 - 7 | 8 - 9 | 10 - 11 | 12 - 14 | 15 - 18 | 19 - 23 | 24 - 29 | 30 - 36 |
| | | lbs | 6 - 11 | 13 - 15 | 18 - 20 | 22 - 24 | 27 - 31 | 33 - 40 | 42 - 51 | 53 - 64 | 66 - 80 |
| FENTANYL (Pain) 1mcg/kg slow IV/IO/IM/IN MR q5 min For IN split dose evenly per nostril Max dose: 3mcg/kg Concentration: 100mcg/2ml (50mcg/ml) | | | 4mcg | 6.5mcg | 8.5mcg | 10.5mcg | 13mcg | 16.5mcg | 21mcg | 26.5mcg | 33mcg |
| | | | 0.08ml | 0.13ml | 0.17ml | 0.21ml | 0.26ml | 0.33ml | 0.42ml | 0.53ml | 0.66ml |
| GLUCAGON (Hypoglycemia/Beta blocker OD) 0.03mg/kg IM MR x2 q15 min if no IV established Max dose: 1mg Concentration: 1mg/1ml | | | 0.12mg | 0.2mg | 0.25mg | 0.3mg | 0.4mg | 0.5mg | 0.6mg | 0.8mg | 1mg |
| | | | 0.12ml | 0.2ml | 0.25ml | 0.3ml | 0.4ml | 0.5ml | 0.6ml | 0.8ml | 1ml |
| IPRATROPIUM - Atrovent Unit dose vial via nebulizer Concentration: 500mcg/2.5ml | | | 500mcg | 500mcg | 500mcg | 500mcg | 500mcg | 500mcg | 500mcg | 500mcg | 500mcg |
| | | | 2.5ml | 2.5ml | 2.5ml | 2.5ml | 2.5ml | 2.5ml | 2.5ml | 2.5ml | 2.5ml |
| LIDOCAINE 2% preservative free- (IO Insertion) 0.5mg/kg slow IO MR x1 half initial dose Max dose: 40mg Concentration: 20mg/ml | | 1st | 2mg | 3mg | 4mg | 5mg | 6mg | 8mg | 10mg | 13mg | 17mg |
| | | | 0.1ml | 0.2ml | 0.2ml | 0.3ml | 0.3ml | 0.4ml | 0.5ml | 0.7ml | 0.8ml |
| | | 2nd | 1mg | 2mg | 2mg | 3mg | 3mg | 4mg | 5mg | 6mg | 8mg |
| | | | 0.05ml | 0.1ml | 0.1ml | 0.2ml | 0.2ml | 0.2ml | 0.3ml | 0.4ml | 0.4ml |
| MIDAZOLAM -Versed (Seizure) IM: 0.2mg/kg MR x1 in 10 min if still seizing Max single dose: 5mg Concentration: 5 mg/ml | | | 0.8mg | 1.3mg | 1.7mg | 2.1mg | 2.6mg | 3.3mg | 4.2mg | 5mg | 5mg |
| | | | 0.16ml | 0.3ml | 0.3ml | 0.4ml | 0.5ml | 0.7ml | 0.8ml | 1ml | 1ml |
| MIDAZOLAM - Versed (Seizure) IN: 0.2mg/kg Split dose equally per nostril Max dose: 5mg Concentration: 5 mg/ml | | | 0.8mg | 1.3mg | 1.7mg | 2.1mg | 2.6mg | 3.3mg | 4.2mg | 5mg | 5mg |
| | | | 0.16ml | 0.3ml | 0.3ml | 0.4ml | 0.5ml | 0.7ml | 0.8ml | 1ml | 1ml |
| MIDAZOLAM - Versed (Seizure) slow IV/IO: 0.05mg/kg MR x2 q15 min Total max dose: 5mg Concentration: 2mg/2ml (1mg/ml) | | | 0.2mg | 0.3mg | 0.4mg | 0.5mg | 0.7mg | 0.8mg | 1mg | 1.3mg | 1.7mg |
| | | | 0.2ml | 0.3ml | 0.4ml | 0.5ml | 0.7ml | 0.8ml | 1ml | 1.3ml | 1.7ml |
| MIDAZOLAM - Versed (Cardioversion) slow IV/IO: 0.05mg/kg Max dose: 1mg Concentration: 2mg/2ml (1mg/ml) | | | 0.2mg | 0.3mg | 0.4mg | 0.5mg | 0.7mg | 0.8mg | 1mg | 1mg | 1mg |
| | | | 0.2ml | 0.3ml | 0.4ml | 0.5ml | 0.7ml | 0.8ml | 1ml | 1ml | 1ml |
| MORPHINE (Pain/Burns) 0.1mg/kg IV/IO/IM MR x2 q15 min (IV/IO) MR in 30 min (IM) Concentration: 10 mg/1 ml | | | 0.4mg | 0.7mg | 0.9mg | 1mg | 1.3mg | 1.7mg | 2.1mg | 2.6mg | 3.3mg |
| | | | 0.04ml | 0.1ml | 0.1ml | 0.1ml | 0.1ml | 0.2ml | 0.2ml | 0.3ml | 0.3ml |
| NALOXONE - Narcan 0.1 mg/kg IV/IO/IM/IN MR q5 min For IN split dose evenly per nostril Concentration: 2mg/2 ml (1mg/ml) | | | 0.4mg | 0.7mg | 0.9mg | 1mg | 1.3mg | 1.7mg | 2mg | 2mg | 2mg |
| | | | 0.4ml | 0.7ml | 0.9ml | 1ml | 1.3ml | 1.7ml | 2ml | 2ml | 2ml |
| ONDANSETRON - Zofran Concentration: 4mg ODT, 4mg/2ml (2mg/ml) | | | | | | 2mg | 2mg | 4mg | 4mg | 4mg | |
| | | | | | | 1ml/1/2 tab | 1ml/1/2 tab | 2ml/1 tab | 2ml/1 tab | 2ml/1 tab | |
| SODIUM BICARBONATE 1mEq/kg IV/IO Concentration: 1mEq/ml | | | 4mEq | 6.5mEq | 8.5mEq | 10mEq | 13mEq | 17mEq | 21mEq | 26mEq | 33mEq |
| | | | 4ml | 6.5ml | 8.5ml | 10ml | 13ml | 17ml | 21ml | 26ml | 33ml |

