Emergency Medical Services



2026 Clinical Guidelines

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Version 2.16.20

MEDICAL DIRECTOR STATEMENT

These guidelines are based around those provided by the State of Tennessee Office of Emergency Medical Services as well as best practices from multiple other national medical organizations. These treatment guidelines provide direction for EMS Personnel to render appropriate care for the sick and injured of all ages. It is recommended that EMS Personnel familiarize themselves with these guidelines, have ready access to them at all times, and ultimately demonstrate knowledge of and clinical competency in the application of guidelines when taking care of the sick and injured.

We have taken great care to make certain that doses of medications and schedules of treatment are compatible with evidence-based EMS and emergency medical practices and the generally accepted standards of care at time of publication. Much effort has gone into the development, production, and proofreading of these EMS Clinical Guidelines. Unfortunately, this process may allow errors to go unnoticed or treatments may change between the creation of these protocols and their ultimate use. Please do not hesitate to contact your medical director if you discover any errors, typos, dosage, or medication errors.

We look forward to any questions, concerns, or comments regarding these protocols. I expect all EMS personnel to follow these guidelines, but also to utilize and exercise good judgment to provide the best care for all patients in the dynamic environments that these guidelines are to be applied.

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AUTHORIZATION FOR STANDING ORDERS

These Emergency Medical Services (EMS) Standing Orders and Guidelines are hereby adopted. They are to be utilized by EMS personnel within their scope of licensure whenever a patient presents with injury or illness covered by the guidelines. Where indicated to contact Medical Control, the EMS Provider should receive voice orders from Medical Control before proceeding. Additional orders may be obtained from Medical Control when the situation is not covered by the guidelines or as becomes necessary as deemed by the EMS Provider.

Effective Date of these SOPs: July 1st, 2026



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2026 - Updates to the Clinical Guidelines

Below is an overview of the major changes to the EMS Clinical Guidelines. Please note that additional minor edits may be present and all Guidelines should be reviewed on a routine basis to ensure competency. Please direct any questions to your EMS Medical Director.

<u>2026 Updates:</u>

1. General Overview
    a. Due to size, the protocols will be split into three main sections:
        i. The Clinical Guidelines
        ii. Procedures
        iii. References
    b. The App will be updated to match these sections, as well as make space for upcoming dedicated critical care protocols.
    c. Numbering for new and adjusted protocol numbers updated throughout the protocols (as recognized).
    d. Adjusted skills and medications to be consistent with 2019 national and current state scopes of practice.
    e. Updated guidelines to be more consistent with 2025 AHA guidelines.
    f.

2. Q - Quick Reference/Destination
    a. Q-01 Destination Capabilities: added Northeast Tennessee Facilities
    b. Q-02 Stroke Destination: standardize onset to 24-hours even for low C-STAT.

3. Universal Care [1]
    a. 1-06 Spinal Immobilization: allows providers to use usual spinal motion restrictions techniques in place of a long spine board even in patients with neurologic deficits or severe altered mental status.
    b. **NEW**: Three ultrasound guidelines for use when an ultrasound is available:
        i. 1-P5 Ultrasound: Basic Cardia

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ii. 1-P6 Ultrasound: Peripheral IV Placement
iii. 1-P7 Ultrasound: E-FAST Examination

4. Airway/Breathing [A]
    a. **NEW** A-01B Respiratory Distress
        i. Modified and transferred ‘breathing-specific’ portions of A-01 into A-01B to have A-01A focus on airway maintenance.
        ii. Focused care on either cases of increased or decreased work of breathing, with immediate consider of CPAP, BPAP or HFNC with cases of increased work of breathing.
    b. A-08 Stridor/Croup/Bronchiolitis
        i. Added IV/IM Epinephrine for severe stridor, as well as the consideration of albuterol/atrovent nebs for possible bronchiolitis or asthma.
        ii. Added the option of oral dexamethasone for pediatric croup patients.
    c. Updated guidelines to reference BPAP and HFNC as alternatives to CPAP for various breathing problems.
    d. Renumbered ‘Procedures”:
        i. “A-PAx” is to delineate airway procedures
        ii. “A-PBx” is to delineate breathing procedures
    e. A-AP2 Suctioning (Basic & Advanced): adds specific procedure for deep suctioning in addition to oropharyngeal suctioning
    f. **NEW** A-PB3 Bi-Level Positive Airway Pressure (BPAP): For services with transport ventilators with a BPAP mode or a specific BPAP device (prehospital or IFT)
    g. **NEW** A-PB4 High-Flow Nasal Cannula (HFNC): For services with HFNC device (either prehospital or IFT)

5. Cardiac [C]
    a. Updated broadly for consistency with the 2025 AHA Guidelines released in October 2025
        i. Added the consideration of escalating energy doses
        ii. Immediate cardioversion for polymorphic VT
        iii. Changes to use of antiarrhythmics in tachycardias
    b. C-02 Asystole/PEA: Split approach to Asystole vs. PEA to utilize secondary signs and Cardiac Ultrasound potentially indicating “Pseudo-PEA”
    c. C-03 Ventricular Fibrillation/Pulseless V-Tach

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i. Consider escalating energy doses
ii. Reference specific Torsades guideline

d. C-05 Bradycardia
    i. Change approach to three different options as first choice for treating adult bradycardia
e. C-07 Narrow-Complex Tachycardia
    i. Adds Amiodarone as the preferred treatment for tachycardiac patients with a CHF exacerbation/pulmonary edema.
    ii. Instructs to withhold all medications for patients with a known preexcitation syndrome (e.g. WPW).
    iii. Adds metoprolol as an alternative to diltiazem.
f. C-08 Wide-Complex Tachycardia: references new Torsades guidelines as well as avoiding medications in preexcitation syndromes.
g. NEW C-09 Torsades/Polymorphic V-Tach
    i. Initial treatment is immediate defibrillation
    ii. Long QT: continue to treat with Magnesium
    iii. Short QT: treat with Amiodarone or Lidocaine
h. C-10 Ventricular Assist Devices (VADs) - number change
i. C-P1 Pit-Crew CPR: adds replacing BIAD with an ET Tube after 6 minutes

6. Environmental [E] - No substantial changes

7. Hazardous Materials/Toxicology [H] - No substantial changes

8. Medical Complaints [M]
    a. Renumbered Seizures [M-08 from M-07] and Stroke/CVA [M-09 from M-08]
    b. M-05 Fever/Sepsis
        i. Updated for consistency with the 2026 Surviving Sepsis Guidelines
        ii. Added ETCO2 <25 or Lactate >4 to indications of hypoperfusion
        iii. Added Prehospital Sepsis Bundle/Antibiotics in participating agencies
    c. NEW M-07 Nasal & Oral Bleeding (Epistaxis)
        i. New protocol to allow for the placement of nasal or oral packing
        ii. Adds TXA use with packing
        iii. Uses Epinephrine as a second line if needed
        iv. Adds option for nebulized TXA for non-compressible bleeding

9. Obstetrics/Gynecology [OB] - No substantial changes

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10. Psychological/Behavioral [P]
    a. NEW/COMBINED P-P2 Consensual Blood Draw
        i. Combined agency-specific protocols into a single guideline.
        ii. Clarified that the patient must be willing to allow the draw and completely unrestrained.

11. Medications [RX]
    a. Pain management split into two guidelines:
        i. RX-02 General Pain Management
            1. Moved ketamine to RX-03
            2. Made opiate administration an Advanced EMT skill. <u>The use of opiates by AEMTs is at the discretion of the agency EMS Director.</u>
            3. Added required monitoring for the administration of pain medications (including ETCO2).
            4. Added specific monitoring parameters and management of respiratory depression based on ETCO2
        ii. NEW RX-03 Ketamine for Pain
            1. Pulls IV/IO and IM Ketamine dosing from RX-02
            2. Adds Inhaled Ketamine as an alternative
    b. Sedation split into three guidelines:
        i. RX-04 Anxiolysis/Chemical Restraint
            1. Replaced the previous 'Sedation/Chemical Restraint'
            2. Added specific management (drugs/dosing) for various levels of agitation, based on the SAT Score
                a. Severe = ketamine
                b. Moderate = benzodiazepines (plus pain control if needed)
                c. Mild = low-dose benzos if needed
        ii. NEW RX-05 Sedation for Brief Procedures
            1. Taken out of previous 'Sedation' guideline
            2. Utilizes only short acting medications
            3. Uses ketamine or combination of sedative and Fentanyl
            4. Adds Etomidate as an option in place of Versed
        iii. NEW RX-06 Advanced Sedation & Analgesia
            1. Added for the administration of constant infusions of sedatives and/or pain medications
            2. Utilizes the entirety of the SAT Score to determine the titration of medications

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3. Provides multiple options for EMS initiation of infusions or the continuation or usage of hospital-provided medications

12. Trauma [T]
    a. Renumbered Procedures
    b. NEW T-P1 Blood Administration
        i. Added the ability to transfuse Whole Blood or Blood Products
        ii. Coadminister Calcium and TXA with blood
        iii. Added blood administration as an “and/or” recommendation (where available) in lieu of just IV fluid administration
        iv. Added reference to T-P1 in multiple traumatic guidelines
    c. T-01 Initial Trauma Care & T-02 Traumatic Arrest:
        i. Blood administration added for consideration
        ii. Providers given flexibility to perform or withhold chest compressions in traumatic cardiac arrest
    d. T-04 Hemorrhagic Shock
        i. Added indications for initiating ‘Volume Resuscitation’
        ii. Clarified approach to determining the use of blood and/or IV fluids with hemorrhagic shock.

13. Death [X]
    a. X-02 Discontinuation of Resuscitation
        i. Time changed to 25 minutes of resuscitation
        ii. Adds a 60-second window of monitoring (following discontinuation of both chest compressions and ventilations) to utilize secondary signs to evaluate for undetected perfusion/ROSC. This includes monitoring for respiratory effort, SpO2 waveform or ETCO2 waveform.
        iii. Splits Termination approach between PEA and Asystole with the incorporation of Cardiac Ultrasound (if available) or the usage of heart rate as a surrogate.

14. General Operations [Z] - No substantial changes

<u>2025 Updates:</u>

15. General Overview

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a. NEW Finger Thoracostomy Guideline [T-P1] as an alternative to needle decompression
b. Updated TXA Administration [T-P4] indications and dosing, including pediatric patients.
c. The addition of a trial protocol for Inhaled Ketamine [RX-T1] as an adjunct to narcotic administration.
d. The addition of an epinephrine drip as an alternative to epinephrine boluses in cardiac arrest

16. Q - Quick Reference/Destination - No substantial changes

17. Universal Care [1] - No substantial changes

18. Airway/Breathing [A]
    a. A-01 Airway/O2 Maintenance & A-04 Drug-Assisted Intubation/RSI & A-P5 Endotracheal Intubation
        i. Video Laryngoscopy use is mandatory (when available)
        ii. Bougie use continues to be mandatory on second (and additional) attempts, and its use is encouraged on the initial attempt.
        iii. Pediatric Ambu-Bag may be considered in adult patient
    b. A-P3 Capnography (ETCO2)
        i. Substantially broadened indications for use, including any patient with AMS, difficulty breathing or signs of hypoperfusion, as well as any patient requiring any oxygen or respiratory intervention (above baseline) or the administration of any sedating medication.
        ii. General guidance on clinical interventions based on the ETCO2 measurement, based on the presenting clinical scenario.

19. Cardiac [C] -
    a. C-02 Asystole/PE & C-03 Ventricular Fibrillation/Pulseless V-Tach
        i. Epinephrine Drip added as an alternative to epinephrine boluses
    b. C-09 Ventricular Assist Devices (VADs)
        i. IF “Low Flow” alarm persists despite IV fluid bolus, initiate a Vasopressor Drip

20. Environmental [E] - No substantial changes

21. Hazardous Materials/Toxicology [H] - No substantial changes

22. Medical Complaints [M]

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a. M-05 Fever/Sepsis
    i. Acetaminophen [Tylenol] IV added as an option for Fever
b. M-07 Seizures
    i. Approach to benzodiazepine dosing clarified:
        1. 1st dose should be IN Versed or IM Ativan
        2. 2nd dose should be IV/IO
    ii. If seizures continue despite two doses, there is an option to go straight to DAI/RSI and intubation, or there is an (NEW) option for an abortive dose of Ketamine (1-2 mg/kg IV/IO)
c. M-08 Stroke/CVA
    i. Consider TXA (after discussion with online medical control) for patients with a possible hemorrhagic stroke.

23. Obstetrics/Gynecology [OB] - No substantial changes

24. Psychological/Behavioral [P] - No substantial changes

25. Medications [RX]
    a. RX-01 Pain Management
        i. Ibuprofen dosing simplified to just 400 mg PO for adults
    b. RX-T1 Intranasal Ketamine Trial (NEW)
        i. If adopted by an agency, allows for the usage of inhaled ketamine (0.75 mg/kg) for the treatment of severe pain not controlled with narcotics.
        ii. Requires a breath-actuated nebulizer to be used, or requires the EMS provider to wear a surgical mask.

26. Trauma [T]
    a. T-02 Traumatic Cardiac Arrest &
        i. Encouraged the avoidance of chest compressions in obvious traumatic arrest (i.e. hemorrhagic) in lieu of other interventions
    b. T-01 Initial Multi-System Trauma, T-02 Traumatic Cardiac Arrest & T-09 Chest/Abdominal Trauma
        i. Added finger thoracostomy as an alternative to needle decompression
    c. T-07 Head Injury
        i. Added TXA administration for head injuries with a significantly decreased GCS (i.e. only responsive to pain)
    d. T-P1 Needle/Finger Thoracostomy
        i. NEW: added procedure for finger thoracostomy for paramedics

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e. T-04 Hemorrhagic Shock & T-P4 TXA Administration
    i. Increased dose to TWO (2) grams IV/IO
    ii. Added pediatric dosing
    iii. Updated indications for use in traumatic or nontraumatic hemorrhage, and added indications for head injury and possible hemorrhagic stroke
    iv. Adjusted contraindications

27. Death [X] - No substantial changes

28. General Operations [Z]
    a. Z-05 ALS Response/Paramedic Intercept - Changed to reflect the role of AEMT ambulances as an ALS resource.

Previous Updates

<u>2024 Updates</u>:

- General Overview
    - NEW Ventricular Assist Device (VAD) Guideline [C-09]
    - Advanced AEMT Medications incorporated into the individual guidelines
- Q - Quick Reference/Destination:
    - Q-01 Regional Hospital Capabilities - updates to some of the previously blank destination capabilities.
- Universal Care [1]
    - 1-02 Initial Assessment & Exam - minor edits
- Airway/Breathing [A]
    - A-07 Asthma/COPD
        - CPAP prioritized for severe respiratory distress.
        - Albuterol administration by EMT
- Cardiac [C] -
    - C-02 Asystole/PE
        - Epinephrine administration by AEMT

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        - C-03 Ventricular Fibrillation/Pulseless V-Tach
            - Epinephrine administration by AEMT
            - Procainamide Removed
            - Emphasize moving/replacing defibrillation pads for refractory rhythms
        - **C-09 Ventricular Assist Devices (VADs) - NEW GUIDELINE**
    - Environmental [E] - No substantial changes
    - Hazardous Materials/Toxicology [H] - No substantial changes
    - Medical Complaints [M]
        - M-01 Abdominal Pain
            - **Added/Modified Phenergan [promethazine] and Benadryl [diphenhydramine] as secondary antiemetics**
                - Phenergan is ONLY intramuscular (IM); dose is 25 mg
                - Benadryl [diphenhydramine] is 25 mg IV/IO or IM
                - Removed pediatric dosing for Phenergan/Benadryl → must contact medical control for administration
            - Zofran [ondansetron] is still primary antiemetic
            - All antiemetics are AEMT skills
        - M-02 Allergic Reaction
            - Epinephrine (IM) and Albuterol are EMT skills
            - Benadryl [diphenhydramine] is an AEMT skill
        - M-03 Altered Mental Status
            - Narcan [naloxone] is a MFR skill (intranasal)
            - Narcan indication changed to <u>only</u> for respiratory depression
        - M-05 Fever/Sepsis
            - Antipyretic Dosing (Tylenol, Ibuprofen & Toradol) are AEMT skills
        - M-07 Seizures
            - Pediatric dosing of Valium (diazepam) slightly adjusted to:
                - IV/IO at 0.2 mg/kg
                - IM at 0.5 mg/kg
    - Obstetrics/Gynecology [OB]
        - OB-03 Obstetrical Emergencies
            - Adjusted Magnesium Sulfate dosing in Eclampsia to 4 grams (from 2 grams)
            - Priority is for usual benzodiazepine use (Versed 5-10 mg IN) for continued active seizures.
    - Psychological/Behavioral [P]
        - P-01 Severe Agitation/Delirium
            - **No changes to clinical care or approach, just terminology.**

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- Renamed the Guideline due to concerns over inflammatory nature of the term ‘Excited Delirium”
- Also, redesignated Excited Delirium Syndrome [ExDS] to “Post-Resistance Syndrome [PRS]”.

- Medications [RX]
  - Medications from Advanced AEMT Medications pilot programs have been adopted across all agencies/guidelines
  - RX-01 Pain Management
    - Acetaminophen, Ibuprofen and Toradol updated to AEMT skills
    - IV Acetaminophen (1 gram or 15 mg/kg) added
  - RX-02 Sedation/Chemical Sedation
    - No changes to clinical care or approach, just terminology.
    - Redesignated Excited Delirium Syndrome [ExDS] to “Post-Resistance Syndrome [PRS]”.
- Trauma [T] - No substantial changes
- Death [X] - No substantial changes
- General Operations [Z] - No substantial changes
  - Z-06 Air Ambulance Transport - Slight adjustments made to possible indications

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<u>2023 Updates:</u>

- General Overview
  - Environmental [E] Guidelines - hazardous materials and toxicologic guidelines removed and a new Hazmat/Toxicology [H] Section added and expanded.
  - **NEW HazMat [H] Section**
    - **General approach to a HazMat scene and decontamination**
    - **Toxidromes highlighted**
    - Mostly highlights decontamination and supportive care
    - Uncommon medications (antidotes) added as special HazMat Medic orders to use with specialized response teams.
    - Examples of substances in each category
  - Trauma [T] Section reorganized to update Thermal Burns and transfer/revise Electrical Burns from the Environmental Guidelines. Care During Extrication guideline added.
- *Q - Quick Reference/Destination:*
  - Q-03 Trauma Destination - updated based on the February 2022 Release of the *CDC Guidelines for Field Triage of Injured Patients*

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- Universal Care [1] - No substantial changes from 2021
- Airway/Breathing [A]
  - A-01 Airway/O2 Maintenance & A-04 Drug Assisted Intubation/RSI - **Added requirement for a Bougie (and/or Video Laryngoscopy) to be used on all patients where the first attempt at intubation fails.**
  - **A-05 Tracheostomy Management - NEW** - new guideline for all providers to the management of tracheostomy malfunction.
  - A-06 Acute Pulmonary Edema/CHF & A-07 Asthma/COPD (Renumbered) - Revised protocol to encourage early utilization of CPAP in patients with respiratory distress.
- Cardiac [C] - No substantial changes from 2021
- Environmental [E] (Renumbered)
  - E-01 Heat Injury (Hyperthermia) - revised to highly need for early (i.e. pre-transport) cooling.
  - E-02 Hypothermia/Cold Injury - minor visual revisions
  - E-03 Near-Drowning - revised guideline for clarity and to highlight need for early breathing support including supplemental oxygen and positive pressure ventilation (i.e. CPAP).
  - E-04 Snake Bite - cleaned up the guideline and added clarification of snake handling and the consideration of transport to an ED capable of anti-venom administration.
- **Hazardous Materials/Toxicology [H] - NEW SECTION**
  - **H-01 Initial HazMat/Toxicology** - fairly extensive initial approach to both HazMat scenes and patients. Includes red flags to involve HazMat specialists, an overview of decontamination as well as an overview of common toxidromes.
  - **H-02 Initial Treatment of Isolated Overdose/Exposure** - general approach to (individual) overdose patients, including cardiac dysrhythmias, seizures and agitation.
  - **H-03 Carbon Monoxide** - look revised, but same treatments.
  - **H-04 Closed Space Fire** - mostly supportive care, but central reference to carbon monoxide, cyanide and corrosive agent guidelines.
  - **H-05 Corrosive Agents** - large amount of information for exposures with chemical skin burns, inhalation exposures, eye exposures, and oral ingestions. Mostly supportive care.
  - **H-06 Cyanide/Hydrogen Sulfide** - mostly informational, with Cyanokit (or other antidote kits) available for HazMat Medics.

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- **H-07 Hydrofluoric Acid** - new guideline essentially for alternative calcium administration by HazMat Medics.
- **H-08 Methemoglobin Formers** - mostly informational, but antidote of Methylene Blue added for HazMat Medics.
- **H-09 Opiates/Sedatives** - revised to highlight the need for respiratory support, not narcan, and additional reference information added.
- **H-10 Organophosphates** (Old Nerve Gas Exposure Guideline) - revised to highlight primary treatment with airway management and (potentially) large doses of atropine, as well a antidotes (HazMat Medic)
- **H-11 Radiation** - revised for clarity and extensive information on radiation injury added, including the fact there is practically no danger to responders once the patient is removed from the source and that medical care supersedes decontamination.
- **References** were added to give EMS providers some basic information regarding common prescription and over-the-counter (OTC) medications and supplements. These provide some basic guidance on identification, effects and treatments utilized in the ED setting. Specific references include:
  - H-R1 Cardiovascular Drugs
  - H-R2 Metals
  - H-R3 Neurologic/Psychiatric Drugs
  - H-R4 Other Common Substances
  - H-R5 Poisonous Plants
  - H-R6 Vitamins/Herbal Supplements

- Medical Complaints [M]
  - M-04 Hypertensive Crisis - removed treatment for CVA, now only utilized with acute CHF/pulmonary edema.
- Obstetrics/Gynecology [OB] - no substantial changes from revised 2021 section.
- Psychological/Behavioral [P]
  - **P-02 Determination of Capacity - added references and instructions related to "Title 33" (i.e. "6401" or "6404") psychiatric holds.**
- Medications [RX]
  - RX-02 Pain Management - dosing slightly tweaked and IM added for some meds.
  - **RX-03 Sedation/Chemical Restraint - Versed (and other benzos) added for "Moderate Agitation"** in addition to specified procedures.
- Trauma [T]

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        - T-03 Care During Extrication - NEW - added guideline to direct care for trauma patients prior to and during extrication. Care is focused on only those interventions necessary for treating immediate life-threats. Also clarifying expectations for DOA criteria, as well as Termination of Resuscitation in entrapped patients.
        - T-05 Thermal Burns - revised to reference updated electrical and chemical burns as well as the new HazMat guidelines. Critical burn criteria also added.
        - T-06 Electrocution/Lightning Injury - brought over from the Environmental section. Basic revisions with the additional of a good amount of reference material.
    - Death [X] - No substantial changes from 2021
    - General Operations [Z] - No substantial changes from 2021

<u>September 2021 Updates:</u>

- General
    - Optional weight-based dosing has been added to include adults for certain patients. Indications where weight-based dosing is not indicated for either adults or pediatric patients will be indicated as such.
    - Guidelines updated to be consistent updated 2020 AHA Guidelines.
    - Appearance of most reference material in the protocols has changed to enlarge type and reduce file size.
- QUICK REFERENCE/DESTINATION:
    - NEW section
    - Includes old Trauma Destination [Q-03] as well as a NEW Stroke Destination [Q-02] guideline, and a list of destination capabilities for all facilities in the region → **Partially Complete/In Progress**
    - Incorporates existing checklists and references from various guidelines into a single location.
    - Also provides reference to other protocols, centralizing multiple checklists and other quick reference material.
    - Q-R3: START Triage moved to Quick Reference Section from 1-R1
- 1-P1 EZ-IO: Yellow needle added. Clarify AEMT utilization with inservice training.
- !-R1 START Triage: moved to Q-R3
- 1-R2 Pediatric Pearls: **PENDING UPDATE** & Renumbered

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- A-01 Airway/O2 Maintenance: The use of a pediatric-size Ambu-bag recommended for all pediatric and adult patients. If not used, recommend close attention to small tidal volumes required to cause only faint chest rise.
- A-04 Drug-Assisted Intubation/RSI: Versed dose changed from “5-10 mg” to “10 mg”.
- A-06 Asthma/COPD: Magnesium added as an optional medication after discussion with Medical Control.
- C-04 Rapidly-Deteriorating/Post-Resuscitation: significantly changed guideline to clarify expectations for cases where ROSC is obtained, or in cases where a patient’s respiratory and/or hemodynamic status is unstable. This includes a “pit-crew” model of stabilizing procedures similar to that in Pit-Crew CPR.
- C-07 Narrow-Complex Tachycardia: Diltiazem (Cardizem) changed to primary medication to treat tachycardia. Adenosine moved to a secondary/optional role.
- C-P2 Induced Hypothermia: REMOVED
- E-03 Drug Ingestion/Overdose:
  - Narcan Administration clarified to include MFR and EMT use of IN Narcan.
  - Maximum dose of Narcan set at 2 mg IV/IO/IM and/or 4 mg IN including dosing by bystanders/first responders. Further treatment focuses on airway management and ventilatory support.
- Medical Section: RENUMBERED after 2 guidelines removed and sepsis added.
- M-01 Complaint Not Otherwise Specified: REMOVED
- M-03 Allergic Reaction/Anaphylaxis:
  - Added EMT IM Epinephrine (non-autoinjector) with service level training.
  - Recommend Epinephrine Drip as primary vasopressor for persistent anaphylaxis (airway symptoms or hypotension).
- ADDED Sepsis/Fever:
  - NEW guideline to clarify identification of SIRS/sepsis and approach to septic patients, including referral to the medical shock guideline.
  - Add treatment of Fever (from pain guideline).
- M-07 Non-Traumatic Pain: REMOVED
- M-08 Stroke:
  - Updated stroke scale to Cincinnati Stroke Triage Assessment Tool (C-STAT).
  - Added focus on avoiding intubation or paralytics unless necessary in possible stroke patients.
  - Added Stroke Destination Criteria (may split this as separate guideline/section)
- M-R3 C-STAT Stroke Scale:
  - NEW guideline will be added to reflect change to C-STAT as primary stroke assessment tool.

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        - Cincinnati Stroke Scale (M-R2) will remain as a reference.
    - M-R3 Thrombolytics Screen: REMOVED
    - OB-GYN Section: Entire section reworked for simplicity and to update OB management to current recommended Standards of Care.
        - OB-01 Initial OB/GYN: General overview/reference for other guidelines.
        - OB-02 Childbirth/Delivery: Similar to previous with the exception of changes to place the child (unwrapped) on mother's abdomen and cover with a blanket.
        - OB-03 Obstetrical Emergencies: Coalesces Nuchal Cord, Prolapsed Cord, Abnormal Presenting Part and Shoulder Dystocia into a single guideline. References Seizure Guideline for Eclampsia and Vaginal Bleeding Guideline. Adds McRoberts Maneuver as an option for shoulder dystocia.
        - OB-04 Vaginal Bleeding: Reworked for all cases of vaginal bleeding, including positioning and referencing Hemorrhagic Shock Guideline.
        - OB-05 Newborn Resuscitation: Revised to reflect updated Neonatal Resuscitation Guidelines.
        - OB-06 Fetal Demise/Non-Viable Fetus: This is added to clarify when to and limit the resuscitation attempts on non-viable fetuses.
        - OB-P1 Umbilical Catheter Insertion: {considering, and pending review from the state}
    - Z-03 Determination of Capacity: moved into the Psych Section.
    - P-01 Agitation/Excited Delirium: Updated to provide guidance and expectations on the assessment and management of violent/combative patients, including increased information on Excited Delirium.
    - P-02 Determination of Capacity: moved from General Care [Z].
    - P-04 Child Abuse & Neglect: **PENDING ADDITION EDUCATION**
    - P-05 Domestic Violence (Abuse)/Neglect: NEW guideline combining old Family Violence [P-02] and Domestic Violence/Reporting [P-R2].
    - RX-01: Fever Management moved to Sepsis Guideline [M-06].
    - RX-03 Sedation/Chemical Restraint: increased IM Ketamine dose to 4-5 mg/kg or 400 mg (standard dose) .
    - RX-R1: Revised to reflect changes to other guidelines.
    - T-P1 Hemorrhage Control Clamp: REMOVED
    - T-P2 Needle Decompression: adding recommendation for Mid-Axillary approach as the primary site for decompression.
    - T-P3 Pelvic Binder: NEW guideline for the use of pelvic binding devices (e.g. SAM Splint device), or utilization of the KED as a pelvic binder.
    - X-01 DOA: adding a Checklist as well as clarification of DOA criteria for bystander/first responder initiated resuscitative efforts. Z-?? Medical Clearance: NEW to clarify expectations of medical clearance in the field.

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- Z-R1 Common Medical Abbreviations: Updated
- Z-R2 Definitions: Updated

<u>September 2020 Updates</u>:

- C-05 Bradycardia:
  - Atropine (or Epi) may be given first-line for bradycardia. Atropine should generally be utilized first in patients with known/suspected heart disease.
  - Initial dose of Epi is decreased to 0.1-0.2 mg (100-200 micrograms for reference).
  - "Low dose" Epi may be used in patients with known/suspected heart disease. This is similar to the Epi Boluses in the Medical Shock Guideline (10-20 micrograms).
- M-09 Seizures:
  - Versed dosing decreased to 2-5 mg IV/IO or 5 mg IN/IM.
- RX-03 Sedation/Chemical Restraint:
  - Ketamine is the primary medication in Chemical Sedation, and the only medication that can be used without online medical control for sedation.
  - Versed dosing decreased to 2 mg IV/IO or 5 mg IN/IM.
- Trauma Section:
  - Slightly reorganized to simplify similar guidelines.
- T-01 Multi-System/Initial Trauma Assessment & Care:
  - Revised to identify critical actions needed on scene versus interventions that can/should be delayed to transport. On-scene interventions for critical patients should be limited to hemorrhage control, airway management and needle decompression, unless the patient remains entrapped.
  - IV fluids should be limited to the minimum necessary to maintain a pulse/SBP of 80 mmHg.
- T-02 Traumatic Cardiac Arrest:
  - Revised to delineate clinical approach with major trauma patients versus those with medical /asphyxiation arrests.
  - Limiting on scene procedures reinforced.
- T-03 Hemorrhagic Shock (Traumatic & Non-Traumatic)
  - Permissive Hypotension" concept added with emphasis on minimizing IV fluids and allowing a goal blood pressure of 80-90mmHg.
  - Vasopressors are to be avoided in Traumatic shock.
- T-04 Thermal & Electrical Burns
  - Blood pressure should be maintained in normal range (SBP 90-110) for patients with primary burn injuries.
- T-05 Head Trauma (Includes Eye & Tooth Injury)

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        - Blood pressure should be maintained in normal range (SBP 90-110) for patients with primary head injuries.
    - T-06 Spinal Cord Injury/Neurogenic Shock
        - Reordered
    - T-07 Chest/Abdominal Trauma (Includes Tension Pneumothorax)
        - Combined chest and abdominal trauma guidelines due to similarity.
    - T-08 Extremity/Soft Tissue Trauma
        - Reordered
    - T-P5 TXA Administration
        - Inclusion and exclusion criteria updated.
    - T-R1 Trauma Destination
        - CDC criteria maintained.
        - Mental status determiner changed from GCS to APVU scale for all patients.
        - Signs of severe injury (step 2) clarified.
        - Destinations based on mechanism (step 3) and special considerations (step 4) clarified.
        - Transport to other trauma centers and capable ED's clarified.
    - X-03 Discontinuation in Traumatic Arrest
        - Added to clarify expectations between typical medical arrests and those with significant traumatic mechanisms.
        - Includes checklist for termination based on the first-arriving, on-duty, licensed, EMS personnel (including dispatched fire/rescue).
    - Z-P1 ED Offloading
        - Revised to update appropriateness and procedure for ED Offloading patients.
        - Example template for paper Offload Report added.
    - SPEC-02 Heat/Intoxication [EVENT]
        - For UT Football Games, IV fluids will not be started until after transport. Otherwise, PO Zofran and oral rehydration should be the primary methods of treatment.
    - SPEC-08 Event Triage/Rehab (SERC)
        - Added to use in conjunction with SPEC-02.
        - Clarifies expectations and mechanisms.
        - Adds expected COVID screening into patient flow mechanisms.

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Legend:

SLT: Service-Level Training Required (EMT, AEMT, Paramedic)
NEW: New Protocol
2026: Significant 2026 Updates

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Quick Reference/ Destination

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Q-01 DESTINATION CAPABILITIES	Below is a combination of information provided directly by the healthcare organizations and information directly obtained from public sources. **Please contact the facility directly to confirm relevant capabilities prior to patient transport.**	First Responder EMT AEMT Paramedic

Hospital/ Destination Capabilities	Stroke	24 Hour STEMI/ Cath	Trauma	OB/GYN & Pediatrics		
				General	High Risk	NICU
Knox County						
Fort Sanders Regional (Covenant)	**Comprehensive**	**YES**	NO	YES	YES	@ETCH
North Knoxville (Tennova)	Primary	**YES**	NO	YES	NO	NO
Parkwest (Covenant)	Primary	**YES**	NO	YES	NO	NO
Turkey Creek (Tennova)	Stroke Ready	**YES**	**Level 3**	NO		
UT Medical Center (Unaffiliated)	**Comprehensive**	**YES**	**Level 1**	YES	YES	YES
Regional						
Anderson Co: Methodist (Covenant)	Primary	**YES**	NO	YES	NO	NO
Blount Co: Blount Memorial (Prisma)	Primary	**YES**	NO	YES	NO	NO
Campbell Co: Jellico (Rennova)	**CLOSED**					
Campbell Co: Lafollette (Tennova)	Stroke Ready	NO	NO	NO		
Claiborne Co: Claiborne (Covenant)	Stroke Ready	NO	NO	NO		
Cocke Co: Newport (Tennova)	Stroke Ready	NO	NO	YES	NO	NO
Cumberland Co: Cumberland (Covenant)	Primary	**YES**	NO	YES	NO	NO
Hamblen Co: Morristown-Hamblen (Covenant)	Primary	**YES**	NO	YES	NO	NO
Jefferson Co: Jefferson Co (Tennova)	Stroke Ready	NO	NO	NO		
Loudon Co: Ft. Loudoun (Covenant)	Primary	NO	NO	NO		
McMinn Co: Starr Regional - Etowah	NO	NO	NO	NO		
McMinn Co: Starr Regional - Athens	NO	NO	NO	YES	NO	NO
Monroe Co: Sweetwater Hospital (Unaffiliated)	NO	NO	NO	NO	NO	NO
Roane Co: Roane MC (Covenant)	Primary	NO	NO	NO		
Scott Co: Big South Fork (Rennova)	NO	NO	NO	NO		
Sevier Co: LeConte MC (Covenant)	Primary	NO	NO	NO		

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Q-01 DESTINATION CAPABILITIES

Below is a combination of information provided directly by the healthcare organizations and information directly obtained from public sources.
Please contact the facility directly to confirm relevant capabilities prior to patient transport.

First Responder
EMT
AEMT
Paramedic

Hospital/ Destination Capabilities *(continued)*	Stroke	24 Hour STEMI/ Cath	Trauma	OB/GYN & Pediatrics		
				General	High Risk	NICU
Northeast Tennessee						
Bristol Regional Medical Center	Primary	**YES**	**Level 3**	YES	NO	NO
Franklin Woods	NO	NO	NO	YES	NO	NO
Greenville Community	NO	NO	NO	YES	NO	NO
Hawkins County Memorial	NO	NO	NO	NO	NO	NO
Holston Valley Medical Center	Primary	**YES**	**Level 3**	NO	NO	NO
Indian Path	NO	NO	NO	YES	NO	NO
Johnson City Medical Center	**Comprehensive**	**YES**	**Level 1**	YES	YES	YES

Hospital Contact Info	MedCom (340)	Direct Phone	Secondary Phone
Knox County			
Fort Sanders Regional (Covenant)	**412**	865-331-1285	
Tennova North (Tennova)	417	865-859-1060	865-859-1031
Parkwest (Covenant)	413	865-373-1280	
Turkey Creek (Tennova)	414	865-218-7115	865-218-7111
UT Medical Center (Unaffiliated)	416	865-305-3985	865-305-9402
Regional			
Anderson Co: Methodist (Covenant)	010	865-835-4908	
Blount Co: Blount Memorial (Unaffiliated)	040	865-983-7211	
Campbell Co: Jellico (Rennova)	**CLOSED**		
Campbell Co: Lafollette (Tennova)	061	423-907-1403	423-907-1404
Claiborne Co: Claiborne (Covenant)	095	423-526-2218	
Cocke Co: Newport (Tennova)	275	423-625-4511	423-625-2200
Cumberland Co: Cumberland (Covenant)		931-484-9511	
Hamblen Co: Morristown-Hamblen (Covenant)	235	423-492-5400	

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Q-01 DESTINATION CAPABILITIES	Below is a combination of information provided directly by the healthcare organizations and information directly obtained from public sources. **Please contact the facility directly to confirm relevant capabilities prior to patient transport.**	First Responder EMT AEMT Paramedic

Jefferson Co: Jefferson Co (Tennova)	400	865-471-2301	865-471-2302
Loudon Co: Ft. Loudoun (Covenant)	480	865-271-6035	
McMinn Co: Starr Regional - Etowah		423- 263-3600	
McMinn Co: Starr Regional - Athens		423-745-1411	
Monroe Co: Sweetwater Hospital (Unaffiliated)		865-213-8200	
Roane Co: Roane MC (Covenant)		865-316-3100	
Scott Co: Big South Fork (Unaffiliated)		423-569-8521	
Sevier Co: LeConte MC (Covenant)	670	865-446-7000	
Northeast Tennessee			
Bristol Regional Medical Center			
Franklin Woods			
Greenville Community			
Hawkins County Memorial			
Holston Valley Medical Center			
Indian Path			
Johnson City Medical Center			

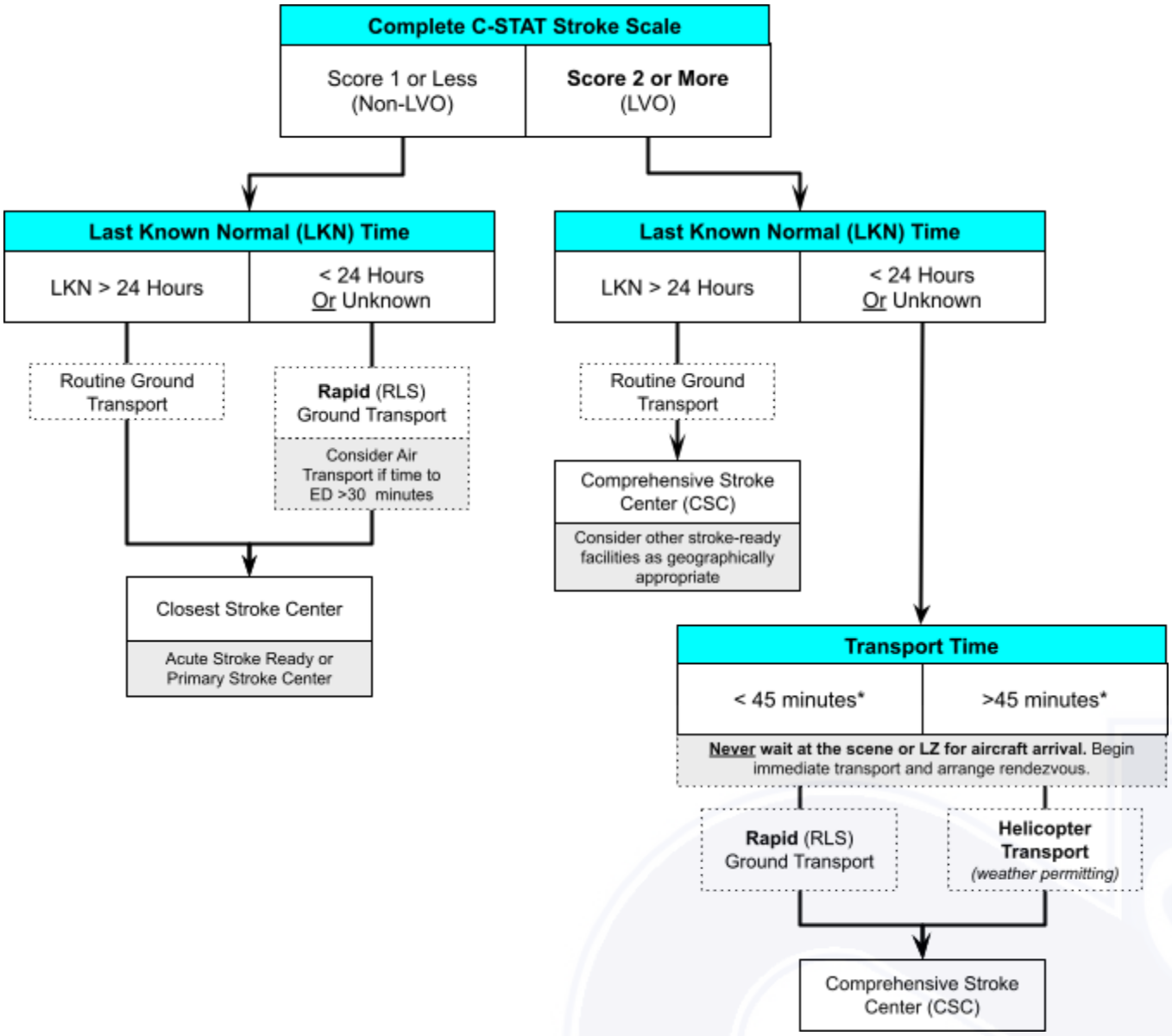
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Q-02 STROKE DESTINATION		First Responder EMT AEMT Paramedic

Indication:

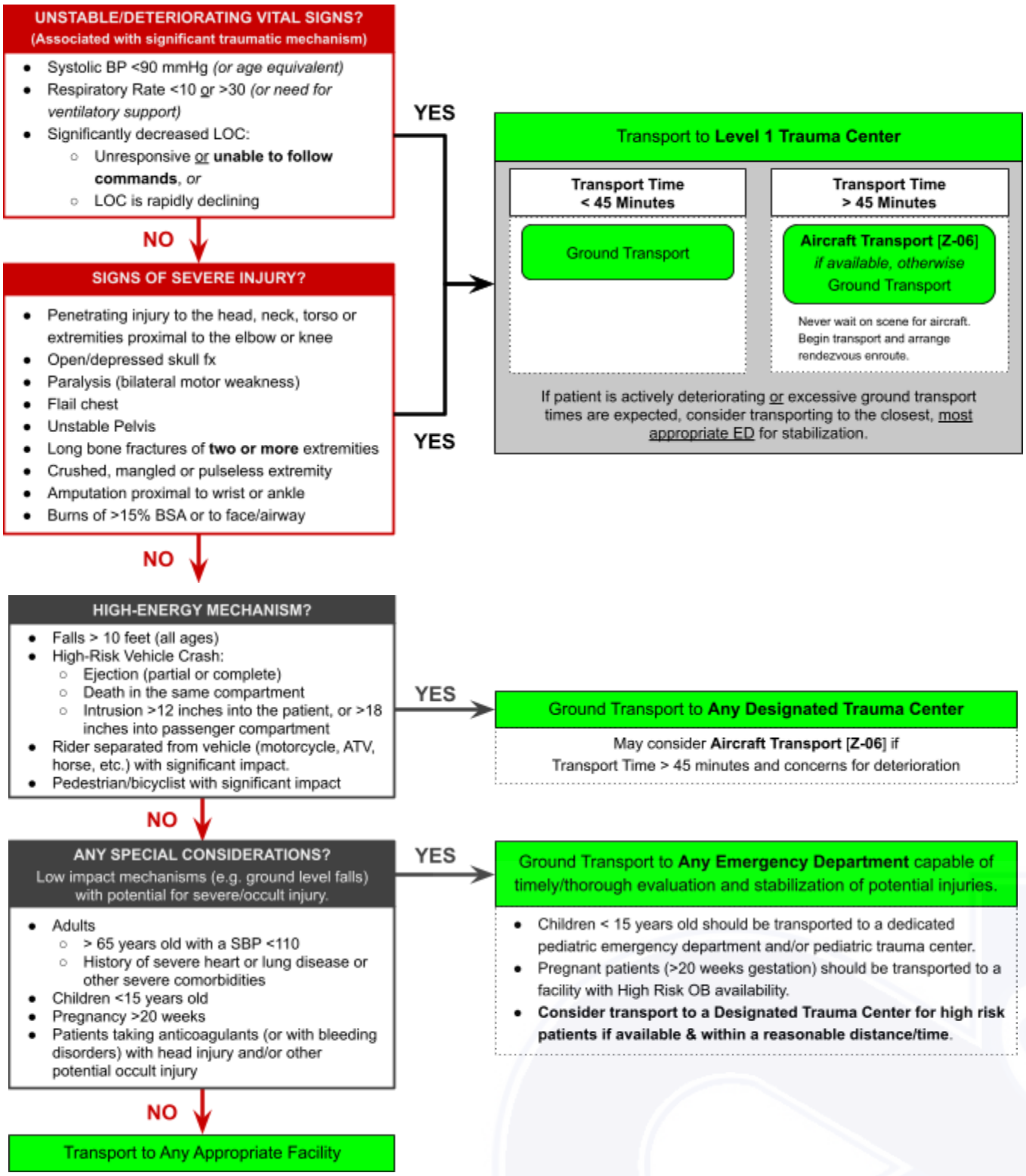
A thorough patient assessment (history, physical exam, Cincinnati Stroke Scale, etc.) raises any concern of stroke or other neurologic dysfunction.

