Protocol Update 2022: WI

Mercyhealth EMS

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Med Control Calls

- Please call RockCom for Med Control at
  - 815-968-0993
- The direct phone numbers will be discontinued
- Going through RockCom will ensure every call is answered, and forwarded to the appropriate place (ie when Walworth MD1 is on a call, will roll to IL Region 1 MD1)

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General Dose Changes

- TXA dose increased to 2 Grams IV/IO over 20 minutes
  - Referenced guidelines:
    - 2.40 Routine Medical Care
    - 2.42 Routine Trauma Care
    - 4.68 Tranexamic Acid (TXA)
    - 6.6 Hemorrhage Control
  - Rationale: Previous dose of 1g in the field was then followed by 1g administered over 8 hours in the hospital
    - Studies showed no difference if given 2g over 20 minutes instead
    - Hospital will not need to give the 1g drip
    - Change supported by the CoTCCC
    - Frees up IV Line in Hospital

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TXA-General Considerations

- Most effective if given within 3 hours of bleeding
  - Considerations for GI Bleeding
- Administration
  - 2G (20ml) in 100ml NS = 120 ml
  - 60 gtt/ml microdrip set
  - 360 gtts/min
  - 6 gtts/seconds
  - Bolus administration can cause hypotension!

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General Dose Changes

- Ketamine 4mg/kg IM (max 400mg) decreased from 5mg/kg IM (max 500mg)
  - Referenced guidelines:
    - 2.0 Agitated and Combative
    - 2.36 Pain Management
    - 4.36 Ketamine (Ketalar)
  - Rationale: Recent literature suggests this is a safer dose
  - Document all uses of ketamine thoroughly, including why it was used and what threat the patient was presenting
  - Don’t take giving Ketamine lightly, and never give it in a punitive fashion

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Ketamine

- Weight Based Dosing a Case Series
- Elijah McClain Aurora Colorado 2019
  - Medic called to assist police
  - Administered 500 mg Ketamine IM (5mg/kg was protocol) and then additional 250 mg ketamine IM
  - Elijah weighed 64 kg (11.7mg/kg)
  - Cardiac Arrest with ROSC, neurologic injury
  - Paramedics charged with Criminally Negligent Homicide

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Ketamine

- Weight Based Dosing vs Fixed Dosing
- 1 kg = 2.2 lbs
  - 220 lbs = 100 kg
- Confirm weight estimate with another provider
- 400 mg IM Max dose at 4 mg/kg IM
- Cardiorespiratory Monitoring mandatory following administration, including EtCO2

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Ketamine IM

- 50 kg (110 lbs) = 200mg = 2 ml
- 75 kg (165 lbs) = 300mg = 3 ml
- 100 kg (220 lbs) = 400mg = 4ml

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General Dose Changes

- Ketamine IV/IO/IM Low dose now the same: 0.25mg/kg
  - Referenced guidelines:
    - 2.6 Asthma/COPD
    - 2.36 Pain Management
    - 2.38 Respiratory Distress
    - 4.36 Ketamine (Ketalar)
  - Rationale: IM dose was previously 0.5mg/kg, however this is more typical of the recreational and partially dissociative dose
- When to use?

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General Dose Changes

- Glucagon increased from 1mg to 2mg IV/IO/IM
  - Referenced guidelines:
    - 2.2 Allergy & Anaphylaxis
    - 2.52 Toxic Exposure/Overdose
  - Note: Dose remains the same for hypoglycemia, see 2.18 Diabetic Emergencies
  - Rationale: Glucagon bypasses the β-receptor to increase cardiac inotropy and chronotropy
    - Given in anaphylaxis to patients on β-blocker therapy as epinephrine effect may be blocked
    - Less effective if given IM
    - Be aware of nausea with high dose glucagon.

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Scenario

- 60 y/o male on Carvedilol takes Bactrim (trimethoprim/sulfamethoxazole) for skin infection and develops wheezing, stridor, tongue and lip swelling
- Epinephrine 0.5 mg IM given with minimal improvement
- 50 mg IV diphenhydramine, 125 mg Solumedrol and 5 mg Albuterol and 0.5 mg Ipratropium given with minimal improvement
- What could be given as an adjunct?

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General Dose Changes

- Epinephrine increased from 0.3 mg to 0.5 mg IM (BLS, ALS)
  - Referenced guidelines:
    - 2.2 Allergy & Anaphylaxis
    - 2.6 Asthma/COPD
    - 4.22 Epinephrine 1mg/1mL
    - 6.12 Care of SWAT Personnel
  - Rationale: Previous failures requiring redosing at 0.3 mg, along with emerging literature supporting increased dosage
    - AAAAI (American Academy of Allergy, Asthma & Immunology) recommendations
  - IM Lateral Thigh = Preferred Site.

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General Dose Changes

- Zofran Pediatric dose changed from 0.1 mg/kg to 0.15 mg/kg (Max dose still 4 mg)
  - Referenced guidelines:
    - 2.34 Nausea, Vertigo, Vomiting
  - Rationale: Updated to reflect current literature recommendations

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Pediatric Dosing of Zofran

- 4 mo/old 15 lbs = 6.8 kg = 1 mg
- 2 y/o 30lbs = 13.6 kg = 2 mg
- 4 y/o 44lbs = 20 kg = 3 mg
- 6 y/o 60lbs = 27 kg = 4 mg

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General Dosing Changes

- Atropine dose increased from 0.5 mg to 1 mg
  - Referenced guidelines:
    - 2.8 Bradycardia
    - 4.10 Atropine Sulfate
  - Rationale: American Heart Association 2020 Updated ACLS guidelines increased dose
  - PALS Pediatric Atropine 0.02 mg/kg
    - Adult dose at 50 kg

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General Dosage Changes

- Albuterol Sulfate MDI 2 puffs increased to 6 puffs
  - Referenced guidelines:
    - 2.2 Allergy & Anaphylaxis
    - 2.6 Asthma/COPD
  - Rationale: 6 puffs is equivalent to a nebulized treatment of 2.5 mg/3 mL

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General Dosing Changes

- Dextrose 10% 12.5 g decreased from 25 g
  - Referenced guidelines:
    - 4.14 Dextrose 10%
  - Rationale: Matches the remainder of the guidelines, which lists 125 mL, equivalent to 12.5 g
  - Additional 12.5 g may be given if blood glucose remains low after first dose

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General Dosage Changes

- Benadryl dose 50 mg IV/IM, previously 25 to 50 mg
  - Referenced guidelines:
    - 4.18 Diphenhydramine Hydrochloride (Benadryl)
  - Rationale: Matches the remainder of the guidelines, which lists 50 mg, creates standard dosage
- Pediatric Remains 1 mg/kg max of 50 mg

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General Dosing Changes

- Magnesium sulfate pediatric dose increased from 25 mg/kg to 50 mg/kg
  - Referenced guidelines:
    - 2.6 Asthma/COPD
- >50 kg Use Adult Dose 2 g over 10 min
- Avoid Bolus as can cause relaxation of all smooth muscles including diaphragm
  - Respiratory Arrest
  - Hypotension (don’t give if less than systolic less than 70 + 2(age)
  - Reversal for magnesium induced hypotension is calcium chloride

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General Language Changes

- 1:100,000 and 1:10,000 in reference to epinephrine removed
  - Instead, referred to actual concentration: 1 mg/10 mL and 1 mg/1 mL
- “Hypoglycemia Guideline” referenced throughout replaced with “Diabetic Emergencies Guideline”
- The term Blindly Inserted Airway Device (BIAD) has been replaced with Supraglottic Airway

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New Medications!
Ondansetron for AEMT