PEDIATRIC DOSING GUIDE

GRAY: 3-5kg/6-11lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 90-160 | 100-205 | 30-53 | 67-104 | 35-56 | 45-62 |

| | |
|-------------------------|------|
| NS Fluid Bolus: 10ml/kg | 40ml |
|-------------------------|------|

| | | |
|--------------------------|---------|----------|
| DEFIBRILLATION: 2, 4J/kg | 1st: 8J | 2nd: 16J |
|--------------------------|---------|----------|

| | |
|--------------------------------|---|
| Blade for Foreign Body Removal | 0 |
|--------------------------------|---|

| | | |
|-------------------------|---------|---------|
| CARDIOVERSION: 1, 2J/kg | 1st: 4J | 2nd: 8J |
|-------------------------|---------|---------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--|---|---|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | <u>1st:</u> 0.4mg <u>2nd:</u> 0.8mg | <u>1st:</u> 0.14ml <u>2nd:</u> 0.27ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR X1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 20mg | 0.4ml | Follow with or dilute in 20ml NS flush Give after 3rd shock |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.1mg | 1ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | <u>Preload:</u> 1mg/10ml (0.1mg/ml) <u>Vial:</u> 0.4mg/ml | 0.05mg/kg IV/IO | 0.2mg | <u>Preload:</u> 2ml <u>Vial:</u> 0.5ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 2ml/kg IV/IO Max dose: 125ml | | 8ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 4mg | 0.08ml | |
| EPINEPHRINE (Cardiac arrest/Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.04mg | 0.4ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.04mg | 0.04ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

GRAY: 3-5kg/6-11lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|--------------------------|---|--|---|--|
| FENTANYL (Pain) | 100mcg/2ml (50mcg/ml) | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 4mcg | 0.08ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 0.12mg | 0.12ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 2mg <u>2nd:</u> 1mg | <u>1st:</u> 0.1ml <u>2nd:</u> 0.05ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg <u>IM</u> Max single dose 5mg | 0.8mg | 0.16ml | MR x1 in 10 min if still seizing |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg <u>IN</u> Max dose 5mg | 0.8mg | 0.16ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow <u>IV/IO</u> Total max dose: 5mg | 0.2mg | 0.2ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow <u>IV/IO</u> Max dose: 1mg | 0.2mg | 0.2ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 0.4mg | 0.04ml | MR x2 q15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN | 0.4mg | 0.4ml | MR q5 min For IN: split dose equally in each nostril |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 4mEq | 4ml | |