Stroke Destination & Method of Transport



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Q-03 TRAUMA DESTINATION	*Based on the CDC Guidelines for Field Triage of Injured Patients* *February 2022 Release*	First Responder EMT AEMT Paramedic



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Q-03 TRAUMA DESTINATION	*Based on the CDC Guidelines for Field Triage of Injured Patients* *February 2022 Release*	First Responder EMT AEMT Paramedic

NOTES:

- "*Medical Miranda*": Transport of the patient to a requested destination shall not constitute neglect of duty imposed by law **IF** the person making the decision (e.g. patient or legal guardian) has been informed that Tennessee has a trauma system, which would in their circumstance transport them to another facility.
- Medical Control will have final jurisdiction over destination, excluding requests made by:
  - Any patient of legal majority (age 18 or over)
  - The parent or legal guardian of a minor patient
  - An emancipated minor
- If the patient's condition deteriorates during transport (such that their life/health are considered in serious jeopardy if the planned destination is pursued), **AND,** when contacted, if online Medical Control deems transport to a higher level trauma center is necessary, the patient may be transported against their request to the appropriate facility.

TRAUMA TREATMENT PRIORITIES - also see Initial Multi-System Trauma [T-01]

- If multiple patients, initiate the S.T.A.R.T. [**1-R3**] and Multiple Casualty Incident System
- Treat patient(s) per appropriate clinical guideline(s), including oxygen/airway maintenance and fluid resuscitation appropriate for the patient's condition.
- The patient should be packaged and transported as soon as possible to a trauma center or to rendezvous with an aircraft if they meet any of the criteria for a Level 1 Trauma Center in the Destination Criteria above.
- Non-lifesaving procedures such as splinting and bandaging must not delay transport (except for control of life-threatening hemorrhage).

QI Review Parameters:

1. {pending}

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Q-C1 DEATH ON ARRIVAL (DOA) CHECKLIST	From **X-01**	First Responder EMT AEMT Paramedic

DOA Checklist

On arrival of the first on-duty, licensed EMS Provider:

1. Patient has NO signs of life → ALL OF THE FOLLOWING:

- ❑ NO Pulse
- ❑ NO Breathing (Apneic)
- ❑ NO Neurologic Signs (movement, pupillary response, etc.)

2. AND there are signs of:

Definitive Death (Non-Traumatic)	OR	Non-Survivable Injury (Traumatic)
❑ Rigor Mortis ❑ Dependant Lividity ❑ Cold body core (not extremities) ❑ Decomposition of Body Tissue		❑ Incineration ❑ Massive trauma to the head, chest, abdomen, and/or pelvis ❑ Gunshot wound to the head* that **clearly crosses the midline** ***NOTE: If there is a possibility of organ donation, proceed with resuscitation.***

If there is ANY question, resuscitative efforts should be initiated/continued or online medical control should be contacted.

3. If BOTH #1 and #2 have been met, then:

- **If no resuscitation has been initiated:**
  - The first on-duty, licensed EMS provider may elect to not initiate resuscitative efforts based on this protocol, and await a paramedic to confirm death.
- **If bystanders have begun resuscitation:**
  - EMS personnel may elect to not continue efforts if the above criteria are met, *but*
  - EMS providers should generally err towards continuing resuscitation unless there are overwhelming signs (as per #2) until a paramedic has arrived on scene.
- **If on-duty EMS personnel (i.e. first responders) have begun resuscitation:**
  - A responding paramedic, on arrival, may halt the resuscitation should the patient meet the above criteria. **Contact Medical Control if ANY question.**

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Q-C2 PIT-CREW CHECKLIST	From **C-P1**	First Responder EMT AEMT Paramedic

Time	**Goal**	Primary Interventions
0:00 - 1:00	**AED/Monitor**	• Place AED/Monitor by patient's head • Place Pads on patient
1:00 - 2:00	**BIAD/Airway**	• Place BIAD & attach to O2/Ambu Bag
10 Second Pause (or Less) - Pulse Check/Defibrillate		
2:00 - 4:00	**IO/Fluids**	• IO Placement • Start IV Fluids • ALS Epinephrine #1
4:00 - 6:00	**Clean-Up**	• Advanced Monitoring (SpO_2/$ETCO_2$)
Continue Additional Resuscitation & Repeat as Necessary		
Additional 0:00 - 2:00		• ALS Amiodarone/Lidocaine #1 & #2 • ALS Epinephrine #2 & #3
Additional 2:00 - 4:00		
Repeat Additional 0:00 - 4:00		
After 20-30 minutes of Resuscitation, Consider Termination of Resuscitation per Guideline, or Transport to nearest appropriate facility		

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Q-C3 RAPIDLY DETER./ POST-ROSC	From **C-04**	First Responder EMT AEMT Paramedic

Checklist for Post-Resuscitation and Rapidly-Deteriorating Patients

Reference Guidelines	Interventions	
	❑ Call for additional resources. ❑ Place appropriate monitoring equipment: *Continuous Pulse-Oximetry, End-Tidal CO2, and Continuous ECG*	
IV Protocol 1-03	❑ Obtain (at least 2) adequate IV access sites	
	Unless profound pulmonary edema, ❑ Begin fluid resuscitation (1 Liter NS)	
	❑ 12-Lead ECG	
	Crashing Patient	**Post Resuscitation**
Airway/O2 Maintenance A-01	**Titrate respiratory support to ensure adequate oxygenation & ventilation:** Goals SpO_2 >94% & $EtCO_2$ 35-45 mmHg	
	❑ Place NRB @ 100% O_2 ❑ Escalate respiratory support as needed: CPAP, BVM, DAI/RSI (Intubation)	*If ROSC with BIAD:* ❑ Place ETT if any concern of BIAD function
Medical Shock M-06	**Ensure adequate perfusion:** Goals SBP > 90 and/or MAP >65	
	Treat as indicated per appropriate clinical guideline: ❑ Medical Shock [M-06] ❑ Hypertensive Crisis [M-05] ❑ Bradycardia [C-05] ❑ Narrow-Complex Tach. [C-07] ❑ Wide-Complex Tach. [C-08]	*For ALL post-arrest patients:* ❑ Prepare vasopressor drip *If any hypotension/bradycardia:* ❑ Begin vasopressor drip
		If Amiodarone or Lidocaine administered: ❑ Begin antiarrhythmic drip
		If any purposeful movement: ❑ Sedate patient

Once interventions have been completed,
begin to "package" the patient for extrication/transport.

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Q-C4 TERMINATION IN MEDICAL ARREST	From **X-02**	First Responder EMT AEMT Paramedic

Termination Checklist

1. Ensure **ALL** of the following interventions have been completed:

- ❑ **High quality CPR** is being performed.
- ❑ **AED or Continuous ECG monitor** has been used throughout the resuscitation.
- ❑ **Advanced airway** has been placed (ET Tube, King LT, iGel, etc.), and the placement has been confirmed by appropriate means.
- ❑ Patient has been adequately **oxygenated and ventilated** with 100% O2.
- ❑ An **IV/IO line** has been placed, with infusion of appropriate fluids and resuscitative medications.

2. If all the above have been completed, then resuscitative efforts may be abandoned **IF**:

- ❑ Appropriate pulseless arrest guideline has been followed, including **three administrations of epinephrine**;
- ❑ **No shockable rhythm** has been detected (i.e. only asystole/PEA) throughout the resuscitation;
- ❑ Patient has **remained pulseless** (i.e. no ROSC at any point) throughout the resuscitation; AND
- ❑ **25 or more minutes** of resuscitation has been performed by an ALS Provider.

Termination may be considered in other situations when the above conditions are not met ONLY when approved by online Medical Control

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Q-C5 TERMINATION IN TRAUMATIC ARREST	From **X-03**	First Responder EMT AEMT Paramedic

Consider Withholding Resuscitation (i.e. DOA) *or*
Terminating Efforts (if initiated by first responders PTA) **IF**:

TERMINATION CHECKLIST

On Arrival of initial EMS Personnel *(including on-duty, licensed first responders)* the patient meets ALL of the following:

- ❑ **Pulseless**
- ❑ **Apneic** *(despite basic airway positioning, e.g. jaw thrust)*
- ❑ Has **no spontaneous movement** or pupillary response.

Note: A lack of organized cardiac activity on ECG *(i.e. asystole or PEA with a rate of less than 40) may support decision to withhold resuscitation, but is not required.*

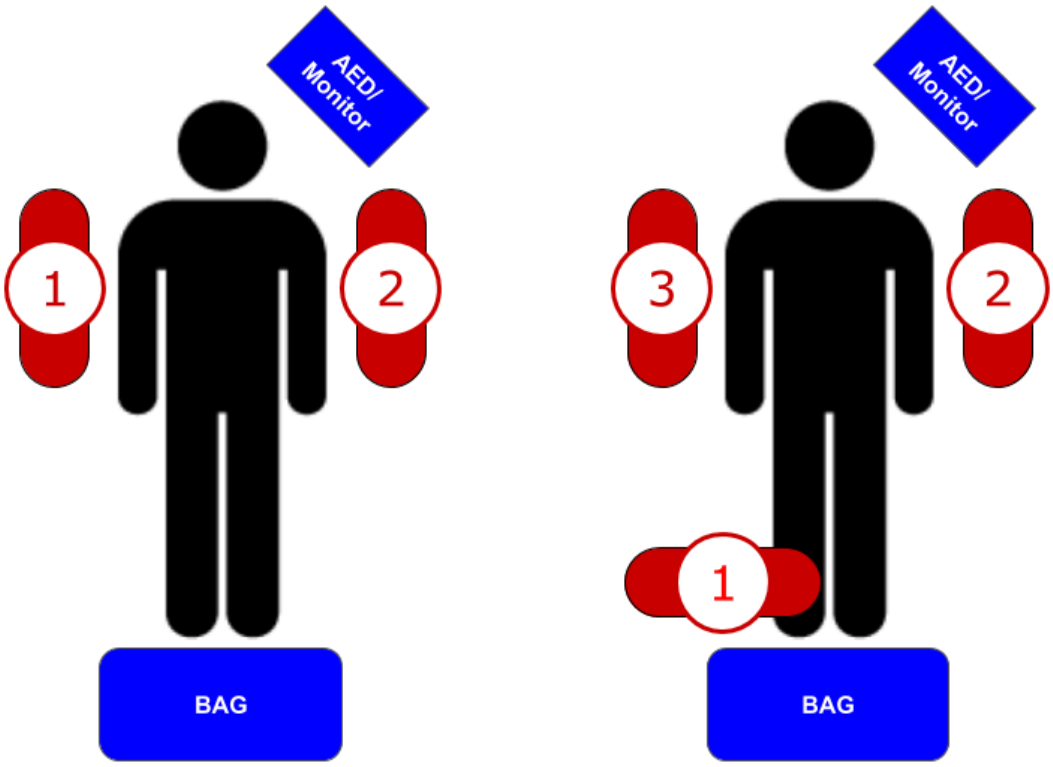
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If all criteria are not met, but resuscitation is felt to be futile due to non-survivable injuries OR scene restrictions [i.e. severe entrapment] contact medical control for termination decision.

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Q-R1 PIT-CREW CPR ROLES	From **C-P1**	First Responder EMT AEMT Paramedic

Two Provider High-Performance CPR Model



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Q-R1 PIT-CREW CPR ROLES	From **C-P1**	First Responder EMT AEMT Paramedic

2 Provider Overview

Lead Provider		Provider 2*
AEMT (BLS), or **Paramedic (ALS)**	**Time**	MFR, EMT, or AEMT
Identify “No Pulse” & **Start CPR**	0:00 - 2:00 <u>Goal</u>: AED/Monitor & Airway/O2	**(1) AED/Monitor:** place by head **(2) Defib Pads:** place and attach to AED/Monitor **(3) Place BIAD** and attach Ambu Bag *(4) Ventilate as able* @1:45 Charge Defib
Check Pulse	Pause	**AED/Shock**
(1) Place IO & start **NS Bolus** **(2) Ventilate** **(ALS) Epinephrine** #1 @3:45 Charge Defib	2:00-4:00 <u>Goal</u>: IO/Meds	**CPR**
Check Pulse	Pause	**AED/Shock**
Place Mechanical CPR Device *(if available)*		
CPR**	4:00 - 6:00 Goal: "Clean Up"	**(1) Monitors:** attach SpO2 and EtCO2 **(2) Ventilate** as able @+5:45 Charge Defib
Check Pulse	Pause	**AED/Shock**

Continue as per next page

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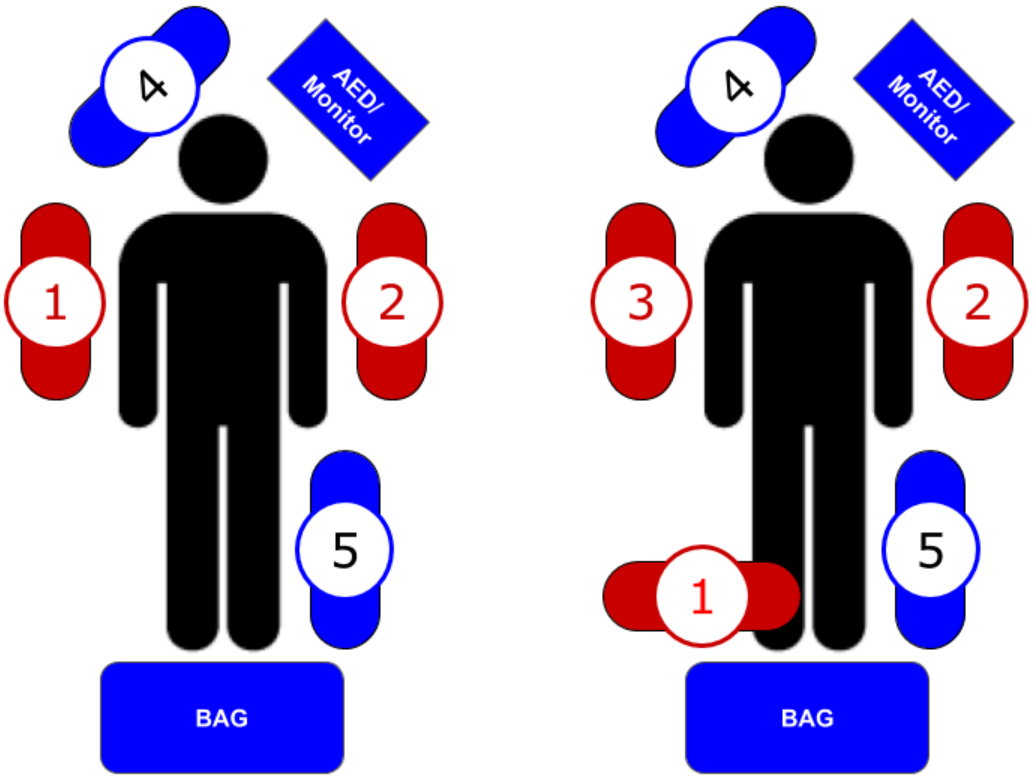
Q-R1 PIT-CREW CPR ROLES	From **C-P1**	First Responder EMT AEMT Paramedic

Continue Additional Resuscitation & Repeat as Necessary		
(1) Ventilate **(ALS) Epi doses (max 3)** **(ALS) Amio/Lido doses (max 2)** @+1:45 Charge Defib	Additional 0:00 - 2:00	**CPR**
Check Pulse	Pause	**AED/Shock**
CPR**	Additional 2:00 - 4:00	**(1) Ventilate** @+3:45 Charge Defib
Check Pulse	Pause	**AED/Shock**
Repeat Additional 0:00 - 4:00		
Consider Termination of Resuscitation per Guideline Or Transport to nearest appropriate facility		
Note**: If Provider 2 is not trained to perform the designated interventions, the Lead Provider should coordinate the transition of CPR duties (utilizing a **Third Provider* when available) to ensure interventions are completed within the designated time frame.		

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Q-R1 PIT-CREW CPR ROLES	From **C-P1**	First Responder EMT AEMT Paramedic

Four Provider High-Performance CPR Model



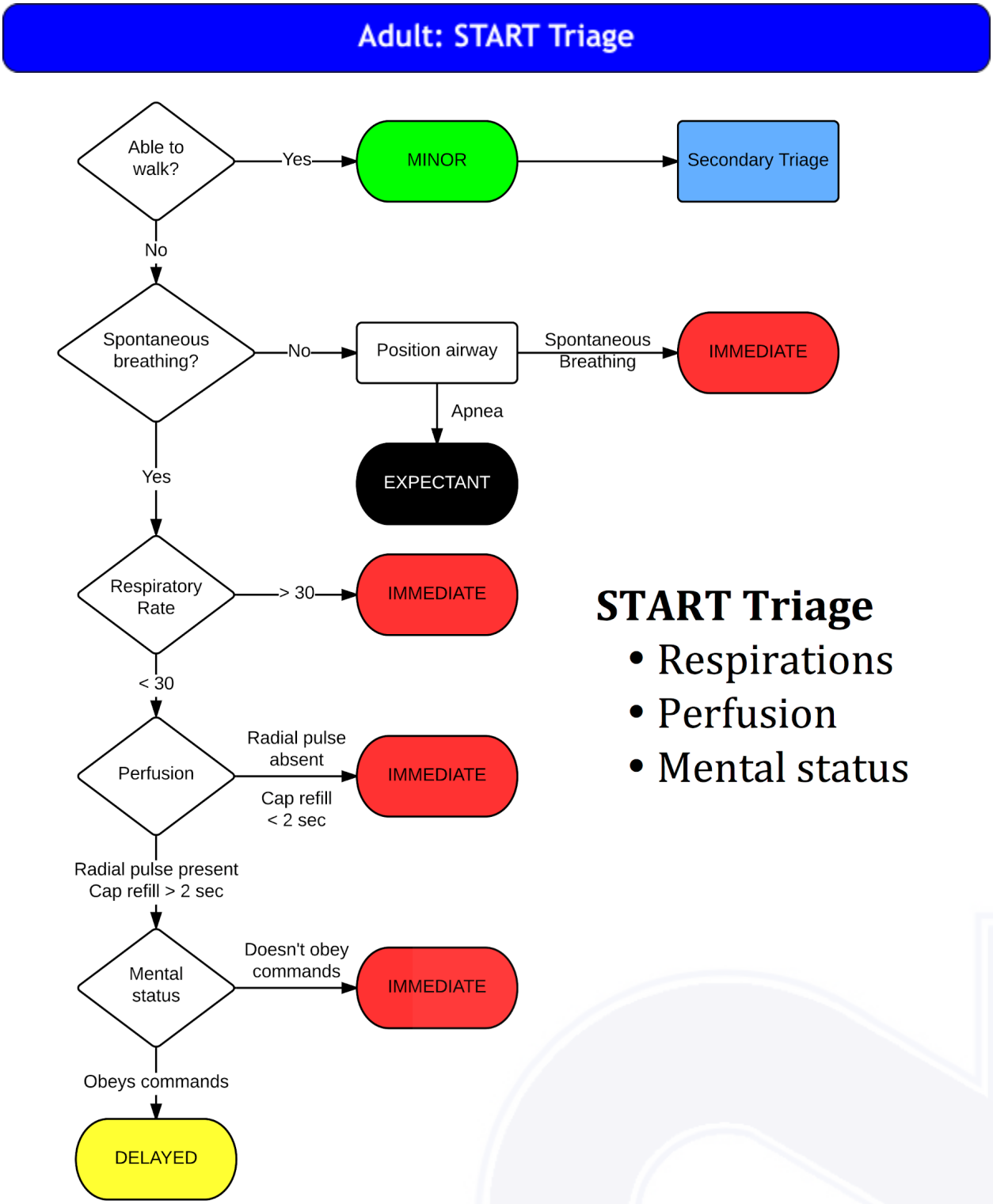
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Q-R1 PIT-CREW CPR ROLES	From **C-P1**	First Responder EMT AEMT Paramedic

4+ Person Procedure					
Provider 4	**Provider 1**	**Time**	**Provider 2**	**Provider 3**	**Provider 5**
IV/Med/Doc	Lead/Timer		CPR/Monitor	CPR/Lucas	Airway/BVM
EMS Paramedic	AEMT or Paramedic (Lead)		MFR, EMT, or AEMT	MFR #2 (if available)	EMS EMT or AEMT
	Identify "No Pulse" & **Start CPR**	0:00 - 2:00 Goal: AED/Monitor & Airway/O2	**(1) AED/Monitor** **(2) Defib Pads:** place and attach to AED/Monitor **(3) BIAD**/Ambu Bag *(4) Ventilate as able* @1:45 Charge Defib		**(1) Place BIAD** (2) Attach to 100% O2 and Ambu Bag *(3) Ventilate as able*
	Check Pulse	Pause (10 sec max)	**AED/Shock**		
(1) Place IO **(2) NS Bolus** **(3) Epinephrine** #1	(1) IO (2) NS Bolus (3) Ventilate (ALS) Epinephrine #1 @3:45 Charge Defib	2:00-4:00 Goal: IO/Meds	**CPR**		**(1) Ventilate**
	Check Pulse	Pause	**AED/Shock**		
Place Mechanical CPR Device *(if available)*					
Prep Meds	**CPR**	4:00 - 6:00 Goal: "Clean Up"	**(1) Monitors:** SpO2 & EtCO2 **(2) Ventilate** as able @+5:45 Charge Defib	**CPR**	**(1) Ventilate**
	Check Pulse	Pause	**AED/Shock**		
Continue Additional Resuscitation and Repeat as Necessary					
(ALS) Epinephrine **(ALS) Amio/Lido**	(1) Ventilate (ALS) Epinephrine (ALS) Amio/Lido @+1:45 Charge Defib	Additional 0:00 - 2:00	**CPR**		**(1) Ventilate**
	Check Pulse	Pause	**AED/Shock**		
	CPR	Additional 2:00 - 4:00	(1) Ventilate @+3:45 Charge Defib	**CPR**	**(1) Ventilate**
	Check Pulse	Pause	**AED/Shock**		
Repeat Additional 0:00 - 4:00					
After 20-30 minutes of Resuscitation, Consider Termination of Resuscitation per Guideline, or Transport to nearest appropriate facility					

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Q-R2 S.T.A.R.T. TRIAGE FLOWCHART		First Responder EMT AEMT Paramedic



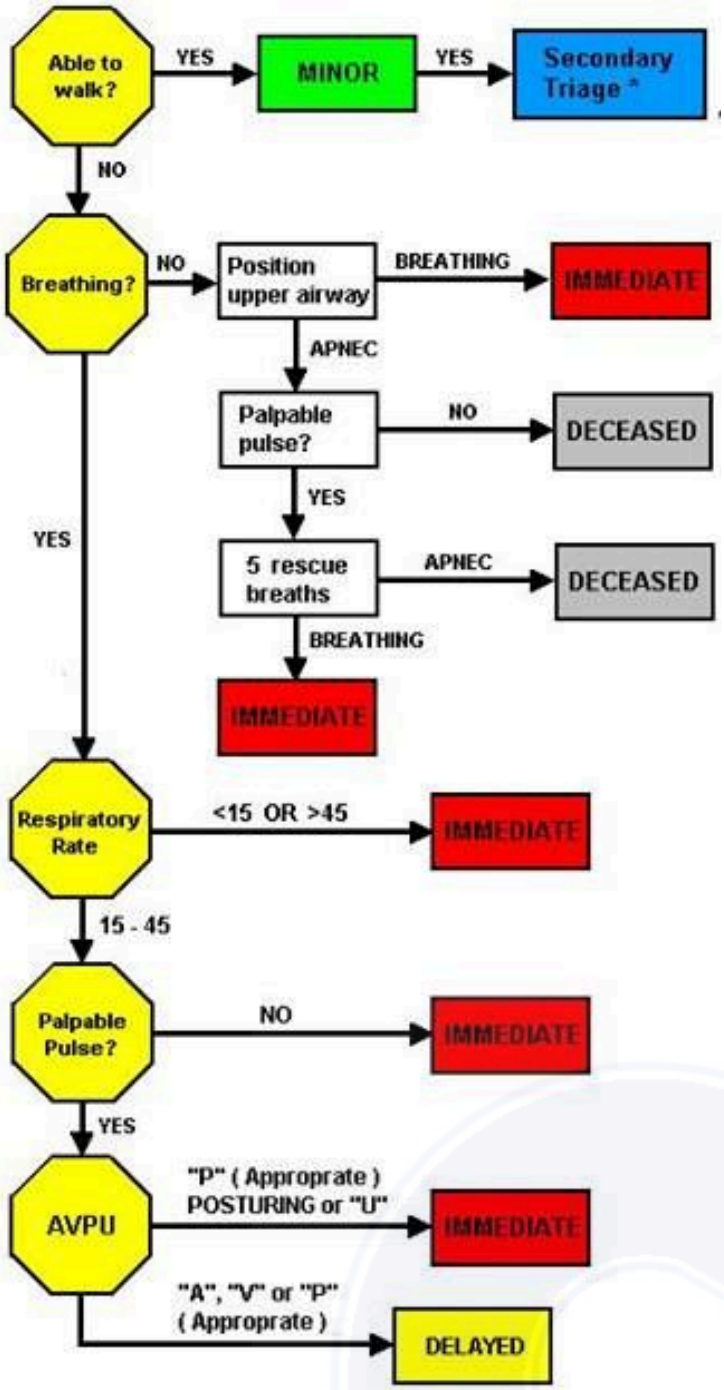
START Triage

- Respirations
- Perfusion
- Mental status

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Q-R2 S.T.A.R.T. TRIAGE FLOWCHART		First Responder EMT AEMT Paramedic

Pediatric: JUMP-START Triage



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Q-R3 C-STAT STROKE SCALE	From **M-R1**	First Responder EMT AEMT Paramedic

Cincinnati Stroke Triage Assessment Tool (C-STAT)

Injury	Positive if...	Value
Conjugate Gaze Deviation	**Gaze is acutely impared in one direction**	**2 Points**
Level of Consciousness	**Fails 1 or more of each of the following:** • **Ask age & current month** • **Ask to follow 2 commands: close eyes, open & close hands**	**1 Point**
Arm Weakness	**When held up, one or both arms drift down to bed within 10 seconds**	**1 Point**
Positive C-STAT = 2 or More		

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Q-R4 MEDICAL SHOCK DRIP CALCULATIONS	From **M-06**	First Responder EMT AEMT Paramedic

250 mL Vasopressor Drip Mixing Guide:

	Epinephrine 0.1 - 1 mcg/kg/min	Norepinephrine 0.1 - 2 mcg/kg/min	Dopamine 5 - 20 mcg/kg/min
Med/Dose:	1 mg	4 mg	400 mg
Volume (NS/D5W):	250 mL	250 mL	250 mL
Concentration:	**4 mcg/mL**	**16 mcg/mL**	**1600 mcg/mL**

Drops per minute (displayed in **BOLD**) on a 60-drop set
(*drops/second ALSO displayed in italics if > 60 gtt/min*)

	Epinephrine 4 mcg/mL		**Norepinephrine (Levophed)** 16 mcg/mL		**Dopamine** 1600 mcg/mL	
Broselow Color/ Weight (kg)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)
Gray (3-5)	**6**	**60**	**1.5**	**30**	**0.8**	**3**
Pink (6-7)	**11**	**105** (*1.7*)	**2.6**	**52.5**	**1.3**	**5**
Red (8-9)	**14**	**135** (*2.2*)	**3.5**	**67.5** (*1.1*)	**1.7**	**6.7**
Purple (10-11)	**17**	**165** (*2.7*)	**4**	**82** (*1.4*)	**2**	**8.2**
Yellow (12-14)	**21**	**210** (*3.5*)	**5**	**105** (*1.7*)	**2.6**	**10.5**
White (15-18)	**27**	**270** (*4.5*)	**7**	**270** (*4.5*)	**3.4**	**13.5**
Blue (19-23)	**35**	**345** (*5.8*)	**9**	**172** (*2.8*)	**4.3**	**17**
Orange (24-29)	**44**	**435** (*7.2*)	**11**	**218** (*3.6*)	**5.4**	**22**
Green (30-36)	**54**	**540** (*9*)	**14**	**270** (*4.5*)	**7**	**27**
Small Adult (50)	**75** (*1.2*)	**750** (*13*)	**19**	**375** (*6.2*)	**10**	38
Large Adult (100)	**150** (*2.5*)	**1500** (*25*)	**38**	**750** (*13*)	**19**	75 (*1.2*)

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Q-R4 MEDICAL SHOCK DRIP CALCULATIONS	From **M-06**	First Responder EMT AEMT Paramedic

500 mL Vasopressor Drip Mixing Guide:

	Epinephrine 0.1 - 1 mcg/kg/min	Norepinephrine 0.1 - 2 mcg/kg/min	Dopamine 5 - 20 mcg/kg/min
Med/Dose:	1 mg	4 mg	400 mg
Volume (NS/D5W):	500 mL	500 mL	500 mL
Concentration:	**2 mcg/mL**	**8 mcg/mL**	**800 mcg/mL**

Drops per minute (displayed in **BOLD**) on a 60-drop set
(*drops/second ALSO displayed in italics if > 60 gtt/min*)

	Epinephrine 2 mcg/mL		**Norepinephrine (Levophed)** 8 mcg/mL		**Dopamine** 800 mcg/mL	
Broselow Color/ Weight (kg)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)
Gray (3-5)	**12**	**120** (*2*)	**3**	**60**	**1.5**	**6**
Pink (6-7)	**21**	**210** (*3.5*)	**5**	**105** (*1.8*)	**2.5**	**10**
Red (8-9)	**27**	**270** (*4.5*)	**7**	**135** (*2.3*)	**3.5**	**13**
Purple (10-11)	**33**	**330** (*5.5*)	**8**	**165** (*2.6*)	**4**	**16**
Yellow (12-14)	**42**	**420** (*7*)	**11**	**210** (*3.5*)	**5**	**21**
White (15-18)	**54**	**540** (*9*)	**14**	**270** (*4.5*)	**7**	**27**
Blue (19-23)	**69** (*1.1*)	**690** (*11.5*)	**17**	**345** (*5.8*)	**9**	**34**
Orange (24-29)	**87** (*1.4*)	**870** (*14.5*)	**22**	**435** (*7.3*)	**11**	**43**
Green (30-36)	**108** (*1.8*)	**1080** (*18*)	**27**	**540** (*9*)	**14**	**54**
Small Adult (50)	**150** (*2.5*)	**1500** (*26*)	**37**	**750** (*13*)	**19**	75 (*1.2*)
Large Adult (100)	**300** (*5*)	**3000** (*50*)	**75** (***1.2***)	**1500** (*25*)	**38**	150 (*2.5*)

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First Responder
EMT
AEMT
Paramedic

UNIVERSAL CARE

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TOC/NOTES: UNIVERSAL CARE		First Responder EMT AEMT Paramedic

Table of Contents: Universal Care

GUIDELINES

1-01 Universal Care
1-02 Initial Assessment & Exam
1-03 IV Protocol
1-04 Glucose Check/Management
1-05 Continuous/12-Lead ECG
1-06 Spinal Immobilization
1-07 Deviation From Standing Orders

PROCEDURES

1-P1 EZ-IO Placement
1-P2 Helmet/Equipment Removal
1-P3 Indwelling Port Access
1-P4 OG Tube Insertion

1-P5 Ultrasound: Basic Cardiac
1-P6 Ultrasound: Peripheral IV Placement
1-P7 Ultrasound: E-FAST Examination

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1-01 UNIVERSAL PATIENT CARE/EVALUATION		First Responder EMT AEMT Paramedic

STOP **Do NOT treat patients currently under the care of an acute care facility (ED, ICU, hospital floor, etc.). Provide immediate, life-saving interventions, but otherwise please contact the facility staff as needed.**

Determine Patient/No-Patient — Z-01
Determine Capacity — Z-02

Demonstrate Professionalism/Courtesy — Z-07
Scene/Crew Safety and PPE — Z-08
Appropriate Equipment to Patient Side

FR	Initial Assessment/Physical Exam Adult & Pediatric Assessment Procedures Vital Signs • *Always* blood pressure, pulse rate, respiratory rate and LOC/GCS • Pulse oximetry/$ETCO_2$ as appropriate	1-02

Consider in the appropriate clinical setting:

FR	Airway/O_2 Maintenance Protocol	A-01
FR	Spinal Immobilization Protocol	1-06
A	Glucose Check/Management Protocol	1-04
A	IV Protocol	1-03
P	Continuous/12-Lead ECG	1-05

Goto the appropriate Clinical Guideline(s) — TOC

Contact **Online Medical Control** if any question on evaluation/treatment

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1-01 UNIVERSAL PATIENT CARE/EVALUATION		First Responder EMT AEMT Paramedic

Use of Guidelines:

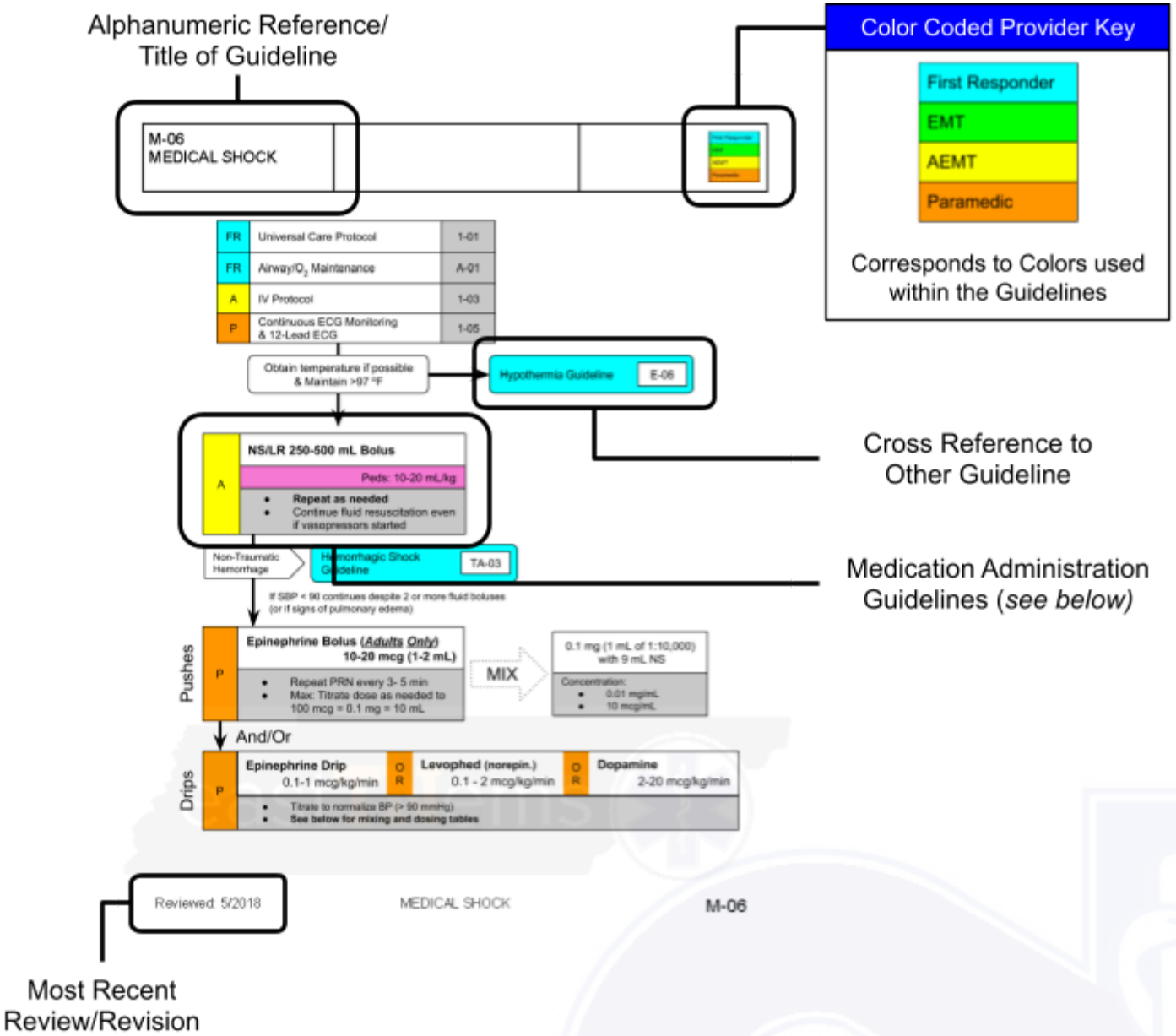
- Patient care is limited to acts within the provider's scope of practice (as designated by the State of Tennessee) and those defined within these guidelines.
- These Guidelines generally should be followed in a top to bottom fashion, but it may be necessary to change the sequence or even omit a treatment due to patient condition, the availability of resources, medications or equipment, or other circumstances.
- Always document your reason for any deviations from these guidelines.
- When treating any patient in the pre-hospital setting use common sense, and always keep the best interest of your patient in mind.

Medical Control:

- These guidelines provide standing orders for **"Offline" Medical Control**. They allow the EMS provider to utilize skills within their scope of practice to treat patients with medications, equipment, procedures, or other interventions to stabilize potentially life or limb-threatening illnesses and injuries.
- "Online" Medical Control consists of discussion with:
    - The Medical Director (or Assistant/Associate Medical Directors) representing the EMS providers immediate affiliated agency (i.e. whose truck you are on).
    - An Emergency Physician from either the Destination Facility of the transporting crew, or an otherwise predetermined central medical control facility.
    - A (verified) Physician On-Scene:
        - Who is accompanying the patient to the destination facility, or
        - Whose orders are verified by one of the two prior "Online" Physicians.
- If there is any question on patient evaluation, treatment or destination, please contact online medical control as soon as possible.
- For any drug administration, use of equipment or procedures outside these Guidelines, the EMS Provider must receive authorization from Online Medical Control.
- Whenever possible, any discussions with online medical control should be patched through dispatch so that they may be recorded.

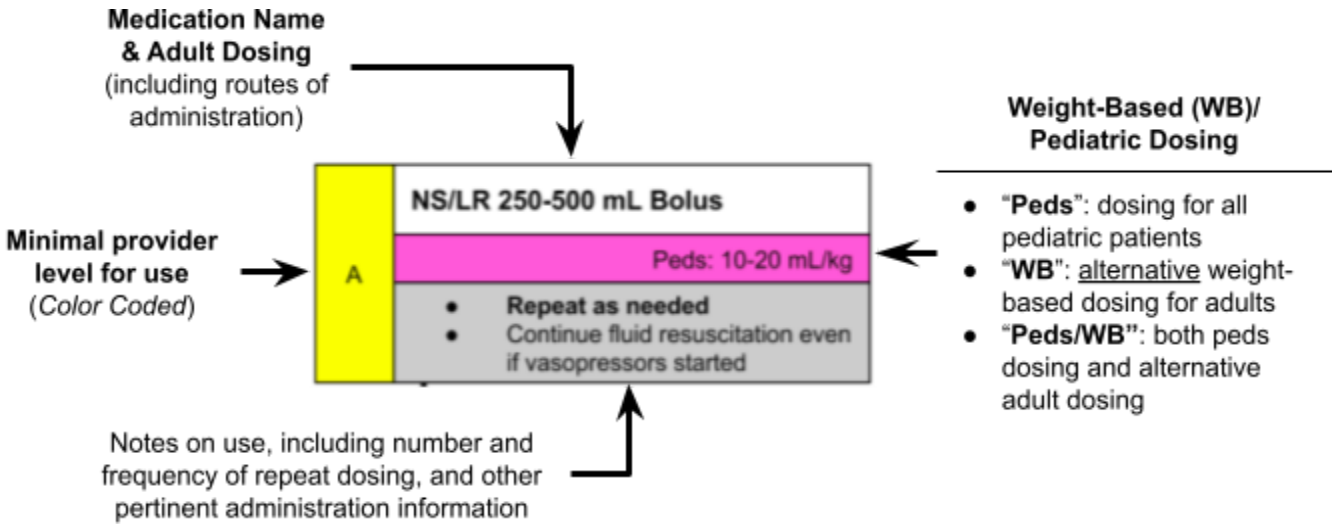
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Layout of Guidelines:



(continued below)

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Pediatric Patients

- For the purposes of these Guidelines, "pediatric patients" are those who are < 37 kg or who fit on the Broselow Tape (or similar measuring device).
- The use of this length based assessment tape is **required** for all pediatric patients as a guide for medications and equipment sizes. This information (*length-based color code*) will be passed along to the receiving facility and documented in the PCR.
- In general, the indications and situations for the use of medications and procedures is similar between adults and children.
- Pediatric Drug Doses are indicated by a PINK BOX beneath the standard adult dose but should be verified by the Broselow Tape, Pedi-Sleeve, or other similar agency-approved tool.
- The EMS provider is encouraged to consult with On-Line medical control for the treatment of pediatric patients whenever possible.
- If in doubt about drug dosage in pediatric patients, contact On-Line Medical Control.

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1-01 UNIVERSAL PATIENT CARE/EVALUATION		

Scene Safety/Management

- For each and every call, the first priorities are provider scene safety and hazardous material/body substance isolation precautions.
- In potential crime scenes, any movement of the body, clothing, or immediate surroundings should be documented and the on scene law enforcement officer should be notified of such.
- Always perform the most appropriate treatment for the patient under the best condition possible. This may mean:
    - Performing most work on scene and then transporting, or
    - Moving quickly to the ambulance and transporting rapidly with care initiated in route.
- Any scene delays need to be documented in Patient Care Record (PCR) (i.e. extrications, arrest, carry outs, etc.)