- 2.34 Nausea, Vomiting, Vertigo
  - Ondansetron (Zofran) 4 mg IV/IM or ODT. May repeat x1 in 15 min. Pediatric 0.15 mg/kg max dose of 4mg
- Indications: Nausea and/or vomiting
- Precautions: May cause headache/dizziness, may cause sedation/drowsiness, may prolong QT
- Supplied in vial containing 4mg/2mL
- Give 4 mg IV slowly over 2 minutes into running IV, max total dose of 8 mg
- Don’t repeat adult dose if they have impaired renal function
- Use cautiously in nursing mothers (benefit typically outweighs risk)

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New Medications! Acetaminophen for EMT/AEMT/Paramedic

- 2.36 Pain Management
  - Prior to giving Acetaminophen or Ibuprofen for pain or fever, document patient's temperature and provide to ED staff upon arrival
  - Acetaminophen (Tylenol) 15mg/kg max dose 1,000mg
- Mechanism not entirely understood, but believed to inhibit cyclooxygenase to reduce pain and fever centrally
- Primarily metabolized by the liver

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New Medications!
Ibuprofen for EMT/AEMT/Paramedic

- 2.36 Pain Management
  - Prior to giving Acetaminophen or Ibuprofen for pain or fever, document patient's temperature and provide to ED staff upon arrival
  - Ibuprofen (Advil) 10mg/kg max dose of 800mg
- Non-selective inhibition of cyclooxygenase both centrally and peripherally, which decreases prostaglandins
- Produces analgesia, antipyresis, and antiinflammation
- May cause kidney injury with prolonged use

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1.0 Introduction: Added language

- XXIII. Blood glucose should judiciously be checked when it guides patient care. Routine use of blood glucose meters on alert patients without recent history of signs or symptoms of dizzy/weak/palpitations/falls/diaphoresis/confusion/CVA/altered mental status is usually not clinically indicated. **Blood glucose evaluation should not be routinely utilized during cardiac arrest, as it is highly inaccurate.**
  - Removed from ACLS HsTs in 2005!
  - What are you going to do with info?

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1.0 Introduction: Added language

XXIV. EMS Providers are mandatory reporters of child and elder abuse. Any suspected abuse should be immediately reported to local law enforcement to provide immediate safety for at risk individuals. Ensure mandatory reporting is completed and documented immediately after safety of EMS and individual is accomplished.

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1.2 Universal Precautions: Added Language

C. Properly fitted N95 masks should be used when caring for patients with respiratory transmissible diseases.

D. Masks should be placed on patients or over oxygen delivery devices as source control of respiratory borne illness.

Rationale: During COVID pandemic, impossible to determine type of respiratory illness, so all should be treated with airborne precautions

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1.2 Universal Precautions

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1.2 Universal Precautions: Added Language

D. HEPA filters should be utilized when possible in the respiratory circuit.

E. Reduce aerosolizing procedures when possible with respiratory transmitted diseases.

Rationale: Source control for spread of COVID to protect the providers

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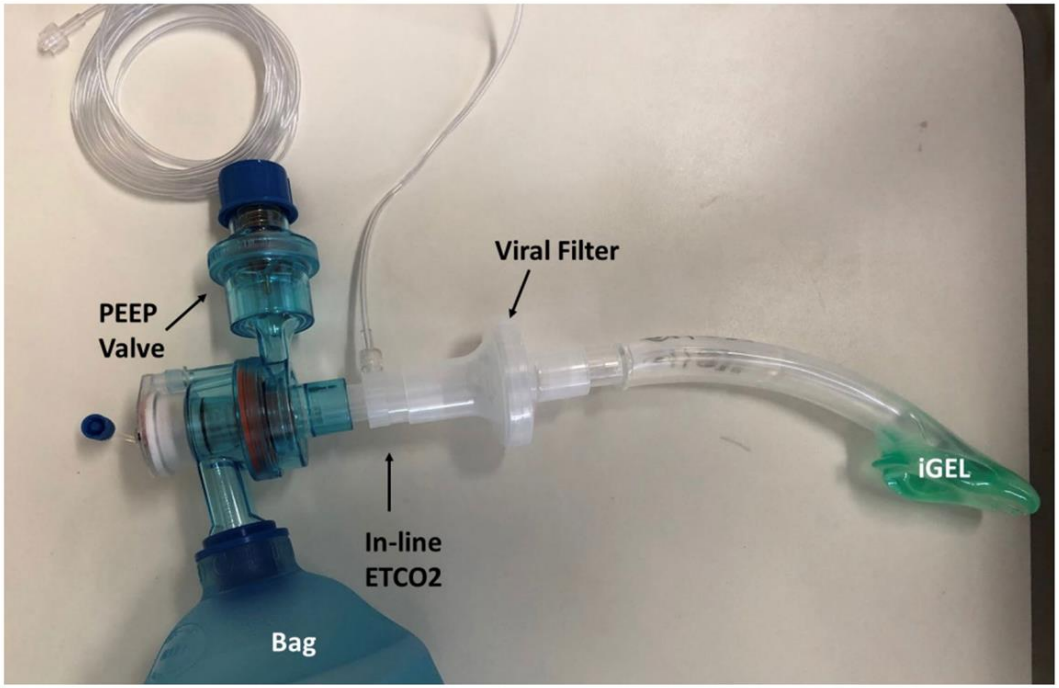
1.2 Universal Precautions



iGEL Setup

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1.6 Crime Scene Management: Added Language

XIV. Every effort to cooperate with law enforcement should be made. In the event of a disagreement with law enforcement, EMS personnel should document the problem and refer the matter to their superior for follow-up and/or action. If the disagreement involves, in the opinion of the pre- hospital provider, an issue that will or could result in patient harm, an immediate request for on- scene EMS and Law Enforcement supervisory personnel should be made, including consideration for direct medical oversight advice.

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Law Enforcement Interaction

- You are not an agent of Law Enforcement
- You are an extension of the Hospital/Physician
- Always act in best interest of the patient!
- PD does not dictate EMS intervention
  - Medication/Restraint etc administered after EMS assessment
  - Body Cameras
- Suicidal Patients

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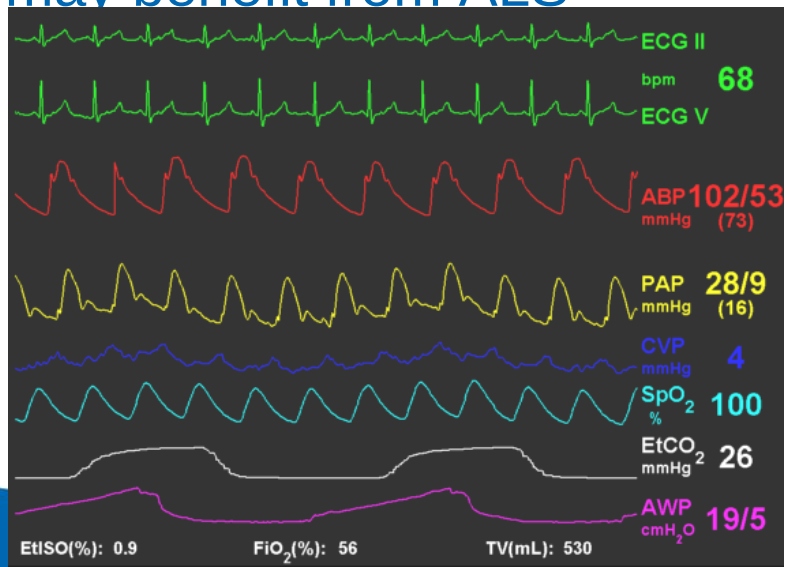
1.12 Paramedic Intercepts: Added Language

The following type of calls may also benefit from rapid Paramedic response based on EMD or agency request:

- Abnormal vital signs(severe hyper/hypotension, brady/tachycardia)
  - Additional criteria to screen for patients that may benefit from ALS



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ALS Intercepts

- Improvement of BLS Scope of Practice
  - Work to your scope
  - 10 Drugs at BLS level
- Time to Hospital vs Time to Intercept
- General Criteria
  - Unresponsive
  - Altered Vital Signs
  - Expected Clinical Conditions
    - Delivery
    - Burn Victims with Airway issues

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1.18 Statement of Release: Added Language

IV. Prior to signing

A. Attempt to obtain a set of vital signs.

V. When a patient is deemed to lack capacity and refuses care, law enforcement involvement and evaluation must be obtained. Ensuring the safety of EMS personnel is of paramount importance. Every effort to cooperate with law enforcement should be made. In the event of a disagreement with law enforcement, EMS personnel should document the problem and refer the matter to their superior for follow-up and/or action. If the disagreement involves, in the opinion of the pre-hospital provider, an issue that will or could result in patient harm, an immediate request for on-scene EMS and Law Enforcement supervisory personnel should be made, including consideration for direct medical oversight advice.