PEDIATRIC DOSING GUIDE

PINK: 6-7kg/13-15lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 90-160 | 100-180 | 30-53 | 72-104 | 37-56 | 50-62 |

| | |
|-------------------------|--------------|
| NS Fluid Bolus: 20ml/kg | 130ml |
|-------------------------|--------------|

| | | |
|--------------------------|-----------------|-----------------|
| DEFIBRILLATION: 2, 4J/kg | 1st: 13J | 2nd: 26J |
|--------------------------|-----------------|-----------------|

| | |
|--------------------------------|----------|
| Blade for Foreign Body Removal | 0 |
|--------------------------------|----------|

| | | |
|-------------------------|----------------|-----------------|
| CARDIOVERSION: 1, 2J/kg | 1st: 7J | 2nd: 13J |
|-------------------------|----------------|-----------------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--|---|---|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | <u>1st:</u> 0.7mg <u>2nd:</u> 1.3mg | <u>1st:</u> 0.2ml <u>2nd:</u> 0.4ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR X1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 32mg | 0.6ml | Follow with or dilute in 20ml NS flush Give after 3rd shock |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.1mg | 1ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | <u>Preload:</u> 1mg/10ml (0.1mg/ml) <u>Vial:</u> 0.4mg/ml | 0.05mg/kg IV/IO | 0.3mg | <u>Preload:</u> 3ml <u>Vial:</u> 0.8ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 2ml/kg IV/IO Max dose: 125ml | | 13ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 6.5mg | 0.1ml | |
| EPINEPHRINE (Cardiac arrest/ Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.07mg | 0.7ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/ Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.07mg | 0.07ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

PINK: 6-7kg/13-15lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---------------------|---|--|--|--|
| FENTANYL (Pain) | 50mcg/ml | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 6.5mcg | 0.13ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 0.2mg | 0.2ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 3mg <u>2nd:</u> 2mg | <u>1st:</u> 0.2ml <u>2nd:</u> 0.1ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg <u>IM</u> Max single dose 5mg | 1.3mg | 0.3ml | MR x1 in 10 min |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg <u>IN</u> Max dose 5mg | 1.3mg | 0.3ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow <u>IV/IO</u> Total max dose: 5mg | 0.3mg | 0.3ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Max dose: 1mg | 0.3mg | 0.3ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 0.7mg | 0.1ml | MR x2 q15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN | 0.7mg | 0.7ml | MR q5 min For IN: split dose equally in each nostril |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 6.5mEq | 6.5ml | |

PEDIATRIC DOSING GUIDE

RED: 8-9kg/18-20lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 90-160 | 100-180 | 30-53 | 72-104 | 37-56 | 50-62 |

| | | | | |
|-------------------------|-------|--------------------------|----------|----------|
| NS Fluid Bolus: 20ml/kg | 170ml | DEFIBRILLATION: 2, 4J/kg | 1st: 17J | 2nd: 34J |
|-------------------------|-------|--------------------------|----------|----------|

| | | | | |
|--------------------------------|---|-------------------------|---------|----------|
| Blade for Foreign Body Removal | 1 | CARDIOVERSION: 1, 2J/kg | 1st: 9J | 2nd: 17J |
|--------------------------------|---|-------------------------|---------|----------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--|---|---|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | <u>1st:</u> 0.9mg <u>2nd:</u> 1.7mg | <u>1st:</u> 0.3ml <u>2nd:</u> 0.6ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR x1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 42mg | 0.8ml | Follow with or dilute in 20ml NS flush Give after 3rd shock |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.2mg | 2ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | <u>Preload:</u> 1mg/10ml (0.1mg/ml) <u>Vial:</u> 0.4mg/ml | 0.05mg/kg IV/IO | 0.4mg | <u>Preload:</u> 4ml <u>Vial:</u> 1.1ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 5ml/kg IV/IO Max dose: 125ml | | 42ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 8.5mg | 0.2ml | |
| EPINEPHRINE (Cardiac arrest/ Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.09mg | 0.9ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/ Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.09mg | 0.09ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

RED: 8-9kg/18-20lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---------------------|---|--|--|--|
| FENTANYL (Pain) | 50mcg/ml | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 8.5mcg | 0.17ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 0.25mg | 0.25ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 4mg <u>2nd:</u> 2mg | <u>1st:</u> 0.2ml <u>2nd:</u> 0.1ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IM Max single dose 5mg | 1.7mg | 0.3ml | MR x1 in 10 min if still seizing |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IN Max dose 5mg | 1.7mg | 0.3ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Total max dose: 5mg | 0.4mg | 0.4ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Max dose: 1mg | 0.4mg | 0.4ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 0.9mg | 0.1ml | MR x2 q15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN | 0.9mg | 0.9ml | MR q5 min For IN: split dose equally in each nostril |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 8.5mEq | 8.5ml | |