Provider Levels

- The highest trained/licensed provider (generally the Paramedic) will be in charge and is responsible for all of the actions as it relates to care provided on-scene or in transport..
- The Emergency Medical Responder (EMR) or “Medical First Responder” (MFR) will function under the current guidelines as stated in the AHA-BLS Healthcare Provider text. They shall also be responsible for other duties as assigned within their Scope of Practice by the AEMT or the Paramedic.
- EMTs and AEMT’s are expected to perform their duties in accordance with the State of Tennessee statutes and rules of Tennessee Emergency Services, and will assist with any request for patient care or maintenance of the unit in their scope of practice as directed by a Paramedic.
- The Paramedic will work within their scope of practice and as defined by these Guidelines, dependent on available equipment and medications
- Paramedics en-route to the scene are not authorized to issue orders.

Transport

- All patients should be transported to:
    a. The facility requested by the patient/surrogate if they maintain decision making capacity, regardless of the facility’s capabilities.

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b. The most appropriate facility that has a level of care commensurate with the patient's condition. Certain emergencies will require transport to a facility with specialized capability.

- Upon arrival at the receiving hospital, all treatment(s) initiated in the field will be continued until hospital personnel have fully assumed patient care.

Transfer of Care/Encoding Report

- It is the responsibility of the most qualified provider caring for the patient to ensure transmission of all aspects of the patient assessment and care to the responding transport unit, to the receiving facility's personnel, or to Medical Control, including the following minimum information:
  - Patient's age and chief complaint or injuries
  - Is the patient stable or unstable, including complete vitals and LOC/GCS.
  - Interventions performed.
  - Provide other information as requested.
- For patients who may require an emergent stabilizing intervention upon arrival to the ED (STEMI, Stroke, etc), notify the receiving facility as soon as possible.
- If the attending provider is unable to call due to patient condition, their partner should make an initial call with as much information about the patient condition as possible.

Patient Care Report (PCR)

- Each patient care contact will be recorded on the EMS patient care report (PCR) as completely and accurately as is practical.
- At minimum, an abbreviated copy of the patient out-of-hospital evaluation(s) and treatment(s) will be given to the emergency department personnel prior to departing from the health care facility.
- A complete copy of the PCR should be forwarded to the receiving facility within no more than 24 hours of patient arrival.
- All EMS Personnel involved in an event are responsible for reviewing all documentation related to patient care and signing the PCR in the required manner
- The highest trained/licensed provider has the ultimate responsibility to ensure that all records and reports are properly completed.

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OVERALL APPROACH TO PATIENT MANAGEMENT

1. Scene Size-Up
2. Primary (Initial) Assessment
3. Provide Critical Interventions
4. Secondary Assessment
5. Vital Signs
6. Additional Interventions
7. Reassess & Document

1

SCENE SIZE-UP (see Scene Safety Guidelines [Z-06])

- Scene safety (emergency services, patient(s), and bystanders)
- Environmental hazards assessment
- Need for additional resources (police, rescue, HazMat, rescue, etc.)
- Patient/caregiver interaction, including appropriate PPE.
- Take reasonable steps to protect patient privacy and modesty

ALWAYS DOCUMENT:

- Number of patients/casualties and their disposition/transfer to other medical personnel.
- Additional resources/personnel on the scene or called to the scene.
- Use of personal protective equipment (PPE) used above and beyond standard precautions.
- Possible Crime Scene: document ANY movement of patients or objects in the environment.

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2

PRIMARY (INITIAL) ASSESSMENT

- General impression/appearance of patient,
- Patient's chief complaint, circumstances and/or mechanism of injury, and
- Rapid evaluation of the patient's airway, breathing, and circulation

1st IMPRESSION (Appearance)	• Alertness/interactiveness [AVPU scale] • Skin [pallor, mottling, cyanosis, etc.] • Peds: TICLS [tone, interactiveness, consolability, look/gaze, & speech/cry]
AIRWAY	• Face/neck trauma or swelling • Foreign body, secretions, blood, vomitus, etc.
BREATHING	• Work of breathing [use of accessory muscles, body positioning, irregular or gasping respirations] • Breathing/Airway sounds [stridor, wheezing, etc.]
CIRCULATION	• Circulation adequacy [pulses, capillary refill, etc.] • Signs of hemorrhage
DISABILITY	• Evaluate responsiveness as appropriate for age/functional level • Assess focal neurologic deficits
EXPOSURE	• Deformity • Obvious injuries

ALWAYS DOCUMENT:

- Chief Complaint/Reason for 911 Activation
- Narrative with

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- History of Present Illness (HPI)
- Mechanism of Injury, and/or
- Circumstances Around 911 Activation

PEDS

COLOR CODE using Broselow, PEDIA, or similar tape:

- Any patient requesting a medical evaluation that is too large to be measured with a Broselow/PEDIA Tape (or ≥ 37 Kg) is considered an adult.
- **ALWAYS DOCUMENT:**
  - Weight or length used to determine color category
  - **AND** Color category used in treatment

3

CRITICAL INTERVENTIONS (per the Appropriate Guidelines)

Assess the need for and complete any critical interventions.

4

SECONDARY ASSESSMENT

Perform a focused history based on patient's chief complaint:

"AMPLE" History	• Allergies • Medications • Past Medical/Surgical/Social History • Last meal • Events leading up to injury or illness

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Pain Assessment ("PQRST")	• Provocative/Palliative (modifying) factors • Quality • Radiation/Region (location) • Severity (0-10) • Time (onset, duration, etc.)

Complete a secondary exam as directed by patient complaint:

- HEENT
- Cardiovascular
- Respiratory
- Abdominal
- Extremities
- Neurological

5

VITAL SIGNS

- **Always Document** (**MINIMUM REQUIRED**):
  - o Blood pressure (initial measurement should be taken manually)
  - o Pulse rate (Compare with continuous ECG if available)
    - If regular, check for 15 sec & multiply by 4
    - If irregular, check for full 60 sec
  - o Respiratory rate
    - If regular, check for 15 sec & multiply by 4
    - If irregular, check for full 60 sec
  - o Mental status
    - AVPU and/or GCS
    - Mental Eval: SI, HI, psychosis sxs, etc.
  - o Pain & Severity (pain scale used & score)
- Also Consider:
  - o *Temperature* (if hx of fever, or hypo/hyperthermia)

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- *Continuous ECG* (once initiated, cannot be removed until care transferred at destination)
- *Pulse Oximetry* (if signs or symptoms of respiratory distress)
- *Capnography* (if signs or symptoms of respiratory distress or unexplained altered level of consciousness)
- *Orthostatic BP* (lying, sitting, standing)

- **Always document at least 2 measurements (MINIMUM REQUIRED):**
  - Initial vitals - measured at rest (not accurate otherwise)
  - Vitals on or just prior arrival to receiving facility
- Additional repeated vitals:
  - If transport or scene time > 15 minutes
    - Repeat every 5 minutes in unstable patients
    - Repeat every 15 minutes in stable patients
  - If medications or other interventions (i.e. intubation) are performed that would reasonably affect airway, breathing or hemodynamic status, vitals should be documented before and after the treatment.
  - If clinical appearance or vitals change, document vitals if immediate intervention is not needed.
- Always document any reasons for not recording vitals (i.e refusal).

6 TREAT CHIEF COMPLAINT

See Table of Contents [TOC] for appropriate guideline(s)

7 REASSESS & DOCUMENT

- Maintain an on-going assessment throughout transport
- Evaluate and document:

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  - Response to (or possible complications of) interventions,
  - Need for additional interventions, and
  - Evolving patient complaints/conditions.
- Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.
- Attach ECG (strips and 12-lead) to the PCR
- Attach Facesheet from destination facility to the PCR

PEDIATRIC POINTS:

- Use infant or child/pediatric BP cuff sizes when appropriate and available
  - 50th percentile BP estimate = (age in years x 2) + 90 mm Hg
  - Hypotension when BP ≤ 70 mmHg + (age in years x 2) + 70 mm Hg
- BP doesn't drop until about 30% of circulating blood volume is lost
- Tachycardia is usually the most common sign of compensated shock in children
- If obtaining a BP is not possible:
  - Evaluate for age appropriate heart rate and
  - Assess perfusion (evaluate for decreased peripheral/central pulses and cool/mottled extremities with decreased capillary refill)

DOCUMENTATION STANDARDS:

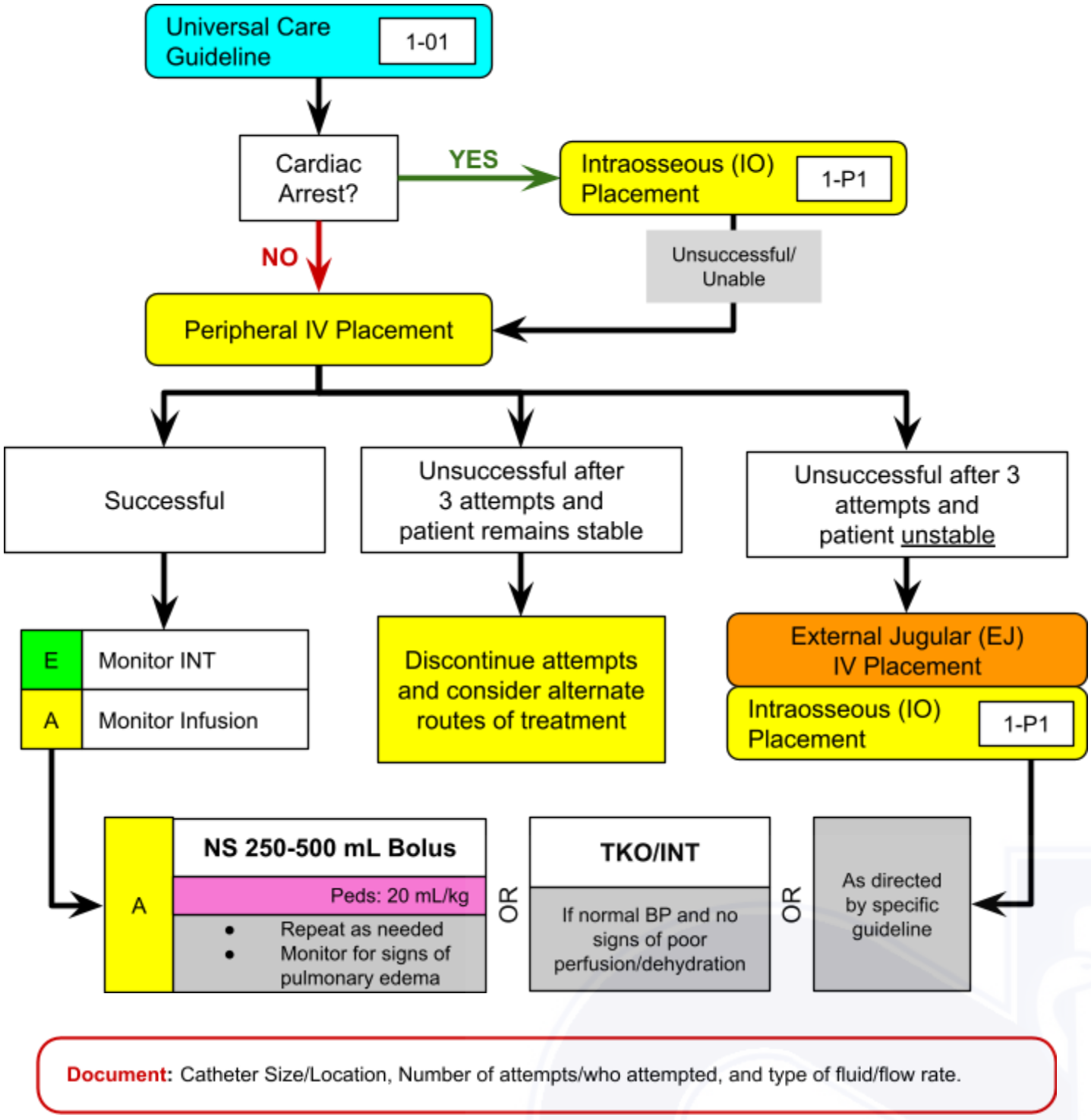
- Be truthful, accurate, objective, pertinent, legible, and complete.
  - Use appropriate spelling and grammar.
  - Use only approved medical abbreviations (refer to “Common Medical Abbreviations [**Z-R2**]).
- Summarize all assessments, interventions and the results of the interventions with appropriate detail so that the reader may fully understand and recreate the events.
  - Reflect the patient’s chief complaint and a complete history or sequence of events that led to their current request or need for care.

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  - Contain a detailed assessment of the nature of the patient's complaints and the rationale for that assessment.
  - Reflect the initial physical findings, a complete set of initial vital signs, all details of abnormal findings considered important to an accurate assessment and significant changes important to patient care.
  - Reflect ongoing monitoring of abnormal findings.
- List all treatments and responses to treatments in chronological order.
  - For drug administrations, include the drug name, drug concentration, volume or dosage administered, route, administration time, and response.
  - For cardiac arrests, the initial strip, ending strip, pre and post defibrillation, pacing attempts, etc. should be attached.
- Medical Control: Document clearly any requested orders, whether approved or denied and MD name/location.
- Include an explanation for why an indicated and appropriate assessment, intervention, or action prescribed by the Clinical Guidelines did NOT occur.
- Once the PCR is completed, original document cannot be modified for any reason. Any changes required to correct a documentation error or for clarification shall be recorded in an addendum.

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1-03 IV PROTOCOL		First Responder EMT AEMT Paramedic



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1-03 IV PROTOCOL		First Responder EMT AEMT Paramedic

INDICATIONS FOR IV ACCESS:

- IV Medications are required as dictated by one or more clinical guidelines.
- IV fluid administration is required based on patient condition or clinical guideline.
- The patient's condition is felt to be likely to deteriorate en route to a point where medication or fluid administration would be necessary.
- Any other situation where the AEMT/Paramedic feel like IV access is beneficial.
- In situations where prehospital IV placement may expedite patient care at the destination facility.

- Routine use of IV placement for INT/TKO fluids is discouraged, and should never delay transport to the emergency department.
- Alternative routes of medication administration (i.e. IN or IM) may be used in lieu of or prior to placement of an IV if medications are being used for symptomatic relief (e.g. pain medications)

KEY POINTS:

- AEMT/Paramedics have standing orders for the insertion of an IV/INT under the following guidelines:
  - The patient must have some indication that they are or could become unstable
  - IVs should *not* be attempted in an extremity with an injury or an existing shunt/fistula, or on the same side as a prior mastectomy <u>if</u> at all possible
  - Upper extremity IV sites are preferable, but lower extremity IV sites may be attempted if necessary (contraindicated with peripheral vascular disease or diabetes)
  - Paramedics, when properly equipped and trained, may utilize indwelling access ports such as Port-A-Cath in an **EMERGENCY ONLY** (as described in **1-P3**, Indwelling Port Access)
  - In the cardiac arrest patient, <u>any</u> pre-existing dialysis shunt or external venous catheter may be used.
- IV fluid administration appropriate for patient's condition or as specified per guidelines:
  - If patient is hypotensive or shows signs of poor perfusion, give a bolus (10-20 mL/kg) of fluid (Normal Saline) AND consider placing a second large-bore IV
  - If patient's BP/perfusion is normal, convert to saline lock (INT) or run IV TKO (To Keep Open; indicates a flow rate of approximately 50 mL/hr)

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- Medication administration:
  - Will be followed by a minimum of 10cc of fluid to flush the catheter.
  - Vasoactive medications/drips should be infused through large bore IV catheter in a large, proximal vein (e.g. antecubital).
  - Any prehospital fluids or medications approved for IV use, may be given via intraosseous (IO) line.

QI Review Parameters:

Peripheral IV Placement

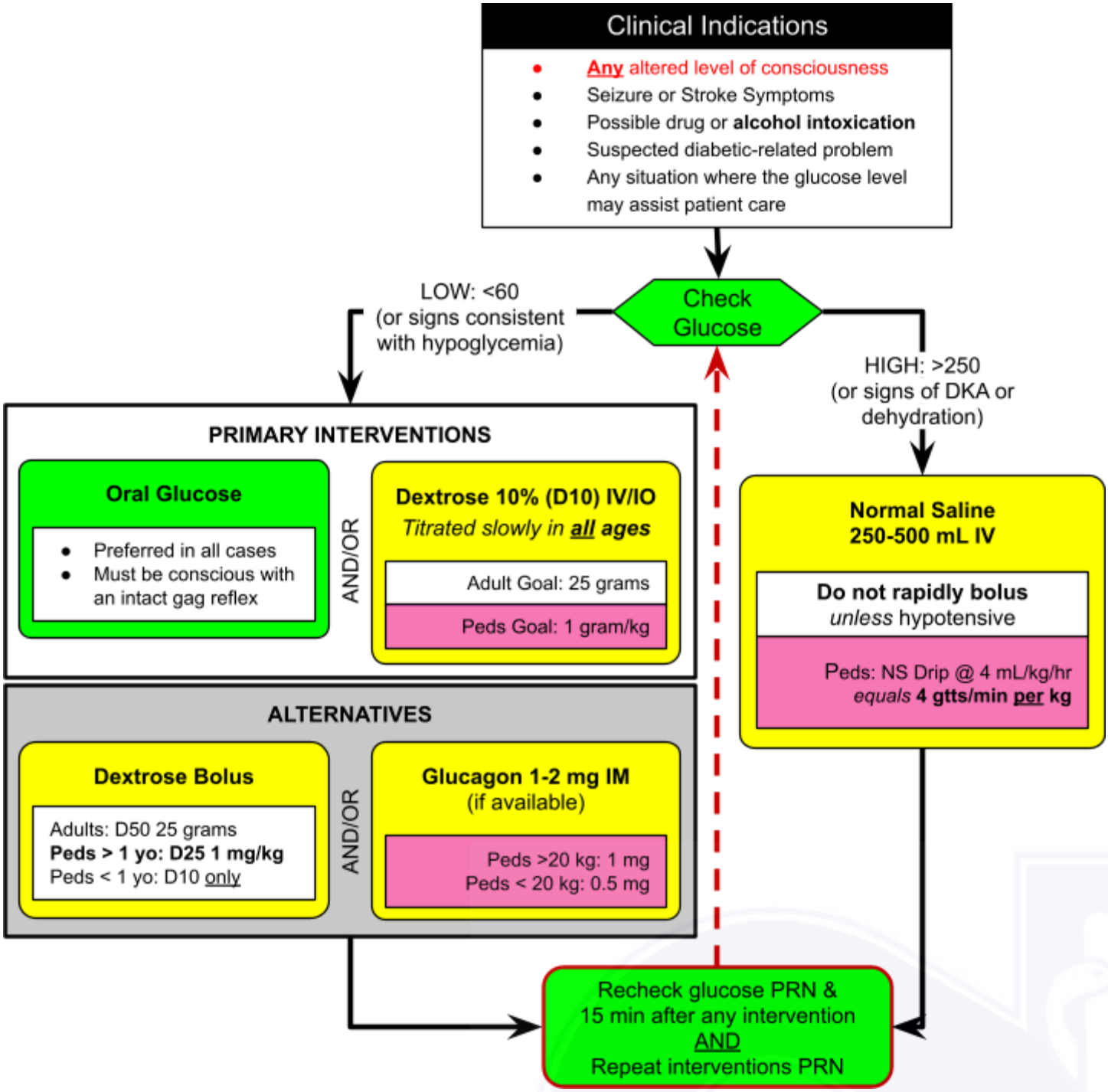
1. Was IV/IO access indicated?
2. Was site, provider and success documented appropriately?
3. If IV was unsuccessful, was appropriate alternative access attempted? (EJ, IO, etc.)
4. Was appropriate fluid administration provided? (Fluid bolus, TKO/INT, etc.)

Intraosseous (IO) Placement

1. Was IO placement indicated?
2. Was appropriate site and needle size used?
3. Was confirmation of appropriate placement documented? (“Marrow aspirated”, “No swelling”, etc.)
4. If patient (at all) responsive, was lidocaine administered?

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1-04 GLUCOSE CHECK/ MANAGEMENT	EMT may check fingerstick glucose if service specific training and check-off is provided	First Responder EMT AEMT Paramedic



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1-04 GLUCOSE CHECK/ MANAGEMENT	EMT may check fingerstick glucose if service specific training and check-off is provided	First Responder EMT AEMT Paramedic

Procedure (GLUCOSE CHECK):

1. Gather and prepare equipment.
2. Cleanse site with chlorhexidine or other appropriate antiseptic wipe.
3. Place the correct amount of blood on the reagent strip or site on glucometer per the manufacturer's instructions.
    a. If sample taken from venous (i.e. IV) stick is not consistent with clinical symptoms, recheck using a finger stick or heel stick (capillary blood) sample.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.

NOTE: If glucometer does not function, returns an error, or returns a reading not consistent with clinical symptoms/presentation, perform quality assurance test immediately after the call and notify a supervisor as appropriate.

REFUSAL OF CARE [*also see **Z-03,** Non-Transport/Refusal of Care*]:

- While medically (and legally) competent adults have the right to refuse transport, in the following situations patients should strongly be encouraged to be evaluated in an ED:
    - Unexplained hypoglycemia
    - Taking oral diabetic medications
    - Unable to take food by mouth
    - No other competent adult available to monitor the patient

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1-04 GLUCOSE CHECK/ MANAGEMENT	EMT may check fingerstick glucose if service specific training and check-off is provided	First Responder EMT AEMT Paramedic

KEY POINTS HYPOGLYCEMIA:

- It is safer to assume and treat for hypoglycemia (than euglycemia or hyperglycemia) if unable to verify glucose or doubt of validity of reading exists.
- Always consider other causes of altered mental status [***M-04***] in patients who do not respond (or only partially respond) to treatment of hypoglycemia: Stroke/CVA [***M-08***], Seizure [***M-09***], Sepsis/infection [***M-06***], Overdose/Intoxication [***E-03***], etc.)
- Do not let alcohol or other intoxicants confuse the clinical picture. Alcoholics do not have reserves to maintain normal glucose levels and frequently develop hypoglycemia.

KEY POINTS HYPERGLYCEMIA:

- Patients often complain of polyuria (excessive urination), polydipsia (excessive thirst), weight loss, fatigue/weakness, nausea/vomiting, and nonspecific abdominal pain.
- Because of the (often substantial) volume depletion, hyperglycemia is first treated with fluids which often will begin to normalize blood glucose.
- **Diabetic Ketoacidosis (DKA)**:
  - Inability of the cells to take up/use glucose results in the release of counterregulatory hormones (epinephrine, cortisol, glucagon, growth hormone) ultimately resulting in worsened hyperglycemia and acidosis.
  - Generally begins with **abdominal pain and vomiting**, progressing to **altered mental status and hyperventilation** due to the acidosis.
  - PEDIATRICS: susceptible to developing cerebral edema while treating DKA. Should receive a maintenance infusion of saline & *only bolus if hypotensive*.
- **Hyperglycemic Hyperosmolar NonKetotic Syndrome (HHNK):**
  - Typically occurs in elderly diabetic patients over days to weeks.
  - Results in volume depletion from an osmotic diuresis (due to glucose dumping into the urine and pulling in large amounts of free water.
  - Generally presents with altered mental status and profound dehydration.

QI Review Parameters:

1. {Pending}

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1-05 CONTINUOUS ECG/ 12-LEAD ECG	**EMT/AEMT**: 12 Lead EKGs may be **acquired** by any provider that has completed service-specific training.	First Responder EMT AEMT Paramedic

Continuous ECG Indications:

Continuous ECG Monitoring will be mandatory under the following conditions:

- Chest Pain or any clinical situation where symptoms are potentially consistent with an anginal equivalent and not explainable by another obvious cause.
- Cardiac Arrest
- Dysrhythmias or Palpitations (i.e. “heart racing”, “palpitations”, or “heart too slow”)
- Difficulty Breathing (with no obvious respiratory cause, i.e. asthma)
- Stroke
- Syncope
- Altered Mental Status not explained by a simple cause (e.g. hypoglycemia)
- Overdose

12-Lead ECG Indications:

12 Lead ECG’s should be performed as part of a complete assessment on patients with the following complaints:

- Chest Pain (or any clinical situation where symptoms are potentially consistent with an anginal equivalent):
  - Chest discomfort (e.g. “pressure”, “tightness” or “heartburn/reflux”)
  - Anginal equivalents: weakness, near syncope/dizziness, shortness of breath, etc.
  - Abdominal Pain above the naval (>40yo)
- **Post Cardiac Arrest - Obtain Prior to Transport**
- Palpitations (i.e. “heart racing”, “palpitations”, or “heart too slow”)
- Dysrhythmias (including post-cardioversion)
- Difficulty Breathing (with no obvious respiratory cause, i.e. asthma)
- Syncope
- Stroke
- Altered Mental Status
- Overdose
- Electrocution

STOP: Treatment decisions based on a 12-lead ECG or rhythm strip may only be made by a paramedic or online medical control.

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1-05 CONTINUOUS ECG/ 12-LEAD ECG	**EMT/AEMT**: 12 Lead EKGs may be **acquired** by any provider that has completed service-specific training.	First Responder EMT AEMT Paramedic

Transmission Procedure:

Make sure to include a name or other patient identifier on the transmission so that the 12 lead can be paired with the patient on arrival at the facility.

1. Transmit 12-lead if:
   a. Any questionable 12 leads (STEMI, dysrhythmias, etc.) should be transmitted to the receiving facility as soon as possible.
   b. Any 12 lead run by an EMT or AEMT.
2. Contact the receiving facility as soon as possible to:
   a. Verify receipt, and
   b. Receive any further instructions (e.g. EMT/AEMT verify STEMI).
3. Then, if EMT/AEMT attending and STEMI confirmed by online medical control:
   a. Notify dispatch and/or supervisor.
   b. Arrange ALS intercept if possible.
   c. Transport as quickly as possible to nearest appropriate facility capable of cardiac intervention (cath lab with PCI capabilities).
   d. Utilize helicopter transport if appropriate per **Air Transport Guideline [Z-06]**.

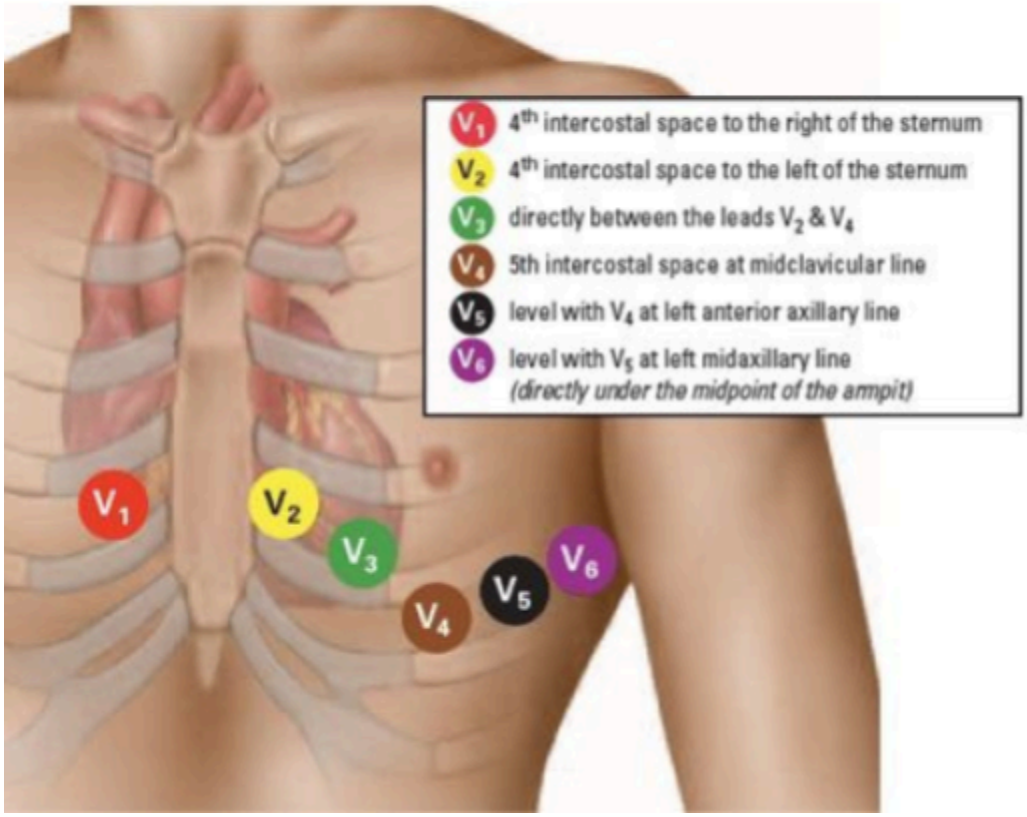
Documentation:

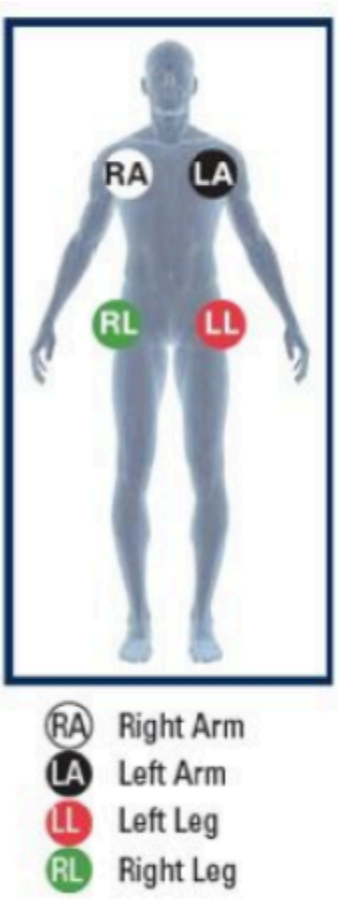
- Any patient placed on the cardiac monitor should have a rhythm strip printed and included in the Patient Care Report.
- 12-Leads and ECG strips will have the following information printed on the recording:
  - Name (or report number)
  - Age (if possible)
  - Unit number
  - Date
- The ECG strip should be reprinted (and recorded) for:
  - Any change in patient condition
  - Any change in cardiac rhythm
  - After any sort of cardiac intervention (i.e. medication or cardioversion)

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1-05 CONTINUOUS ECG/ 12-LEAD ECG	**EMT/AEMT**: 12 Lead EKGs may be **acquired** by any provider that has completed service-specific training.	First Responder EMT AEMT Paramedic

12-LEAD ECG LEAD PLACEMENT

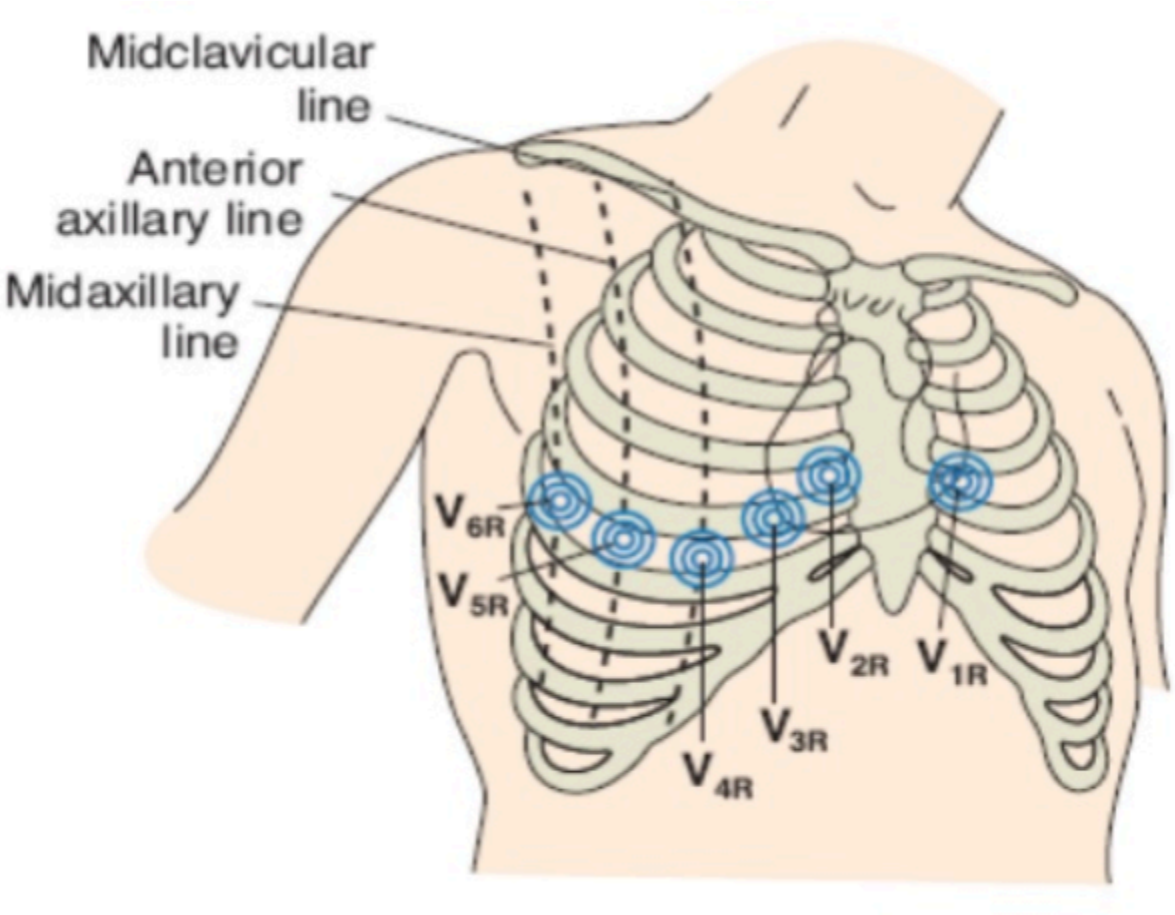




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1-05 CONTINUOUS ECG/ 12-LEAD ECG	**EMT/AEMT**: 12 Lead EKGs may be **acquired** by any provider that has completed service-specific training.	First Responder EMT AEMT Paramedic

RIGHT-SIDED 12-LEAD ECG LEAD PLACEMENT



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1-06 SPINAL IMMOBILIZATION		First Responder EMT AEMT Paramedic

Spinal Motion Restriction

- SMR describes the procedures and techniques used to care for patients with possible unstable spinal column injuries.
- Goals include utilizing alternative methods to achieve spinal protection in patients with possible spinal injury, while:
  - Reducing gross movement of the patient
  - Preventing the duplication of damaging mechanism to spine
  - Decreasing the risk of negative effects caused by traditional spinal immobilization

Indications/Procedure: See flowchart (*below*), and SMR procedure (*below*)

"Selective Spinal Immobilization"

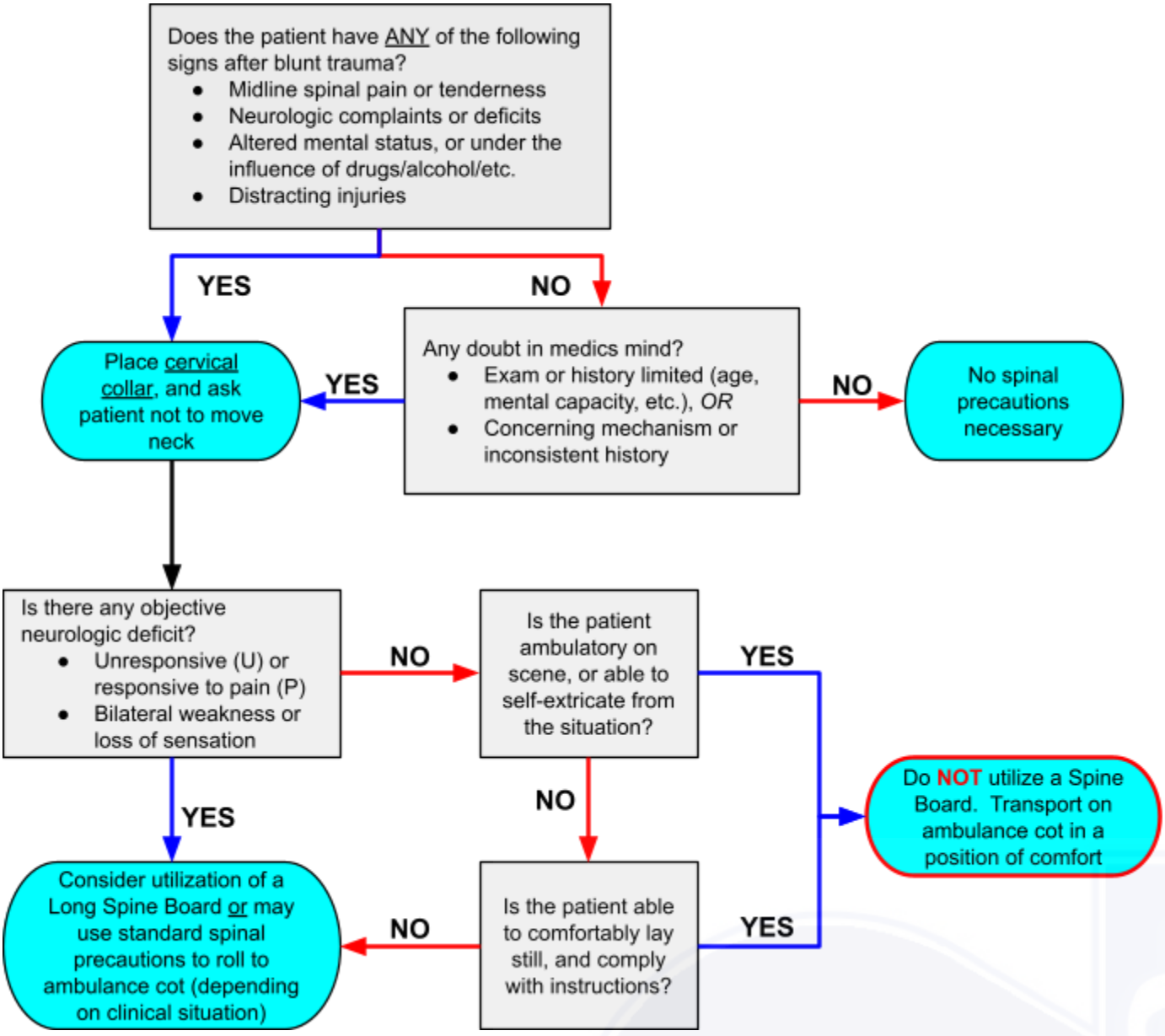
- The intent of this guideline is to decrease injury and discomfort to patients caused by unnecessary spinal immobilization and use of long spine boards and similar devices.
- Studies show that immobilizing trauma victims may cause more harm than good to the patient.
- Backboards should be avoided for spinal immobilization with conscious patients.
- Placing ambulatory patients on backboards is unacceptable.
- Use of the backboard is recommended in the event of ongoing or potential need for CPR.

This protocol is based on recommendations or position statements from:

- American College of Surgeons Committee on Trauma (ACS-COT) -- 2013
- National Association of EMS Physicians (NAEMSP) position statement -- 2014
- American College of Emergency Physicians (ACEP) position statement -- 2015
- National Athletic Trainers Association (NATA) -- 2015
- PE Fischer, et al. *Spinal Motion Restriction in the Trauma Patient - A Joint Position Statement*. Prehospital Emergency Care, DOI: 10.1080/10903127.2018.1481476 (from ACS-COT, ACEP and NAEMSP) -- 2018

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Immobilization Decision Flowchart



Essentially, if the patient is neurologically intact and can comply with commands, they may be extricated with a long spine board (*if needed*) and rolled onto a cot with a cervical collar in place.

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1-06 SPINAL IMMOBILIZATION		First Responder EMT AEMT Paramedic

SMR Procedure

First:
Restrict gross motion of the spine:
	• Alert and cooperative patients should be allowed to self-limit motion, and are encouraged to self-extricate if appropriate.
	• Ambulatory patients should be allowed to sit onto the stretcher, and a standing take-down should never be performed.
	• If uncooperative or unable to control body/self-extricate, the patient should be moved by EMS personnel:
	  ○ Standard spinal precautions apply (i.e. holding c-spine, multiple provider lifts, etc.) to limit distraction of the spine.
	  ○ Use sheets, scoops, or other devices as needed.

Then: Apply cervical collar:	• Patients who are unable to tolerate cervical collar may benefit from soft collars, pillows, or other padding.

If a long spine board (LSB) or similar device is utilized for extrication:	• Patients should be unstrapped and log-rolled off the board as soon as possible, and transported on the ambulance stretcher.
	• May be left on LSB if:
	  ○ The device is being used for other (e.g. extremity) immobilization.
	  ○ If removal would delay transport of an unstable patient.
	• If any device is used, apply adequate padding to prevent tissue ischemia and increase comfort.

Finally: To achieve SMR:	• Place patient in position of maximum comfort on the gurney (supine, lateral, semi fowlers, or fowlers). • Tools to achieve position of comfort include, but are not limited to: pillows, children's car seat, scoop, vacuum mattress. • If patient experiences negative effects of with any of the SMR methods used, alternative methods should be considered.
Evaluation & Monitoring:	• Neurological exam documentation is MANDATORY, including serial exams and reevaluation after each transfer/intervention.

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1-06 SPINAL IMMOBILIZATION		First Responder EMT AEMT Paramedic

Removal from Long Spine Board (LSB)

- Backboards/scoops are useful tools for carrying non-ambulatory patients to a cot.
- Patients who do not need a backboard should be slid off of the device onto a cot.
- If the immobilization process is initiated prior to the arrival, the highest level of provider should reassess the patient and STOP and perform spine injury assessment to determine the best course of action.
- Determination that immobilization devices should be used or removed if already placed should be made by the highest level provider on scene.

Notes:

- Backboards have not shown to be of any benefit for spinal injuries, and may cause harm.
    - There is evidence that backboards cause unnecessary pain, induce agitation. change the normal anatomic lordosis of the spine, cause pressure ulcers, and compromising respiratory function.
    - SMR has been shown to limit respiratory function an average of 17% (worst with LSB and the elderly).
    - Use SMR with caution with patients presenting with dyspnea, and position appropriately/to comfort.
- Self-extrication from a vehicle with or without assistance is likely better than standard extrication procedures.
- Elderly patients are at much higher risk of spinal injury, and may have minimal symptoms.
- “Full spinal immobilization” includes backboard, scoop, vacuum splint, or agency approved device, though the same stabilization can be achieved with a cervical collar and appropriate securing of the patient to the cot.
    - Consider improvised immobilization (e.g. towel rolls or a SAM splint) if needed to prevent airway compromise or worsening spinal injury if the rigid cervical collar cannot be correctly sized to the patient

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Special Circumstances/Populations:

Penetrating Trauma	• Penetrating trauma victims benefit the most from rapid assessment and transport to a trauma center without spinal immobilization/SMR. • Cervical collars and/or long spine boards (LSB's) are *contraindicated* in penetrating trauma, unless there is evidence of spinal cord injury (i.e. bilateral extremity neuro symptoms).
Pediatrics/Car Seats	• Infants restrained in a rear-facing car seat may receive SMR (cervical collar placed) and be extricated in the car seat. • Children may remain in the seat if SMR is secure (c-collar and 5-point harness) and condition allows (no signs of respiratory distress or shock) • Children restrained in a booster seat (without a back) need to be extricated and receive standard SMR procedures.
Pregnant	• Left lateral decubitus position is preferred after 20 weeks • Consider placing a towel or wedge under the left hip
Interfacility Transports	• Spine board do not have a role for transport between facilities. • If the sending facility requests EMS to use a LSB for transport, EMS providers should discuss protocols with the sending physician before transporting a patient. • EMS providers may use their discretion to roll the patient to a cot once in the ambulance, especially for prolonged transports.

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1-07 DEVIATION FROM STANDING ORDERS		First Responder EMT AEMT Paramedic

NEVER simply disregard a standing order or guideline.

- These Standing Orders have been established so that EMS Personnel may provide the best care possible for our patients.
- Most patients can be treated by the Standing Orders included under a single guideline, however, some patients may have signs and symptoms of illness and/or injury that can and should be treated by more than one guideline.
- If utilizing multiple sets of clinical guidelines, be aware that combining Standing Orders may lead to medication errors, overdose, or medication incompatibility.
- In rare cases, following a Standing Orders from a particular clinical guideline may not be in the patient's best interest.
- You are expected to use your judgment and to always make decisions that are in the best interest of the patient.and document such decisions.
- Always, if there is any question, contact online medical control.