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Statement of Release

- High Risk
- Call medical control with Abnormal Vitals
- Inform Patients that Vitals are abnormal and document as such
- If you disagree with PD on scene ask for their supervisor and call medical control
  - Recorded Line

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2.12 Cardiac Arrest

EMR/EMT

- If refractory to multiple shocks an attempt to change pad location and energy vector may be warranted
- If refractory to multiple shocks and 2nd defibrillator available perform dual sequential defibrillation

Ventilating with BVM and oral airway increases aspiration risks. Intubation by Paramedic or Supraglottic Airway by First Responder and above. Do not interrupt compressions or defibrillation attempts for airway placement. Ventilate at 6/minute only enough volume to just make chest rise. Pediatric-follow AHA Guidelines.

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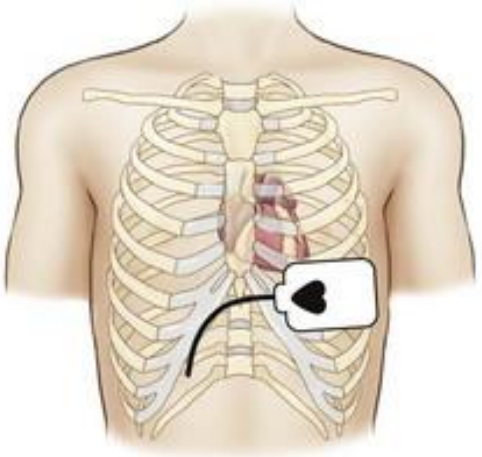
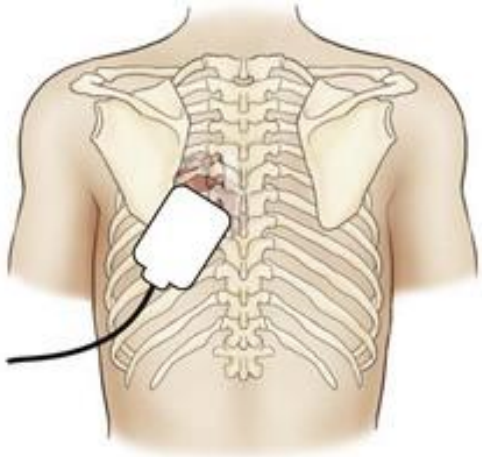


Anterior



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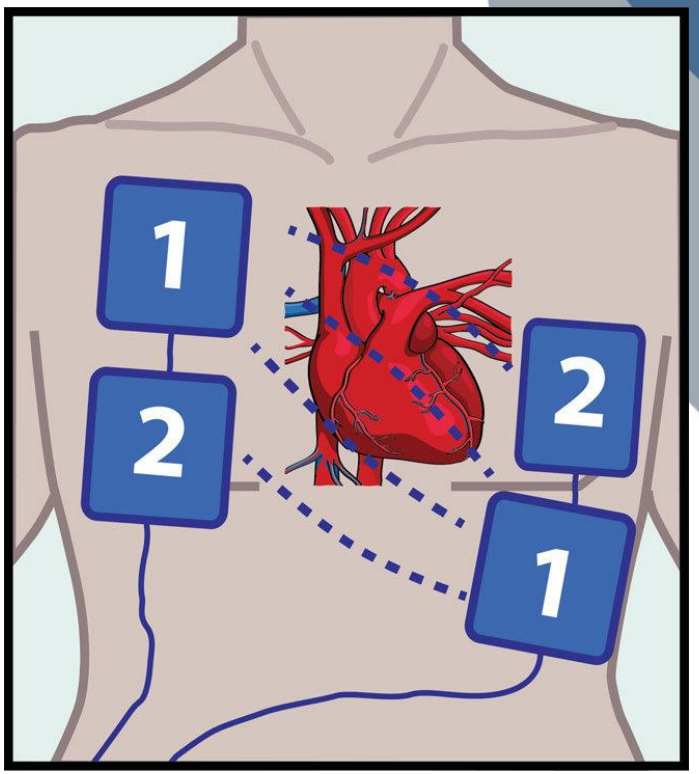

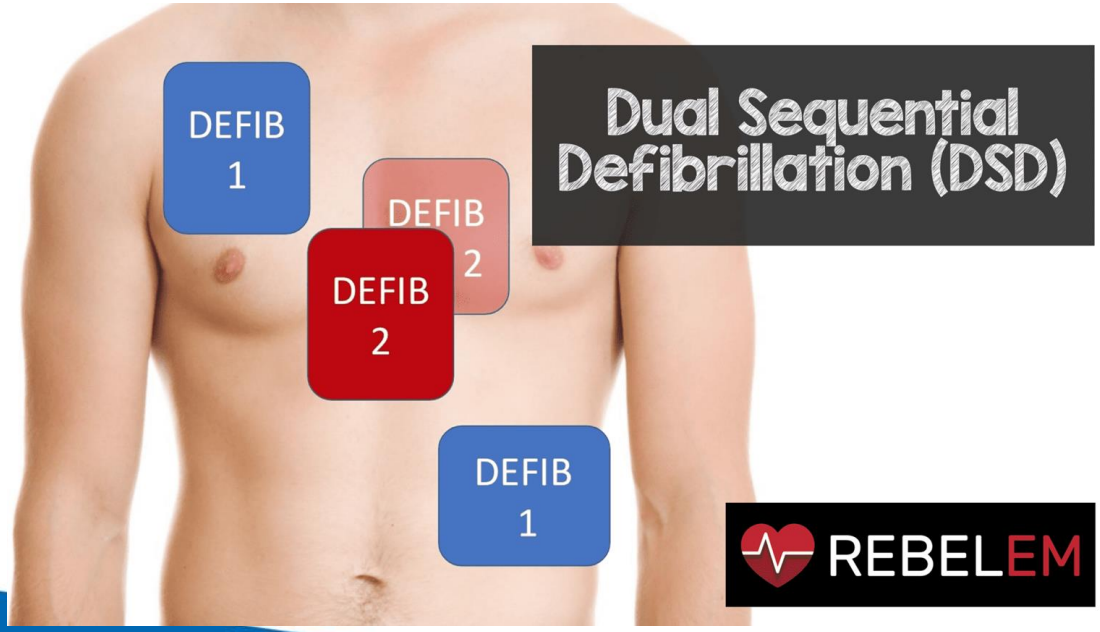

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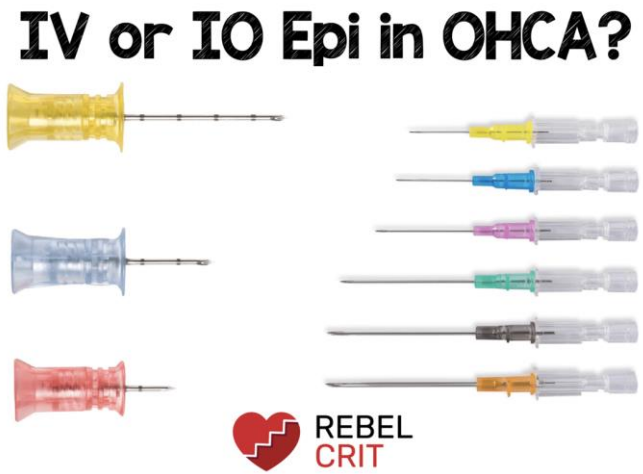
2.12 Cardiac Arrest