PEDIATRIC DOSING GUIDE

PURPLE: 10-11kg/22-24lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 90-160 | 100-180 | 30-53 | 72-104 | 37-56 | 50-62 |

| | |
|-------------------------|--------------|
| NS Fluid Bolus: 20ml/kg | 210ml |
|-------------------------|--------------|

| | | |
|--------------------------|----------|----------|
| DEFIBRILLATION: 2, 4J/kg | 1st: 20J | 2nd: 40J |
|--------------------------|----------|----------|

| | |
|--------------------------------|----------|
| Blade for Foreign Body Removal | 1 |
|--------------------------------|----------|

| | | |
|-------------------------|----------|----------|
| CARDIOVERSION: 1, 2J/kg | 1st: 10J | 2nd: 20J |
|-------------------------|----------|----------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--|---|---|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | <u>1st:</u> 1mg <u>2nd:</u> 2.1mg | <u>1st:</u> 0.3ml <u>2nd:</u> 0.7ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR X1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 50mg | 1ml | Follow with or dilute in 20ml NS flush Give after 3rd shock |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.2mg | 2ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | <u>Preload:</u> 1mg/10ml (0.1mg/ml) <u>Vial:</u> 0.4mg/ml | 0.05mg/kg IV/IO | 0.5mg | <u>Preload:</u> 5ml <u>Vial:</u> 1.3ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 5ml/kg IV/IO Max dose: 125ml | | 53ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 10.5mg | 0.2ml | |
| EPINEPHRINE (Cardiac arrest/Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.1mg | 1ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.1mg | 0.1ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

PURPLE: 10-11kg/22-24lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---------------------|---|--|--|--|
| FENTANYL (Pain) | 50mcg/ml | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 10.5mcg | 0.21ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 0.3mg | 0.3ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 5mg <u>2nd:</u> 3mg | <u>1st:</u> 0.3ml <u>2nd:</u> 0.2ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IM Max single dose 5mg | 2.1mg | 0.4ml | MR x1 in 10 min |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IN Max dose 5mg | 2.1mg | 0.4ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Total max dose: 5mg | 0.5mg | 0.5ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Max dose: 1mg | 0.5mg | 0.5ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 1mg | 0.1ml | MR x2 q15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN | 1mg | 1ml | MR q5 min For IN: split dose equally in each nostril |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 10mEq | 10ml | |

PEDIATRIC DOSING GUIDE

YELLOW: 12-14kg/27-31lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 80-120 | 98-140 | 22-37 | 86-106 | 42-63 | 49-62 |

| | |
|--------------------------------|--------------|
| NS Fluid Bolus: 20ml/kg | 260ml |
|--------------------------------|--------------|

| | | |
|---------------------------------|-----------------|-----------------|
| DEFIBRILLATION: 2, 4J/kg | 1st: 26J | 2nd: 52J |
|---------------------------------|-----------------|-----------------|

| | |
|---------------------------------------|----------|
| Blade for Foreign Body Removal | 2 |
|---------------------------------------|----------|

| | | |
|--------------------------------|-----------------|-----------------|
| CARDIOVERSION: 1, 2J/kg | 1st: 13J | 2nd: 26J |
|--------------------------------|-----------------|-----------------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--|---|---|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | <u>1st:</u> 1.3mg <u>2nd:</u> 2.6mg | <u>1st:</u> 0.4ml <u>2nd:</u> 0.9ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR x1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 65mg | 1.3ml | Follow with or dilute in 20ml NS flush Give after 3rd shock |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.3mg | 3ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | <u>Preload:</u> 1mg/10ml (0.1mg/ml) <u>Vial:</u> 0.4mg/ml | 0.05mg/kg IV/IO | 0.7mg | <u>Preload:</u> 7ml <u>Vial:</u> 1.6ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 5ml/kg IV/IO Max dose: 125ml | | 65ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 13mg | 0.3ml | |
| EPINEPHRINE (Cardiac arrest/ Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.13mg | 1.3ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/ Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.13mg | 0.13ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

YELLOW: 12-14kg/27-31lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---------------------|---|--|--|--|
| FENTANYL (Pain) | 50mcg/ml | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 13.5mcg | 0.27ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 0.4mg | 0.4ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 6mg <u>2nd:</u> 3mg | <u>1st:</u> 0.3ml <u>2nd:</u> 0.2ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IM Max single dose 5mg | 2.6mg | 0.5ml | MR x1 in 10 min |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IN Max dose 5mg | 2.6mg | 0.5ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Total max dose: 5mg | 0.7mg | 0.7ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Max dose: 1mg | 0.7mg | 0.7ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 1.3mg | 0.1ml | MR x2 q15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN | 1.3mg | 1.3ml | MR q5 min For IN: split dose equally in each nostril |
| ONDANSETRON <i>Zofran</i> | 4mg tab 4mg/2ml | 2mg ODT/slow IV | 2mg | 1ml 1/2 tab | Slow IV over 30 sec |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 13mEq | 13ml | |