Protocol for Deviation from Standing Orders:

- If you use more than one standing order when treating your patient, you must document your reasoning (i.e. clinical decision making) in the NARRATIVE SECTION of the Patient Care Report.
- If, in your judgment, disregarding or altering a standing order is not in the best interest of the patient, CONTACT MEDICAL CONTROL, regarding your treatment. Document the rationale for deviation, and the name of the physician giving the order.

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First Responder
EMT
AEMT
Paramedic

AIRWAY / BREATHING

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A-01B Respiratory Distress (Breathing)

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A-03 Obstructed Airway
A-04 Drug-Assisted Intubation/RSI
A-05 Tracheostomy Emergencies

A-06 Acute Pulmonary Edema/CHF
A-07 Asthma/COPD
A-08 Stridor/Croup/Bronchiolitis

PROCEDURES

A-PA1 Airway Adjuncts
A-PA2 Airway Suctioning (Basic & Advanced)
A-PA3 BIAD (iGel or King LT) Insertion
A-PA4 Endotracheal Intubation
A-PA5 ET Bougie Introducer
A-PA6 Needle Cricothyrotomy
A-PA7 Surgical Cricothyrotomy

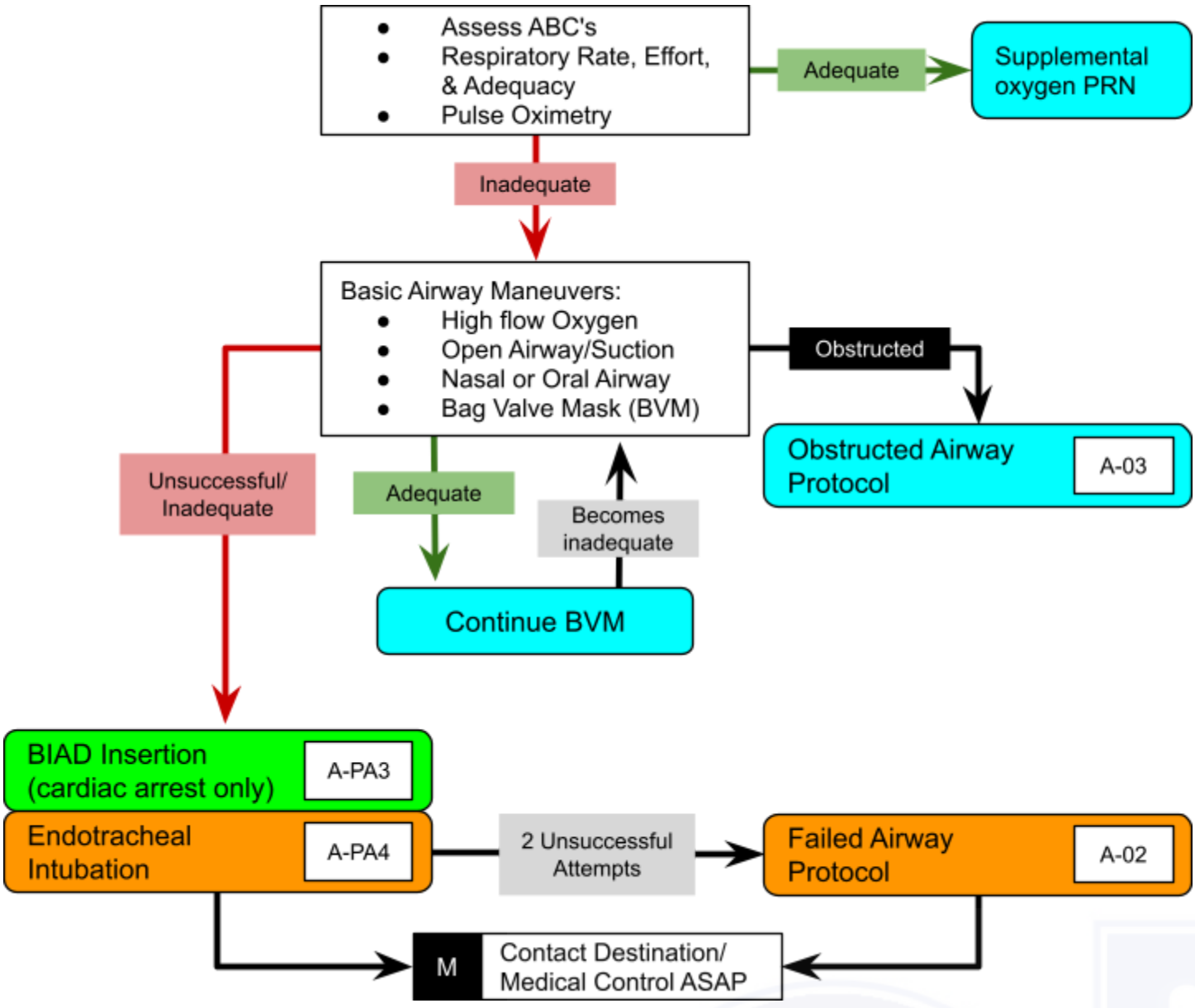
A-PB1 Capnography
A-PB2 Continuous Positive Airway Pressure (CPAP)
A-PB3 Bi-Level Positive Airway Pressure (BPAP)
A-PB4 High-Flow Nasal Cannula (HFNC)
A-PB5 Transport Ventilators (Prehospital Initiation) ****PENDING****

REFERENCE

(none)

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A-01A AIRWAY MAINTENANCE		First Responder EMT AEMT Paramedic



***If available*, the use of a *Video Laryngoscope* is MANDATORY on ALL endotracheal intubation attempts, and a BOUGIE is mandatory on the second and all subsequent attempts.**

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A-01A AIRWAY MAINTENANCE		

3 GOALS OF RESPIRATORY CARE :

- FIRST = OXYGENATION (SpO2)
  - Your primary goal should be ensuring an adequate SpO2 (>90%).
  - If you can maintain SpO2 by other means, you may forgo continued intubation attempts or surgical airway:
    - Non-rebreather (NRB)/High flow O2
    - Bag-valve mask (BVM)
    - Needle Cricothyrotomy
- Second = Ventilation (CO2/ETCO2)
  - While airway interventions should achieve ventilation whenever possible, if you can maintain oxygenation (in the short term), it is better to emergently transport the patient rather than continue attempting airway interventions on scene.
  - Over time increasing CO2 will become detrimental, but it takes some time to accumulate.
- Third = Airway Protection
  - While we preach intubation for airway protection, in general airway protection can be deferred unless there is active aspiration of vomitus, blood or other material.
  - Just because a patient is substantially altered does not mean they need immediate airway protection, especially if their SpO2 is adequate.

KEY POINTS:

- Use only the interventions needed to deliver adequate oxygenation and ventilation.
- *Except in Cardiac Arrest*, if an effective airway is being maintained by BIAD with continuous pO2 > 90%, it is generally encouraged to continue with successful measures instead of endotracheal intubation.
- Capnometry (EtCO2) and pulse oximetry is mandatory with all methods of advanced airways, supplemental oxygen administration or ventilatory support.
- Colorimetric (EZ Cap) may be used for initial CO2 detection when continuous capnometry is not available.
- Ventilatory rate should be adequate to maintain ETCO2 or 35-45 mmHg. Refer to **Capnography [A-PB1]** for further direction.
- If difficult intubation is anticipated, consider use of BIAD or an assist device (i.e. Bougie).

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A-01A AIRWAY MAINTENANCE		First Responder EMT AEMT Paramedic

QI Review Parameters:

Basic Airway & Oxygen Management

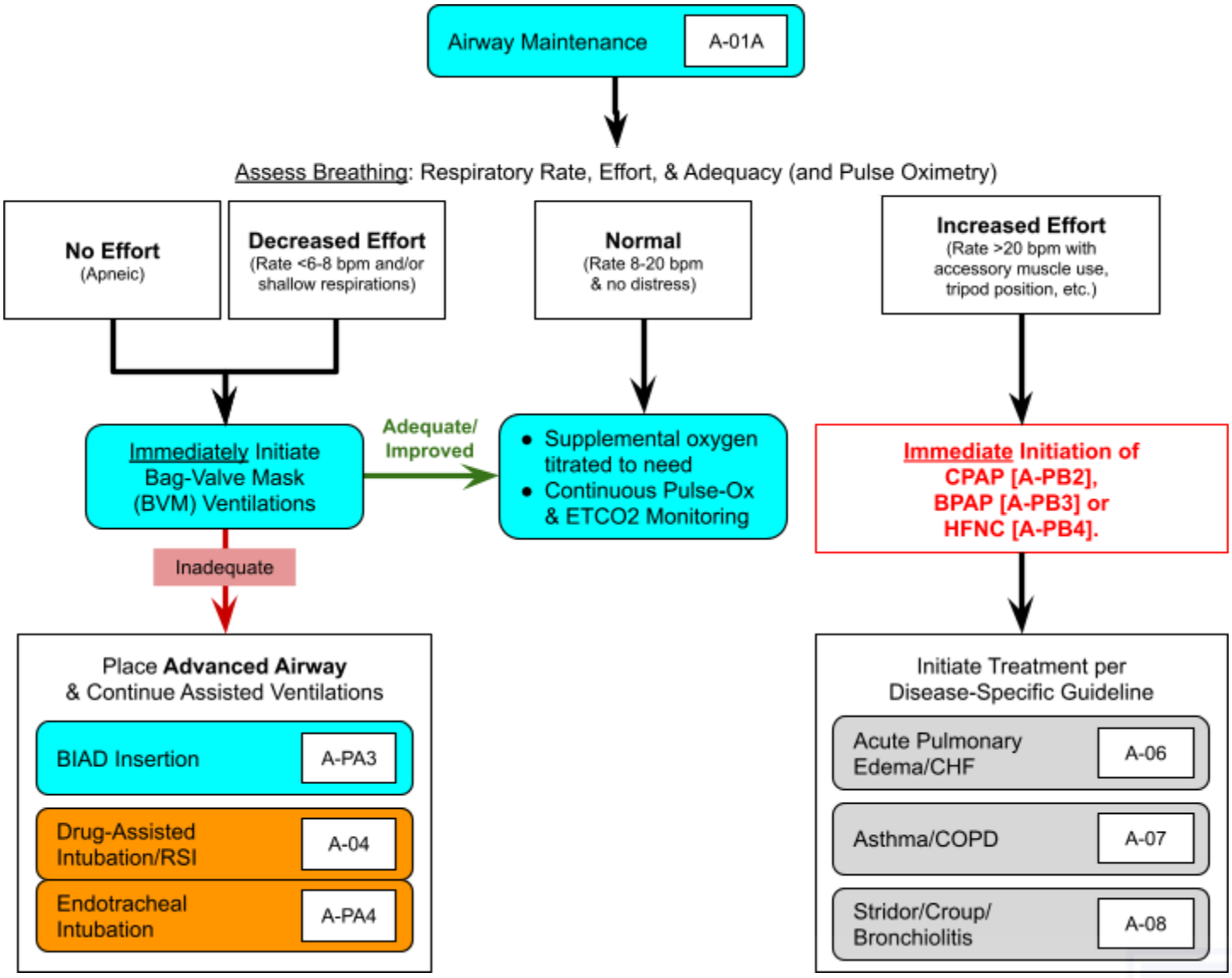
1. Airway assessment and pulse oximetry documented?
2. Appropriate supplemental O2 provided, or documented as provided for comfort?
3. If inadequate, appropriate basic airway equipment and maneuvers provided?
4. If a patient failed basic airway interventions, was advanced airway management appropriate to situation?

Advanced Airway Placement

1. Was Advanced Airway placement indicated?
2. Was appropriate equipment used/attempted?
3. Was airway placement overall successful? (i.e. Was an appropriate airway secured?)
4. How many attempts were required for final placement of an airway?
5. Was confirmation of appropriate placement documented, including EtCO2?

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A-01B RESPIRATORY DISTRESS		First Responder EMT AEMT Paramedic



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A-01B RESPIRATORY DISTRESS		First Responder EMT AEMT Paramedic

NOTE: A Pediatric-Sized Ambu-Bag *may be considered* in ADULT patients

- The smaller reservoir provides adequate tidal volumes while protecting against hyperventilation/hyperinflation injury, gastric distention and increased intrathoracic pressures.
- A **"TWO-FINGER PINCH" technique** should ALWAYS be used with an adult-sized bag.

General Management of HYPOXEMIA

Normal **94-100%**	• Supportive care • Nasal Cannula (2-6 Lpm) or Non-Rebreather (NRB) mask (12-15 Lpm) may be considered if indicated per patient appearance and/or complaint.
Mild (Borderline) Hypoxemia **90-93%**	• **Nasal cannula (2-6 Lpm)**, or (if indicated per patient's condition/clinical guideline) a NRB mask (at 12-15 Lpm)
Moderate Hypoxemia **85-89%**	• Moderate-flow O2 via Nasal Cannula (4-6 Lpm) or **Non-rebreather mask (12-15 Lpm)** • Monitor for possible loss of airway patency • May consider use of CPAP, BPAP or HFNC if available
Severe Hypoxemia **≤ 84%**	• **Immediate Non-rebreather, CPAP, BPAP, HFNC or BVM** • Prepare to assist ventilations with bag-valve-mask @ 15 Lpm or advanced airway • Prepare for DAI/RSI and Intubation if not responsive to conservative treatment

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A-01B RESPIRATORY DISTRESS		First Responder EMT AEMT Paramedic

General Management of RESPIRATORY DISTRESS	
No Respiratory Distress	• Titrate supplemental oxygen as needed to the patient's condition & continue to monitor.
Mild-to-Moderate Distress	• Titrate supplemental oxygen as needed to the patient's condition • Consider the early use of Non-Invasive Ventilation (CPAP, BPAP or HFNC).
Severe Distress (Conscious)	• Titrate supplemental oxygen as needed to the patient's condition, generally starting with 100% FiO2. • **<u>Immediate</u> initiation of Non-Invasive Ventilation (CPAP, BPAP or HFNC).** • Monitor for possible loss of airway patency or the development of respiratory failure. Prepare to assist ventilations with BVM or advanced airway.
Unconscious with Adequate Respirations	• Titrate supplemental oxygen as needed to the patient's condition. • May consider Non-Invasive Ventilation (CPAP, BPAP or HFNC) in select situations. • Monitor for possible loss of airway patency or the development of respiratory failure. Prepare to assist ventilations with BVM or advanced airway.
Unconscious with Inadequate or No Respirations	• **Immediate assistance with BVM.** • Prepare for DAI/RSI and endotracheal intubation.

If Bi-Level Positive Airway Pressure [BPAP; A-PB3] is available, it is <u>preferred</u> in most patients. CPAP [A-PB2] use should be limited to providers without the equipment or credentialing for BPAP use.

High-Flow Nasal Cannula [A-PB4] is another option for patients with increased supplemental oxygen needs but limited needs for assisted ventilations. It may be considered **in patients who do not have respiratory distress or do not tolerate BPAP.**

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A-01B RESPIRATORY DISTRESS		First Responder EMT AEMT Paramedic

NOTES:

- Treat the patient and **NOT** the pulse oximeter's display**.**
- Always titrate supplemental oxygen to the lowest possible level to maintain oxygen saturation **(SpO2)** ≥ 94**%**, unless otherwise specified.

- Other key signs and symptoms must be assessed and evaluated so that the oximeter's readings are interpreted within the context of the patient's overall condition.
- Pulse Oximetry should be deferred until more urgent assessment and care priorities have first been resolved.
- It is useful both in the assessment of the patient and as an adjunct for evaluating the effectiveness of the airway management, ventilation, and oxygen enrichment provided.
- The pulse rate determined by the pulse oximeter is <u>not</u> an accurate indicator of the patient's pulse rate.

Falsely LOW readings may occur in:

- Patients with poor perfusion
  - Hypothermia/cold extremities
  - Hypovolemic/Hypotensive patients
- Patients with hemoglobin abnormalities

Falsely HIGH readings may occur in:

- Carbon monoxide poisoning
- Cyanide toxicity treated with the antidote
- Very bright lighting (direct sunlight or nearby strong lamp)

Other factors affecting accurate readings:

- Patient movement
- Action of vasopressor drugs
- Peripheral vascular disease
- Abnormal hemoglobin values (anemia)

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A-01B RESPIRATORY DISTRESS		First Responder EMT AEMT Paramedic

PEDS PEARLS:

- **In children <u>BRADYCARDIA = HYPOXIA</u>, until proven otherwise.**
- Pediatric is generally defined as age less than 10 yrs, less than 37 Kg, or any patient which can be measured with the Broselow Tape.
- The majority of these pediatric airways can be managed with basic interventions.
- Use only the interventions needed to deliver adequate oxygenation and ventilation.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of > 90, it is encouraged to continue with basic airway measures instead of Intubation.
- Ventilatory rate should be age appropriate to maintain a ETCO2 between 35 and 45.

- *Peds (Infant and Young Child)*: For a child with mild to moderate respiratory distress consider the “blow-by” technique. Hold the end of a supply tube or a nonrebreather mask approximately two inches away from the patient’s face. Another method to supply “blow-by” is with a paper cup. This can be done by pushing a supply tube through the bottom of the cup. Set the flow rate to 4-6 L/min.

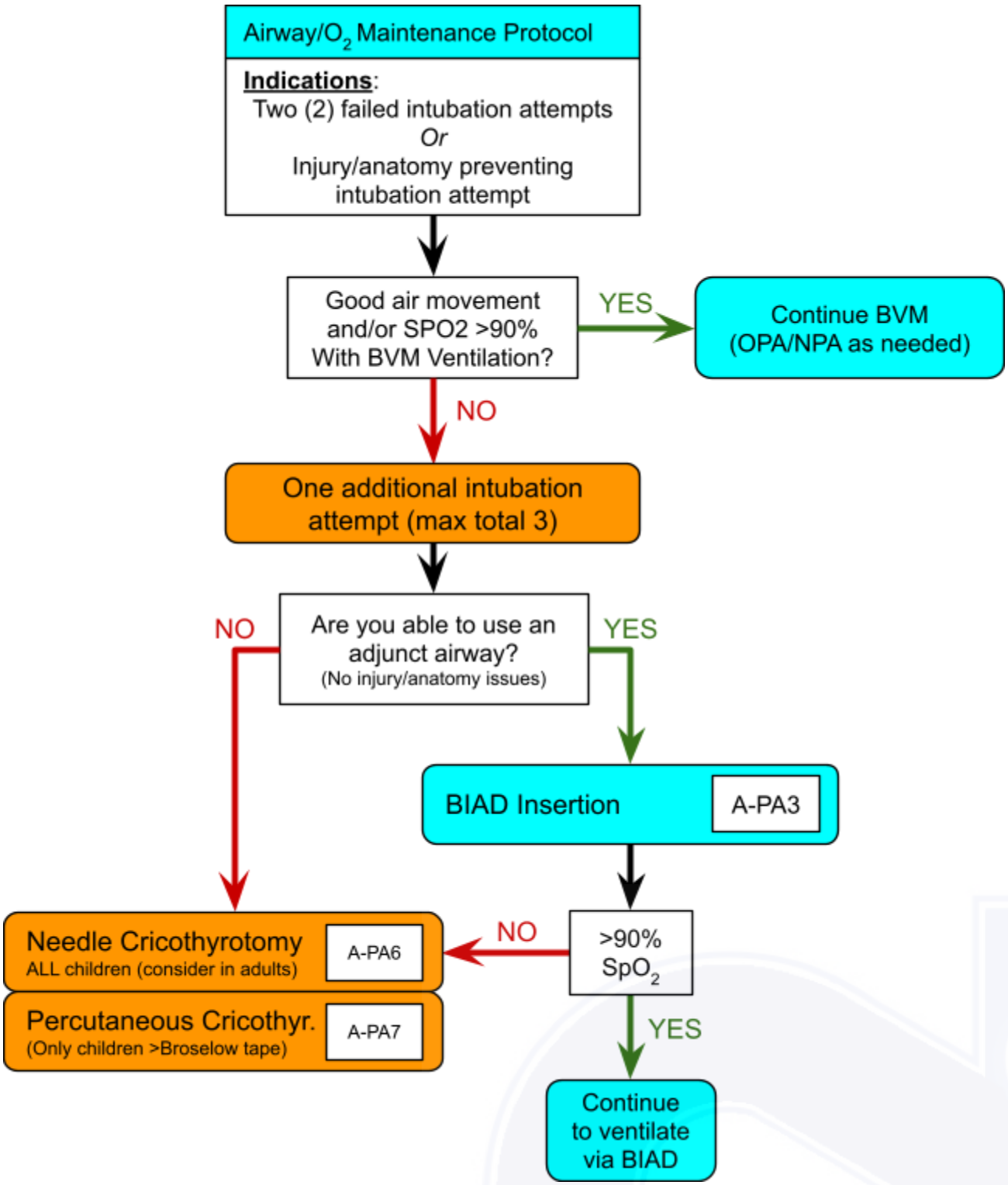
PEDS: Age-appropriate Resp. Rate		Oxygen Delivery	
Age	Breaths/min	Devices	O2 Flow
Neonate	40	Nasal Cannula (Low flow)	2-4 L/min
Infants	30	Nonrebreathing Mask (High flow)	10-15 L/min
Children	20	Bag-Valve Mask (BVM)	15-25 L/min

QI Review Parameters:

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A-02 FAILED AIRWAY		First Responder EMT AEMT Paramedic

KEY POINTS:

- If you have concerns over obtaining airway access or maintaining an airway your primary destination should be the CLOSEST emergency department, regardless of patient complaint/disease process.
    - Notify Destination Hospital ASAP regarding patient's difficult or failed airway.
- A secure airway is when the patient is appropriately oxygenated and ventilated.
    - *BVM*: If an airway is being maintained by BVM with Pulse Oximetry >90%, it is acceptable to maintain basic airway measures instead of attempting an advanced airway.
    - *BIAD*: If a BIAD is providing good ventilatory exchange and is functioning appropriately: DO NOT REMOVE or exchange.
- Intubation: If first attempt fails, make an adjustment and try again:
    - Sellick's and/or BURP maneuvers
    - Different laryngoscope blade
    - Change head positioning
    - Different ETT size
    - Different Provider

SPECIAL SITUATIONS:

Pediatrics:

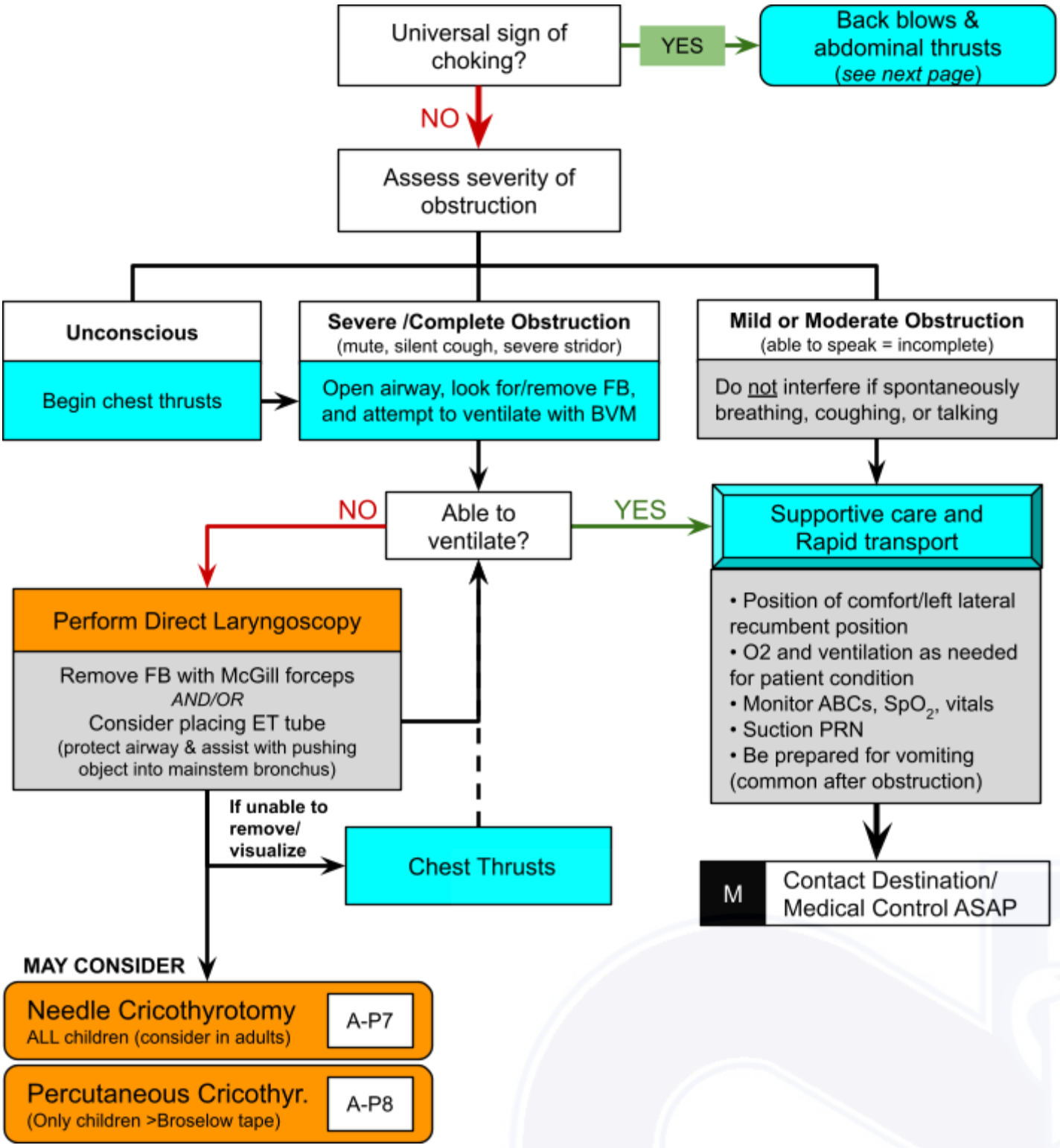
- The majority of pediatric airways can be managed with basic interventions.
- Use only the interventions needed to deliver adequate oxygenation and ventilation.
- **If the child fits on the Broselow Tape, DO NOT perform a surgical airway.**
- ALL "Broselow" Children needing a surgical airway **should receive a needle cricothyrotomy**.
- Children *longer than the Broselow tape* *and adults* CAN receive a needle cricothyrotomy as a temporizing measure until more definitive airway access is obtained.
    - If oxygenation is being maintained with a needle cricothyrotomy, you may defer surgical intervention and transport to the nearest facility as quickly as possible.

QI Review Parameters:

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A-03 OBSTRUCTED AIRWAY		First Responder EMT AEMT Paramedic



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A-03 OBSTRUCTED AIRWAY		First Responder EMT AEMT Paramedic

HEIMLICH -- Conscious (Standing or Sitting)

1st: Give FIVE back blows





2nd: Give FIVE abdominal thrusts (*or 5 chest thrusts for infants*)





Continue alternating until the object is expelled or the patient becomes unconscious (*below*).

HEIMLICH -- Unconscious

1st: Give THIRTY chest compressions



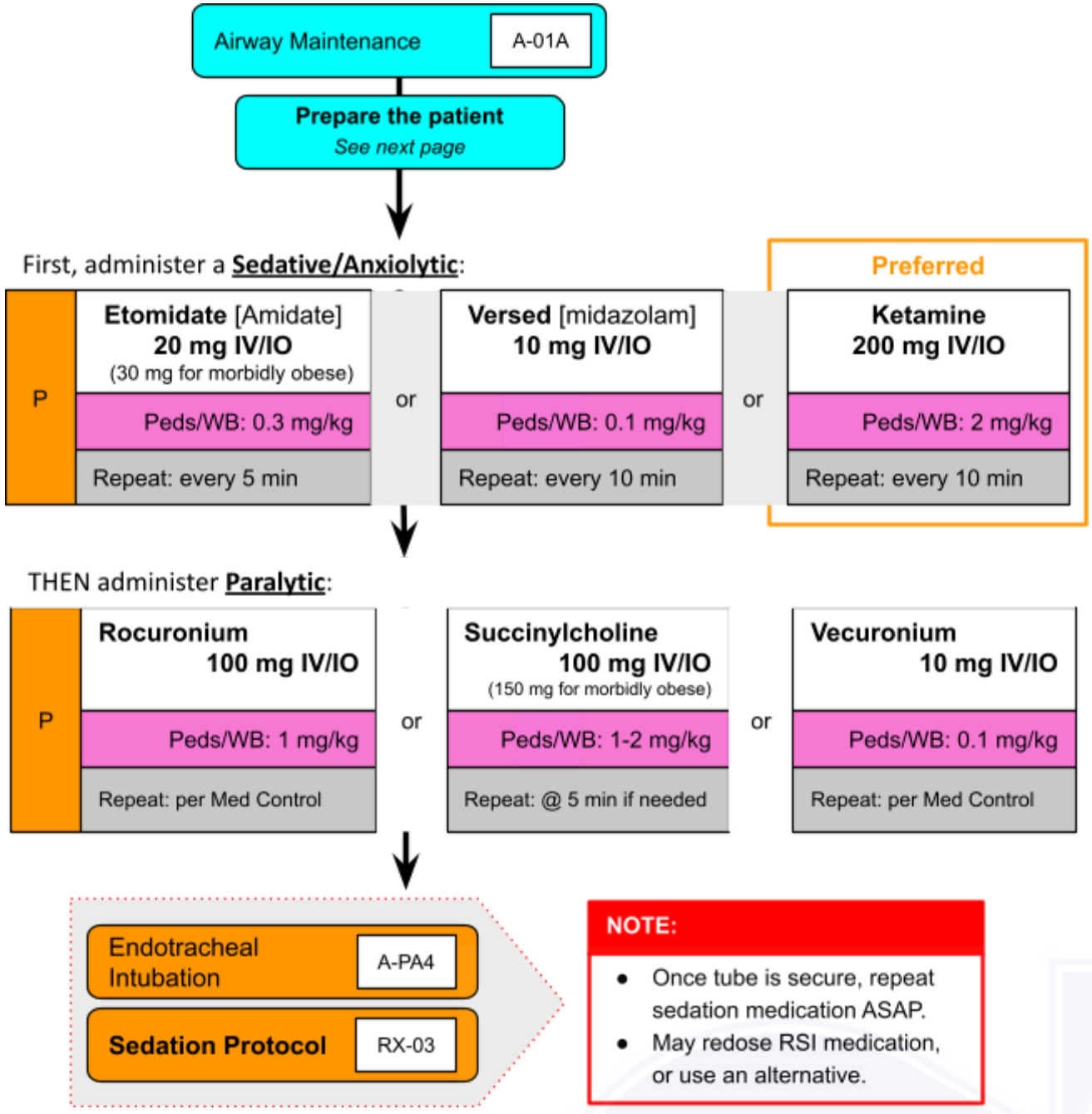


2nd: Look for/remove the object from the oropharynx

Continue until the object is expelled and ventilations are successful
(Paramedics may consider direct laryngoscopy per guidelines)

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A-04 DRUG-ASSISTED INTUBATION/RSI	RSI/DAI may ONLY be performed with written documentation of training and competency from the medical director.	First Responder EMT AEMT Paramedic



***If available*, the use of a *Video Laryngoscope* is MANDATORY on ALL endotracheal intubation attempts, and a BOUGIE is mandatory on the second and all subsequent attempts.**

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A-04 DRUG-ASSISTED INTUBATION/RSI	RSI/DAI may ONLY be performed with written documentation of training and competency from the medical director.	First Responder EMT AEMT Paramedic

INDICATIONS

- Patients that are unable to adequately control their own airway (or as prophylaxis for airway burns/inhalation injuries).
- Severe difficulty breathing with inability to adequately oxygenate and/or ventilate patients

AND

- **All** non-invasive measures to establish adequate airway/breathing per the Airway/O_2 Maintenance protocol [**A-01**] have failed.

CONTRAINDICATIONS

- Known allergy to agents
- Succinylcholine contraindications: Malignant hyperthermia, hyperkalemia (dialysis patient), severe burns/crush injury >12 hours old

Precautions

- Pregnancy
- Dehydration/Sepsis
- Respiratory or Cardiac disease
- Neuromuscular disease
- Facial fractures/instability

PREPARE THE PATIENT

- Provide **c-spine stabilization** as needed, and consider removing the anterior portion of the collar.
- **Position** the patient for optimal visualization
- **Preoxygenate** with high flow O_2 for 2 or more minutes if possible → utilize method appropriate to patient condition. (This establishes an oxygen reserve which will allow for several minutes of apnea.)
- **Assist with a manual resuscitator only if spontaneous ventilation is inadequate/absent**. Avoid positive pressure ventilation if possible to prevent gastric insufflation.
- Establish IV access, and if potentially/currently hypotensive provide fluids and observe for deterioration.
- Attach cardiac monitor and pulse oximetry, and end-tidal CO_2 if available.

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A-04 DRUG-ASSISTED INTUBATION/RSI	RSI/DAI may ONLY be performed with written documentation of training and competency from the medical director.	First Responder EMT AEMT Paramedic

NOTES:

- Rapid Sequence Induction/Intubation (RSI) or Drug-Assisted Intubation (DAI) is a procedure used to optimize the airway to maximize the success of endotracheal intubation.
- While intubation may be attempted with only a sedative medication, using a paralytic is generally recommended, and is safe as long as ventilation can be effectively performed with a BVM.
- Sedation (re-medicating) should be one of the main priorities as soon as possible after intubation.
    - Improves patient comfort/experience.
    - Allows for maximal benefit from assisted ventilation/oxygenation.
    - If the patient begins to awaken (with or without concurrent use of paralytics), the fight-or-flight response can create a situation where it will become very difficult to re-sedate them.

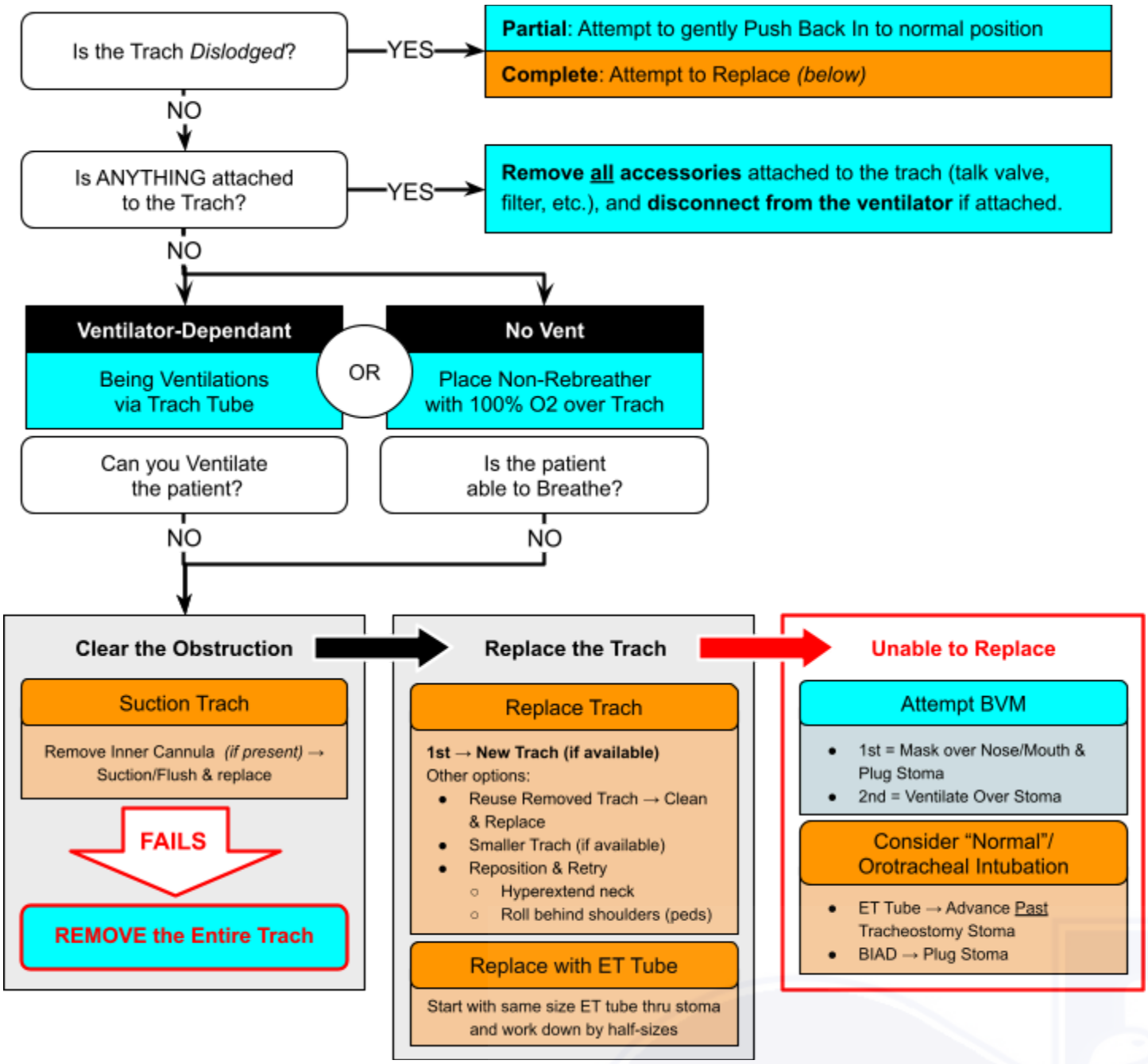
QI Review Parameters:

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A-05 TRACHEOSTOMY MANAGEMENT

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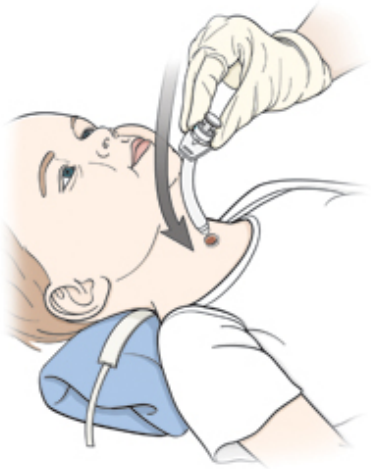


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A-05 TRACHEOSTOMY MANAGEMENT		First Responder EMT AEMT Paramedic

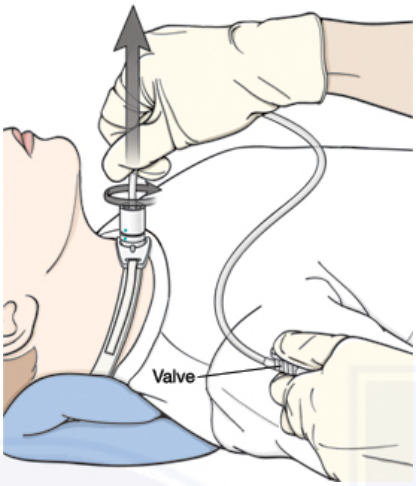
Procedure: Tracheostomy Tube Replacement

- Position the patient:
  - Hyperextend neck (if possible)
  - **Pediatrics: place a roll under the shoulders**
- Open a new Trach Tube (if available) and at least one backup airway (smaller trach, ET Tube, etc.)
- Make sure the obturator (i.e. stylet) is in place
- Lubricate the tube
- **Start at a 90-degree angle into the stoma and rotate the tube inferiorly into the trachea.**
- Pull obturator, place the inner cannula into the trach and ventilate
- Secure as appropriate



Procedure: Clearing Secretions

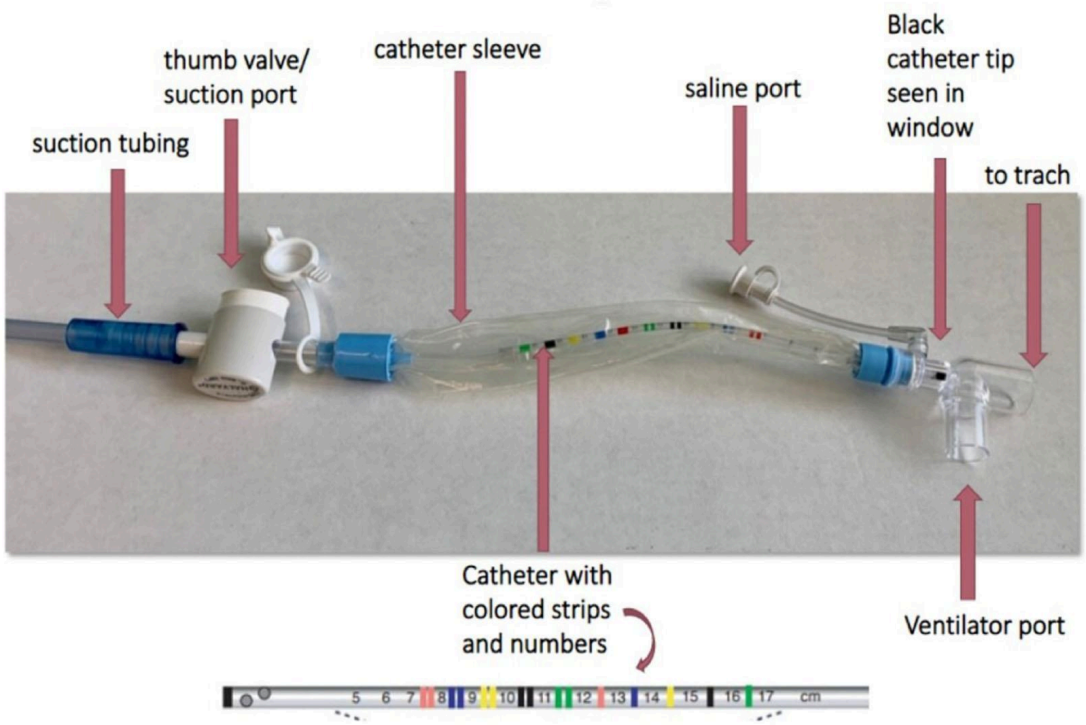
- Suction Trach in Place →
  - Suction the **length of the tube only** (do not deep suction)
    - **Depth for pediatrics (color coded, *see below)* is noted on the patients spec sheet**
  - No more than 10-15 seconds
  - Twirl while removing
  - Consider instilling saline if not successful initially
- If unable to suction (hard/thick secretions) →
  - Remove the inner cannula (clean, suction and/or flush with saline)
  - Remove the entire trach, clean as above and replace (as above)



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A-05 TRACHEOSTOMY MANAGEMENT		First Responder EMT AEMT Paramedic

Pediatric Suction Catheter (Example)



Pediatric "Go Bag"

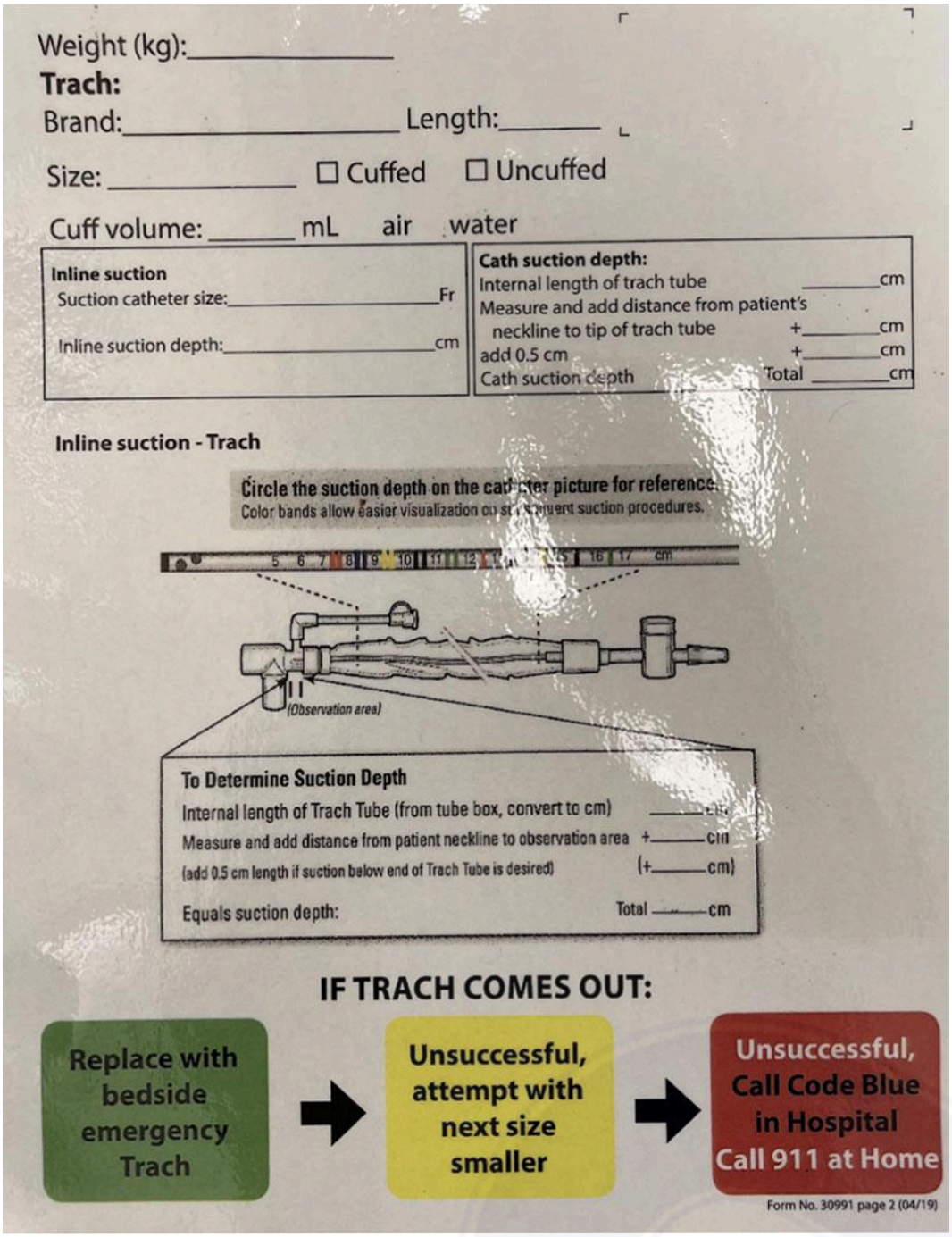


Contains:

- Trach Instruction/Infosheet
- BVM & Back up mask
- Trach replacement & 1 size smaller
- Trach ties
- Suction
- Lubricant
- Gloves

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Pediatric Trach Infosheet (Example)



Weight (kg):_____

Trach:

Brand:_____ Length:_____

Size: _____ ☐ Cuffed ☐ Uncuffed

Cuff volume: _____ mL air water

Inline suction
Suction catheter size:_____Fr
Inline suction depth:_____cm

Cath suction depth:
Internal length of trach tube _____cm
Measure and add distance from patient's neckline to tip of trach tube +_____cm
add 0.5 cm +_____cm
Cath suction depth Total _____cm

Inline suction - Trach

Circle the suction depth on the catheter picture for reference.
Color bands allow easier visualization during frequent suction procedures.