Paramedic

Fifth Priority: I-(IV) Establish venous access

- Initiate IV/IO 0.9% Normal Saline
- IV is preferred route for ACLS medications



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2.16 Congestive Heart Failure

- Note: No NTG if patient has used Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours
- If SBP>160 may use Nitroglycerine 0.8mg (2 sublingual spray or tablets) every 3-5 minutes. If SBP<160 after initial 0.8mg dose, use 0.4mg dose for subsequent doses
- If SBP < 90 mmHg withhold NTG and consider Push Dose Epinephrine per section 5.42 to maintain SBP >100

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2.18 Diabetic Emergencies

- Pediatric patient under 25kg give 1⁄2 dose, may repeat x1 in 15min
  - Changed from 50kg

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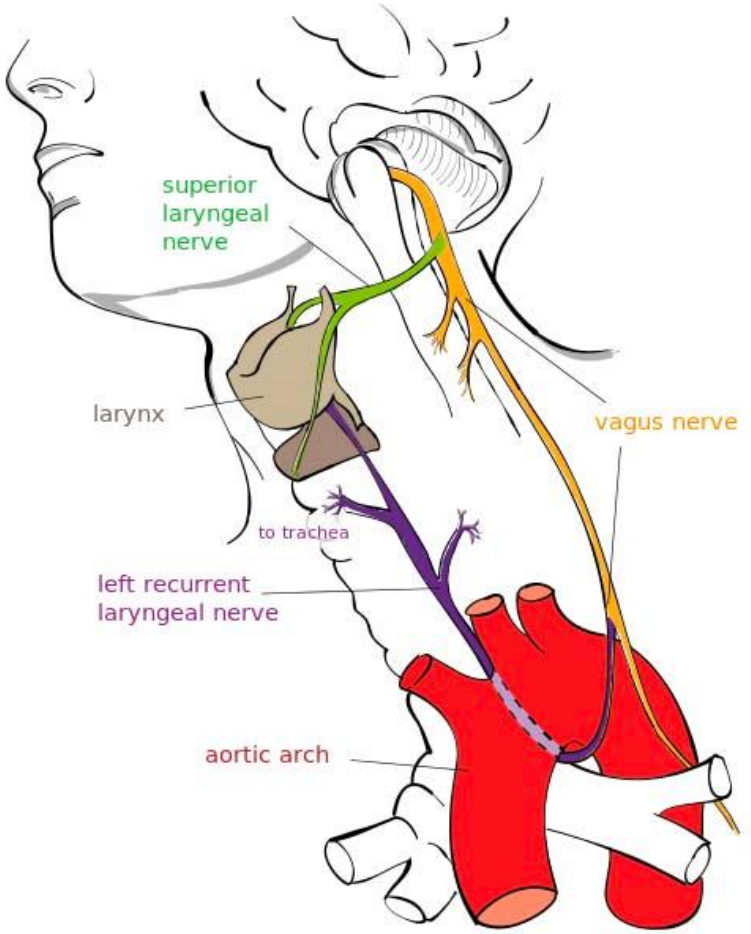
2.22 Emergency Childbirth

- EMT/EMR
  - Suction mouth then nose as needed, do not aggressively suction as this may stimulate bradycardia
  - BGM if signs of hypoglycemia



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2.30 Hypovolemia & Shock

- If suspected infection accompanied by two or more of below signs/symptoms, notify receiving facility of Sepsis Alert
  - T<36C or T>38C
  - P>90
  - BP<90
  - RR>20
  - BGM>120(no DM hx)
  - etCO2<25
  - acute mental status changes
  - chills/rigors

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2.32 Narrow Complex Tachycardia

- Valsalva Maneuvers moved from Paramedic Level to EMT:
- If the rhythm is faster than 150, is perfectly regular, and the patients is stable, attempt Valsalva maneuvers.
  - Have patient bear down.
  - If no success, have seated patient blow through a 10ml syringe enough to move plunger. Once plunger moves, lie them flat and elevate their legs.

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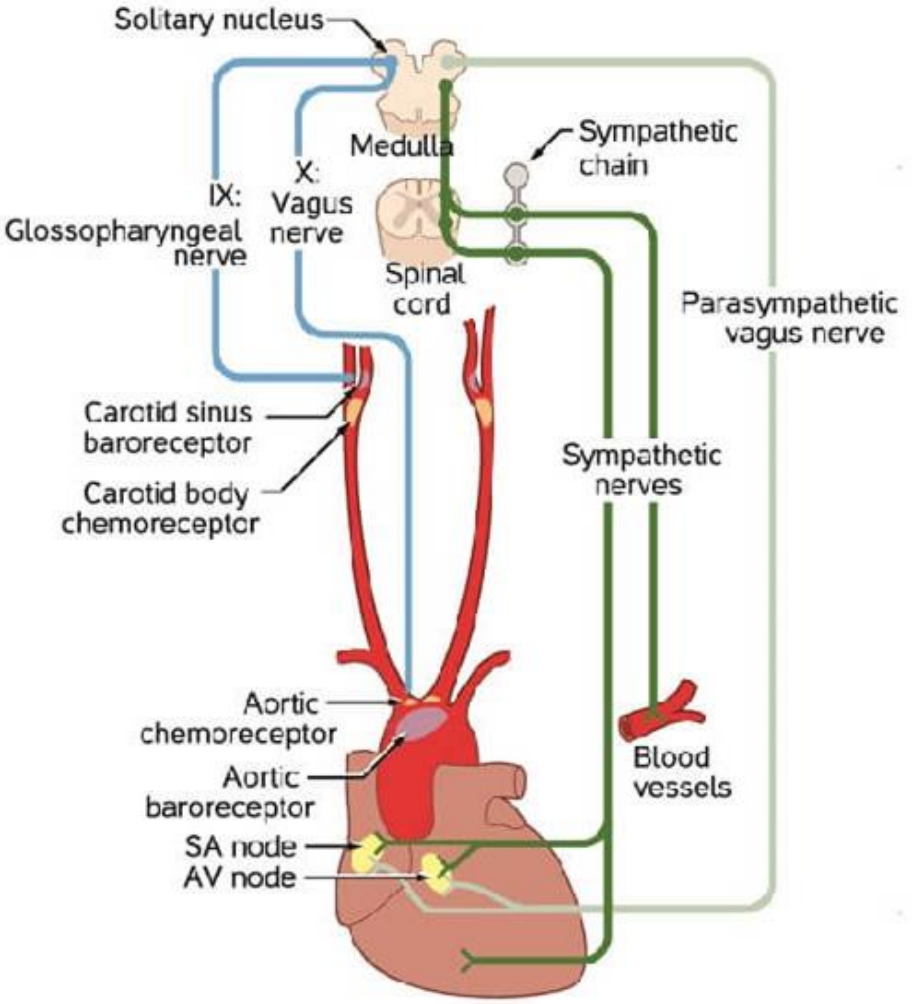
Valsalva Maneuver

- Baroreceptors on the aortic arch sense increased arterial pressures
- Signals sent to the brain, increasing signals from the Vagus nerve
- Vagus nerve supplies parasympathetic signal to the heart
  - Right vagus nerve supplies the SA node, Left vagus nerve supplies AV node
- This increased parasympathetic tone slows the heart rate



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2.32: Narrow Complex Tachycardia

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2.32 Narrow Complex Tachycardia

- Paramedic
- Adenosine 6 mg IV over 1-2 seconds. If unsuccessful, repeat with 12 mg (may repeat once) IV over 1-2 seconds. Follow all doses with a 20-30 ml saline flush by rapid IV push

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2.36 Pain Management

- Fentanyl Citrate pediatric dose 1mcg/kg IV/IO and 2mcg/kg IN (max dose 100mcg per bolus)
  - Previously no max dose listed, simply caps the max dose at a standard adult dose

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2.38 Respiratory Distress

- Non RSA intubations are restricted to patients with no gag reflex and need for airway management. Paramedics performing non RSA intubations should use the below guidelines for airway management, may not sedate or paralyze unless RSA credentialed.