PEDIATRIC DOSING GUIDE

WHITE: 15-18kg/33-40lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 65-100 | 80-120 | 20-28 | 89-112 | 46-72 | 58-69 |

| | | | | |
|--------------------------------|--------------|---------------------------------|-----------------|-----------------|
| NS Fluid Bolus: 20ml/kg | 330ml | DEFIBRILLATION: 2, 4J/kg | 1st: 33J | 2nd: 66J |
|--------------------------------|--------------|---------------------------------|-----------------|-----------------|

| | | | | |
|---------------------------------------|----------|--------------------------------|-----------------|-----------------|
| Blade for Foreign Body Removal | 2 | CARDIOVERSION: 1, 2J/kg | 1st: 17J | 2nd: 33J |
|---------------------------------------|----------|--------------------------------|-----------------|-----------------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--------------------------------|-----------------------------------|---|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | 1st: 1.7mg 2nd: 3.4mg | 1st: 0.6ml 2nd: 1.1ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR x1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 80mg | 1.6ml | Follow with or dilute in 20ml NS flush Give after 3rd shock |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.3mg | 3ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | Preload: 1mg/10ml (0.1mg/ml) Vial: 0.4mg/ml | 0.05mg/kg IV/IO | 0.8mg | Preload: 8ml Vial: 2.1ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 5ml/kg IV/IO Max dose: 125ml | | 83ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 16.5mg | 0.3ml | |
| EPINEPHRINE (Cardiac arrest/ Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.17mg | 1.7ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/ Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.17mg | 0.17ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

WHITE: 15-18kg/33-40lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---------------------|---|--|--|--|
| FENTANYL (Pain) | 50mcg/ml | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 16.5mcg | 0.33ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 0.5mg | 0.5ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 8mg <u>2nd:</u> 4mg | <u>1st:</u> 0.4ml <u>2nd:</u> 0.2ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IM Max single dose 5mg | 3.3mg | 0.7ml | MR x1 in 10 min |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IN Max dose 5mg | 3.3mg | 0.7ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Total max dose: 5mg | 0.8mg | 0.8ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Max dose: 1mg | 0.8mg | 0.8ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 1.7mg | 0.2ml | MR x2 in 15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN | 1.7mg | 1.7ml | MR q5 min For IN: split dose equally in each nostril |
| ONDANSETRON <i>Zofran</i> | 4mg tab 4mg/2ml | 2mg ODT/slow IV | 2mg | 1ml 1/2 tab | Slow IV over 30 sec |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 17mEq | 17ml | |

PEDIATRIC DOSING GUIDE

BLUE: 19-23kg/42-51lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 65-100 | 80-120 | 20-28 | 89-112 | 46-72 | 58-69 |

| | | | | |
|-------------------------|-------|--------------------------|----------|----------|
| NS Fluid Bolus: 20ml/kg | 420ml | DEFIBRILLATION: 2, 4J/kg | 1st: 42J | 2nd: 84J |
|-------------------------|-------|--------------------------|----------|----------|

| | | | | |
|--------------------------------|---|-------------------------|----------|----------|
| Blade for Foreign Body Removal | 2 | CARDIOVERSION: 1, 2J/kg | 1st: 21J | 2nd: 42J |
|--------------------------------|---|-------------------------|----------|----------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--------------------------------|------------------------------------|---|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | 1st: 2.1mg 2nd: 4.2mg | 1st: 0.7ml 2nd: 1.4ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR x1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 105mg | 2.1ml | Follow with or dilute in 20ml NS flush Give after 3rd shock |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.4mg | 4ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | Preload: 1mg/10ml (0.1mg/ml) Vial: 0.4mg/ml | 0.05mg/kg IV/IO | 1mg | Preload: 10ml Vial: 2.6ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 5ml/kg IV/IO Max dose: 125ml | | 105ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 21mg | 0.4ml | |
| EPINEPHRINE (Cardiac arrest/ Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.2mg | 2ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/ Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.2mg | 0.2ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