(Observation area)

To Determine Suction Depth
Internal length of Trach Tube (from tube box, convert to cm) _____cm
Measure and add distance from patient neckline to observation area +_____cm
(add 0.5 cm length if suction below end of Trach Tube is desired) (+_____cm)
Equals suction depth: Total _____cm

IF TRACH COMES OUT:

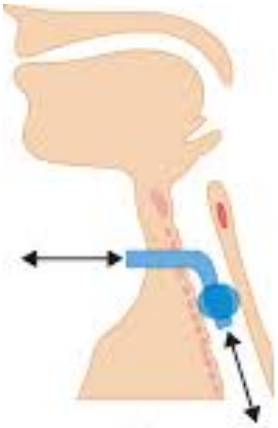
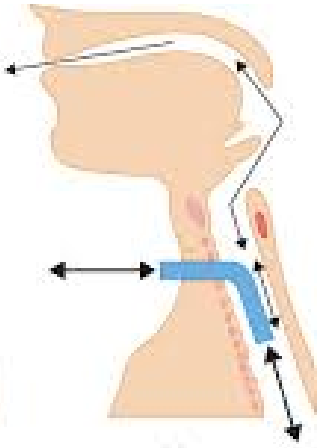
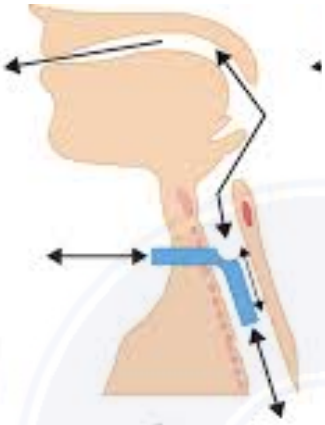
Replace with bedside emergency Trach → Unsuccessful, attempt with next size smaller → Unsuccessful, Call Code Blue in Hospital Call 911 at Home

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A-05 TRACHEOSTOMY MANAGEMENT		First Responder EMT AEMT Paramedic

Trach Anatomy (Airflow)

Cuffed ● Balloon blocks airflow up the trachea to the vocal cords/oropharynx. ● **All ventilation is dependant on a patent tube**		
Uncuffed (or cuff deflated) ● Closed tube to neck, but some air can escape around the tube to the vocal cords/oropharynx. ● If the tube becomes clogged, may have enough air exchange to ventilate thru nose/mouth if not obstructed. ● **Cannot provide significant positive pressure ventilation** → may need to be replaced with a cuffed tube.		
Fenestrated ● Separate hole in trach allows for easy air passage to vocal cords/oropharynx. ● **Allows the patient to talk** when the trach hole is covered.		

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A-05 TRACHEOSTOMY MANAGEMENT		First Responder EMT AEMT Paramedic

Trach Anatomy (Structure)

- Outer cannula (left
  - Generally hard plastic
  - May have a balloon (cuff) similar to an ET tube, as well as an inflation port.
  - Smaller (pediatric) trachs may be soft(er)/flexible
- Inner cannula (center)
  - Generally only used in adults (larger trachs).
  - May need to be removed/cleaned to improve partial or full obstructions.
- Stylet/Obturator (far right)
  - Allows for easier insertion.



Trach Accessories/Attachments

Filters

- Filters air and keeps moisture in place (humidifies).
- **May get clogged with secretions**



Passy-Muir Valve (i.e. “Talk Valve”)

- **One-way valve** that allows inspiration (air in) & forces air out (expiration) thru vocal cords.
- **Do not use with a cuffed tube** (or while cuff is blown up)



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A-05 TRACHEOSTOMY MANAGEMENT		First Responder EMT AEMT Paramedic

KEY POINTS:

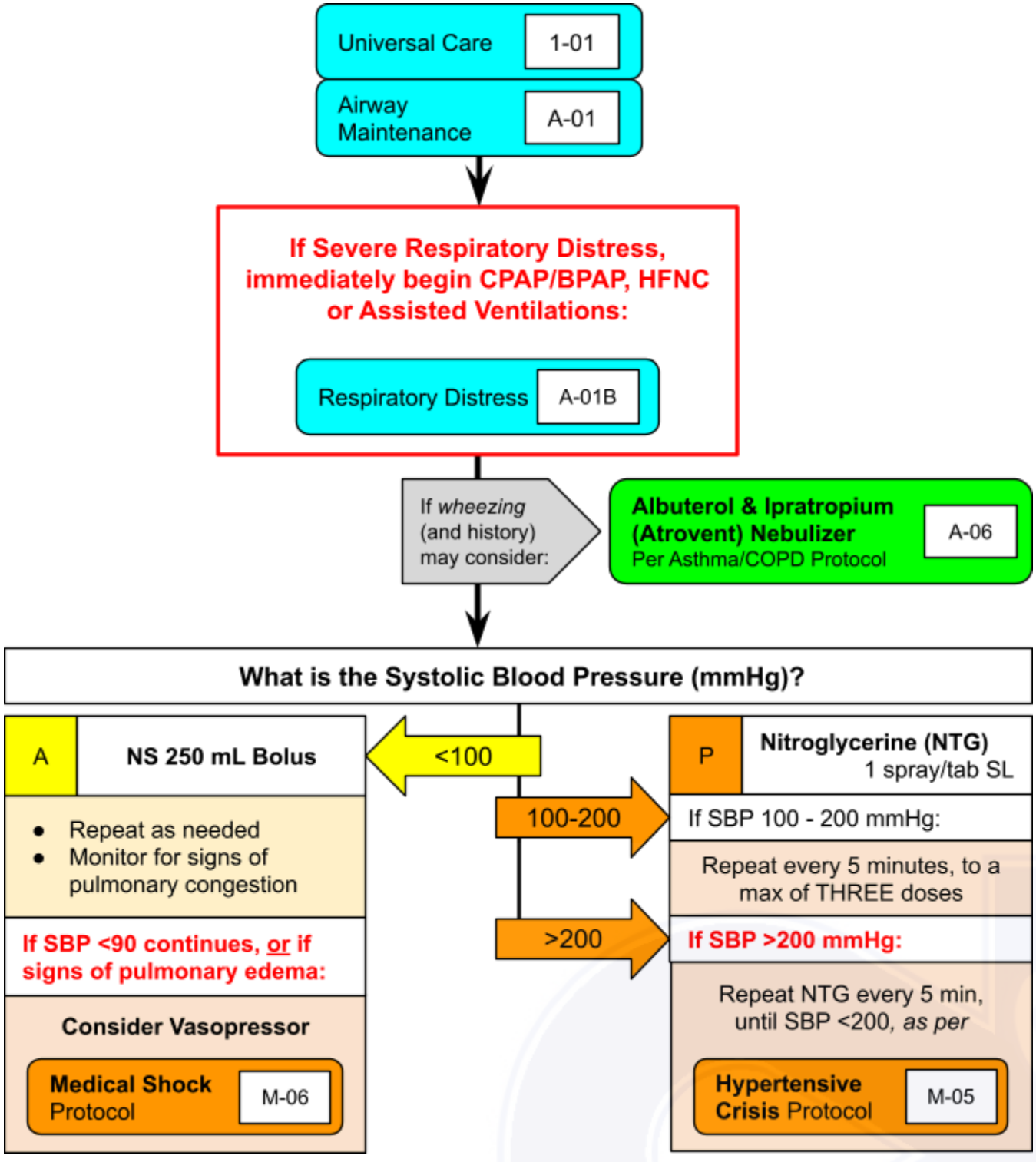
- Who may need a tracheostomy?
  - Anatomical Malformations (tracheal stenosis, vocal cord paralysis, congenital craniofacial abnormality, severe facial trauma/surgery or oropharyngeal mass, etc.)
  - Prolonged Ventilation (chronic lung problems, congenital cardiac abnormalities, spinal cord injury/neurologic disease)
  - Pulmonary secretion clearing (cerebral palsy, cystic fibrosis, etc.)

QI Review Parameters:

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A-06 ACUTE PULMONARY EDEMA/CHF		First Responder EMT AEMT Paramedic



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A-06 ACUTE PULMONARY EDEMA/CHF		First Responder EMT AEMT Paramedic

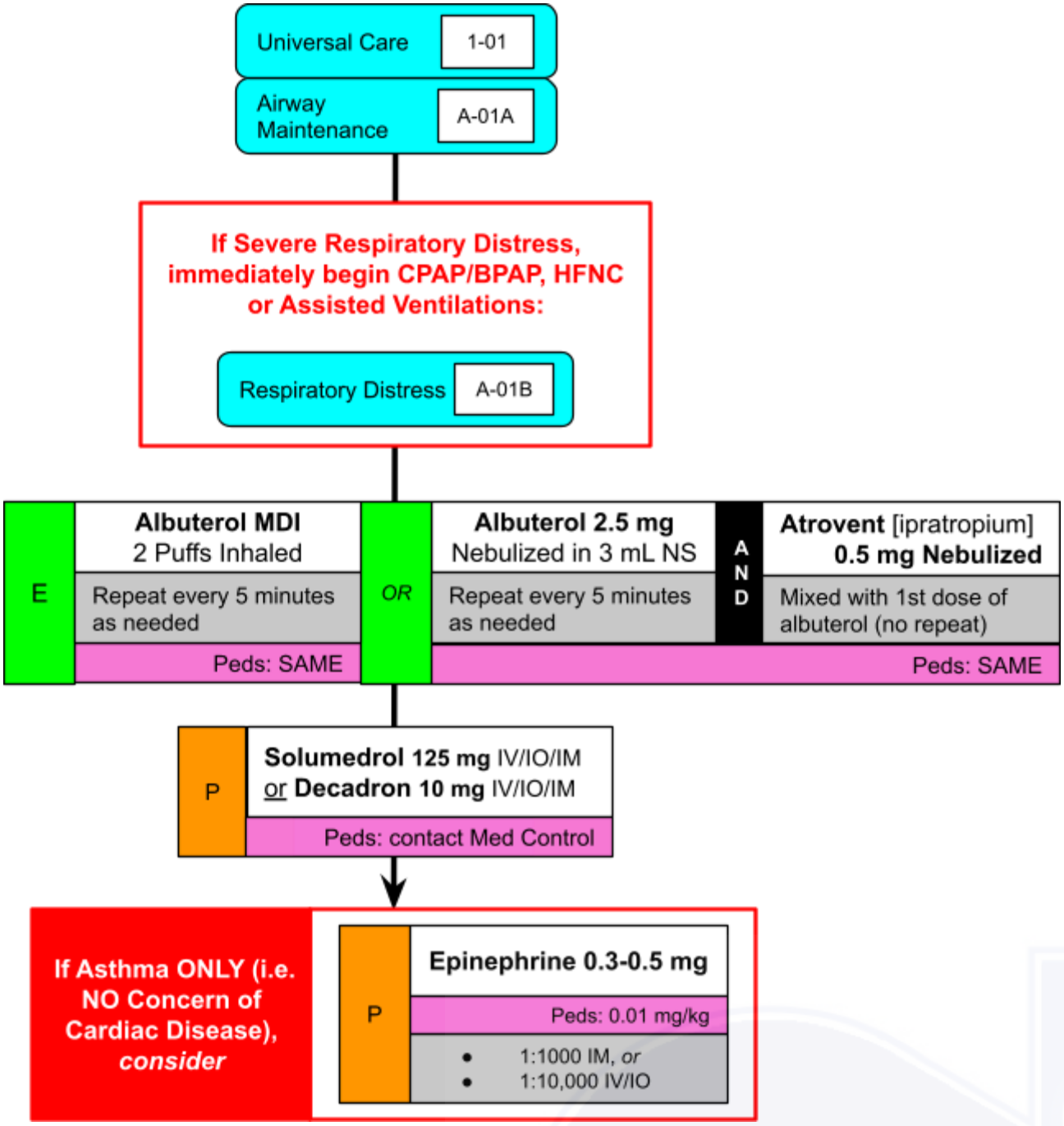
KEY POINTS:

- *Diuretics*: These have been used in the past, but have generally been replaced with positive pressure ventilation (i.e. CPAP). Because they generally take time to work and have possible side effects, they have little role in initial treatment of acute pulmonary edema and are no longer considered first line therapy.
- *Erectile Dysfunction Drugs*: Avoid Nitroglycerin in any patient who has used Viagra or Levitra in the past 24 hours or Cialis in the past 48 hours due to possible severe hypotension.
- Consider myocardial infarction in all these patients. If suspected, give ASA.
- Allow the patient to be in their position of comfort to maximize their breathing effort.

QI Review Parameters:

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A-07 ASTHMA/COPD		First Responder EMT AEMT Paramedic

KEY POINTS:

- **<u>Rule #1 = Always correct hypoxia</u>**: do not withhold oxygen for fear of CO2 retention.
- The physiology of a person with COPD (emphysema/bronchitis) differs from that of a healthy person in that the primary stimulus to breathe comes from a decrease of pO2 in the blood rather than an increase in pCO2. Providing high concentrations of oxygen could theoretically depress their respiratory drive.
- As long as they are not in severe distress, it is advisable to provide COPD patients with lower levels of oxygen initially. If they do not improve, increase oxygen as needed.
- **ETCO2 (when available) & Pulse Oximetry should be monitored continuously in any patient with hypoxia, increased work of breathing or altered mental status.** If the patient's mental status or respiratory drive begins decreasing, be prepared to assist ventilations.
- COPD exacerbations are particularly responsive to CPAP or BPAP, which may help avoid the need for intubation and should be considered early in treatment.
- Wheezing may be a presentation of pulmonary edema, i.e. “cardiac asthma”. See Acute Pulmonary Edema guidelines [**A-05**] as needed.

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A-07 ASTHMA/COPD		First Responder EMT AEMT Paramedic

SPECIAL SITUATIONS:

Steroids: methylprednisolone OR dexamethasone (Decadron) will help resolve acute asthma/COPD exacerbation over hours, without immediate effect. Focus of initial management should be on nebulizer treatments and additional oxygen/ventilatory support as needed (CPAP, intubation, etc.)

Epinephrine: Only indicated for severe attacks deemed life-threatening and not responding to inhaled bronchodilators. **Use extreme caution when administering, and it should be avoided if at all possible for patients with known or possible cardiac disease.**

Magnesium: Smooth muscle relaxation properties may be beneficial in some patients with severe attacks. It has historically been used as an adjunct to conventional nebs and supplemental O_2 in severe exacerbations to try and prevent the need for intubation. Since the addition of positive pressure ventilation (i.e. CPAP/BiPAP), it is no longer needed except in extreme circumstances, and should not be given routinely. You may contact online medical control for permission for use, but attention should be focused on CPAP or other interventions if hypoxic. **If other medications/interventions are not available or not working, may consider:**

P	**Magnesium 2 grams IV/IO SLOWLY over 30 mins** Peds: 25-50 mg/kg

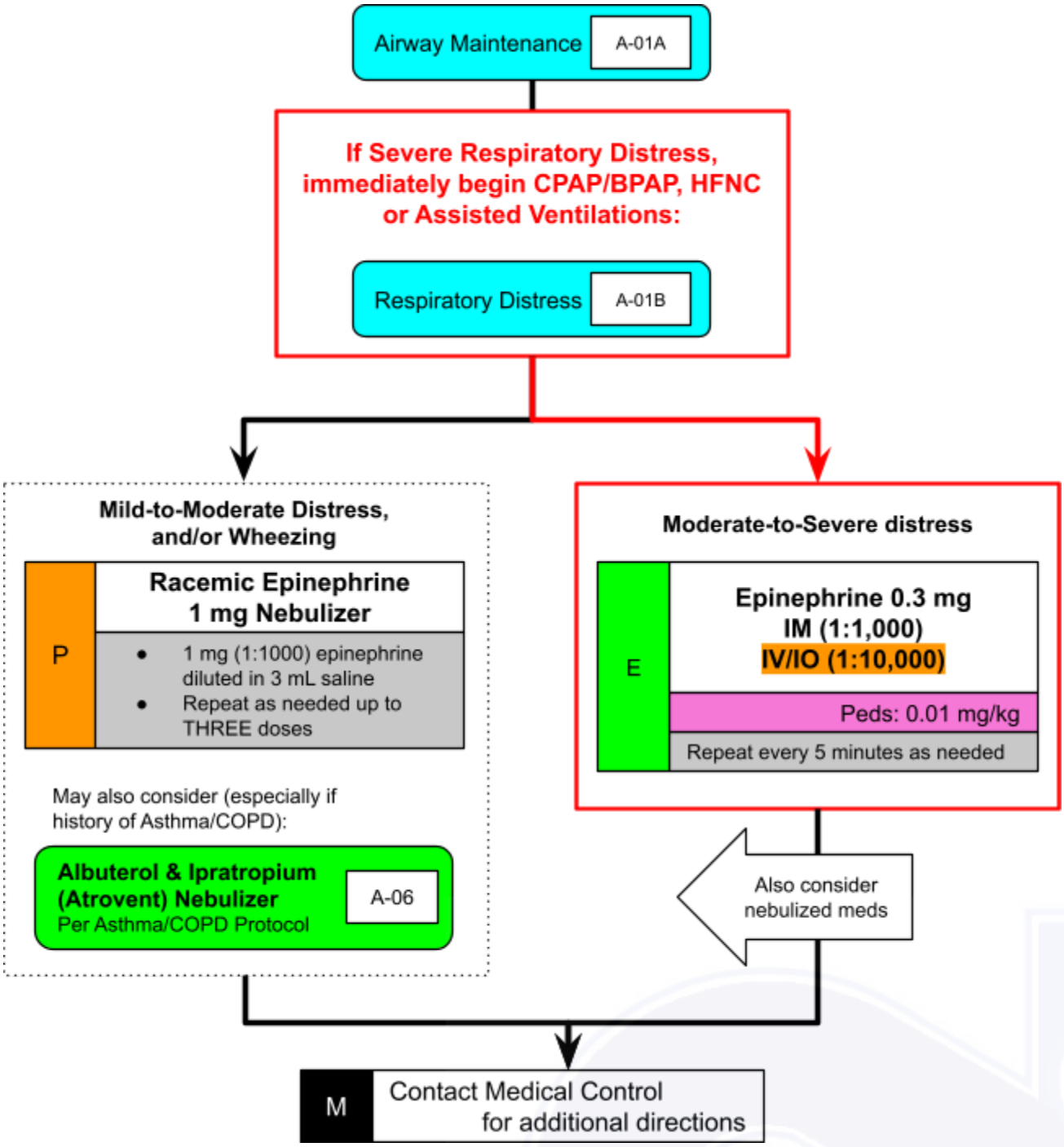
Peds: Bronchiolitis and asthma are the most common causes of wheezing in infants and children, respectively. However, always consider other pulmonary and nonpulmonary causes of respiratory distress, especially if patient not responding as expected to treatment: pneumonia, pulmonary edema, congenital heart disease, anaphylaxis, pneumothorax, sepsis, metabolic acidosis (e.g.: DKA, toxic ingestion), foreign body aspiration, and croup.

QI Review Parameters:

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A-08 STRIDOR/CROUP & BRONCHIOLITIS		First Responder EMT AEMT Paramedic



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A-08 STRIDOR/CROUP & BRONCHIOLITIS		First Responder EMT AEMT Paramedic

STRIDOR (Adult & Pediatric):

- Stridor is a harsh, inspiratory sound caused by narrowing or obstruction of the upper airway.
- Causes: croup (kids), foreign body aspiration, allergic reactions (generally with other findings of anaphylaxis), trauma, infection (various), mass (i.e. vocal cord polyp).
- Epiglottitis is exceedingly rare, but consider in the unimmunized child or adult.
- Minimize patient agitation, and (in general) airway manipulation should be avoided.

CROUP:

- Most common cause of stridor in children.
- The child generally has URI symptoms for a day or two, followed by a sudden (often nocturnal) onset of a barky cough and possibly stridor.
- Most often seen in children < 5 years old (peak about 2 years).
- Often simply taking the child into an area with cool air (outside in “croup season”) will improve symptoms.
- **Oral Dexamethasone (Decadron) 0.6 mg/kg** may be considered for children with a typical clinical presentation and prolonged transport times.

BRONCHIOLITIS:

- Caused by RSV and other viruses.
- Most cases are generally mild, and the child generally has only URI symptoms.
- In younger infants–especially those with a history of premature birth–bronchiolitis can progress to a severe and life-threatening lower respiratory infection predominated by hypoxemia.
- Care is mostly supportive with varying degrees of supplemental oxygen administration.
- **Albuterol and Atrovent (ipratropium) can be tried** (as per the Asthma/COPD [A-07] Guideline), although are generally not helpful.
- **High-Flow Nasal Cannula** or other non-invasive ventilatory support devices can be used where available.

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First Responder
EMT
AEMT
Paramedic

CARDIAC

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C-02 Asystole/Pulseless Electrical Activity (PEA)
C-03 Ventricular Fibrillation/Pulseless Ventricular Tachycardia (VF/pVT)
C-04 Rapidly-Deteriorating Patient/Post-Resuscitation

OTHER CARDIAC

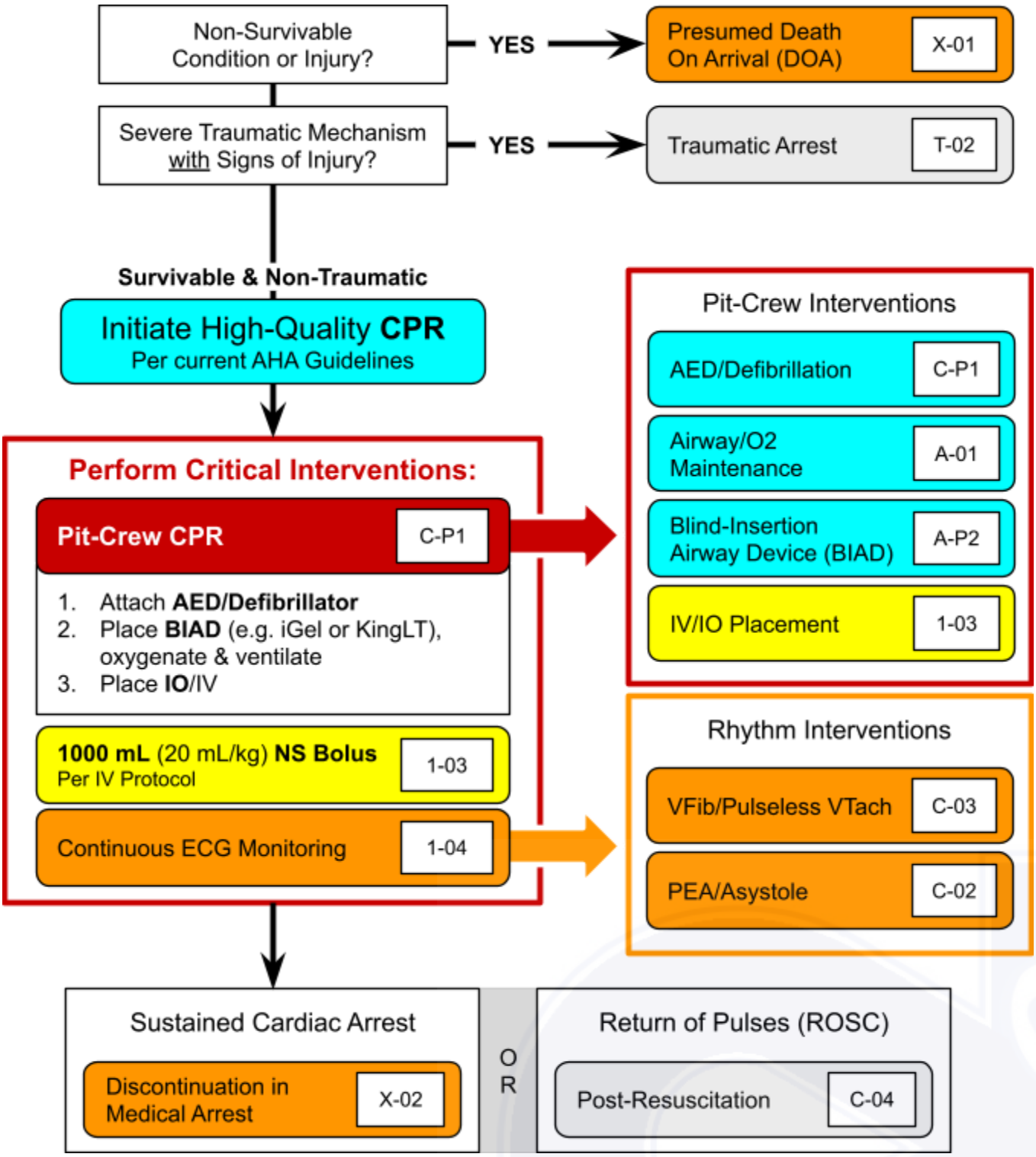
C-05 Bradycardia
C-06 Chest Pain/STEMI
C-07 Narrow-Complex Tachycardia
C-08 Wide-Complex Tachycardia
C-09 Torsades/Polymorphic V-Tach
C-10 Ventricular Assist Devices (VADs)

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C-P1 Pit-Crew CPR
C-P2 AED/Manual Defibrillation
C-P3 Mechanical CPR Device
C-P4 Synchronized Cardioversion
C-P5 Transcutaneous Pacing

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C-01 INITIAL CARDIAC ARREST		First Responder EMT AEMT Paramedic



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C-01 INITIAL CARDIAC ARREST		First Responder EMT AEMT Paramedic

INMATES IN PRISON/JAIL



- Incarcerated Patients should be **WORKED ON SCENE.**
  - If possible, move the patient to a nearby more private/secure area.
  - Continue 20-30 minutes of resuscitation on scene.
- If patient remains pulseless:
  - **DO NOT TERMINATE ON SCENE.**
  - Load and transport the patient, preferably non-emergency, as per the CPR During Transport Procedure (*below*).

CARDIAC ARREST PHILOSOPHY = "STAY-AND-PLAY"

- **Almost every patient should be resuscitated on scene prior to transport.**
- Resuscitation in both adult and pediatric patients, is not a "load and go" situation, and a minimum of 10 - 20 minutes of resuscitative efforts should be performed prior to transport. This includes:
  - Near immediate placement of a BIAD with appropriate oxygenation and ventilation.
  - Insertion of an IO/IV with appropriate IV fluids and resuscitative medications.
- The**"Stay & Play"** Philosophy includes:
  - Moving a patient only if absolutely necessary, and
  - Moving the patient only the minimal distance needed to provide safety and privacy.
- If provider safety is a concern, attempt the following prior to extrication and transport:
  - Attempt to deescalate the situation (i.e. family) and move *them* to a different area
  - Call for law enforcement (if not already present) to provide crowd control.
  - Move the patient to another nearby area on the scene.
  - Move the patient to the ambulance, and resuscitate in the ambulance.
  - Resuscitating a patient in a *moving* ambulance is an absolute last resort.

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C-01 INITIAL CARDIAC ARREST		First Responder EMT AEMT Paramedic

PEDIATRIC ARREST

- Positioning:
  - INFANT: Place a folded towel under the shoulders to prevent further flexion of the neck and possible obstruction of the airway.
- Chest compressions:
  - INFANT: Compress with two hands encircling the chest and compressing with two thumbs on the sternum.
  - CHILD: Compress the chest with the heel of one or both hands over the lower third of the sternum at the nipple line.
  - ADOLESCENT/ADULT: Compress in the center of the chest at the nipple line with the heel of one hand and the other hand on top.
  - Compress at least **1/3rd** the depth of the chest.
  - Allow complete recoil of the chest wall between compressions.
  - Provide 100 compressions per minute
    - INFANT/CHILD: 15:2 CPR:Vent.
    - ADULT (i.e. >Broselow): 30:2 CPR:Vent.
- Defibrillation:
  - 1st shock @ 2 J/kg
  - Subsequent shocks @ 4 J/kg
- Ventilate:
  - Deliver 2 breaths with an appropriate BVM or preferably through a BIAD (iGel).
  - Ventilations should be provided at a rate of 20-30 breaths per minute.







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TRANSPORT DECISION & TIMING in Cardiac Arrest

Load-and-Go!

- The only Load-and-Go Exceptions, include:
  - Serious and immediate concern of physical injury to the EMS providers.
  - Patient is obviously **pregnant** (can palpate uterus above the umbilicus = >20 weeks) with arrest *witnessed by EMS*.
  - **Penetrating trauma** (that is potentially survivable) with signs of life on EMS arrival.
- In these cases, provide hemorrhage control (if applicable) and stabilize the patient's airway as soon as possible then transport to the closest ED. See **CPR During Transport (*below*)**.

Full (20+ Minute) Resuscitation On Scene

- Patients who will likely meet criteria for Discontinuation (of Resuscitation) in Medical Arrest [X-02]--i.e. do not meet any of the "Critical Criteria":
  - Should have full resuscitative efforts and interventions (20+ minutes) performed on scene, regardless of ultimate disposition/transport.
  - Should be transported only:
    - After ROSC.
    - If in a public place (or was moved to the ambulance for privacy/safety), or
    - If there is substantial resistance from family, that does not improve with discussion.

15-20 Minute Resuscitation On Scene with Delayed Transport

- Patients who meet one or more of the "Critical Criteria" (i.e. do NOT meet criteria for field Discontinuation of Resuscitation) should be transported only:
    - After ROSC, or
    - After the patient has been given **adequate resuscitative efforts on scene,** including: high-quality CPR, placement of an advanced airway, and fluid/medication administration per the appropriate guideline.
  - It is recommended that online medical control be contacted prior to transport to make termination or transport decision.
  - See "Special Situations" (*below*) for more information on patient's meeting "Critical Criteria".

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C-01 INITIAL CARDIAC ARREST		First Responder EMT AEMT Paramedic

SPECIAL SITUATIONS in Cardiac Arrest

- **Cardiac arrest is <u>witnessed</u> by a prehospital provider**
  - Witnessed on scene: resuscitate on scene, per “Transport Decision and Timing”.
  - Arrests in the ambulance *while* on scene: provide 15-20 minutes of resuscitative efforts on scene, then transport the patient as per the *CPR During Transport*, below.
  - Arrests en route to the destination:
    - STOP! Pull over to as safe and private an area as is reasonably possible, and call for First Response or other assistance.
    - Provide resuscitative interventions as per the Pit-Crew CPR Guideline [C-P1].
    - Once interventions have been completed (airway, IO/IV and mechanical CPR device), continue on to destination, as per *CPR During Transport*.
    - **NEVER pronounce a patient in a vehicle**. You may terminate efforts on the orders of online medical control if they are deemed unreasonable and put EMS personnel at risk during transport.
- **Patient is a <u>minor</u> (<18 years old)**
  - Work on scene for at least 15-20 minutes, focusing on airway management and oxygenation. Then transport, as per CPR During Transport, *below*.
  - ED Goal = Provide Social Services
- **Patient is <u>obviously pregnant</u>** (can palpate uterus above the umbilicus)
  - If an obviously pregnant patient (*as above*) sustains a witnessed arrest AND you are **less than 10 minutes from an ED, rapid evacuation and transport <u>IS</u> indicated.**
  - ED Goal = Emergency C-Section
- **Hypothermia**/Cold Water Drowning
  - In cases of <u>rapid submersion</u> in near-freezing liquid or snow:
    - Treat as per the **Hypothermia Guideline [E-06]**.
    - Provide initial interventions as described in the **Pit-Crew CPR Guideline [C-P6]**, and the patient should be transported soon after the interventions have been completed to the nearest ED.
  - ED Goal = rewarming via ECMO (cardiac bypass) or other invasive techniques.
  - <u>Note</u>: for prolonged exposure/gradual decrease in core temperature (i.e. submersion in cool water [40-60 degrees]): Resuscitate on scene and provide warm fluids.
- **Patient displays <u>any</u> shockable rhythm (VF/VT) at <u>any time</u>:**

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- If the shockable rhythm is due to cardiac ischemia, there is a possibility of survival with emergent (intra-arrest) cardiac catheterization.
- This is a highly debated and somewhat experimental intervention with conflicting data at present and is not supported by most specialists. The standard of care at present is to resuscitate the patient and only catheterize if pulses are restored.
- This may change in the future, but for now resuscitate on scene and contact medical control for termination or transport orders.

AIRWAY IN CARDIAC ARREST

- Airway management remains an important part of cardiac resuscitation, but its importance has been placed secondary to high-quality CPR and defibrillation.
  - Evidence suggests that oxygenation of blood is maintained for several minutes after sudden (i.e. witnessed) cardiac arrest.
  - In addition, there is a decreased demand in the amount of ventilation and oxygenation that a pulseless patient requires.
  - Hyperventilation can be detrimental to successful resuscitation, because the increased intrathoracic pressure decreases coronary perfusion pressure. Be extremely mindful of ventilation rates and volumes.
  - Higher rates with lower volumes are preferred to maintain minute ventilation while minimizing high intrathoracic pressures.
- ***Pediatric or Other Respiratory Arrests***: In arrests that are hypoxic/respiratory in nature, care <u>should</u> focus on obtaining adequate ventilation/oxygenation as soon as possible.
  - **<u>Un</u>witnessed cardiac arrests** (that generally require several minutes or more of response time) should be assumed to have oxygen depleted blood and should have oxygenation and ventilation addressed immediately after CPR has begun and defibrillation pads are placed.
- Initial airway management should be performed with rapid placement of a BIAD (Blind Insertion Airway Device), which should generally be inserted as soon as possible during the initial stages of resuscitation.
- Early Endotracheal (ETT) Intubation in cardiac arrest can be considered if BVM and supraglottic airway methods fail.
- Once all core resuscitative interventions have been performed (see Pit-Crew CPR [C-P1]), or upon obtaining ROSC, consider replacing a BIAD with an ETT. If the BIAD is functioning,

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replacement is not necessary and may be deferred to the destination facility.

- It is unacceptable to interrupt chest compressions more than momentarily while performing airway procedures.
- In cases of sole respiratory arrest (pulses present), the endotracheal tube may be placed as the initial airway device. Be extremely mindful of increased vagal tone produced by intubation which can lead to bradycardia and full cardiac arrest.
- **"When in doubt, take it [*the tube*] out!"** Correct airway placement is paramount.

BREATHING (O_2/VENTILATION) in Cardiac Arrest

- If hypoxic arrest suspected (e.g.: any pediatric patient, or adult with asphyxiation, overdose, status asthmaticus, etc.), begin ventilations and oxygenation immediately.
- In a witnessed, sudden arrest (i.e. not a respiratory/hypoxic arrest), you may consider placing an NPA/OPA and a NRB face mask with O_2 for first 2 cycles of CPR.

VENTILATIONS:

- **Ventilations should be timed WITH the chest compression (not on recoil).**
- Do not over ventilate: squeeze the bag with a 2-3 finger "pinch".
- If no advanced airway is in place, alternate ventilations and compressions per current BLS/ACLS guidelines (generally 30:2 in adults or 15:2 in children).
- If advanced airway in place, ventilate continuously at 12-20 breaths/minute in adults (20-30 breaths/minute in pediatrics).
- **Be careful to ensure appropriate (i.e. small) ventilation volumes with the increased rate.**

CPR/CHEST COMPRESSIONS in Cardiac Arrest

- CPR should **always** take priority over any other intervention and interruption of chest compressions should be kept to an absolute minimum.
  - Resume compressions immediately after shocks & rhythm checks.
  - Check pulses only if organized rhythm is present.
- Assess quality of CPR with continuous waveform capnography (goal = 10-20 or more).
  - If ETCO2 < 10: improve quality of compressions or change compressor.

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C-01 INITIAL CARDIAC ARREST		First Responder EMT AEMT Paramedic

ELECTRICITY (i.e. Defibrillation and Pacing)

- Pacing is **NEVER** indicated for asystole and PEA.
- If a patient has an implantable cardioverter defibrillator (ICD) or pacemaker: place pacer/defib pads at least 1 inch from the device.
- Defibrillation
  - Biphasic: per manufacturer recommendation, or if unknown, use 200 J.
    - **May consider escalating energy doses (300J, 360J, etc.) as per 2025 AHA Guidelines.**
  - Monophasic defibrillator: 360 J
- If the AED is being utilized upon ALS arrival, ALS personnel shall allow the AED to complete the upcoming analysis including a shock if required. Immediately after this, the patient shall be switched over to the ALS monitor.

VASCULAR ACCESS in Cardiac Arrest

- Renal Dialysis and Cardiac Arrest
  - In non-arrest, do not take blood pressures or attempt IV's in the same area of the dialysis access or catheter.
  - In an arrest situation, accessing dialysis shunts or catheters is appropriate.
  - If accessing a VasCath or similar dialysis catheter (central Line used for temporary dialysis with red and blue ports).
    - Remove at least 3-5 ml of the catheter fluid (heparin solution) from either port.
    - Then flush the port with 10 ml of Normal Saline, prior to attaching IV tubing and infusing fluids or medications.

"OTHER" NOTES:

- Family Presence
  - Family presence during resuscitation is preferred by most families, is rarely disruptive, and may help with the grieving process.
  - It should be encouraged, unless disruptive to the resuscitation efforts.

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C-01 INITIAL CARDIAC ARREST		First Responder EMT AEMT Paramedic

CPR DURING TRANSPORT

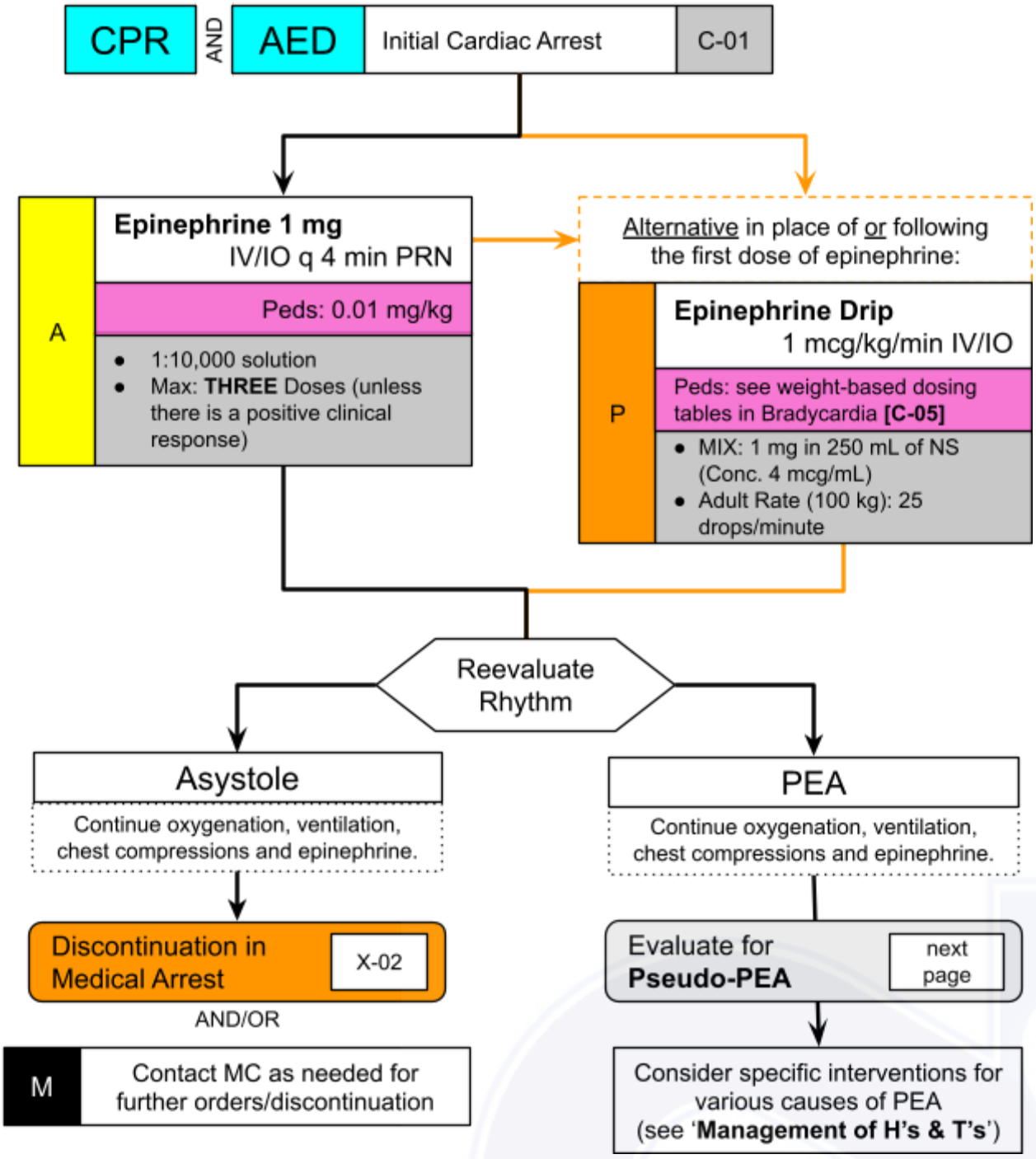
- Resuscitation in a moving ambulance is INEFFECTIVE and DANGEROUS.
  - Evidence shows it is associated with poorer patient outcomes.
  - The majority of on-job deaths of EMS personnel are due to being unrestrained in the box of an ambulance running lights-and-siren towards its destination.
- IF it is necessary to transport a patient in cardiac arrest the following must be met:
  - **ALL individuals in the ambulance** (patient and crew) **must be restrained. There are NO EXCEPTIONS.**
  - All critical interventions will be performed while the vehicle is stopped. These include:
    - Advanced airway (BIAD) or ETT placement.
    - IO/IV Placement
    - Attachment additional of monitoring equipment (including EtCO2)
  - Manual CPR should NOT be performed in a moving ambulance.
    - Mechanical CPR (Lucas or Autopulse) should be initiated prior to extrication to the ambulance, if available.
    - If a functional Mechanical CPR device is not available, Manual CPR may only be performed if the EMS Provider is FULLY RESTRAINED in the bench seat.
  - Avoid Red Lights & Siren (RLS) Transport
    - With the exception of patients who meet the “Load-and-Go” criteria (*above*), transports should generally be non-emergent (“Code 2”).
    - If traffic is heavy and/or multiple stops at intersections are anticipated and there is concern about the general public witnessing resuscitative efforts, transport with Red Lights & Siren (RLS, “Code 3”) may be warranted in select circumstances.