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2.38 Respiratory Distress: Intubation

- Pre-paralysis Sedation/Induction (2 RSA trained providers at bed side [2])::
  - Etomidate 0.3mg/kg IV/IO(max dose 40mg)

    Do not repeat any administration of Etomidate after initial sedation.

    or
  - Give Ketamine 2 mg/kg IV/IO (max dose 200mg), or 4 mg/kg IM (max dose 400mg)

    For patients with concern of cardiac ischemia, avoid Ketamine.

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2.38 Respiratory Distress: Intubation

- What's Different?
  - Versed removed from sedation/induction agents
    - Versed predisposes to hypotension, which is already a dangerous risk of RSA
  - Etomidate moved to first preference

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2.38 Respiratory Distress: Intubation

- [2] Minimum of two Paramedics or one Paramedic and one EMT that are current with all RSA education and skill requirements of the local EMS Medical Director. If a single Paramedic unit, attempt to request a second Paramedic unit to respond, but do not delay procedure if patient condition warrants immediate action.

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2.38 Respiratory Distress: Intubation

- Long acting paralytics should only be used on patients at risk or self-extubation or those requiring full muscle paralysis for effective ventilation. Repeat doses are not usually indicated.
- Provide adequate sedation every 10 minutes as necessary. Long term paralysis may be unnecessary if adequately sedated and soft restraints utilized. Monitor vitals, as adjustment in sedation drugs may be necessary. If hypotensive, use Ketamine(1-2mg/kg IV/IO max 200mg per bolus) or Fentanyl(1mcg/kg IV/IO max 100mcg per bolus). If possibility of ongoing seizures, or inadequate sedation with other agents use Versed (0.1mg/kg IV/IO max 5mg per bolus).

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Discussion

Why administer Vecuronium?

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High Risk Medications

High risk medications such as Epinephrine 1mg/1ml, Succinylcholine, and Vecuronium should be labeled with high visibility markings. Epinephrine 1mg/1ml should be easily identified for IM use only. Placing it with a small volume syringe and IM needle will further reduce risk. Succinylcholine and Vecuronium should be easily identified as a paralytic.

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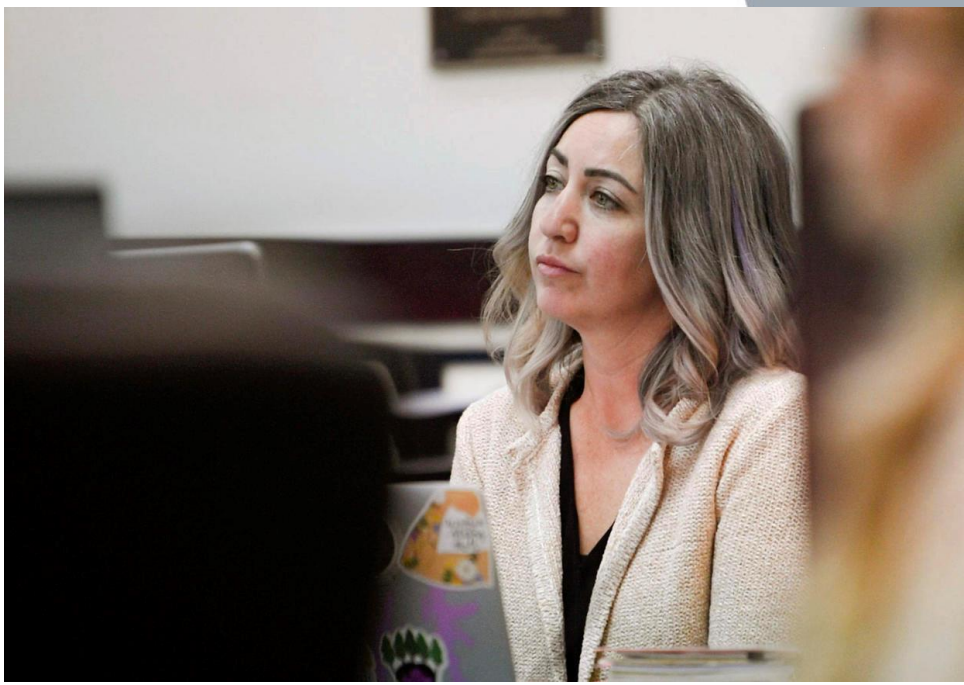
High Risk Medications

- RaDonda Vaught
- Vanderbilt Hospital
- Injected Vecuronium intended to inject versed
- Found guilty of criminally negligent homicide
- No charges for hospital
- How are you preventing medication errors?



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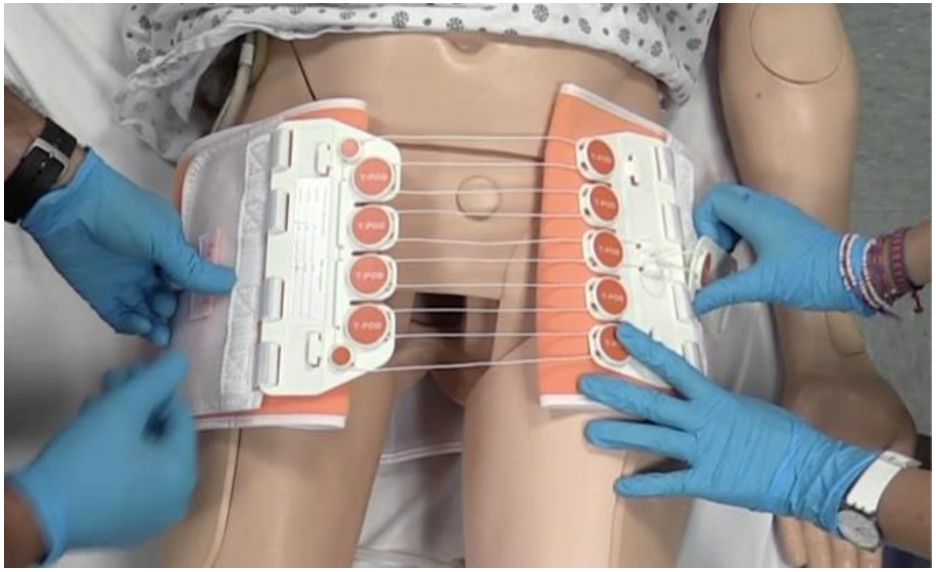
2.42 Routine Trauma Care

- Paramedic:
- Bilateral needle decompression, pelvic binder, and pericardiocentesis for traumatic arrest