BLUE: 19-23kg/42-51lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---------------------|---|---|--|--|
| FENTANYL (Pain) | 50mcg/ml | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 21mcg | 0.42ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 0.6mg | 0.6ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 10mg <u>2nd:</u> 5mg | <u>1st:</u> 0.5ml <u>2nd:</u> 0.3ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IM Max single dose 5mg | 4.2mg | 0.8ml | MR x1 in 10 min |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IN Max dose 5mg | 4.2mg | 0.8ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Total max dose: 5mg | 1mg | 1ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Max dose: 1mg | 1mg | 1ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 2.1mg | 0.2ml | MR x2 q15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN | 2mg | 2ml | MR q5 min For IN: split dose equally in each nostril |
| ONDANSETRON <i>Zofran</i> | 4mg tab 4mg/2ml | 4mg ODT/slow IV | 4mg | 2ml 1 tab | Slow IV over 30 sec |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 21mEq | 21ml | |

PEDIATRIC DOSING GUIDE

ORANGE: 24-29kg/53-64lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 58-90 | 75-118 | 18-25 | 97-115 | 57-76 | 66-72 |

| | | | | |
|-------------------------|-------|--------------------------|----------|-----------|
| NS Fluid Bolus: 20ml/kg | 530ml | DEFIBRILLATION: 2, 4J/kg | 1st: 53J | 2nd: 106J |
|-------------------------|-------|--------------------------|----------|-----------|

| | | | | |
|---------------------------------|---|-------------------------|----------|----------|
| Blade for Foreign Body Removal: | 2 | CARDIOVERSION: 1, 2J/kg | 1st: 26J | 2nd: 53J |
|---------------------------------|---|-------------------------|----------|----------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--------------------------------|------------------------------------|---|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | 1st: 2.7mg 2nd: 5.4mg | 1st: 0.9ml 2nd: 1.8ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR x1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 130mg | 2.6ml | Follow with or dilute in 20ml NS flush Give after 3rd shock |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.5mg | 5ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | Preload: 1mg/10ml (0.1mg/ml) Vial: 0.4mg/ml | 0.05mg/kg IV/IO | 1.3mg | Preload: 13ml Vial: 3.3ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 5ml/kg IV/IO Max dose: 125ml | | 125ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 26mg | 0.5ml | |
| EPINEPHRINE (Cardiac arrest/ Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.26mg | 2.6ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/ Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.26mg | 0.26ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

ORANGE: 24-29kg/53-64lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---------------------|---|---|--|--|
| FENTANYL (Pain) | 50mcg/ml | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 26.5mcg | 0.53ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 0.8mg | 0.8ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 13mg <u>2nd:</u> 6mg | <u>1st:</u> 0.7ml <u>2nd:</u> 0.4ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IM Max single dose 5mg | 5mg | 1ml | MR x1 in 10 min |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg IN Max dose 5mg | 5mg | 1ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Total max dose: 5mg | 1.3mg | 1.3ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow IV/IO Max dose: 1mg | 1mg | 1ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 2.6mg | 0.3ml | MR x2 q15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN | 2mg | 2ml | MR q5 min For IN: split dose equally in each nostril |
| ONDANSETRON <i>Zofran</i> | 4mg tab 4mg/2ml | 4mg ODT/slow IV | 4mg | 2ml 1 tab | Slow IV over 30 sec |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 26mEq | 26ml | |

PEDIATRIC DOSING GUIDE

GREEN: 30-36kg/66-80lbs

Normal Vital Signs

| HR asleep | HR awake | Respiratory Rate | Systolic BP | Diastolic BP | MAP |
|-----------|----------|------------------|-------------|--------------|-------|
| 58-90 | 75-118 | 18-25 | 97-115 | 57-76 | 66-72 |

| | |
|-------------------------|--------------|
| NS Fluid Bolus: 20ml/kg | 660ml |
|-------------------------|--------------|

| | | |
|--------------------------|-----------------|------------------|
| DEFIBRILLATION: 2, 4J/kg | 1st: 66J | 2nd: 132J |
|--------------------------|-----------------|------------------|

| | |
|---------------------------------|----------|
| Blade for Foreign Body Removal: | 3 |
|---------------------------------|----------|

| | | |
|-------------------------|-----------------|-----------------|
| CARDIOVERSION: 1, 2J/kg | 1st: 33J | 2nd: 66J |
|-------------------------|-----------------|-----------------|