QI Review Parameters:

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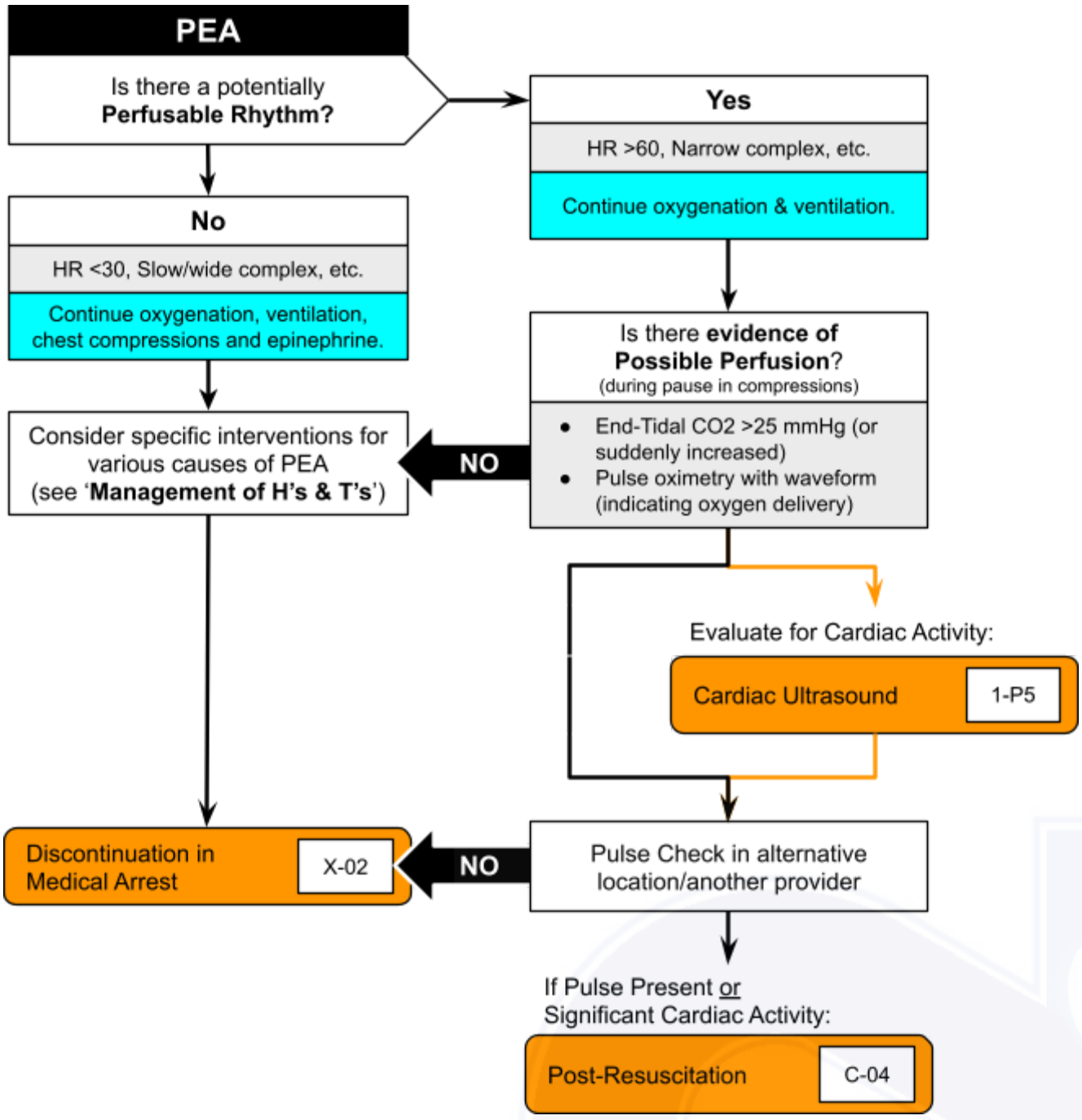
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C-02 ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY		First Responder EMT AEMT Paramedic



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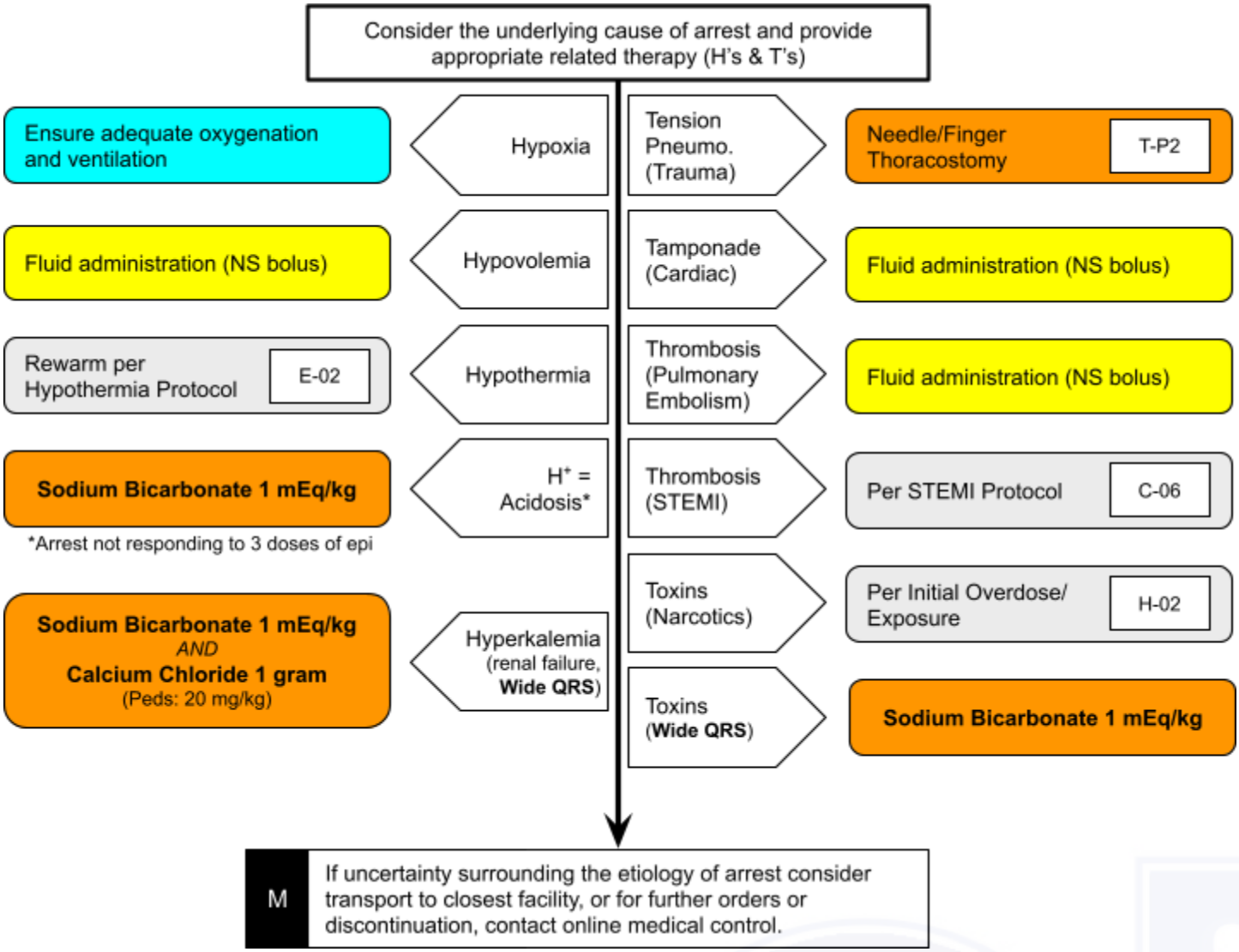
Pseudo-PEA Evaluation



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C-02 ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY		First Responder EMT AEMT Paramedic

Management of H's & T's



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C-02 ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY		First Responder EMT AEMT Paramedic

ASYSTOLE NOTES:

Treatment of asystole = “turn on” the electricity:

- The primary goal with asystole is to get an electrical rhythm that is able to…
  - 1: be defibrillated, or
  - 2: (preferably) cause “mechanical capture”.
- ...that is to say, you must have electricity running through the pump before you can get a pulse.
- Always check multiple leads as well as the placement and contact of the leads before assuming that the rhythm is asystole.

To accomplish this, you must get oxygen and nutrients to the coronary arteries (i.e. perfuse them), and hope the heart’s electrical system is able to respond.

- Resuscitation **first and foremost** should focus on **high quality continuous CPR**.
- Oxygenation = high-flow O2
- Ventilation = Use the quickest available method that effectively provides appropriate ventilatory volume to the patient.
  - This should be started with a BVM and (generally) a BIAD (Blind Insertion Airway Device, i.e. iGel or King-LT) should be placed as soon as possible.
  - Endotracheal Intubation should only be attempted if adequate medical personnel are on scene and **CPR is not interrupted** during placement, or if other methods of ventilation fail.
- IV access should always be obtained on a cardiac arrest that does not meet presumed Death-on-Arrival [X-01] guidelines.
- IO should be placed on most cardiac arrests unless very rapid peripheral or external jugular (EJ) access can be obtained.
- Perfusion should be assisted with IV fluid bolus as soon as possible.

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C-02 ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY		First Responder EMT AEMT Paramedic

PEA NOTES:

Unlike in asystole, the problem in PEA is that there is an organized electrical rhythm, but for some reason the heart is unable to create enough (or any) cardiac output to produce a pulse.

- Historically, this has been termed “electromechanical dissociation” for obvious reasons, but this over simplifies the breadth of potential underlying problems.
- While the pathophysiology is a decreased or absent cardiac output, the ultimate reason for the decreased output can be divided into three different types.
    a. Pump failure = This is the classic “electromechanical dissociation” where there is electricity pumping through the heart, but there is no (or limited) response from the myocardium.
        - Often this is due to a myocardial infarction or some metabolic cause (i.e. hypoxia or acidosis) that prevents the myocardium from responding.
    b. Preload problem = the heart is not receiving enough blood to maintain cardiac output.
        - This is often due to **inadequate blood volume** from dehydration, hemorrhage, or vasodilation (i.e. sepsis).
        - Obstruction of venous return from the body (or lung) can also prevent blood from getting to the heart--this occurs most commonly with pulmonary embolism or tension pneumothorax.
    c. Afterload problem = something is obstructing the flow of blood out of the heart.
        - Most commonly we think of an aortic aneurysm/dissection.
- Always consider there may be more than one pathology causing the problem (i.e. sepsis with decreased preload and decreased myocardial contractility).

Pseudo-PEA

- Pseudo-PEA is a state in which there is some degree of cardiac output, but the medical provider is unable to definitively document a palpable pulse.
- When a pulse cannot be palpated, secondary mechanisms can be used to determine perfusion (pulse-ox waveform, ETCO2, etc.).
- Patients with adequate cardiac activity do not require ongoing chest compressions, and clinical interventions should focus on respiratory and hemodynamic support, and management of the the underlying cause of instability.

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C-02 ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY		First Responder EMT AEMT Paramedic

H'S & T'S IN PEA ARREST:

- There are several mnemonics for listing the potential causes of PEA cardiac arrest--the 5 H's and T's being the most common.

Hypoxia	Tension PTX
Hypovolemia	Tamponade (Cardiac)
Hypothermia	Thrombosis (PE)
(H+) Acidosis	Thrombosis (STEMI)
Hyperkalemia	Toxins

- When we break down the treatment of the potential causes of PEA arrest, *most* can be treated with our most basic resuscitation techniques--<u>oxygenation, ventilation and fluid resuscitation</u>.
    - These basic interventions should address **Hypoxia (oxygen)** and **Hypovolemia (fluids)**.
- The treatment for **Acidosis (H+)** is to **perfuse the acidotic tissues** (CPR and fluids) and to get rid of CO2 (i.e. ventilate the patient).
    - With prolonged downtime or resuscitation, Bicarb can be considered but should never supercede basic interventions.
- **Thrombosis (PE or STEMI)** and **Cardiac Tamponade** will almost never receive specific care in the field.
    - 12-lead EKG should be performed ASAP after ROSC if STEMI is suspected.
    - Tamponade and Pulmonary Embolism should generally present like Tension PTX as preload is decreased = narrow complex tachycardia.
    - STEMI can present with a variety of cardiac rates and rhythms (from normal sinus rhythm to various bradyarrhythmias/blocks to various tachyarrhythmias) depending on location and severity of occlusion.
- **Hyperkalemia**
    - Potassium elevation severe enough to cause cardiac dysfunction should almost always present with a **wide, slow rhythm**.
    - If suspected, treatment with Bicarb and Calcium should be initiated.
- **Tension PTX**
    - Always should be suspected with chest trauma and decreased breath sounds.

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- Generally, these patients rapidly decline with increasing pulse rate and decreasing O2 sats as preload rapidly decreases.
- Treatment should be by needle decompression per guidelines.

- **Hypothermia** should be suspected by history of exposure and rewarmed per protocol.
- **Toxins** almost are almost always treated by basic supportive care.
  - Most respiratory and ALL cardiac arrests with **opiate overdose** (or other respiratory depressant) should be treated with **<u>oxygenation and ventilation</u>**.
  - Narcan will not work until the brainstem is reperfused in arrest.
  - One overdose that can be potentially treated in the field is any drug that has *sodium-channel blocking properties*.
    - Most commonly this is going to be with a **tricyclic antidepressant**.
    - Should see a **WIDE QRS complex** PEA.
    - Treatment is with Bicarb.

QI Review Parameters:

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C-03 VENT. FIBRILLATION/ PULSELESS V-TACH	**For Polymorphic Wide-Complex Tachycardia, refer to Torsades [C-09]**	First Responder EMT AEMT Paramedic

CPR AND **AED** | Initial Cardiac Arrest | C-01

As soon as possible:

P

DEFIBRILLATE @ 200 J

Peds: 2 J/kg

Repeat & **consider escalating energy dose** per AHA Guidelines

2 min cycles of CPR, re-evaluate rhythm, and defibrillate as needed

This is the ONLY treatment for the rhythm (vFib/vTach). Medications help with successful defibrillation but do not convert the rhythm themselves.

Second, If remains pulseless:

A

Epinephrine 1 mg IV/IO q 4 min

Peds: 0.01 mg/kg

Max: **THREE** Doses (unless there is a positive clinical response)

AND/OR

Alternative in place of or following the first dose of epinephrine:

P

Epinephrine Drip 1 mcg/kg/min IV/IO

Peds: see weight-based dosing tables in Bradycardia **[C-05]**

- MIX: 1 mg in 250 mL of NS (4 mcg/mL)
- Adult Rate (100 kg): 25 drops/minute

Then, if persistent VF/VT:

P

Amiodarone 300 mg IV/IO bolus

Peds: 5 mg/kg, repeat x1 PRN

- Repeat once at **150 mg** after 5 min if needed

Then, if VF/VT converts:

Amiodarone Drip 1 mg/min

Peds: Contact Medical Control

OR

Lidocaine 100 mg IV/IO over 1 min

Peds: 1 mg/kg

- Repeat at ½ of initial dose every 3-5 min PRN
- Max THREE doses

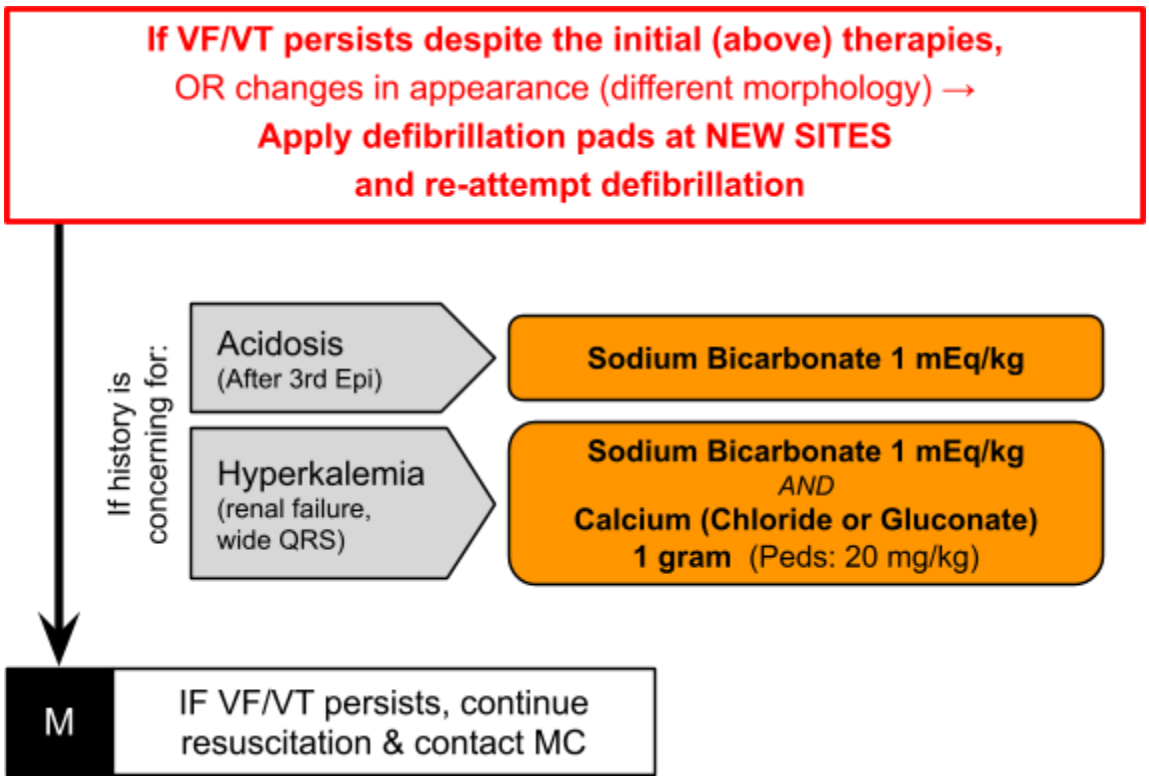
Then, if VF/VT converts:

Lidocaine Drip 2-4 mg/min

Peds: Contact Medical Control

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C-03 VENT. FIBRILLATION/ PULSELESS V-TACH	**For Polymorphic Wide-Complex Tachycardia, refer to Torsades [C-09]**	First Responder EMT AEMT Paramedic



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C-03 VENT. FIBRILLATION/ PULSELESS V-TACH	**For Polymorphic Wide-Complex Tachycardia, refer to Torsades [C-09]**	First Responder EMT AEMT Paramedic

VF/VTACH NOTES

- Cardiac resuscitation on a patient in VF/pVT or who had a shockable rhythm (or AED defibrillation) during resuscitation **cannot** be terminated by the Termination of Resuscitation guideline [X-02].
- Contact online medical control for termination or other online orders

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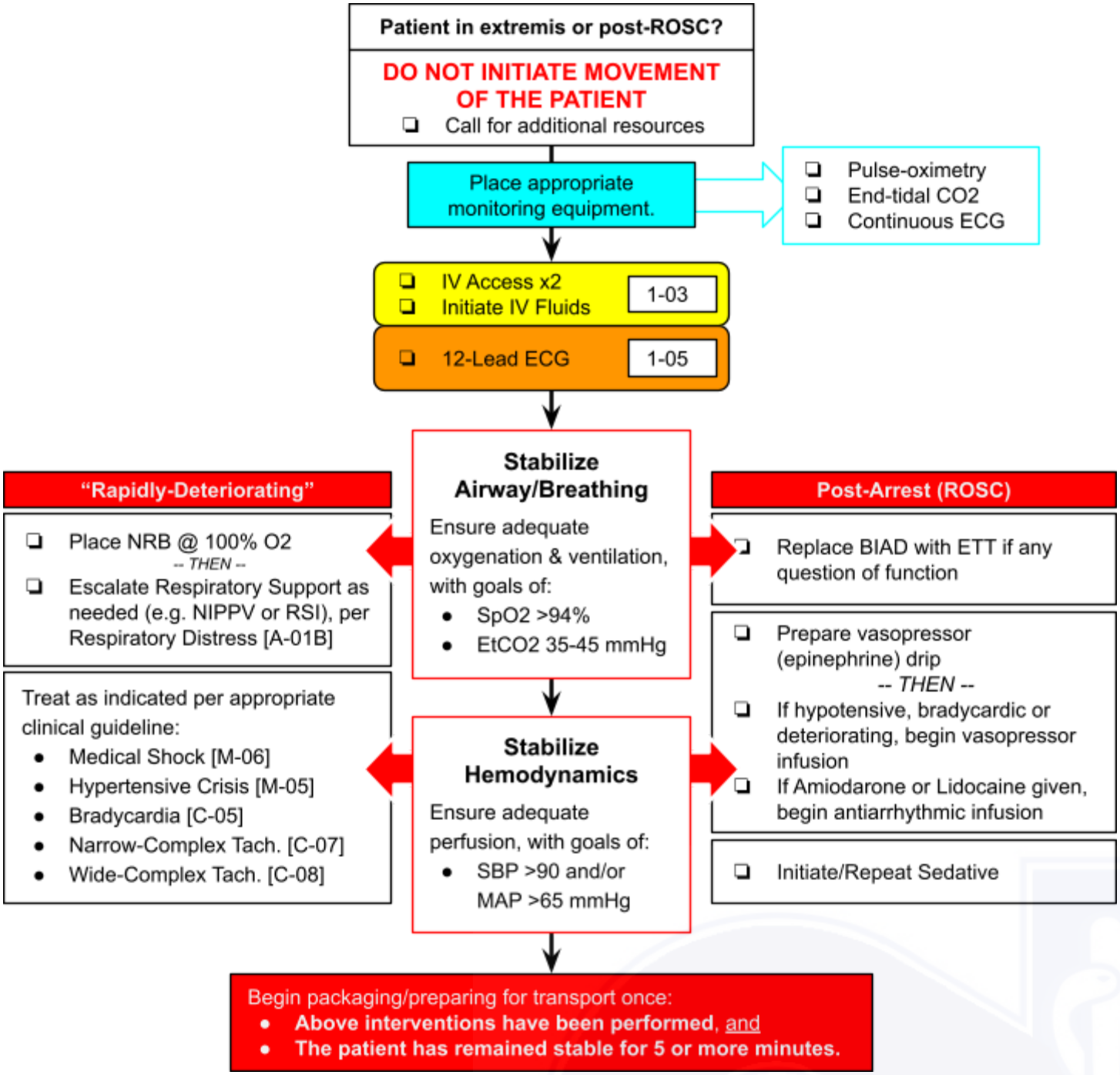
- **THE treatment for VF/VT is cardioversion/defibrillation.**
  - Medications (e.g. Amiodarone) improve the likelihood of ROSC but have little if any effect on survival.
- If VF/VT does not convert with 2-3 defibrillation attempts, replace electrodes/pads and place them in a different position (i.e. if placed right chest/apex, then attempt anterior-posterior placement)
- Automatic Internal Defibrillator:
  - If a patient's internal defibrillator is firing/shocking VF/VT appropriately and successfully (i.e. converts rhythm at least temporarily), continue other resuscitative efforts and allow it to continue to do so.
  - If it is not successfully converting the dysrhythmia, consider transthoracic (*normal*) defibrillation with pads placed at least 1” away from defibrillator.
- If the patient appears to grimace or respond at all to shocks, please provide sedation per guidelines [**RX-03**].
- **Polymorphic VTach (i.e. Torsades)** should always assumed to be unstable and should be defibrillated immediately, as per Torsades [**C-09**].

QI Review Parameters:

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C-04 RAPIDLY DETER./ POST-ROSC		First Responder EMT AEMT Paramedic



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C-04 RAPIDLY DETER./ POST-ROSC		First Responder EMT AEMT Paramedic

Indications

- Any patient in whom cardiac or respiratory arrest appears imminent.
- Any patient who appears in extremis, including new onset altered mental status, airway compromise, severe respiratory distress, or signs of shock/poor perfusion.
- Any patient who regains pulses following resuscitation.

Exclusion Criteria

- Any patient with evidence of severe, life-threatening trauma.

Purpose

EMS traditionally has attempted rapid extrication and transport of patients in extremis or in whom ROSC is achieved. Many times this leads to patients quickly deteriorating to the point of cardiac arrest, often while packaging and loading these patients. It is important to rapidly recognize the deteriorating patient and take immediate action where you encounter the patient to stabilize the condition BEFORE loading and transporting.

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C-04 RAPIDLY DETER./ POST-ROSC		First Responder EMT AEMT Paramedic

Checklist for Post-Resuscitation and Rapidly-Deteriorating Patients

Reference Guidelines	Interventions	
	❑ Call for additional resources. ❑ Place appropriate monitoring equipment: *Continuous Pulse-Oximetry, End-Tidal CO2, and Continuous ECG*	
IV Protocol 1-03	❑ Obtain (at least 2) adequate IV access sites	
	Unless profound pulmonary edema, ❑ Begin fluid resuscitation (1 Liter NS)	
	❑ 12-Lead ECG	
	Crashing Patient	**Post Resuscitation**
Airway Maintenance A-01A Respiratory Distress A-01B	**Titrate respiratory support to ensure adequate oxygenation & ventilation:** Goals SpO_2 >94% & $EtCO_2$ 35-45 mmHg	
	❑ Place NRB @ 100% O_2 ❑ Escalate respiratory support as needed: NIPPV, BVM, DAI/RSI	*If ROSC with BIAD:* ❑ Place ETT if any concern of BIAD function
Medical Shock M-06	**Ensure adequate perfusion:** Goals SBP > 90 and/or MAP >65	
	Treat as indicated per appropriate clinical guideline: ❑ Medical Shock [M-06] ❑ Hypertensive Crisis [M-05] ❑ Bradycardia [C-05] ❑ Narrow-Complex Tach. [C-07] ❑ Wide-Complex Tach. [C-08]	*For ALL post-arrest patients:* ❑ Prepare vasopressor drip *If any hypotension/bradycardia:* ❑ Begin vasopressor drip
		If Amiodarone or Lidocaine administered: ❑ Begin antiarrhythmic drip
		If any purposeful movement: ❑ Sedate patient

Once interventions have been completed,
begin to "package" the patient for extrication/transport.

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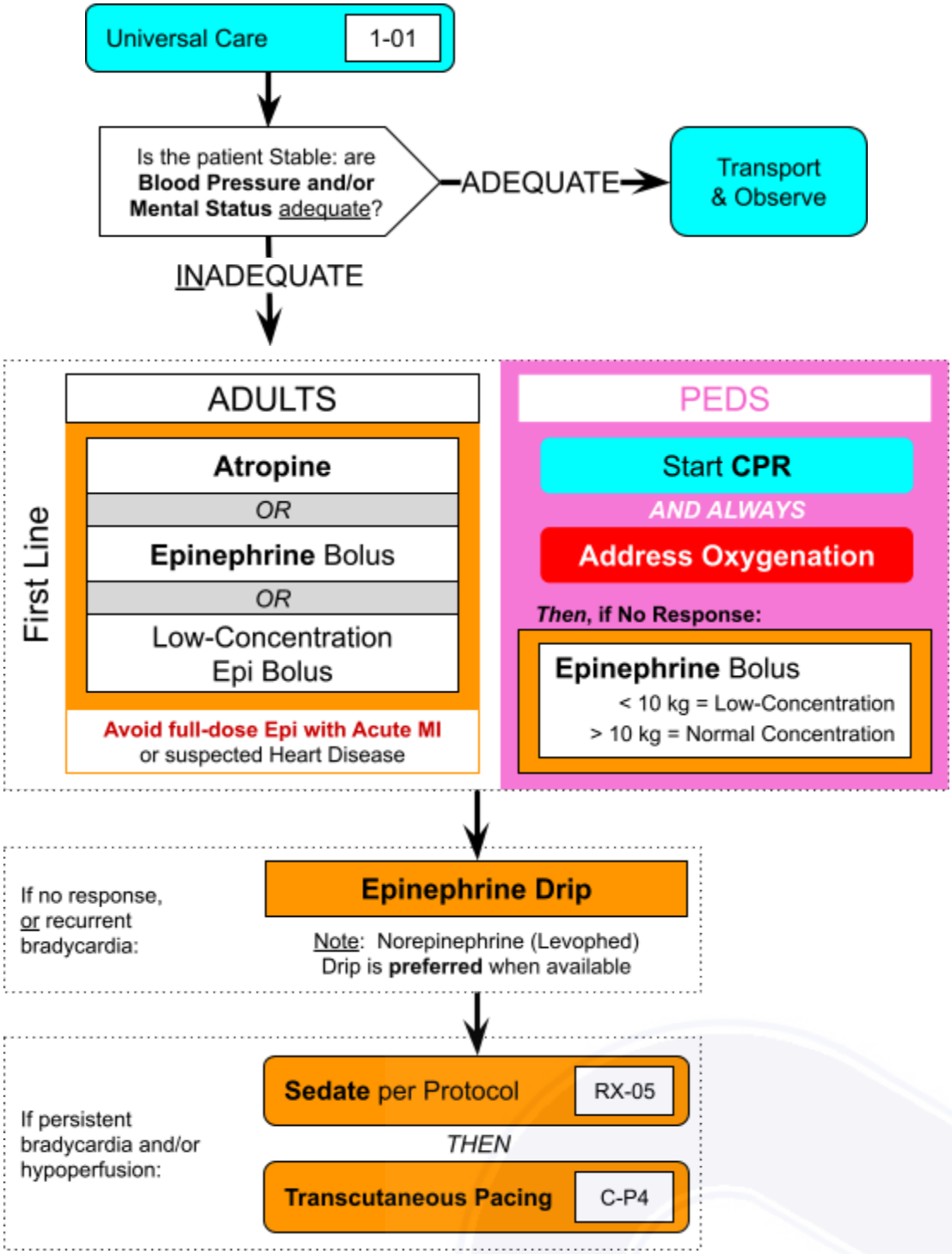
C-04 RAPIDLY DETER./ POST-ROSC		First Responder EMT AEMT Paramedic

NOTES:

- Survival/neurologic outcome worsen with fever, hypoxia, hypo/hypercapnia, and hypotension. Post-ROSC care should focus on prevention of these elements.
    - Prevent hypotension: Maintain normal blood pressure (SBP>90 and/or MAP>65) with fluids and vasopressors as per guidelines:
        - Medical shock [**M-06**, includes Cardiogenic Shock], and/or
        - Hemorrhagic shock [**T-03**]
    - Prevent hypoxemia:
        - Respiratory Distress [**A-01B**] or other appropriate guidelines.
        - Oxygen should be titrated to maintain SaO2 of >94%.
    - Prevent hypo/hypercapnia:
        - Always use ETCO2 monitoring [**A-P3**]
        - Titrate ventilations (respiratory rate) to goal:
            - **Goal ETCO2 35-45 mmHg** (although slight elevations may be considered, especially in patients with chronic lung disease)
            - **Patients in extremis or following resuscitation should generally be assumed to be in a state of acidosis, and respiratory rates should generally be in the 12-20 bpm range for adults.**
            - Higher rates should always be accompanied by a relative decrease in tidal volume to prevent hyperventilation and elevated intrathoracic pressures (which may result in decreased preload and hypotension). Typical adult-sized reservoir bags (Ambu Bags) should utilize a “two-finger pinch” technique to limit the volume of air delivered.
    - Prevent/treat fever:
        - Consider contacting online medical control to initiate cooling (hypothermia) with ice packs and cool/room-temperature IV fluids.
        - Maintain temperature <38 ºC (<100.4 ºF) using appropriate passive cooling techniques.
- Always monitor for and prepare to treat arrhythmias as per specific guidelines.
- Obtain 12-lead EKG as soon as possible to evaluate for STEMI.

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C-05 BRADYCARDIA		First Responder EMT AEMT Paramedic



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C-05 BRADYCARDIA		First Responder EMT AEMT Paramedic

Bradycardia Dosing

Atropine or Epi Bolus

Atropine Bolus	Epinephrine Bolus	
	Normal Concentration	***Low*** *Concentration*
1 mg IV/IO	**0.1-0.2 mg** = 100-200 mcg = ***1-2 mL*** *of 1 mg/10 mL*	**0.01-0.02 mg** = 10-20 mcg = ***1-2 mL*** *of diluted epi*
Peds: 0.02 mg/kg IV/IO = **0.2 mL/kg**	Peds: 0.01 mg/kg IV/IO = **0.1 mL/kg**	Peds: 0.01 mg/kg IV/IO = **1 mL/kg**
• Repeat PRN every 3-5 min • Adults: 3 mg MAX • Peds: 2 doses MAX	• Repeat PRN every 3- 5 min • Titrate up to 0.5 mg = 5 mL	• Repeat PRN every 3- 5 min • Titrate up to 0.1 mg = 100 mcg = 10 mL
Concentration = 0.1 mg/mL = 100 mcg/mL	Concentration = 0.1 mg/mL = 100 mcg/mL	Concentration = 0.01 mg/mL = 10 mcg/mL

Epi Drip

Epinephrine Drip @ 0.1 - 1 mcg/kg/min

- Titrate to normalize BP (> 90 mmHg)
- **See *below* for dosing tables**

Alt.	**Levophed** (norepin.) 0.1 - 2 mcg/kg/min	OR	**Dopamine** 2-20 mcg/kg/min

PEDS

If possible, contact medical control prior to starting a vasopressor drip on pediatric (i.e. Broselow) patients.

MIX: Low-Conc. = 0.1 mg (1 mL of 1 mg/10 mL) diluted with 9 mL NS — Drip = 1 mg mixed into 250 mL of NS (4 mcg/mL)

Pace

If continued INADEQUATE PERFUSION:

Sedate per Protocol RX-03 *THEN* **Transcutaneous Pacing** C-P4

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C-05 BRADYCARDIA		First Responder EMT AEMT Paramedic

250 mL Vasopressor Drip Mixing Guide:

	Epinephrine 0.1 - 1 mcg/kg/min	Norepinephrine 0.1 - 2 mcg/kg/min	Dopamine 5 - 20 mcg/kg/min
Med/Dose:	1 mg	4 mg	400 mg
Volume (NS/D5W):	250 mL	250 mL	250 mL
Concentration:	**4 mcg/mL**	**16 mcg/mL**	**1600 mcg/mL**

Drops per minute (displayed in **BOLD**) on a 60-drop set
(*drops/second ALSO displayed in italics if > 60 gtt/min*)

	Epinephrine 4 mcg/mL		**Norepinephrine (Levophed)** 16 mcg/mL		**Dopamine** 1600 mcg/mL	
Broselow Color/ Weight (kg)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)
Gray (3-5)	**6**	**60**	**1.5**	**30**	**0.8**	**3**
Pink (6-7)	**11**	**105** (*1.7*)	**2.6**	**52.5**	**1.3**	**5**
Red (8-9)	**14**	**135** (*2.2*)	**3.5**	**67.5** (*1.1*)	**1.7**	**6.7**
Purple (10-11)	**17**	**165** (*2.7*)	**4**	**82** (*1.4*)	**2**	**8.2**
Yellow (12-14)	**21**	**210** (*3.5*)	**5**	**105** (*1.7*)	**2.6**	**10.5**
White (15-18)	**27**	**270** (*4.5*)	**7**	**270** (*4.5*)	**3.4**	**13.5**
Blue (19-23)	**35**	**345** (*5.8*)	**9**	**172** (*2.8*)	**4.3**	**17**
Orange (24-29)	**44**	**435** (*7.2*)	**11**	**218** (*3.6*)	**5.4**	**22**
Green (30-36)	**54**	**540** (*9*)	**14**	**270** (*4.5*)	**7**	**27**
Small Adult (50)	**75** (*1.2*)	**750** (*13*)	**19**	**375** (*6.2*)	**10**	38
Large Adult (100)	**150** (*2.5*)	**1500** (*25*)	**38**	**750** (*13*)	**19**	75 (*1.2*)

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C-05 BRADYCARDIA		First Responder EMT AEMT Paramedic

500 mL Vasopressor Drip Mixing Guide:

	Epinephrine 0.1 - 1 mcg/kg/min	Norepinephrine 0.1 - 2 mcg/kg/min	Dopamine 5 - 20 mcg/kg/min
Med/Dose:	1 mg	4 mg	400 mg
Volume (NS/D5W):	500 mL	500 mL	500 mL
Concentration:	**2 mcg/mL**	**8 mcg/mL**	**800 mcg/mL**

Drops per minute (displayed in **BOLD**) on a 60-drop set
(*drops/second ALSO displayed in italics if > 60 gtt/min*)

	Epinephrine 2 mcg/mL		**Norepinephrine (Levophed)** 8 mcg/mL		**Dopamine** 800 mcg/mL	
Broselow Color/ Weight (kg)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)
Gray (3-5)	**12**	**120** (*2*)	**3**	**60**	**1.5**	**6**
Pink (6-7)	**21**	**210** (*3.5*)	**5**	**105** (*1.8*)	**2.5**	**10**
Red (8-9)	**27**	**270** (*4.5*)	**7**	**135** (*2.3*)	**3.5**	**13**
Purple (10-11)	**33**	**330** (*5.5*)	**8**	**165** (*2.6*)	**4**	**16**
Yellow (12-14)	**42**	**420** (*7*)	**11**	**210** (*3.5*)	**5**	**21**
White (15-18)	**54**	**540** (*9*)	**14**	**270** (*4.5*)	**7**	**27**
Blue (19-23)	**69** (*1.1*)	**690** (*11.5*)	**17**	**345** (*5.8*)	**9**	**34**
Orange (24-29)	**87** (*1.4*)	**870** (*14.5*)	**22**	**435** (*7.3*)	**11**	**43**
Green (30-36)	**108** (*1.8*)	**1080** (*18*)	**27**	**540** (*9*)	**14**	**54**
Small Adult (50)	**150** (*2.5*)	**1500** (*26*)	**37**	**750** (*13*)	**19**	75 (*1.2*)
Large Adult (100)	**300** (*5*)	**3000** (*50*)	**75** (***1.2***)	**1500** (*25*)	**38**	150 (*2.5*)

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C-05 BRADYCARDIA		First Responder EMT AEMT Paramedic

NOTES:

- Pediatrics:
  - Any HR <60 in an ill child should be considered abnormal
  - **Bradycardia in children is most likely due to hypoxia.**
  - Oxygenation should be addressed ASAP and adequate ventilations should be ensured with appropriate intervention.
  - If HR < 60 with poor perfusion, CPR should be started while airway, oxygenation and ventilation are addressed.
- **Epinephrine** should preferably be used as first-line treatment of bradycardia for most patients, unless otherwise noted in these guidelines.
- **Atropine** may be considered for all patients, and is encouraged in patients with known or suspected coronary artery disease.
  - Atropine blocks the vagal nerves effect on the AV node. This should increase the conduction rate *through* the AV node.
  - For cardiac rhythms that originate below the AV node, atropine will have no effect. This includes many blocks and primary ventricular rhythms. These rhythms should, however, respond to epinephrine.
  - There is not a significant downside to atropine, just that it may not work for a lot of patients, and attempting repeat doses should not delay meds that can improve the bradycardia.
  - For this reason, these guidelines elect to focus on epinephrine for first-line use in most bradycardic patients.
- With a **wide complex bradycardia,** consider hyperkalemia. Treatment is with Bicarb and calcium if available.
- ALWAYS attempt to increase heart rate with medication bolus(es) or drip prior to transcutaneous pacing. ALWAYS sedate a patient who is awake, is or becomes moderately responsive after initiation of pacing.

QI Review Parameters:

1. {PENDING}

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C-06 CHEST PAIN/STEMI	EMT or AEMT may run and transmit 12-lead EKG's when service specific training is provided.	First Responder EMT AEMT Paramedic

Universal Care 1-01

Continuous ECG & 12-Lead ECG 1-05

Transmit ECG if able AND Evaluate for STEMI

STEMI ALERT Protocol

1. 12-lead EKG ASAP with concerning symptoms.
2. As soon as 12-lead EKG confirms STEMI, determine destination preference (if able):
   a. Patient/family preference (<u>always first</u> IF facility has appropriate level of care)
   b. No preference (<45 minute transport) = transport to closest appropriate facility
   c. No preference (>45 minute transport) = request air transport if available [see **Z-01**].
3. Contact dispatch with "STEMI ALERT" and destination.
4. Dispatch will alert receiving ED by phone of "STEMI ALERT", or HEMS if >45 minute transport expected.
5. Transmit 12-Lead EKG to destination facility (*if able*).
6. Encode to receiving facility 5-10 minutes out, starting with "I have a STEMI ALERT, ___ year-old M/F, etc..."

E **Aspirin 324 mg**

Chewed/swallowed if not self-dosed within 24 hours (or if unknown)

SBP?

<100

- A **NS 250 mL bolus**
  - Repeat as needed
  - Monitor for signs of pulmonary congestion

If SBP <90 continues (or if signs of pulmonary edema)

Consider **Vasopressor** Per Medical Shock Protocol M-06

>100

- A **Nitroglycerine** 1 spray/tab SL
  - EMT may assist with home NTG
  - Repeat every 5 minutes
  - Max of THREE doses (unless treating HTN per M-04)
  - Consider 1-inch Nitroglycerin Paste if available

If pain continues (greater than 5 out of 10)

Pain Management RX-02

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C-06 CHEST PAIN/STEMI	EMT or AEMT may run and transmit 12-lead EKG's when service specific training is provided.	

NOTES:

- EMT/AEMT may **run and transmit** 12-lead EKG's after service specific training.
  - EMT/AEMT cannot base treatment decisions on the 12-lead EKG.
  - For patients with symptoms concerning for STEMI, notify the receiving ED that the 12-lead was transmitted so that it can be interpreted and STEMI code activated if appropriate.
- Do not administer Nitroglycerin in any patient who has used an erectile dysfunction medication due to potential severe hypotension:
  - Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours, or
  - Revatio (sildenafil)--used for pulmonary hypertension--in the past 24 hours, or
  - Cialis (tadalafil) in the past 48 hours.
- Diabetics and geriatric patients often have atypical pain, or only generalized complaints such as abdominal pain, nausea, indigestion, back pain, etc.
- Hypersympathetic state from stimulant abuse (e.g. cocaine or methamphetamine) usually presents with sustained HR >120 bpm and HTN. If chest pain occurs in setting of stimulants utilize benzodiazepine per Excited Delirium [**F-01**] /Sedation [**RX-03**] Protocol in addition to above.