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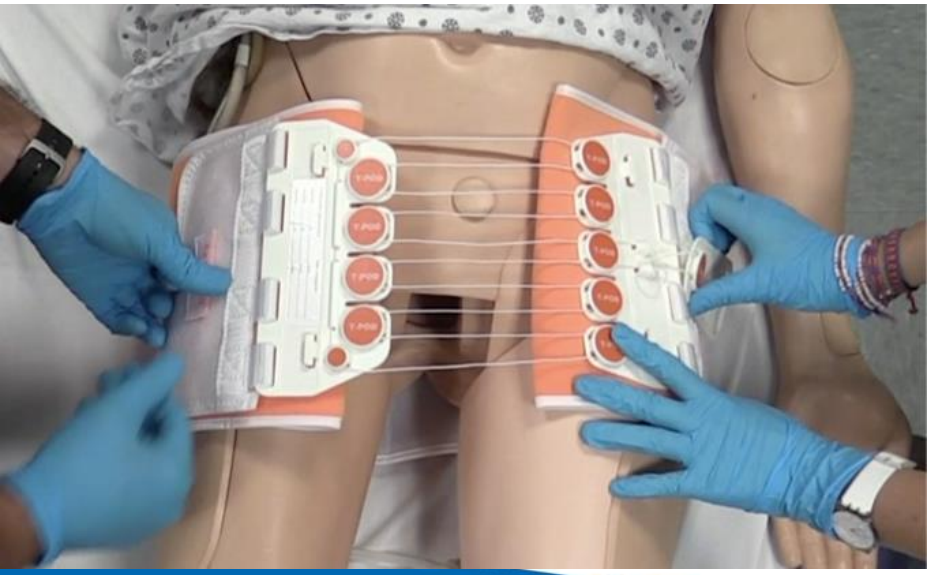
2.42 Routine Trauma Care

- Pelvic Hemorrhage now recognized as a source of life threatening hemorrhage
- Should be addressed in “Circulation” portion of Primary Survey similar to Tourniquet Placement



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2.42 Routine Trauma Care

- Paramedic:
- Traumatic Brain Injury
  - Adults with TBI within 3 hours of injury and Glasgow Coma Scale (GCS) score of 12 or lower
  - Over 12 years old: TXA 2 Grams IV/IO over 20 minutes
  - Under 12 years old: TXA 15mg/kg(maximum dose 2 Grams) IV/IO over 20 minutes

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2.46 Stroke

- Those scoring 3 or more on the GFAST stroke scale should preferentially be taken to a thrombectomy capable center if the diversion time from acute stroke ready or primary stroke center is less than 30 minutes and additional transport time will not disqualify for thrombolytics.

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Stroke Transport Considerations

- Where is your local Thrombectomy Capable Center?

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2.48 Submersion

- DAN, US Navy, as well as hyperbaric treatment centers have additional reference materials on neurological exams for divers. Have a low threshold for transport, as any divers experiencing neurologic or musculoskeletal complaints warrant a full medical evaluation.
- Increasing submersion duration is associated with worse outcomes regardless of water temperature. Submersion durations <5min are associated with favorable outcomes, while those >30min are associated with poor outcomes and the incident commander should consult with the EMS medical director to make a risk vs benefit analysis when determining rescue vs. recovery.

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3.42 NIPPV Noninvasive Positive Pressure Ventilation (BiPAP)

Indications for use: Severe Respiratory Distress(Asthma, CHF, COPD, etc. not responding to other treatments)

Adverse Reactions: Hypotension, pneumothorax, gastric distention, aspiration, pressure sores/skin breakdown

Contraindications: Respiratory/cardiac arrest, hypotension, altered mental status, inability to maintain patent airway, pneumothorax/penetrating chest trauma, vomiting or active GI bleeding with emesis, unstable facial fractures, circumstances in which endotracheal intubation or a surgical airway is preferred or necessary to secure a patent airway

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3.42 NIPPV Noninvasive Positive Pressure Ventilation (BiPAP)

Standing Order:

Noninvasive Positive Pressure Ventilation (NIPPV) other than CPAP is limited to Tier One Providers that have completed NIPPV training, credentialed by the medical director, and are equipped with NIPPV Equipment. NIPPV other than CPAP will only be used for interfacility transport per orders of the sending facility.

Refer to the manufacturer's ventilator operation manual for specific directions on how to operate the BiPAP device.

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3.42 NIPPV Noninvasive Positive Pressure Ventilation (BiPAP)

- Patient shall be placed and maintained on cardiac and pulse oximetry monitors during transport.
- Reassess vital signs every five min while the patient is on NPPV and document.
- Continue NIPPV settings for appropriate clinical conditions.
- Monitor ETCO2 and waveform capnography
- Do not exceed 20 cmH20 on total inspiratory pressure. Typical starting pressures may be IPAP 10-14 and EPAP 4-8
- Pressure support is typically no less than 5 cmH2O (Difference between IPAP/EPAP)
- Explain the procedure to the patient. Be prepared to coach patient.
- Fit and size mask to patient, ensure seal.
- If able, continue FIO2 per sending facility. Goal is to titrate FIO2 to maintain SPo2 >94% but may change depending on clinical circumstances.
- Set high-pressure alarm limit.

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3.42 NIPPV Noninvasive Positive Pressure Ventilation (BiPAP)

- Consider adjusting rise time and flow termination parameters to enhance patient synchrony and comfort.
- If the patient is receiving a nebulized bronchodilator, it may be continued by placing the nebulizer device in-line with the NPPV circuit, between the filter and the patient mask. Follow manufacturer's instructions.
- Per Orders Adjust IPAP (Pressure Support) up or down depending on the amount of assistance that the patient requires (check expired tidal volumes) and adjust the EPAP (PEEP) according to the patients respiratory status at that time. (Note that delivered tidal volumes depend on the gradient between the IPAP and EPAP, inspiratory time, and the patient's inspiratory effort).
- If the patient deteriorates and/or meets one or more of the contraindications below then discontinue the use NIPPV. Consider, BVM, Supraglottic Airway or Intubation as needed.
- Consider anxiolytic administration per sending facility order however be aware of potential for respiratory depression.

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3.42 NIPPV Noninvasive Positive Pressure Ventilation (BiPAP)

Special Notes:

1. Do not remove NIPPV until hospital therapy is ready to be placed on the patient.

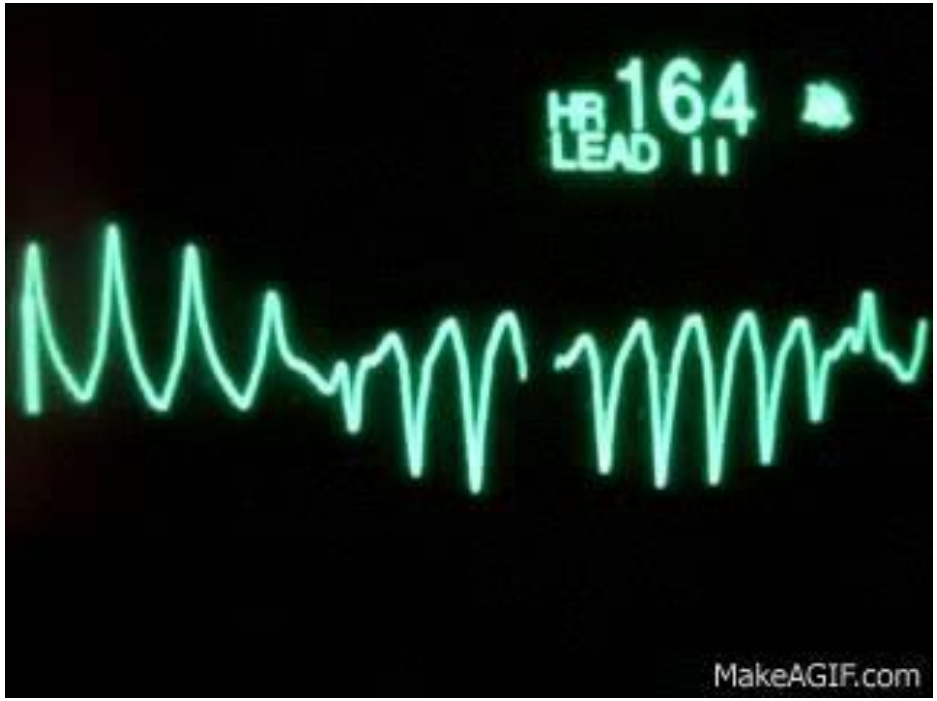
2. Assess the patient for gastric distention.