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---|--|--|--|--|
| ADENOSINE | 6mg/2ml (3mg/ml) | 0.1mg/kg RIVP Max 1st dose: 6mg Max 2nd dose: 12mg | <u>1st:</u> 3.3mg <u>2nd:</u> 6.6mg | <u>1st:</u> 1.1ml <u>2nd:</u> 2.2ml | RIVP w/ 10ml NS flush MR x1 double the dose |
| ALBUTEROL | 2.5mg/3ml | 2.5mg/3ml HHN | 2.5mg | 3ml | MR x1 |
| AMIODARONE (Pulseless arrest) | 150mg/3ml (50mg/ml) | 5mg/kg IV/IO Max single dose: 300mg | 165mg | 3.3ml | 20ml NS flush MR x2 refractory rhythm |
| ATROPINE (Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.02mg/kg IV/IO Min dose: 0.1mg Max single dose: 0.5mg | 0.5mg | 5ml | MR x1 in 3-5 min |
| ATROPINE (Organophosphate poisoning) | <u>Preload:</u> 1mg/10ml (0.1mg/ml) <u>Vial:</u> 0.4mg/ml | 0.05mg/kg IV/IO | 1.7mg | <u>Preload:</u> 17ml <u>Vial:</u> 4.1ml | MR q5-10 min until symptoms resolve |
| DEXTROSE | 10% | 5ml/kg IV/IO Max dose: 125ml | | 125ml | Give over 10 min |
| DIPHENHYDRAMINE <i>Benadryl</i> | 50mg/ml | 1mg/kg IM/IV/IO Max dose: 50mg | 33mg | 0.7ml | |
| EPINEPHRINE (Cardiac arrest/ Bradycardia) | 1mg/10ml (0.1mg/ml) | 0.01mg/kg IV/IO | 0.33mg | 3ml | MR q3-5 min |
| EPINEPHRINE (Allergic reaction/ Asthma) | 1mg/ml | 0.01mg/kg IM Total max dose: 0.6mg | 0.3mg | 0.3ml | MR x1 in 5 min |
| EPINEPHRINE (Upper airway/Stridor) | 1mg/ml | 5mg HHN | 5mg | 5ml | |