QI Review Parameters (Chest Pain):

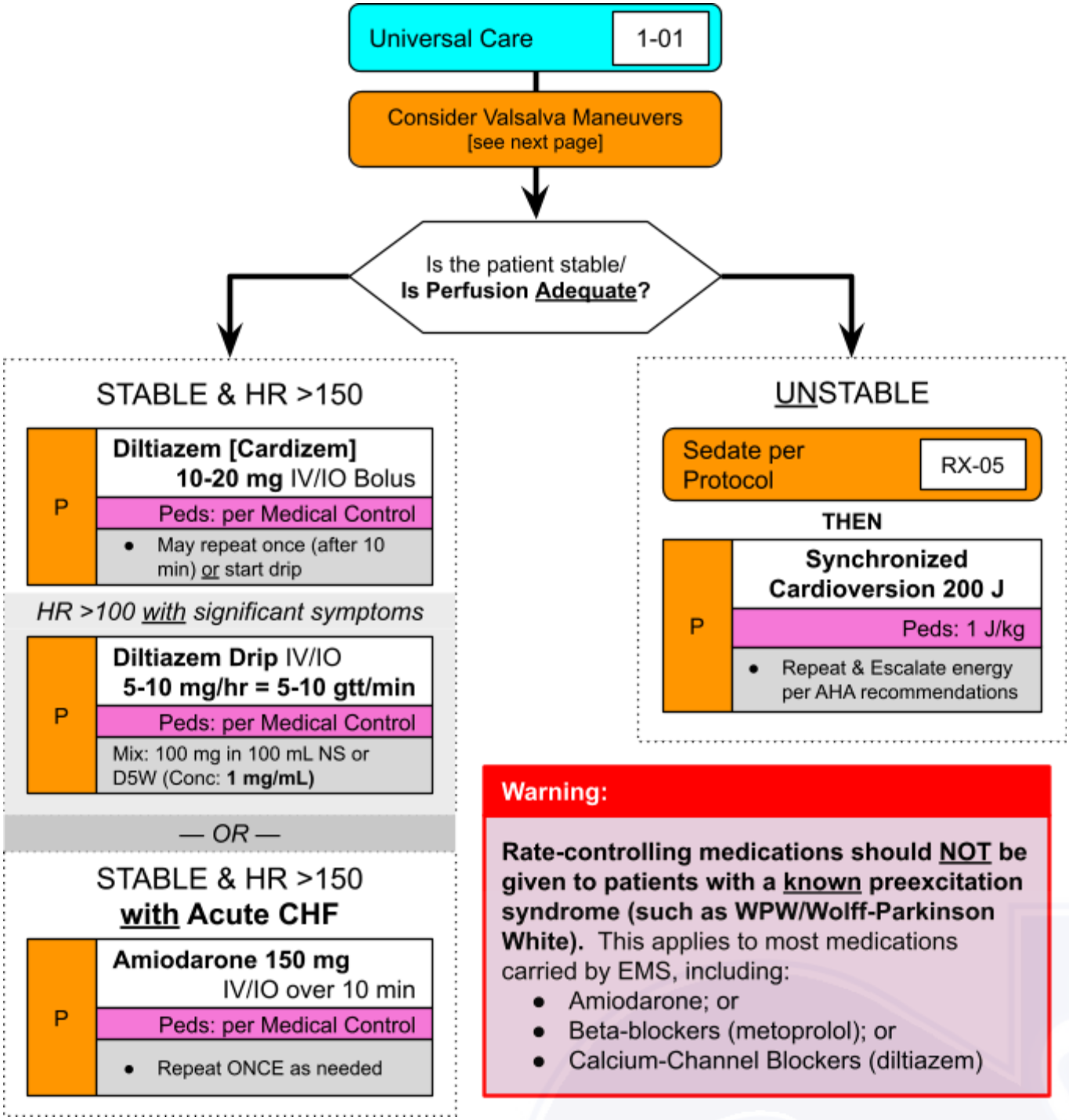
1. 12-Lead ECG performed and attached to PCR?
2. Appropriate Interpretation of 12-Lead ECG? *(Within reason)*
3. ASA given (or documented "given PTA" or allergy)?
4. ***Male Only***: Viagra, Cialis or other erectile dysfunction drug use in past 24 hours documented?
5. NTG given appropriately?

QI Review Parameters (STEMI):

1. Appropriate EKG Interpretation of STEMI?
2. 12-Lead Run within 10 minutes of Patient Contact?
3. EKG Transmitted to Destination?
4. Destination Facility notified of "STEMI Alert"? *(via dispatch or direct contact)*

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C-07 NARROW-COMPLEX TACHYCARDIA	**Peds: Consult Online Medical Control prior to any meds or cardioversion when possible**	First Responder EMT AEMT Paramedic



Warning:

Rate-controlling medications should NOT be given to patients with a known preexcitation syndrome (such as WPW/Wolff-Parkinson White). This applies to most medications carried by EMS, including:

- Amiodarone; or
- Beta-blockers (metoprolol); or
- Calcium-Channel Blockers (diltiazem)

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C-07 NARROW-COMPLEX TACHYCARDIA	**Peds: Consult Online Medical Control prior to any meds or cardioversion when possible**	First Responder EMT AEMT Paramedic

Alternative/Second-Line Medications

May Consider as an **Alternative to Diltiazem** [Cardizem] bolus for Narrow-Complex Tachycardia

P	**Metoprolol 2.5-5 mg** IV/IO
	Peds: per Medical Control
	• May repeat once (after 10 min)

May Consider as a **Second-Line** for REGULAR Narrow-Complex Tachycardia

P	**Adenosine 6 mg** IV/IO
	Peds: 0.2 mg/kg
	• Rapid Flush with NS • Repeat at **12 mg** dose x2

"Unstable" Definition:

- UNSTABLE does NOT mean (just) hypotension
- UNSTABLE = **significant inadequate perfusion** of vital organs:
  - Hypotension with significantly altered LOC (i.e. an alert and talking patient should be considered stable).
  - Symptoms and 12-lead EKG suggesting acute coronary syndrome (severe chest pain, SOB, diaphoresis, etc.).
  - Any BP with significant pulmonary edema and hypoxia.
- Bottomline: *significant* clinical symptoms + clinical signs (i.e hypotension & tachycardia) = inadequate perfusion

Valsalva Maneuvers:

These may be considered in patients with a stable, narrow-complex tachycardia, but should never preclude more successful interventions from being performed:

1. Bear down like having a bowel movement.
2. Blow through a blocked straw.
3. Ice/cold pack to the face.

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C-07 NARROW-COMPLEX TACHYCARDIA	**Peds: Consult Online Medical Control prior to any meds or cardioversion when possible**	First Responder EMT AEMT Paramedic

Wolff Parkinson White (WPW):



- If patient has a known history of or 12 lead ECG [*see right with 'delta' wave*] concerning for Wolff Parkinson White (WPW):
  - DO NOT administer calcium channel blocker (e.g. diltiazem) or beta-blocker.
  - Adenosine is generally regarded as safe to attempt with accessory pathways, but use caution and be prepared to defibrillate.
  - Treat per Wide-Complex Tachycardia [**C-08**].
  - **Amiodarione is no longer recommended (2025 AHA Guidelines).**

NOTES:

- **In mild-to-moderately hypotensive patients (with a reasonable LOC), it is generally recommended to first give a fluid bolus and observe for response:**
  - **If the BP increases and HR decreases, the primary problem is unlikely cardiac and care should focus on the underlying cause (e.g. sepsis).**
  - If the hemodynamics do not significantly change and there are no other signs or symptoms (e.g. fever) suggesting an alternative cause, treating the rate/rhythm may be appropriate.
- Heart Rates > 150 (Pediatrics HR > 200-220):
  - HR > 150 are almost always pathologic in adults and should generally be treated unless certain that it is a sinus tachycardia.
  - With elevated HR, hypotension may be related to decreased cardiac output.
  - Slowing the heart rate may improve cardiac output, and blood pressure should increase as diastolic filling improves. **Concurrent fluid bolus is recommended.**
- Heart Rates 100-150 (NOT sinus tachycardia):
  - If symptomatic (significant palpitations, SOB, dizziness, etc.), you may consider medications to decrease the HR.
  - **If asymptomatic (or those with only minimal symptoms) observe and transport.**
  - If HR 100-150 and normotensive consider a small fluid bolus and reevaluation rather

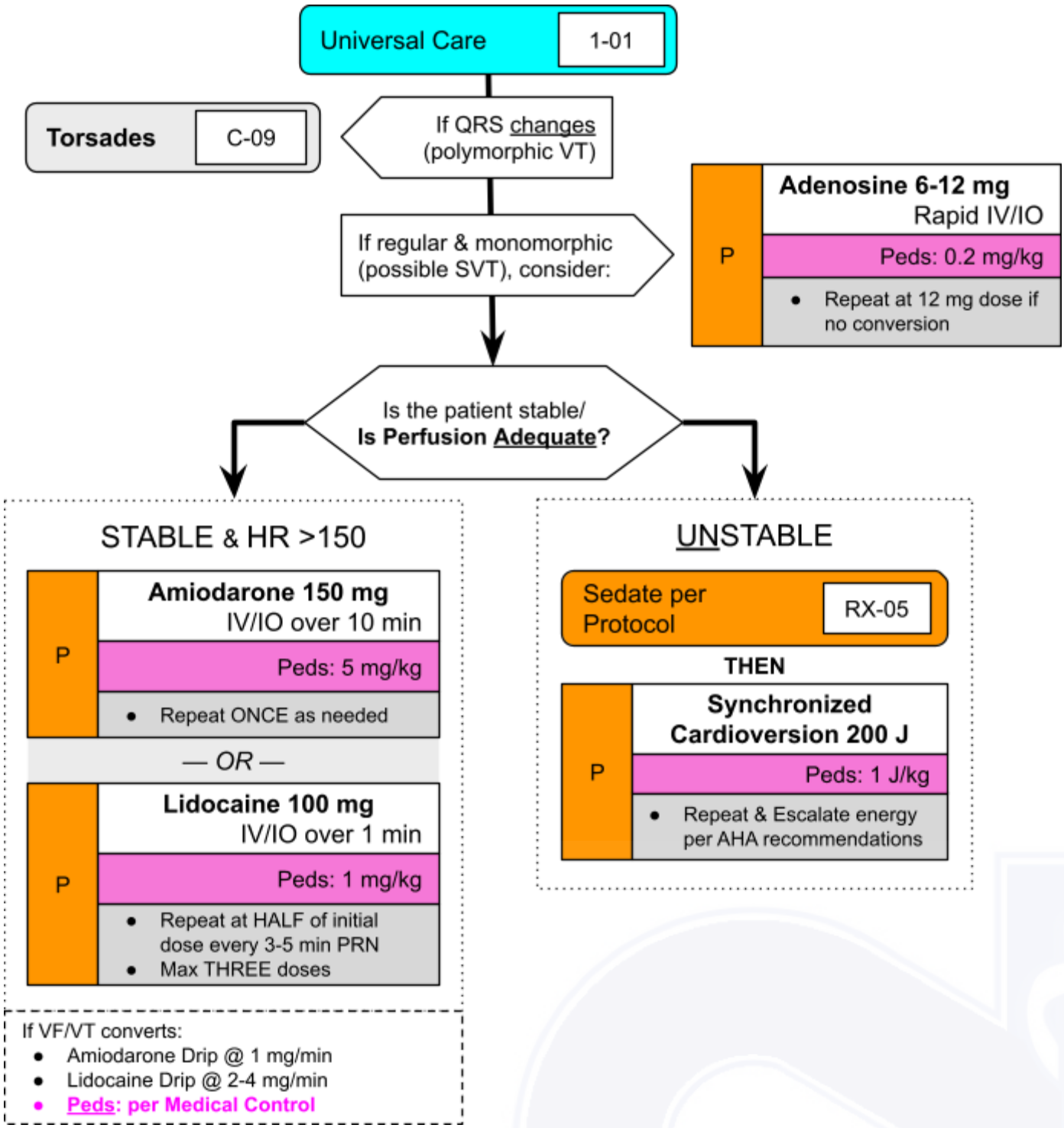
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than immediate treatment with and antiarrhythmic medication.

- Sinus Tachycardia (HR 100-150 or higher in young/health individuals):
  - Sinus Tach is NOT a dysrhythmia, but likely a **sign of an underlying disturbance**.
  - If pain-induced, treat per Pain Management guideline [**RX-02**].
  - If substance-abuse related (meth, cocaine, etc.), treatment is with benzodiazepines per the Excited Delirium [**F-01**]/Sedation guideline [**RX-03**].
  - Other worrisome causes stimulating increased cardiac output include sepsis, pulmonary embolism, dehydration, etc. Most should be initially treated with a **fluid bolus** unless signs of pulmonary edema are present.
  - Trauma: consider hemorrhage or tension pneumothorax.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Adenosine may not be effective in identifiable atrial flutter/fibrillation, but is not harmful.

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C-08 WIDE-COMPLEX TACHYCARDIA	**Peds: Consult Online Medical Control prior to any meds or cardioversion when possible**	First Responder EMT AEMT Paramedic



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C-08 WIDE-COMPLEX TACHYCARDIA	**Peds: Consult Online Medical Control prior to any meds or cardioversion when possible**	First Responder EMT AEMT Paramedic

With known Preexcitation Syndromes (e.g. Wolff-Parkinson-White/WPW), AHA recommends AGAINST most prehospital medications.
Consult Online Medical Control prior to medication in stable but symptomatic patients.

"Unstable" Definition:

- UNSTABLE does NOT mean (just) hypotension
- UNSTABLE = **significant inadequate perfusion** of vital organs:
  - Hypotension with significantly altered LOC (i.e. an alert and talking patient should generally be considered stable).
  - Symptoms and 12-lead EKG suggesting acute coronary syndrome (severe chest pain, SOB, diaphoresis, etc.).
  - Any BP with significant pulmonary edema and hypoxia.
- Bottomline: *significant* clinical symptoms + clinical signs (i.e hypotension & tachycardia) = inadequate perfusion

NOTES:

- **Wide-complex Rates > 150:**
  - Generally should be considered abnormal and treated per the above guidelines unless otherwise discussed with online medical control.
  - Treatment should generally be with a medication that will slow ventricular conduction (i.e. amiodarone, lidocaine or procainamide as available).
  - Regular WCT > 150 = typically V-Tach or SVT with aberrancy.
    - Adenosine may be given if regular and monomorphic (i.e probably SVT) and if a defibrillator is available.
  - Irregular WCT > 150 = likely A-fib with aberrancy (or A-fib with LBBB)
    - **If QRS complexes are changing (i.e. Torsades de Pointe), treat per Torsades/Polymorphic V-Tach [C-XXXX]**
    - Do NOT administer medications that slow the AV node (i.e. beta-blockers or calcium channel blockers (e.g., Diltiazem).
    - **2025 AHA Guidelines: Avoid Amiodarone (or similar medications) with preexcitation syndromes.**

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C-08 WIDE-COMPLEX TACHYCARDIA	**Peds: Consult Online Medical Control prior to any meds or cardioversion when possible**	First Responder EMT AEMT Paramedic

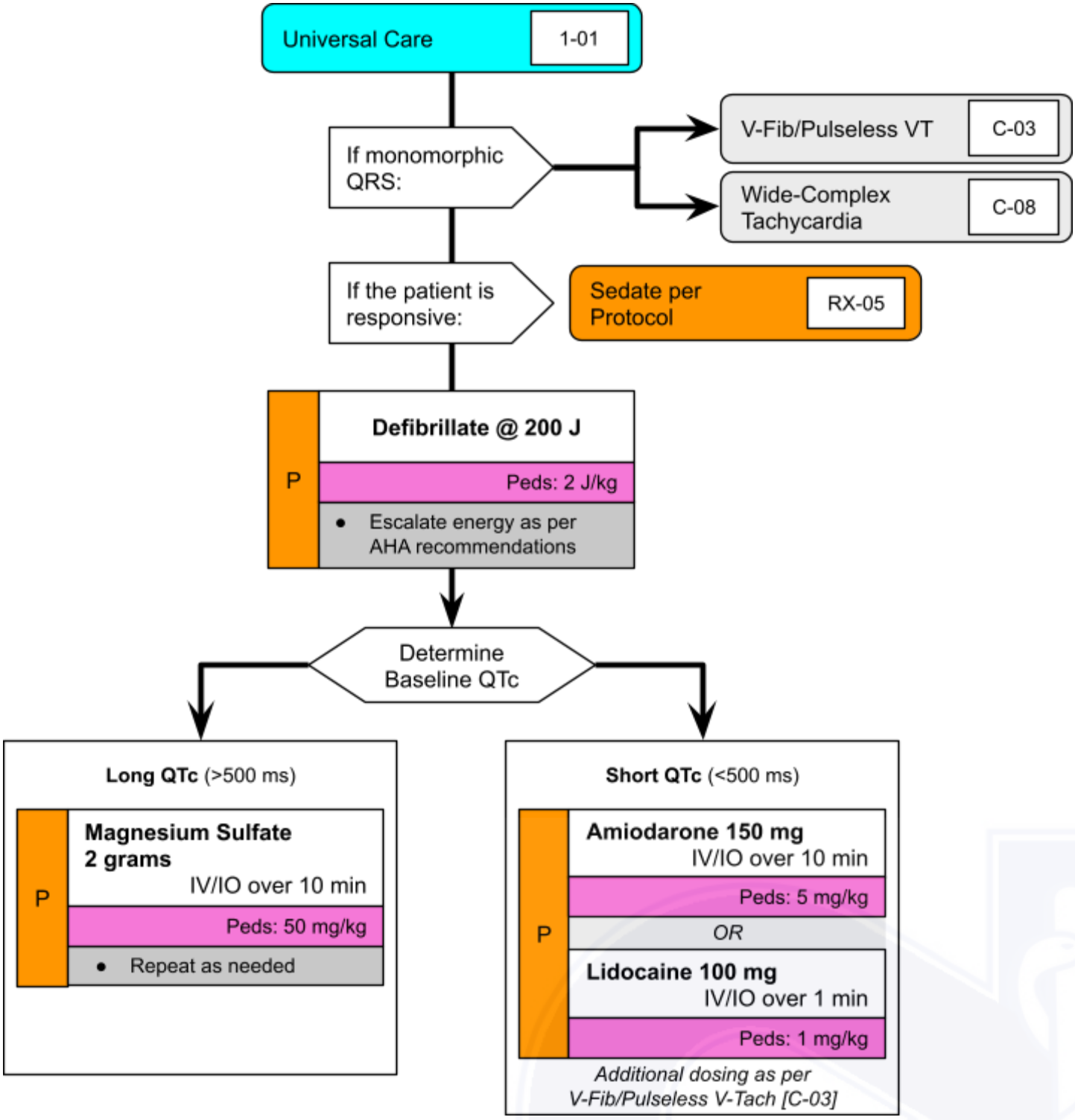
NOTES (*continued*):

- Wide-complex Rates 100-150:
  - Consider a “normal” rhythm with a chronic bundle-branch block (BBB)
  - Consider close observation and/or fluid bolus rather than immediate treatment with an antiarrhythmic medication.
  - Regular = consider sinus tachycardia with BBB (should see P-waves)
    - Consider/treat underlying condition causing the sinus tach (see *below*).
  - Irregular = consider new-onset or chronic A-fib (irregular without P-waves)
    - A-fib with a rapid ventricular response may be pathologic OR may be is a sign of an underlying disturbance (similar to sinus tachycardia).
    - If chronic A-fib with tachycardia, consider underlying cause as above.
    - If **known history of A-fib and BBB** with WCT <150, you may consider treatment with diltiazem as per Narrow-Complex Tachycardia [C-07].

- Causes of elevated heart rate (i.e. sinus tach or chronic A-fib with elevated rate)
  - If pain-induced, treat per Pain Management guideline [**RX-02**].
  - If substance-abuse related (meth, cocaine, etc.), treatment is with benzodiazepines per the Severe Agitation/Delirium [**P-01**]/Sedation guideline [**RX-03**].
  - Other worrisome causes stimulating increased cardiac output include sepsis, pulmonary embolism, dehydration, etc. Most should be initially treated with a fluid bolus unless signs of pulmonary edema are present.
  - Trauma: consider hemorrhage or tension pneumothorax.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Maximum dose of antiarrhythmic should be given before changing antiarrhythmic (if applicable).

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C-09 TORSADES/ POLYMORPHIC V-TACH		First Responder EMT AEMT Paramedic



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C-09 TORSADES/ POLYMORPHIC V-TACH		First Responder EMT AEMT Paramedic

QTc Determination:

- Gold standard for QTc measurement is a 12-lead ECG
  - **12-Lead should be obtained as soon as possible following initial defibrillation for polymorphic V-tach.**
  - This is to determine QTc but also evaluate for concurrent ischemia.
- Continuous ECG monitoring (3 or 4-lead) may be used if 12-Lead is unattainable.
- Lastly, if no ECG is available, the determination of QTc may be extrapolated from:
  - A known history of QT-prolongation
  - The known use of multiple medications associated with QT-prolongation; or
  - Through a clinical history favoring either a sudden dysrhythmia or acute myocardial infarction.

NOTES:

- Long QTc
  - Generally caused by a congenital/genetic abnormality or by various drugs or metabolic issues that prolong the interval through changes to various ion channels.
  - Following defibrillation, the initial treatment continues to be with Magnesium.
- Short QTc
  - Most often caused by myocardial ischemia.
  - Treatment is directed at the underlying heart attack (aspirin, oxygen, hemodynamic support, etc.) with doses of Amiodarone or Lidocaine for rhythm control (after defibrillation).

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C-10 VENTRICULAR ASSIST DEVICES (VADs)		First Responder EMT AEMT Paramedic

CAUTION: The majority of complaints/medical problems in patients with a VAD have nothing to do with the device itself. **Quickly confirm device function, stabilize the patient and consider other problems.**

DO NOT FOCUS ON THE DEVICE

Most patients do not have a device malfunction. Assess and manage them as any other patient.

Always Stabilize Airway & Breathing

Airway/O2 Maintenance — A-01

Is the VAD **Alarming**? — **YES**

NO

Is the VAD Functioning? (Auscultate for a whirring sound) — **NO**

YES

Is the patient Hemodynamically Stable? (Talking, following commands, fairly normal breathing, decent peripheral perfusion, etc.)

Device Troubleshooting

Always ensure that:

1. **Fresh (full) batteries are attached;**
2. **The Power cable is connected to the controller; and**
3. **The driveline (line into the patient's abdomen) is connected securely to the controller.**

Is there a "LOW FLOW" Alarm?

❑ IV Access x2
❑ Initiate IV Fluids — 1-03

Administration of IV Fluid bolus(es) is very important as one of the most common complications of a VAD is a low flow state due to relative volume depletion..

If 'Low Flow' alarm continues: Initiate a vasopressor drip, per Medical Shock **[M-06]**

NOTE: *See below* for details on specific devices

NO: Follow usual cardiac assessment and resuscitation guidelines:

Initial Cardiac Arrest — C-01

...including Chest Compressions, Defibrillation, IV Access & Fluid Administration, and appropriate ACLS Medications

YES = Probably not a VAD Problem

Follow usual clinical guidelines.

Always:

- **Contact the patient's VAD Coordinator as soon as possible**
- **Bring ALL the patient's equipment and backup supplies**
- **Allow the patient's significant other/caretaker to act as an expert on the device**

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C-10 VENTRICULAR ASSIST DEVICES (VADs)		First Responder EMT AEMT Paramedic

Ventricular Assist Device (VAD)

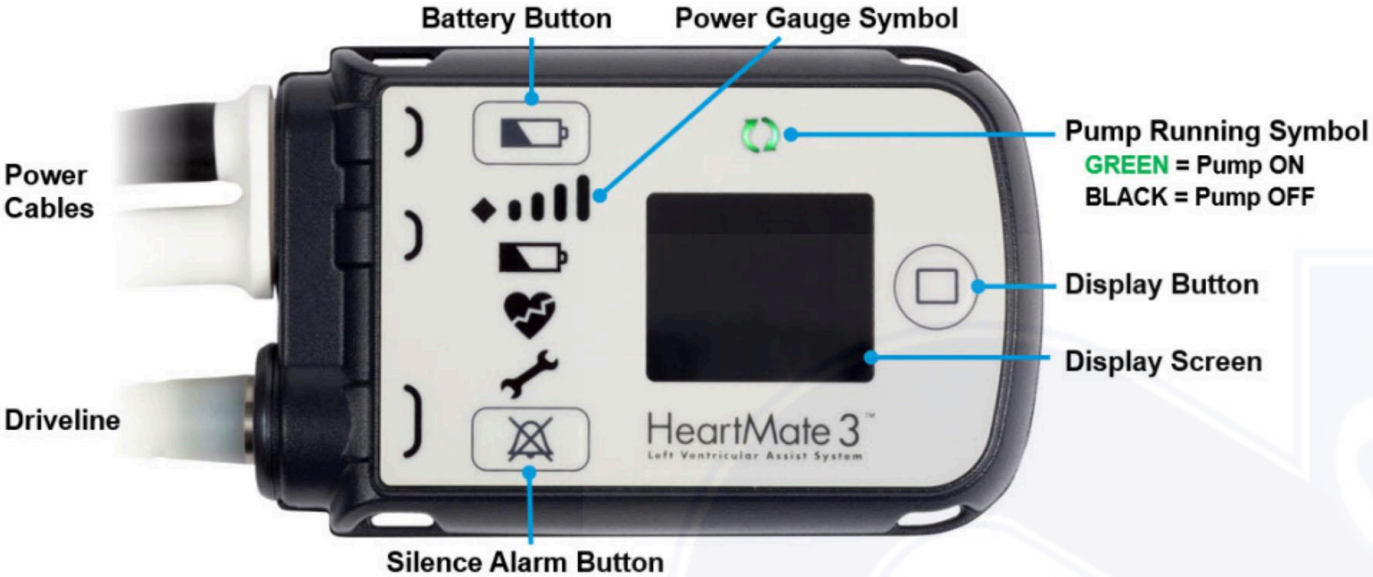
A Ventricular Assist Device (VAD) is a mechanical device used to support circulation in a patient with significant cardiac ventricular dysfunction. The Left Ventricular Assist Device (LVAD) is commonly used to support the left side of the heart and to provide extra cardiac output to the body. This device can be placed short term to bridge patients until they can receive a heart transplant or long term for people who are not candidates for a transplant.

Anatomy of a VAD - All VADs have at least 4 components:

1. The **Pump** consisting of a short tube placed inside the ventricle pulling blood thru the pump and out a tube;
2. A **Driveline** that exits the abdomen and connects to a controller and power source;
3. A **Power Source**: All VADs can be powered by either rechargeable batteries or an AC power adapter.
4. A **Controller** that operates the heart pump. It gives information about pump performance such as blood flow through the pump (L/min), pump speed (RPM) and the amount of power consumed (Watts). It also gives warnings and alarms if there is an alert/problem with the pump or with the power source, such as low battery or low flow.



VAD Controller (HeartMate 3™)



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C-10 VENTRICULAR ASSIST DEVICES (VADs)		First Responder EMT AEMT Paramedic

Common VAD Complications:
CVA • Arrhythmias • Infections/Sepsis • Obstructions • Heart Failure

VAD Patient Assessment

• VAD patients (typically) have no discernible pulse–this depends on how much (or if) underlying cardiac output (contractility) remains.
• Blood pressure measurement:
  ○ As VADs typically provide a fixed-speed, continuous outflow, there is generally only a single, constant intravascular pressure–essentially only a mean arterial pressure (no systolic or diastolic pressures).
  ○ Automatic BP cuffs may or may not register a singular BP.
  ○ The most accurate blood pressure is generally a palpated or auscultated manual BP.
• Secondary Assessment of Perfusion
  ○ Level of consciousness
  ○ Respiratory rate and work of breathing
  ○ Signs of perfusion: skin color/temperature, capillary refill, etc.

Key Points
• Unstable VAD patients should be transported to the closest appropriate facility. • Most VAD patients will ultimately require transfer to Vanderbilt (or other implant center) for definitive care, although non-VAD issues can generally be managed by facilities with cardiology and cardiothoracic surgery coverage. • **Contact the patient's VAD Coordinator as soon as possible at the number provided by the patient/family.** • • VAD patient family members are excellent resources to assist with patient history and evaluation/repair of VAD alarms/faults. • It is vital to transport the patient's back-up batteries and emergency equipment with the patient.

HeartMate 3 (Vanderbilt Patients) - Full Reference
PLEASE SEE BELOW
Additional Device-Specific Information
https://www.mylvad.com/medical-professionals/resource-library/ems-field-guides

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HeartMate 3™ Left Ventricular Assist System

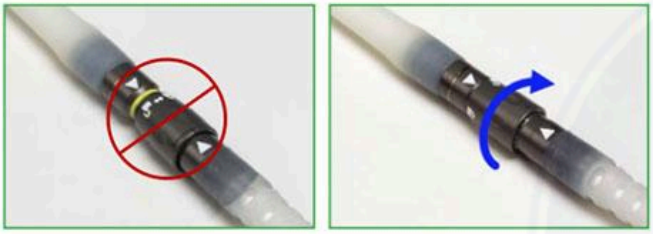
1. **Can I do CPR?**
   Yes, in the right clinical scenario. Chest compressions may pose a risk of dislodgement - use clinical judgment. If compressions are administered, confirm function and positioning of the pump.
2. **Can the patient be defibrillated while connected to the device?**
   Yes you can defibrillate, and you do not have to disconnect anything.
3. **Can this patient be externally paced?**
   Yes.
4. **What type of alarm occurs in a low flow state?**
   A red heart alarm indication and steady audio alarm will sound if less than 2.5 lpm. Can give a bolus of normal saline and transport to a VAD center.
5. **Can I change the speed of the device?**
   No, it is a fixed speed.
6. **Does the patient have a pulse with this device?**
   Likely they will not because it is a continuous flow device, however some patients may have a pulse.
7. **What are acceptable vital sign parameters?**
   MAP 70 - 90 mm Hg with a narrow pulse pressure.

FAQs

- Pump has "artificial pulse" created by rapid speed changes in the pump. This can be heard when auscultating the heart and differs from other continuous flow devices.
- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to driveline exiting patient's abdominal area and is attached to controller which runs the pump.
- Pump does not affect ECG.
- All ACLS drugs may be given.
- A pair of fully charged batteries lasts up to 17 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Avoid pulling, twisting, or kinking the driveline when strapping the patient to a stretcher.
- Be sure to bring **ALL** of the patient's equipment with them.

The HeartMate 3™ LVAD has a modular cable connection near the exit site of the driveline (Figure 1). This allows a damaged driveline to be quickly replaced (if damage is external).

- When disconnecting a driveline, NEVER use the modular cable connection.
- If the modular cable requires replacement, it must be done at and by the implanting center. Patients are not given a backup modular cable.
- If the connection is loose, a yellow line at the connection will be showing. If the line is visible, turn the connector in the locked direction. It will ratchet and stop turning once tight.



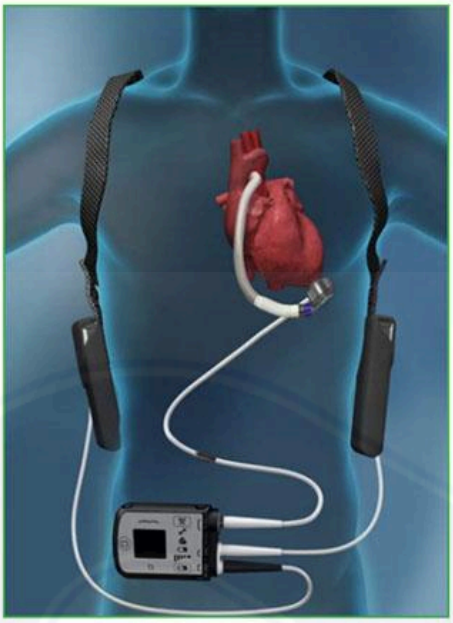
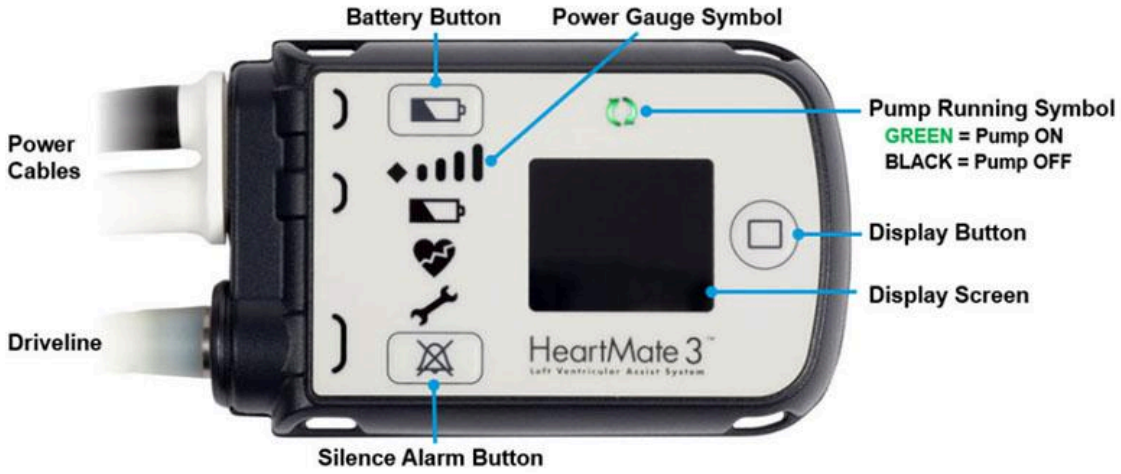


Figure 1

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HeartMate 3™ Left Ventricular Assist System

System Controller



Changing Batteries

WARNING: At least one controller power cable must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each battery can be assessed by pressing the button on the battery. Fully charged batteries will display 5 lights. (Figures 1 and 2)

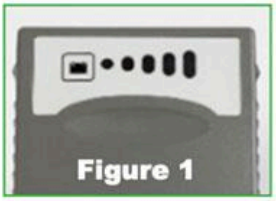

Figure 1


Figure 2

- Check the power level on the batteries, replace the battery with the fewest lights first. Remove only ONE battery from the clip by pressing the release button on the clip to unlock the battery. (Figure 3)



Figure 3

- Controller will start beeping and flashing yellow symbols and will read **CONNECT POWER** on the front screen.

- Insert a new, fully charged battery into the empty battery clip by aligning the **RED** arrows on the battery and clip (Figure 4). The battery will click into the clip. Gently tug on battery to ensure connection. If the battery is properly secured, the beeping and yellow flashing will stop.


Figure 4

- Repeat previous steps with the second battery and battery clip.

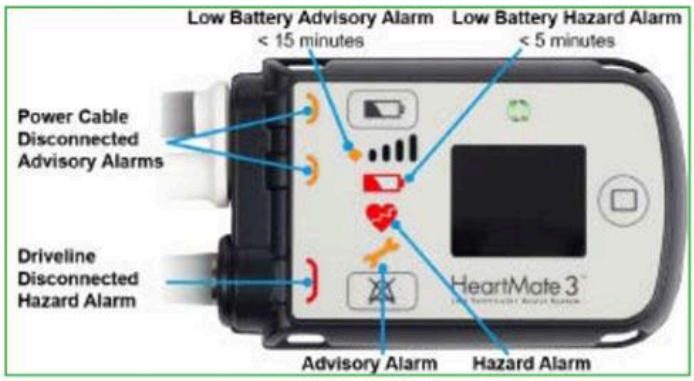
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Troubleshooting HeartMate 3™ LVAS

Alarms: Emergency Procedures

When an alarm occurs:

- Contact the Implant Center for direction when possible.
- Check alarm messages on controller display screen.
- Check if pump is running:
- Allow care providers trained on LVAD emergencies to remain with the patient.



When the Pump Has Stopped

- Check modular cable connection, driveline and power cable connections to the controller. Fix any loose connections to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. (see Changing Batteries section on previous page)
- If pump does not restart, change controllers if directed by implant center. (see Changing Controllers on next page)
- Be sure to bring ALL of the patient's equipment with them.

HAZARD ALARMS		Continuous Audible Tone
Low Flow :03 + Call Hospital Contact :07	Pump is off.	See above, when pump has stopped
	Pump flow is < 2.5 lpm.	Ensure that a power source is connected to the controller. Evaluate the patient for low flow - treat the cause. Assess volume status, hypertension, arrhythmia, right heart failure, etc.
Connect Driveline :02	Driveline disconnected.	Immediately reconnect Driveline to the controller. Check modular cable connection.
Connect Power Immediately :05 + Backup Battery :01	Both power cables are disconnected.	Immediately connect to batteries or the Mobile Power Unit.
Low Battery :06 + Replace Power :02	Low Battery Power < 5 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.
ADVISORY ALARMS		**Intermittent Audible Tone**
Low Battery :06 + Replace Power Immediately :02	Low Battery Power <15 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.
Connect Power :04	A power cable is disconnected.	Reconnect the power cable to power.
Check display for alarm type.		Call VAD Coordinator at implant center for direction.

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Emergency Medical Services



2026 Clinical Guidelines

Release: 7/1/2026

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Version 2.16.20

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Legend:

SLT: Service-Level Training Required (EMT, AEMT, Paramedic)
NEW: New Protocol
2026: Significant 2026 Updates

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First Responder
EMT
AEMT
Paramedic

ENVIRONMENTAL INJURY

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First Responder
EMT
AEMT
Paramedic

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E-04 Snake Bite

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E-01 HEAT INJURY (HYPERTHERMIA)		First Responder EMT AEMT Paramedic

Universal Care 1-01

COOL!!! As soon as possible

- Move patient to a protected environment (shade, *air conditioning,* etc.)
- Remove restrictive clothing
- Cooling Measures:
  - Utilize dunk tank or similar ice bath if available on scene (preferred).
  - Apply wet linen or cool pads to groin and axillae.
  - Expose to circulating air, utilizing fans and misting of the skin if able.
- **DO NOT** cool patient to the point of shivering.
- **DO NOT** use cooled IV fluids.

Only basic airway/resuscitative interventions should supercede cooling measures.

Fluid Replacement (Resuscitation)

F — **Oral Rehydration**
Preferred initial route if normal mental status

AND/OR

IV Protocol 1-03

A — **NS 250-500 mL Boluses**
Peds: 20 mL/kg
- Repeat as needed

Provide Basic Airway & Hemodynamic Support:

- **Advanced interventions as cooling measures allow**, per Airway Maintenance [A-01] & Respiratory Distress [A-01B]
- **Additional Fluid Resuscitation and Vasopressors**, per Medical Shock [M-06]

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E-01 HEAT INJURY (HYPERTHERMIA)		First Responder EMT AEMT Paramedic

KEY POINTS:

- The first priority of treatment is always cooling. Any other interventions (short of immediate, life-saving interventions) should be delayed until cooling measures have been initiated.
- Submersion of the patient's body in cool water should be considered prior to transport if resources are available (e.g. cooling tub/tank at an athletic event/practice).
- Illicit drug use (cocaine, methamphetamine, hallucinogens, etc.) may lead to increased metabolism and heat production worsening heat-related illness.
- Overdose of some prescription and OTC medications may also increase heat production or the body's ability to regulate heat production/loss (e.g. antihistamines).

PRESENTATIONS OF HEAT INJURY

- Heat Exhaustion
  - Primarily related to volume depletion (dehydration).
  - Signs/Symptoms: **normal mental status**, lightheadedness, weakness and diaphoresis, and probable GI symptoms (nausea, vomiting, etc.).
  - Vitals: mild hyperthermia (<40ºC/104ºF) with tachycardia
- **Heat Stroke = change in mental status**
  - *"Classic"/Non-Exertional* Heat Stroke (i.e. exposure-related) → Generally in infants (e.g. locked in a car) or elderly exposed passively to heat.
  - *Exertional* Heat Stroke → Heat production overwhelms the body's ability to lose heat. Generally seen with hours of strenuous activity (i.e. athletes).
  - Signs/Symptoms: likely similar to/more extreme than heat exhaustion (i.e. worse on the spectrum of disease) with altered/decreased mental status.
  - Vitals: severe hyperthermia (>40ºC/104ºF)
  - Extreme cases may lead to multiorgan failure and cardiovascular collapse.
- Localized Heat-Related Illness:
  - Heat Edema: minor swelling of the hands and feet from heat exposure due to vasodilation.
  - Heat Cramps (Tetany): contractions of large muscle groups associated with strenuous activity, heat exposure dehydration, and/or other factors.

QI Review Parameters:

1. {pending}

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E-02 HYPOTHERMIA & COLD INJURY		First Responder EMT AEMT Paramedic

Universal Care 1-01

WARM!!! As soon as possible

- Remove the patient from the cold environment ASAP
- Remove wet clothing and cover with warm, dry blankets
- Warming Measures
  - Heat packs (groin, axillae, and neck)
  - Warm IV Fluids
  - *Consider early transport if active/internal warming may be needed*
- Handle patient gently *(aggressive movement may trigger V-Fib)*
- Do not allow patient to walk or exert themselves & do not massage extremities

Does the patient have a pulse?

NO → **Go to "Pulseless Patient with Hypothermia"** *Next Page*

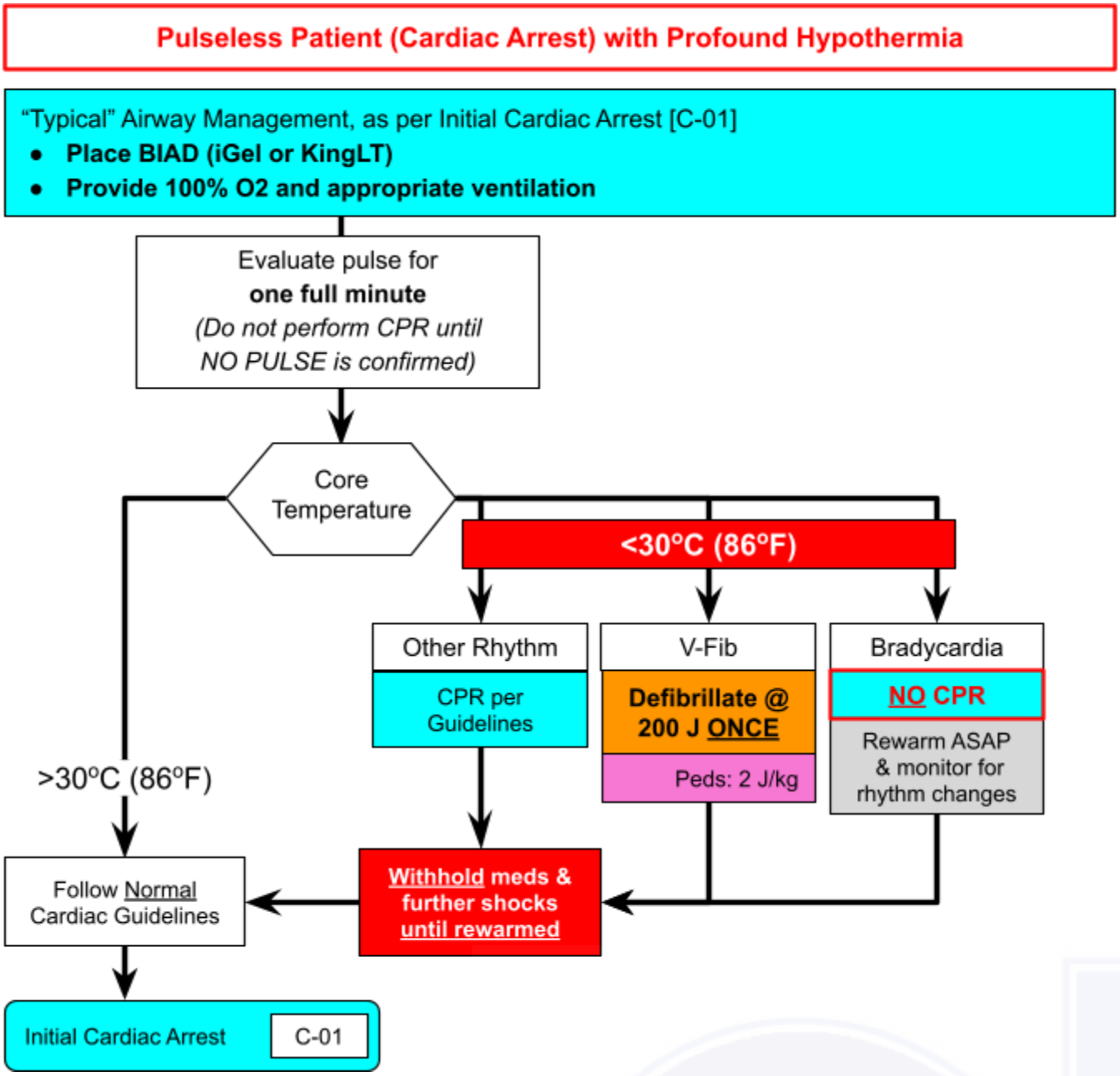
YES

Glucose Check/ Maintenance 1-04 AND Continuous ECG Monitoring/12-Lead 1-05

Provide Basic Respiratory & Hemodynamic Support:

- **100% Oxygen by Non-Rebreather**, as per Airway Maintenance [A-01A]
- **Ventilatory Support** (as needed), as per Respiratory Distress [A-01B]
- **IV/IO Access**, per IV Protocol [1-03]
- **Fluid Resuscitation and Vasopressors**, per Medical Shock [M-06]

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E-02 HYPOTHERMIA & COLD INJURY		First Responder EMT AEMT Paramedic

TREATMENT PEARLS:

- The primary treatment of hypothermia is through aggressive rewarming.
- Handle patients gently → rough handling may precipitate dysrhythmias.
- Defibrillation is usually ineffective <30ºC (86ºF). If the initial defibrillation does not convert the cardiac dysrhythmia (usually v-fib), further shocks should be delayed until the patient's core temperature is >30ºC (86ºF).