3. NIPPV may be able to be used on DNR patients not in arrest.

4. Due to changes in cardiac preload and afterload during NIPPV closely monitor vitals

4.6 Amiodarone Hydrocloride (Cordarone)

- Torsades added as a contraindication
- Rationale= Amio can prolong Qtc



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4.74 Etomidate (Amidate)

- CONTRAINDICATIONS:
  - Hypersensitivity
  - Do not use under age 10

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5.10 EZ-IO Placement

- Site locations: Paramedic – Proximal Humerus(Adult Only), AEMT/Paramedic- Distal Femur, Proximal Tibia

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Femoral EZ IO Placement

- 5cm Proximal to Patella in Adults
  - Avoid Suprapetella Bursa
- Less demineralization than humerus

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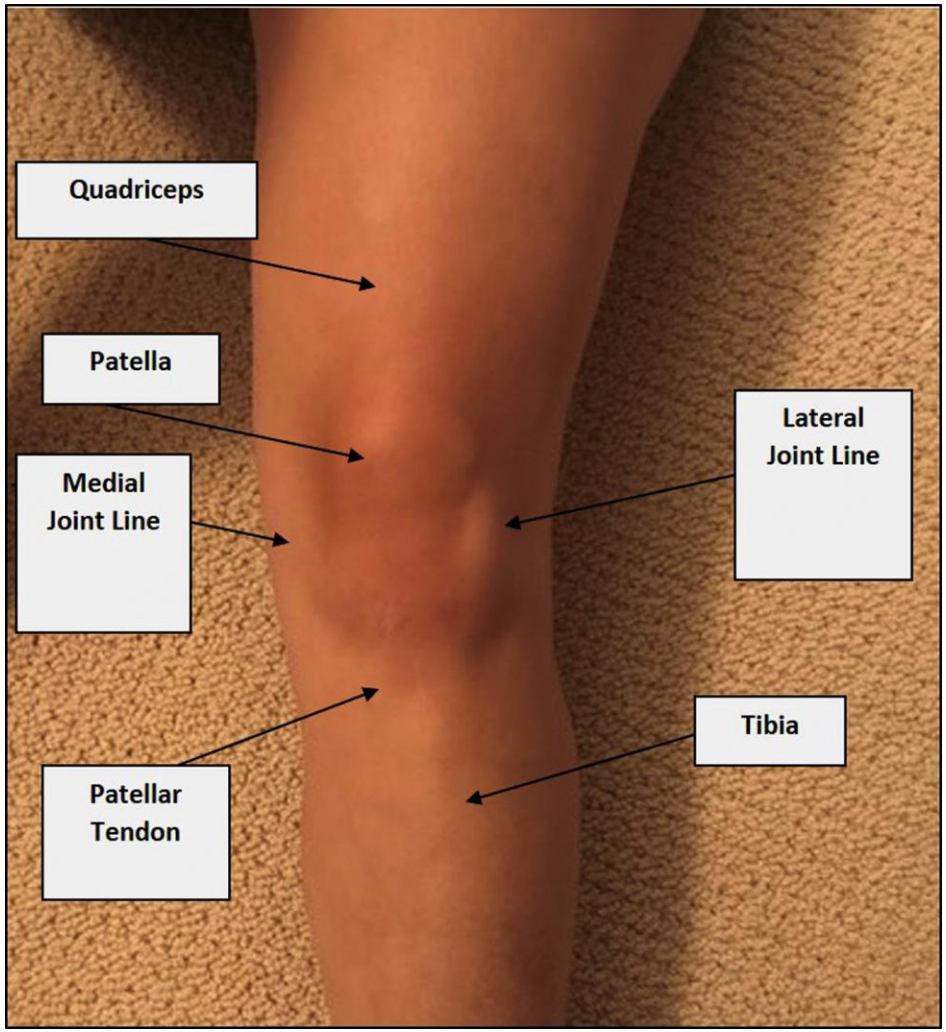
Femoral EZ IO Placement



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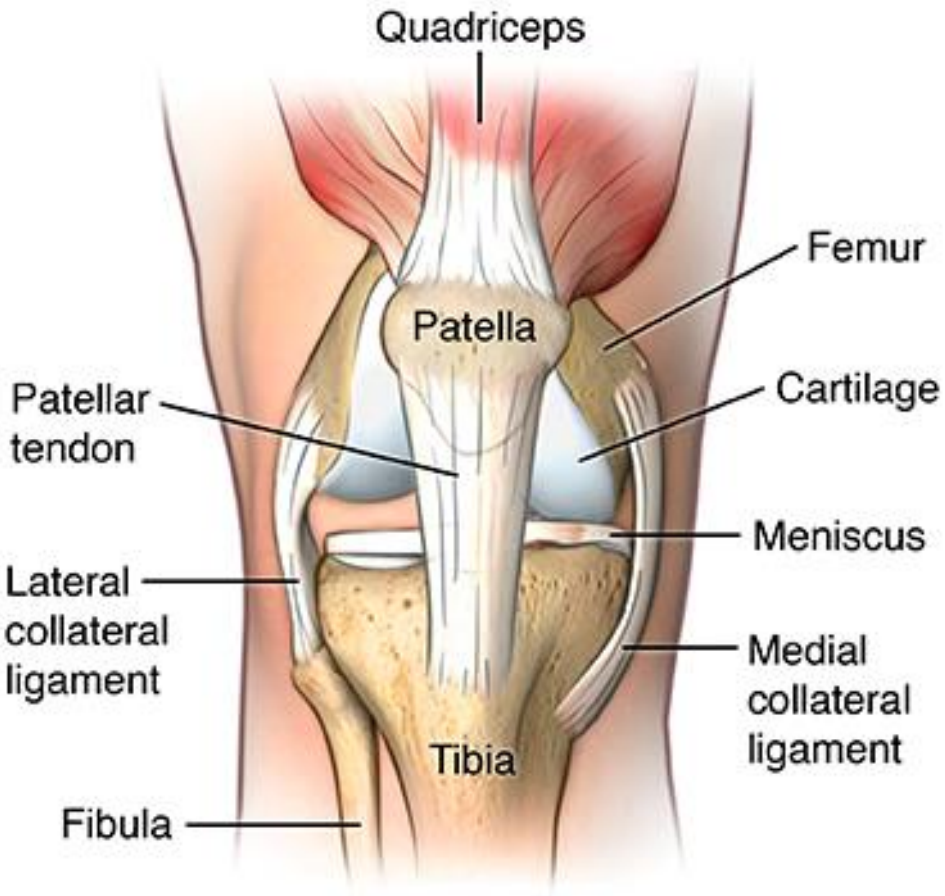
Femoral EZ IO Placement



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5.22 Supraglottic Airways

The current medical director approved Supraglottic Airways for adult and **pediatric** patients are the King Airway and the i-gel.