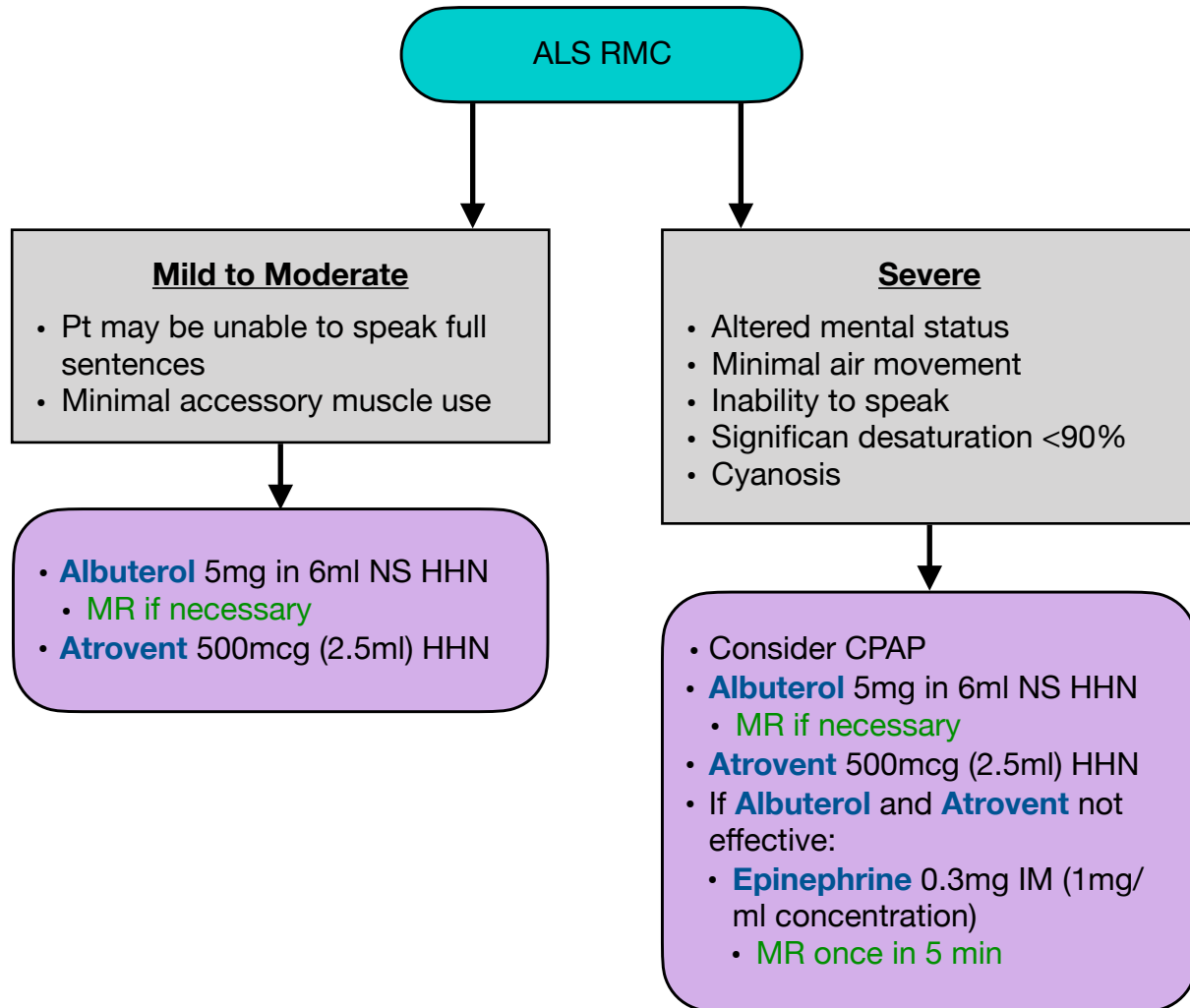
GREEN: 30-36kg/66-80lbs

| Medication | Concentration | Dose | Dose in mg | Dose in ml | Details |
|--|---------------------|--|---|--|--|
| FENTANYL (Pain) | 50mcg/ml | 1mcg/kg IV/IO/IM/IN Max dose: 3mcg/kg | 33mcg | 0.66ml | MR q5 min For IN: split dose equally in each nostril |
| GLUCAGON (Hypoglycemia/Beta blocker OD) | 1mg/ml | 0.03mg/kg IM Max dose: 1mg | 1mg | 1ml | MR x2 q15 min if no IV established |
| IPRATROPIUM <i>Atrovent</i> | 500mcg/2.5ml | 500mcg/2.5ml HHN | 500mcg | 2.5ml | |
| LIDOCAINE 2% preservative free (IO insertion) | 20mg/ml | 0.5mg/kg slow IO Max dose: 40mg | <u>1st:</u> 17mg <u>2nd:</u> 8mg | <u>1st:</u> 0.8ml <u>2nd:</u> 0.4ml | MR x1 half initial dose |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg <u>IM</u> Max single dose 5mg | 5mg | 1ml | MR x1 in 10 min |
| MIDAZOLAM <i>Versed</i> (Seizure) | 5mg/ml | 0.2mg/kg <u>IN</u> Max dose 5mg | 5mg | 1ml | Split dose equally in each nostril |
| MIDAZOLAM <i>Versed</i> (Seizure) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow <u>IV/IO</u> Total max dose: 5mg | 1.7mg | 1.7ml | MR x2 q15 min |
| MIDAZOLAM <i>Versed</i> (Cardioversion) | 2mg/2ml (1mg/ml) | 0.05mg/kg slow <u>IV/IO</u> Max dose: 1mg | 1mg | 1ml | |
| MORPHINE (Pain/burns) | 10mg/ml | 0.1mg/kg IV/IO/IM | 3.3mg | 0.3ml | MR x2 q15 min (IV/IO) MR in 30min (IM) |
| NALOXONE <i>Narcan</i> | 2mg/2ml (1mg/ml) | 0.1mg/kg IV/IO/IM/IN Max dose: 2mg | 2mg | 2ml | MR q5 min For IN: split dose equally in each nostril |
| ONDANSETRON <i>Zofran</i> | 4mg tab 4mg/2ml | 4mg ODT/slow IV | 4mg | 2ml 1 tab | Slow IV over 30 sec |
| SODIUM BICARBONATE | 1mEq/ml | 1mEq/kg IV/IO | 33mEq | 33ml | |

BRONCHOSPASM/ASTHMA/COPD

Indications

- Acute or progressive shortness of breath, chest discomfort, wheezing, cyanosis



SPECIAL CONSIDERATIONS

- Do not repeat **Albuterol/Atrovent** if significant tachycardia or chest pain
- **Epinephrine** may cause anxiety, tremor palpitation, tachycardia, HTN and headache, and may precipitate AMI, hypertensive crisis and intracranial hemorrhage
- Consider use of patient actuated nebulizer with prolonged scene times and/or transport times over 10 minutes.
- Suspected carbon monoxide in cases of exposure to fire or smoke in confined areas; pulse oximetry in these settings is not accurate measure of respiratory status