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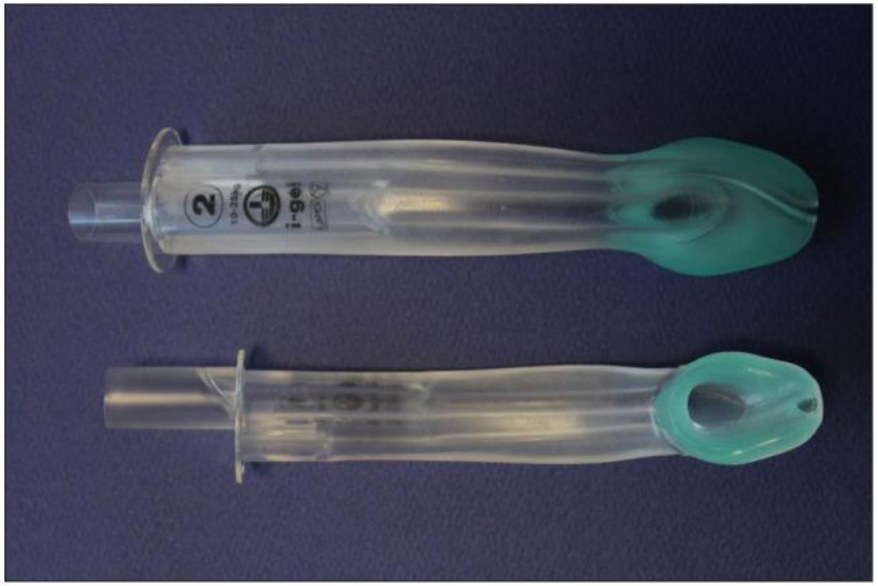
I-gel sizing

Size of iGel	Patient Weight (kg)	Size ETT that can be passed through	Size OG tube that can be passed through
1	2 - 5	3.0	NA
1.5	5 - 12	4.0	10
2	10 - 25	5.0	12
2.5	25 - 35	5.0	12



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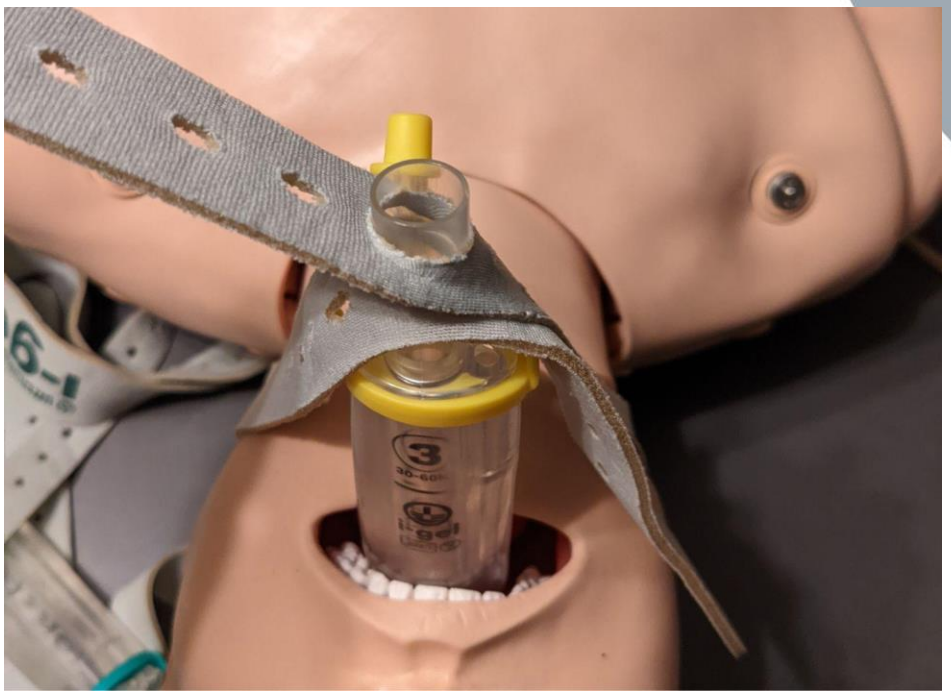
5.22 Supraglottic Airways

Securing the pediatric i-gel



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5.22 Supraglottic Airways

- Placement confirmation with colorimetric capnometry is required if $EtCO_2$ unavailable.

- Device is attached to end of i-Gel or King (or ETT)
- Color changes with exhalation (release of bag-valve) as Carbon Dioxide is released
- Gold is Good!

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5.22 Supraglottic Airways

- If ventilation port becomes occluded with secretions or blood, proceed to suction. Suction attempt should not exceed 10 seconds, and patient must be ventilated between attempts. Suction catheter should not be inserted past the airway device distal tip.

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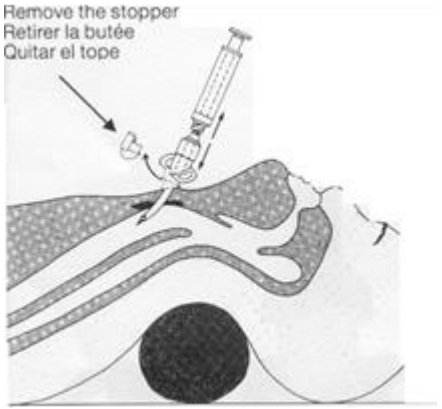
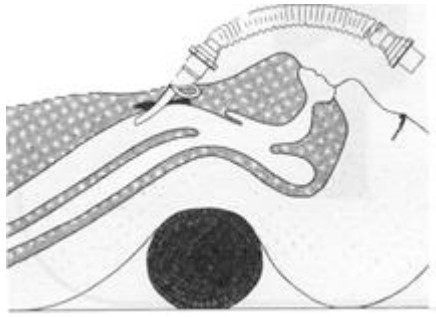
5.34 Emergency Cricothyrotomy

- Paramedics credentialed and trained by medical director for open surgical cricothyrotomy(age>12)/pediatric needle cricothyrotomy may use that technique or QuickTrach





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5.38 Chest Decompression

- Landmarks: 4th/5th intercostal space, anterior axillary line
  - The 2nd intercostal space midclavicular line has a higher failure rate, primarily due to anatomy and body habitus
  - This new site typically has less tissue, making accessing the pleural space easier with a standard ARS decompression needle

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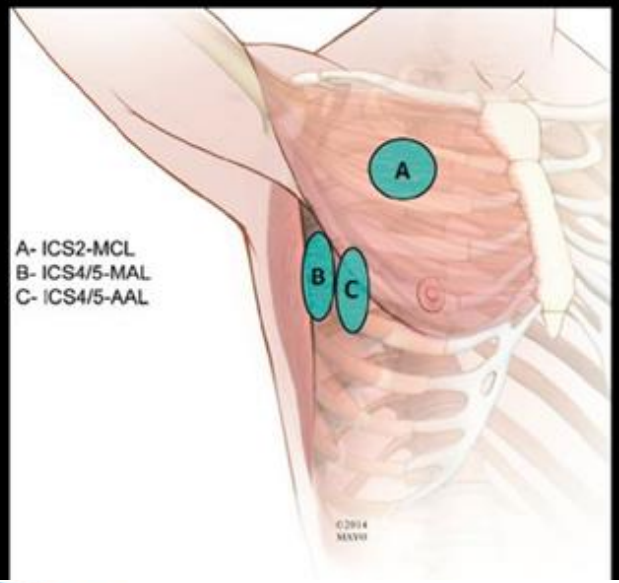
Needle Thoracostomy Failure

Location	Chest Wall Thickness (cm)	Failure Rate with 5 cm Angiocatheter
2nd ICS – MCL	4.3 (3.9 – 4.7)	38% (24 – 54%)
4th/5th ICS – MAL	4.0 (2.9 – 5.1)	31% (10 – 64%)
4th/5th ICS – AAL	3.4 (2.8 – 4.0)	13% (8 – 22%)

2nd ICS – MCL = 2nd Intercostal Space – Mid-Clavicular Line
4th/5th ICS – MAL = 4th/5th Intercostal Space – Mid-Axillary Line
4th/5th ICS – AAL = 4th/5th Intercostal Space – Anterior-Axillary Line



BOTTOM LINE: Evidence from Observational Studies Suggests that 4th/5th ICS-AAL has Lowest Predicted Failure Rate of Needle Decompression with a Standard 5-cm Angiocatheter

@srrezaie

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5.38 Chest Decompression: Pediatrics

- At this time, the anterior placement remains the recommendation for pediatric patients
  - Lateral placement is a secondary alternative

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Questions?

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