NOTES:

- Definitions
  - Mild
    - 32-35ºC (89.6-95ºF)
    - Shivering, possible confusion or minor loss of coordination
  - Moderate
    - 29-32ºC (84.2-89.6ºF)
    - Progressive lethargy and delirium, bradycardia (possible J-waves or other dysrhythmias)
  - Severe
    - <29oC (84.2ºF)
    - Coma/unresponsiveness with metabolic and hemodynamic instability progressing to profound bradycardia and PEA/asystole.
- Loss of thermoregulatory ability occurs in a multitude of conditions:
  - Environmental exposure = homelessness, mental illness, wilderness activities
  - Loss of central thermoregulation (hypothalamus) = CNS lesions, medications/toxins (e.g. antihistamines)
  - Decreased heat production (metabolic disorders) = hypothyroidism, malnutrition
  - Increased heat loss (skin/vascular disorders) = burns, EtOH use
- Measurement of true core body temperature (*rectal* or via temperature catheter in the bladder or esophagus) is preferred when equipment is available.

PRESENTATIONS OF COLD-RELATED INJURY

- Frostbite:
  - Freezing of tissues (i.e. ice crystal formation) causing cellular injury/death. Thawing results in a reperfusion injury and inflammatory response.
  - Signs/symptoms: starts with vasoconstriction and minor symptoms (i.e. “Frostnip”, similar to chilblain/pernio) and progresses to frank necrosis (dry gangrene).

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    - Treatment = rewarming ASAP
        - Tissues *should <u>not</u> be rewarmed if refreezing is possible* (i.e. in the wilderness).
- Chilblain/Pernio: prolonged vasospasm and microvascular injury from cold exposure (generally 1-3 days) leading to bluish-red (cyanotic and erythematous) patches on exposed skin.
- Trench Foot: prolonged exposure to non-freezing cool and wet environments. Initially with vasoconstriction and edema with progression to hemorrhagic blisters/bullae (similar to rewarmed frostbite injury).

QI Review Parameters:

1.
2.

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E-03 NEAR DROWNING		First Responder EMT AEMT Paramedic

Rescue/Extrication:

Always contact Fire/Rescue if any question of provider safety.

Consider Trauma → Spinal Immobilization 1-06

Aggressive Airway Management & Ventilatory Support:

- Consider starting ventilations prior to removal from the water.
- **100% Oxygen**, as per Airway Maintenance [A-01A]
- **Early & aggressive Positive Pressure Ventilation (if needed)**, as per Respiratory Distress [A-01B]:
  - If normal mentation → CPAP, BPAP, or HFNC
  - If decreased LOC → Intubation/RSI
- Consider **Bronchodilators** for wheezing/bronchospasm, as per Asthma/COPD [A-06]
- Consider gastric decompression/OG Tube [1-P4]

Provide Basic Hemodynamic Support:

- **IV/IO Access**, per IV Protocol [1-03]
- **Fluid Resuscitation and Vasopressors**, per Medical Shock [M-06]
- Treatment of Dysrhythmias as per Guidelines [C-TOC]

Consider → Hypothermia Guideline E-02

All Near-Drowning Patients Should be Transported to the Emergency Department for Observation

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E-03 NEAR DROWNING		First Responder EMT AEMT Paramedic

KEY POINTS:

- Near-Drowning = Immersion injury of sufficient severity to warrant medical attention, and that may lead to morbidity and death. Drowning = immersion injury with resultant death.
- Pathophysiology:
  - Hypoxemia leading to acidosis and ultimately CNS damage and cardiac arrest.
  - Even after survival of the initial immersion, fluid aspiration can cause pulmonary surfactant washout leading to atelectasis and ventilation-perfusion (VQ) mismatch. This leads to hypoxia from the perfusion of the non-oxygenated (non-ventilated) lung. Ultimately this can cause "*secondary drowning*" = death due to development of ARDS/hypoxia.
- Concurrent trauma should be considered on all patients, especially head and neck/spinal injuries.

QI Review Parameters:

1. Pending

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E-04 SNAKE BITE		First Responder EMT AEMT Paramedic

Universal Care 1-01

Wound Management & Immobilization

- **Cleanse**/gently irrigate the wound with saline or tap water.
- Dress wound with a small, loose dressing if actively bleeding.
- Remove rings, bracelets and other constrictive clothing from the extremity.
- **Splint/Immobilize the limb in a position of comfort** to limit movement. (Maintain a neutral position, as above the heart may hasten venous drainage/venom spread and below the heart may worsen edema.)
- Monitor for signs of anaphylaxis (treat as per Allergic Reaction [M-02])

Mark the skin with the initial location of erythema and/or swelling and mark progression every 5-15 minutes.

Do NOTs!

- **DO NOT incise fang marks or apply suction.**
- **Do NOT use ice or a pressure dressing at or proximal to the wound.**
- **Do NOT use Tourniquets → if placed by bystanders, remove them immediately.**

Do NOT kill the snake!!! Take a picture if possible to help with identification.

- If bystanders killed the snake prior to arrival, please educate them not to do this in the future.
- *Never handle a dead snake* as the bite reflex remains intact for hours.

Provide Respiratory & Hemodynamic Support:

- **100% Oxygen by Non-Rebreather**, as per Airway Maintenance [A-01A]
- **Ventilatory Support** (as needed), as per Respiratory Distress [A-01B]
- **IV/IO Access**, per IV Protocol [1-03]
- **Fluid Resuscitation and Vasopressors**, per Medical Shock [M-06]

***For venomous snake bites*, Rapid Transport should be instituted to an ED capable of administering Antivenom (utilize Air Transport if >30-45 ground transport)**

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E-04 SNAKE BITE		First Responder EMT AEMT Paramedic

NOTES:

- Non-Venomous Snakes
  - Multiple rows of tiny puncture marks (versus 1-2 fang marks).
  - Only danger is with local wound healing and infection/sepsis.
- Crotalids/Pit Vipers (e.g. Copperheads, Rattlesnakes, Cottonmouths)
  - Have triangular-shaped head and elliptic (not round) pupils.
  - Pathophysiology: venom increases vascular permeability, causes hemolysis, systemic coagulopathy and local tissue necrosis.
  - Most bites only cause localized injury. Erythema and swelling should be marked and monitored as persistent extension/worsening is an indication for antivenom. Systemic symptoms are rare but can be deadly, especially in children. Only 25% of bites are considered “dry” bites (i.e. no venom was injected.)
- Elapids (e.g. Coral Snakes)
  - Red-on-yellow banding = BAD (“Red on yellow, kill a fellow. Red on black, venom lack.”), though coloring may vary somewhat.
  - Higher incidence of dry bites with coral snakes (50-70%).
  - Pathophysiology: Neuromuscular blockade via nicotinic acetylcholinesterase (ACh) receptor blockage. Minimal hemolysis/necrosis.
  - Symptoms = generalized neurologic symptoms: weakness, vision changes (blurry vision, diplopia, etc.), difficulty swallowing, etc. May progress to overt paralysis and associated respiratory failure.

QI Review Parameters:

1. Pending

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TOC: HAZARDOUS MAT./ TOXICOLOGY		First Responder EMT AEMT Paramedic

Hazardous Mat. & Toxicology

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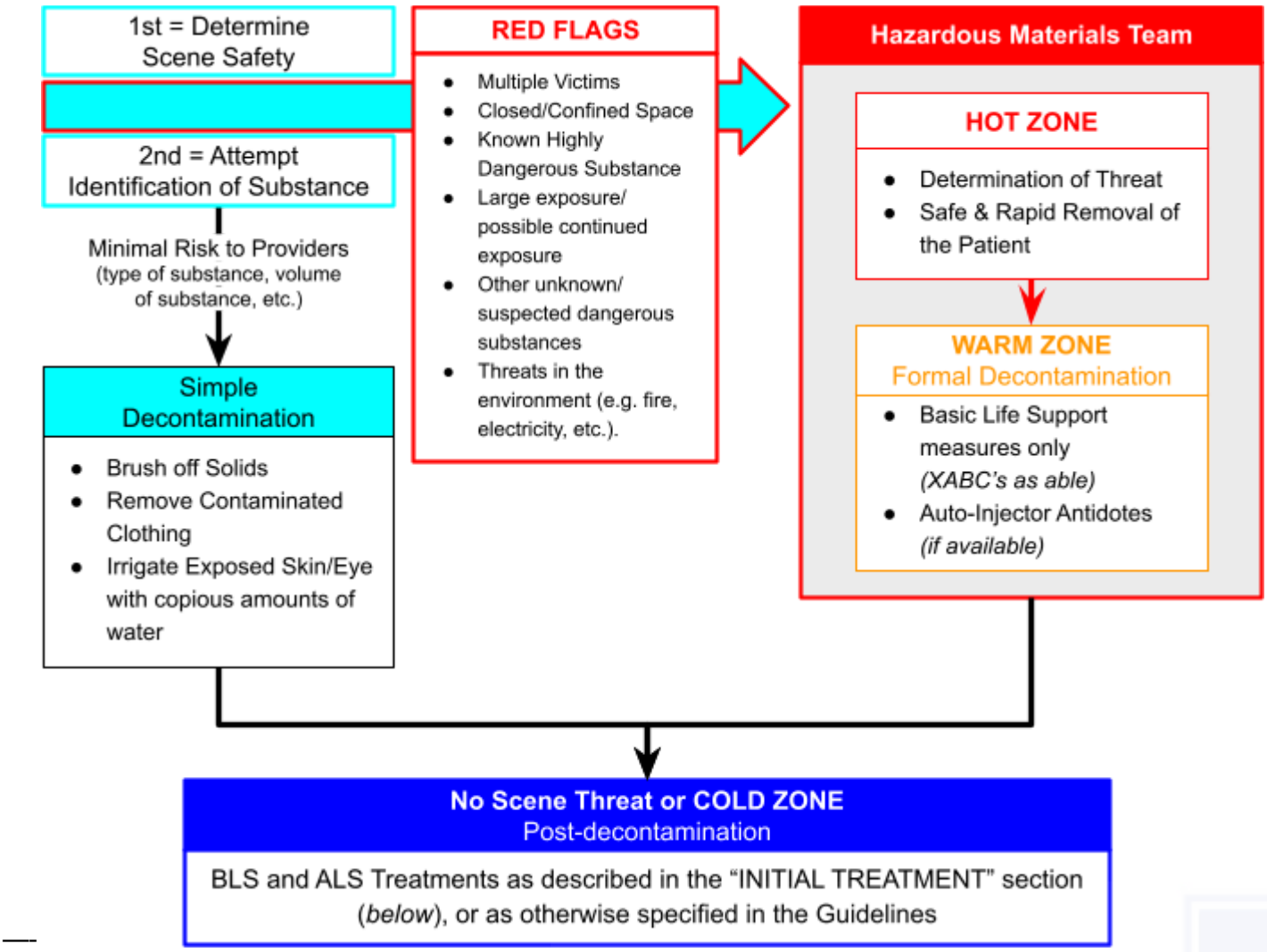
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H-R4 Other Common Substances
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INITIAL APPROACH TO AN EXPOSED PATIENT



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H-01 INITIAL HAZMAT/ TOXICOLOGY		First Responder EMT AEMT Paramedic

SCENE SAFETY

1st = Hazard Determination/Risk Assessment

- Responder self-protection is of paramount importance when dealing with hazardous materials, and any attempts to rescue a victim from a hazardous environment needs to be based upon a risk/benefit analysis.
- The size-up of the scene, likelihood of victim survival, likelihood of success and the protective abilities of the responder's personal protective equipment (PPE) all must be assessed prior to implementing any such rescue attempts.
- If any question, must be made by qualified hazardous materials technicians.

RED FLAGS

- **If there is ANY QUESTION of the safety of the EMS providers and other first responders, a HazMat Team should be requested to perform a well developed risk assessment and plan.**
- Red Flags *include*:
  - Multiple Victims
  - Large exposure/possible continued exposure
  - Unknown substance
  - Closed/confined space (poor ventilation)
  - Other suspected dangerous substances or threats in the environment (e.g. fire, electricity, etc.)

SUBSTANCE

2nd = Attempt to Identify the Substance Involved

- If labeled containers are noted (i.e. substance is known)
  - Follow any relevant clinical guidelines.
  - Review and follow the recommendations of the North American Emergency Response Guide Book (NAERG), if available.
  - Contact Poison Control at 1-800-222-1222.
- If the substance is unknown:
  - Determine if the patient has symptoms consistent with a specific **Toxidrome** (*below*).
  - Contact the Hazardous Materials Team, if any question.

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H-01 INITIAL HAZMAT/ TOXICOLOGY		First Responder EMT AEMT Paramedic

SELF-PROTECTION

- Basic “Droplet-Precaution” PPE (gloves, mask, gown, and eye protection) should generally protect against most simple (i.e. small) exposures, but are likely inadequate with larger exposures or with dangerous/corrosive substances.
- Protection against gasses and most vapors requires the use of a Self-Contained Breathing Apparatus (SCBA) in addition to a specific suit (e.g. Class A or B, *below*). No routine mask (surgical, N95, etc.) will protect the provider against possible exposure.

Classes of PPE

- Class A = “All-Hazards”/maximum protection
  - Full body protection against direct contact and vapors/gasses with a *fully-encapsulated chemical-resistant suit, and*
  - Complete respiratory protection with *SCBA*.
- Class B
  - Splash protection (liquids), but <u>not</u> against skin contact of vapors/gasses with a *hooded chemical-resistant suit*, and
  - Complete respiratory protection with *SCBA*.
- Class C (not used in initial emergency response)
  - Splash protection (liquids) with a *hooded chemical-resistant suit* (same as Class B), but
  - Limited protection against breathing (lung exposure) of vapors/gasses with an *air purifying respiratory* (<u>not</u> SCBA).
- Class D:
  - No respiratory protection and minimal skin protection
  - Typical daily PPE (gloves & mask for EMS, firesuit, etc.)

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DECONTAMINATION

Responders need to value the difference between “exposure” and “contamination”. Not all exposures result in a contaminate patient. Physical state of the product, location of the patient with regards to the release and direct contact with the product all play in determining the possibility of contamination. In addition to the patient care discussed below, protection of downstream medical facilities from contamination must be considered. Early notification of receiving facilities and field decontamination are essential. Any large volume or continued exposures should be formally decontaminated by a Hazardous Materials Team.

Basic Decontamination Procedure (For “Simple” Exposures)**:**

- **Contaminated clothing should be removed.**
  - Care should be taken to not contaminate any unexposed areas of the patient (or other first responders).
  - Clothing should be placed in an appropriate container (generally a plastic or paper bag).
- Solids
  - Any solid material still on the patient should be gently brushed off prior to irrigation.
- Liquids
  - For all liquids (unless there is a known contraindication to irrigation), **copious amounts of water should be used to irrigate any exposed skin or eyes.**
    - Tap water is ideal and acceptable in almost every case.
    - Sterile water or saline may be used as well.
  - Take care to not cross-contaminate unexposed areas.
  - For non-water soluble liquids (e.g. oils):
    - *Irrigation with large volumes of water should be attempted.*
    - Any remaining liquids/solids should be provided additional decontamination in the field by a HazMat Specialist utilizing mineral oil, polyethylene glycol or other appropriate solvent.
- Vapors/Gasses
  - Victims exposed only to gasses and vapors present little risk of secondary contamination/exposure once removed from the environment and clothing is removed (i.e. “off-gassing”)
  - If exposed to corrosive vapors/gasses (Chlorine, ammonia, HCL, ect.) then flush the skin (and eyes) with copious amounts of water/irrigant.

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H-01 INITIAL HAZMAT/ TOXICOLOGY		First Responder EMT AEMT Paramedic

HAZMAT OVERVIEW

HOT ZONE (Scene)

- Area of exposure
- Only trained Fire/Rescue personnel with appropriate PPE (generally Class A or Class B) should enter this area to extricate patients to the warm zone.
- *No medical treatments are rendered.*

WARM ZONE (Decontamination)

- Dedicated decontamination area, as close as reasonably (i.e. safely) possible to the Hot Zone.
- Only trained Fire/Rescue personnel with appropriate PPE (generally one class below that used in the Hot Zone) should be actively decontaminating patients.
- *Only basic life support measures* and autoinjector antidotes should be administered in the Warm Zone. This includes:
    - Basic airway maneuvers
    - Bag-valve mask ventilation
    - Placement of a BIAD (iGel or KingLT) if BVM is inadequate
    - Chest Compressions

COLD ZONE (Post-decontamination)

- Immediately outside of the Warm Zone (decontamination area).
- This will include additional Fire/Rescue personnel, transport EMS personnel as well as additional "officers" associated with an MCI event (Triage Officer, Transport Officer, etc.).
- *The full scope of ALS interventions are available*, including advanced HazMat Medic treatments and resources as outlined in these guidelines.
    - These will be initiated based on the number of patients needing treatment and resources available, based on standard MCI protocols.
    - Initial stabilizing treatments should generally be performed on scene unless there are additional safety issues limiting scene time.

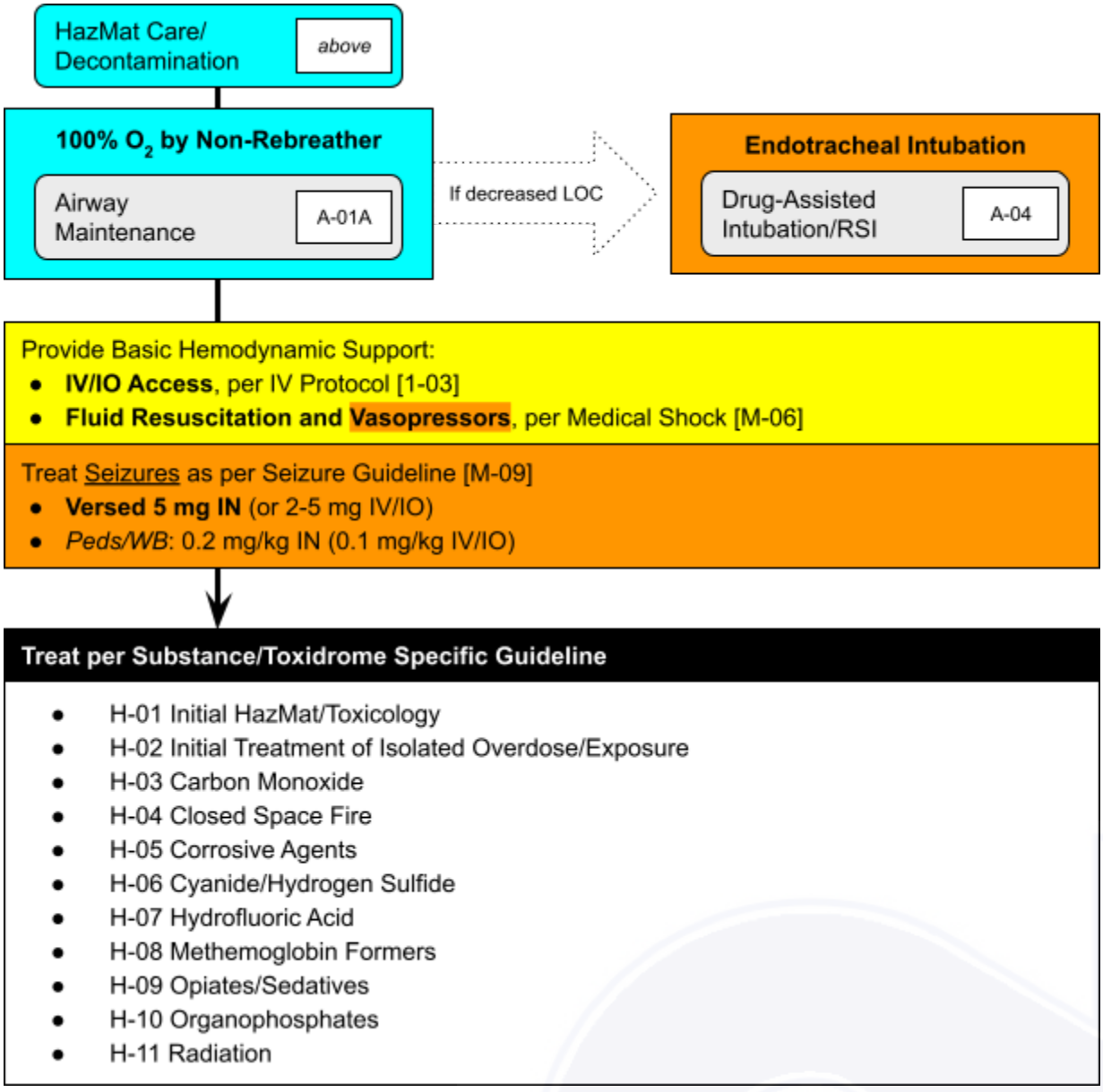
Always request Hazardous Material Team/HazMat Medic assistance early if there is:

- **Any question on the scene or the substance, or**
- **The potential need for medications/equipment not normally carried by the EMS provider.**

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INITIAL TREATMENT OF PATIENTS

For patients with isolated overdose, refer to Initial Treatment of Isolated Overdose/Exposure [H-02]



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H-01 INITIAL HAZMAT/ TOXICOLOGY		First Responder EMT AEMT Paramedic

TREATMENT PEARLS

- Once the patient is decontaminated, most toxic exposures only require basic supportive measures in the prehospital setting.
- Airway/Breathing
    - Basic airway management and support of respirations should be ensured on all patients. This is one of the few interventions that should be attempted during decontamination (i.e. in the Warm Zone).
    - Pulse-oximetry should be monitored closely, and a device capable of measuring carboxyhemoglobin and methemoglobin levels should be used (if available) in any patient with potential exposure or in cases of unknown exposure.
    - The early initiation of CPAP/Bipap or endotracheal intubation is encouraged in inhalation injuries, patients with unstable hemodynamics or with severe decrease in mental status.
- Basic fluid resuscitation and vasopressor use, as well as appropriate use of defibrillation/antiarrhythmics are indicated to support cardiovascular status.
- *Seizures* should be treated in the usual approach, generally starting with intranasal (IN) Versed (midazolam) and escalating as needed.
- Specific treatment of exposure (as noted in these guidelines) is generally only needed for patients with persistent cardiovascular dysfunction despite maximizing supportive care.

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PRIMARY TOXIDROMES

Toxidromes are constellations of clinical signs and symptoms that are essential for the successful recognition of chemical exposure.

Examples of Agents	Examination Findings *(most common in **bold**)*	Treatment Overview *(see referenced guidelines for specifics)*
Cholinergic = Drowning in Secretions + Bradycardia + Pinpoint Pupils (miosis)		
Insecticides (organophosphates and carbamates) **Chemical warfare agents** (sarin, VX)	*Muscarinic* = "DUMBELS" (or "SLUDGE") • Defecation/**Diaphoresis** • Urination • Miosis (pinpoint pupils) • Bradycardia & **bronchorrhea**/ bronchospasm • Emesis • Lacrimation • **Salivation**/Seizures *Nicotinic* = **Muscle fasciculations & weakness**	*See Organophosphates [E-XX]* **Atropine** **2-PAM** (pralidoxime)
Anticholinergic = Altered LOC + Tachycardic + Dilated Pupils (mydriasis) + DRY Skin		
Atropine **Antihistamines** Antipsychotics	Altered mental status, mydriasis (dilated pupils), Dry/flushed skin and mucous membranes, Tachycardia, Hyperthermia, Seizures, Urinary retention	Supportive
Sympathomimetic = Altered LOC + Tachycardic + Dilated Pupils (mydriasis) + WET Skin (diaphoresis)		
Amphetamines **Cocaine** Cathinones (Bath Salts) Hallucinogens (LSD, PCP, etc.)	Altered mental status (anxiety, agitation, hallucinations, etc.), Mydriasis (dilated pupils), Diaphoresis, Tachycardia, Hypertension, Hyperthermia,, Seizures	**Sedation** (generally with benzodiazepines), as per [RX-03]
Sedative/Hypnotic = CNS Depression/Respiratory Depression		
Benzodiazepines Barbiturates **Opiates** **Alcohols**	**CNS depression** (confusion, ataxia, dysarthria, etc.), Bradycardia, **Respiratory depression** *Pupils → Opiates = pinpoint; Others = variable*	*See Opiates/Sedatives [E-XX]* **Respiratory support**

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OTHER TOXIDROMES

Examples of Agents	Examination Findings *(most common in **bold**)*	Treatment Overview *(see referenced guidelines for specifics)*
Corrosive Agents		
Acids or Alkalis (Bases) Irritant Gases (**chlorine**, **ammonia**, mustard gas, etc.) Phosgene (delayed pulmonary edema)	*Skin*: **burning** (with or without visible burns), blistering; *Eye*: **pain/burning**, redness, tearing; *Inhalation*: nasal drainage, burning, **coughing**, **bronchospasm/wheezing**, rales/pulmonary edema	*See Corrosive Agents [E-XX]* **Copious Irrigation** & Wound Care **Respiratory Support** (bronchodilators, CPAP, RSI/Intubation, etc.)
Asphyxiants (Simple or Chemical)		
Simple Asphyxiant = any gas that displaces oxygen (**nitrogen**, carbon **dioxide**, etc.) *Chemical Asphyxiant* = prevents normal oxygen transport (e.g. **carbon monoxide,** nitrates/ methemoglobin formers) or cellular metabolism (oxygen utilization, e.g. **cyanide or hydrogen sulfide**)	Hypoxemia, **CNS depression** (and eventual respiratory depression), **Cardiovascular Instability** (initially tachycardia, then progressing to hypotension and bradycardia).	**Remove from the environment** **100% Oxygen** Respiratory & hemodynamic support *See Carbon Monoxide [E-XX]* *See Cyanide/Hydrogen Sulfide [E-XX]* *See Methemoglobin Formers [E-XX]*
Hydrocarbons (and Halogenated Hydrocarbons)		
Methane, Butane, Hexane Turpentine, Toluene, Chloroform	**Simple asphyxia**/hypoxemia, **CNS depression** (from direct effect on the nerves), respiratory depression	Respiratory & Hemodynamic Support NOTE: Inhalation sensitizes the myocardium to the effects of catecholamines. **Epinephrine should generally be AVOIDED.**

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Other Medication Reactions		
Reaction	Examples of Agents	Examination Findings *(most common in **bold**)*
Extrapyramidal	Antipsychotics (risperidone, haloperidol, phenothiazines, etc.)	**Dystonia**, torticollis, muscle rigidity, hyperreflexia, akathisia (feeling of restlessness).
Neuromuscular Malignant Syndrome	Antipsychotics	**Lead-pipe muscle rigidity, hyperpyrexia**, altered mental status, autonomic instability, diaphoresis
Serotonin Syndrome	Antidepressants (SSRIs, MAOIs, St. John's wort, etc.) Tricyclic antidepressants	**Altered mental status,** hyperreflexia and hypertonia (>lower limbs), **tachycardia, diaphoresis, hypertension**, flushing, tremor

Treatment for the above reactions is **mostly supportive,** this includes:

- Fluid resuscitation, hemodynamic support and the treatment of arrhythmias.
- *Passive and active cooling measures* should be utilized for hyperthermia (hyperpyrexia).
- Seizures should be treated as per usual.
- **Online Medical Control should be contacted for:**
    - Concerns over **significant neuromuscular hyperactivity (dystonias, rigidity, etc.)** as sedation (i.e. benzodiazepines) may be considered with severe symptoms.
    - Diphenhydramine (Benadryl) use for moderate to severe extrapyramidal symptoms.

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H-02 INITIAL TREATMENT OF ISOLATED OVERDOSE		First Responder EMT AEMT Paramedic

General Treatment Overview

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received through online Medical Control.

HazMat Care/Decon H-01

Provide Basic Respiratory Support, per *Airway Maintenance [A-01] & Resp. Distress [A-01B]*

Provide Basic Hemodynamic Support:

- **IV/IO Access**, per *IV Protocol [1-03]*
- *Hypotension*: **Fluid Resuscitation and Vasopressors**, per *Medical Shock [M-06]*:

- *Bradycardia*: Atropine and/or Vasopressors, per *Bradycardia [C-05]*
- Tachycardia:

If Narrow-Complex Tachycardia [C-07]:

- **Consider Sedation [RX-04]**
- Treat dysrhythmias per guideline

If Wide-Complex Tachycardia [C-08]:

- **Sodium Bicarbonate 1-2 mEq/kg**
- Treat dysrhythmias per guideline

Neurological/Psychological Crisis:

Treat Seizures [M-07] per guideline:

- **Versed 5 mg IN** (or 2-5 mg IV/IO)
- *Peds*: 0.2 mg/kg IN (0.1 mg/kg IV/IO)

Treat Acute Agitation [P-01] per guideline:

- **Sedation/Chemical Restraint [RX-04]**

Maintain Normal Body Temperature, per Hypothermia [E-02] or Hyperthermia [E-01]

Treat per Substance/Toxidrome Specific Guideline

Please refer to Table of Contents [H-TOC] for exposures with specific treatments, refer to the appropriate Reference Section, or contact Online Medical Control.

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H-02 INITIAL TREATMENT OF ISOLATED OVERDOSE		First Responder EMT AEMT Paramedic

TREATMENT PEARLS

- The multitude of substances that patients can ingest, inhale or otherwise expose themselves to is too numerous to be able to be covered in these guidelines.
- **Always bring containers or labels indicating substances with the patient to the ED if possible.** Pictures are adequate but the physical container is preferred.
- **Poison Control**
  - May be contacted at 1-800-222-1222
  - **Should never delay treatment or transport.**
  - **May not provide medical direction** and their use in the prehospital setting is limited.
  - They **can provide help identifying substances in unknown household goods,** but this is generally not needed until the patient has been stabilized and evaluated in the ED.
- **Online medical control must approve any treatments beyond the scope of these clinical guidelines.**

Airway/Breathing

- Primary Goal = Support Oxygenation (>90% SpO2)
- ETCO2 should be monitored on all altered overdose patients.
- If a patient has a decreased mental status with hypoventilation, respirations should be assisted.
- **In patients who may be acidotic (hypoxia, hypoperfusion, etc.), providers should ensure an elevated respiratory rate (16-20 bpm or greater) to ensure adequate exchange of CO2.**
- Endotracheal intubation/RSI, should be considered on any obtunded/unresponsive patient with any concern for airway protection or the need for assisted ventilations.

Circulatory

- Circulatory collapse should be anticipated on all patients with unknown ingestions/exposures and exposures to known cardioreactive substances.
- At minimum, all overdose patients should:
  - Have one (or more) quality peripheral IV/IO's placed
  - Receive a fluid bolus (unless severe pulmonary edema present)
  - Be placed on continuous ECG monitoring
  - Have a baseline 12-lead ECG should be obtained (if time allows)
- Bradycardia:
  - Some substances (e.g. organophosphates) can cause a profound and resistant bradycardia that may require very high doses of atropine or vasopressors.
  - Follow the Bradycardia guideline [C-05], and titrate (escalate) doses of atropine and vasopressors as needed.
- Narrow-complex tachycardia
  - Tachycardia may be caused by direct sympathetic stimulation or may be related to hallucinogenic/psychotropic effects of the substance.

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    - Sinus tachycardia should be initially approached with fluid bolus and observing for improvement. Chemical Sedation [RX-03] should be considered on stimulant/psychotropic medications associated with increased agitation.
    - Cardiac tachydysrhythmias (i.e. not sinus tachycardia) should be addressed as per Narrow-Complex Tachycardia [C-07].
- Wide-Complex Tachycardia
    - Many medications (e.g tricyclic antidepressants) and other substances (e.g. cocaine) can cause **sodium channel blockage**, leading to a **wide QRS.** Any patient with a QRS >100 ms should be administered 1-2 mEq of Sodium Bicarb. This may be repeated until QRS changes resolve.
    - Patients with a wide-complex tachycardia should otherwise be treated as per guideline [C-08], unless otherwise noted. This includes antiarrythmics (amiodarone/lidocaine & cardioversion).

Disability

- Seizures are fairly common with many overdoses and should be treated as per usual.
    - **Intranasal (IN) midazolam (Versed) is preferred in adults and children.**
    - Intramuscular (IM) administration is discouraged.
- Acute agitation should be addressed as per guideline [P-01], with verbal deescalation, physical restraint and chemical sedation [RX-03] utilized as needed.

Exposure

- Many medications affect the hypothalamus and the patient's ability to thermoregulate, and many also increase heat production.
- Patients should be passively heated or cooled, as appropriate per Hyperthermia [E-01] or Hypothermia [E-02] guidelines.

GI Decontamination

- **Do NOT induce vomiting**
- Keep patient NPO
- If <1 hour post ingestion or with some extended-release medications, the emergency department may consider activated charcoal or whole bowel irrigation.

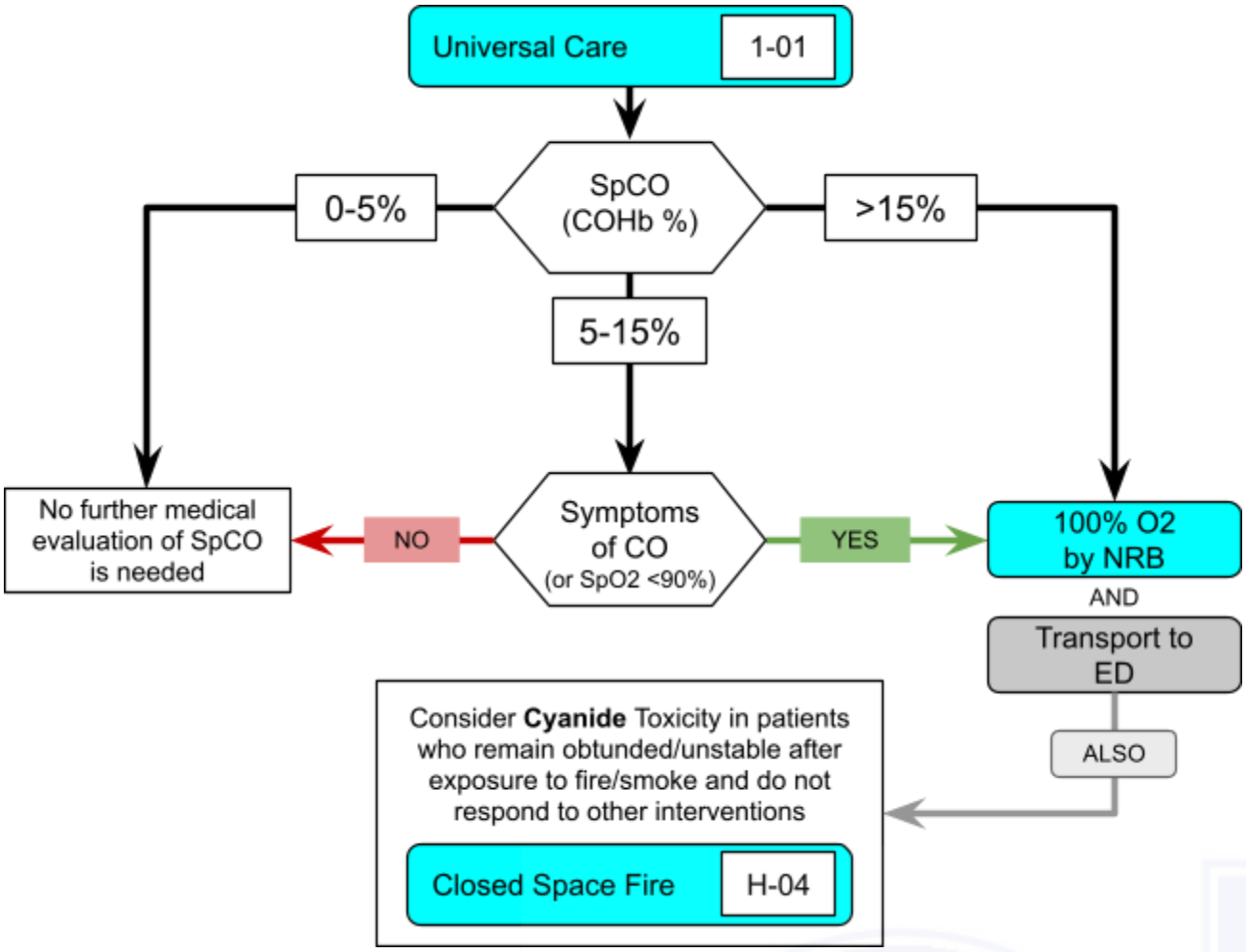
QI Review Parameters:

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H-03 CARBON MONOXIDE EXPOSURE		First Responder EMT AEMT Paramedic

Description:
Colorless, odorless, tasteless, non-irritating gas formed by incomplete combustion of organic compounds (e.g closed space fire).



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H-03 CARBON MONOXIDE EXPOSURE		First Responder EMT AEMT Paramedic

NOTES:

- Converts hemoglobin into carboxyhemoglobin, a non-oxygen carrying compound causing chemical asphyxiation.
- Pulse oximetry can indicate an incorrect (false high) oxygen saturation. PaO2 should be obtained with a device that has the ability to read carboxyhemoglobin and methemoglobin.
- Symptoms:
    - Mild (5-15%) - headache, dizziness, nausea (i.e. “flu-like symptoms”)
    - Moderate (15-25%) - vision changes, vomiting, worse headache
    - Severe (>25%) - confusion/altered mental status (can lead to seizures, coma, cerebral edema, etc.)
- Altered mental status in the setting of smoke inhalation is probably due to mixed exposures including cyanide, carbon monoxide, and acid gasses as well as many other toxic products of combustion (see Closed Space Fire guideline [H-05]).

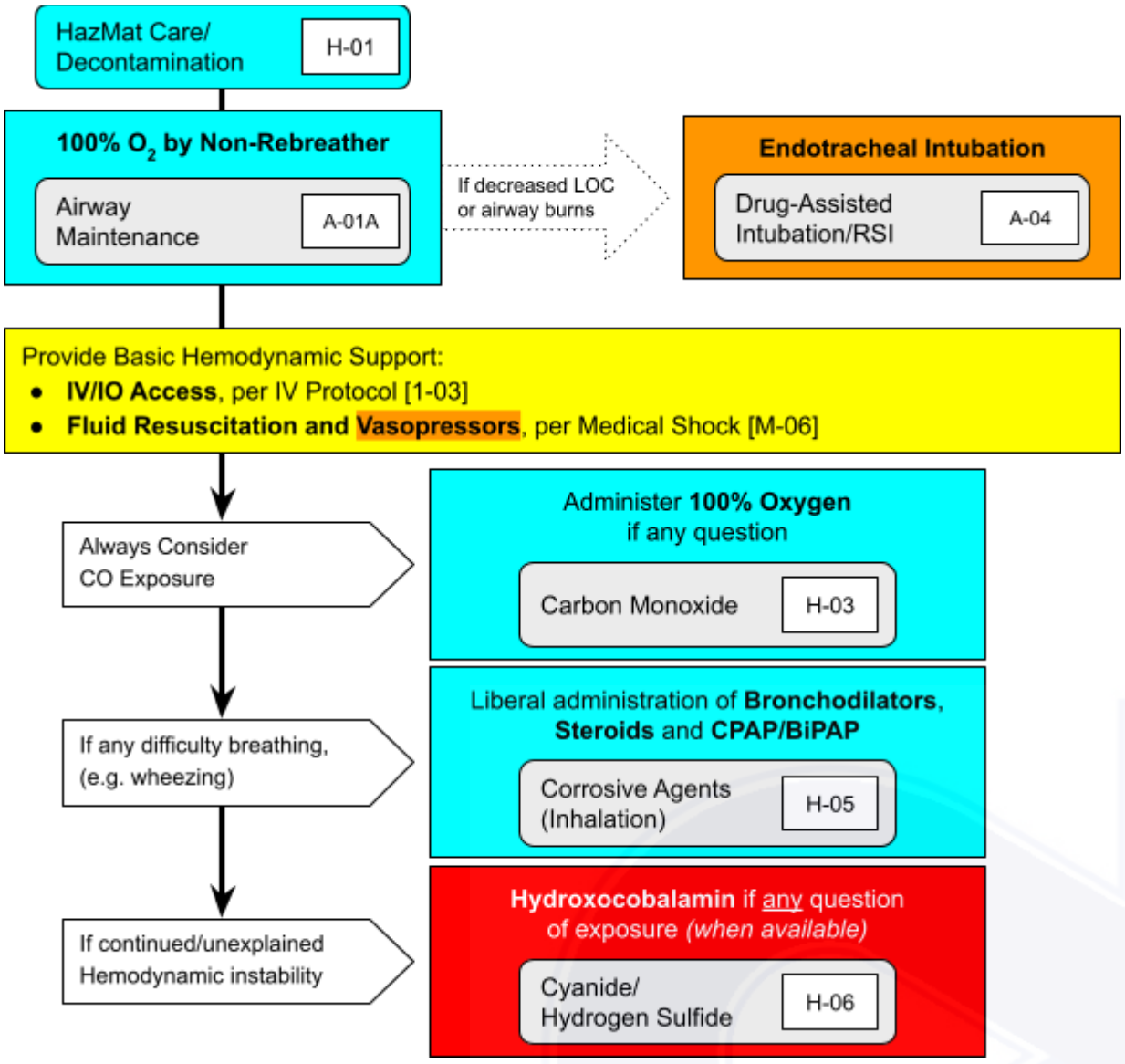
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H-04 CLOSED-SPACE FIRE (SMOKE INHALATION)		First Responder EMT AEMT Paramedic

Closed-space fires produce many toxic substances. This creates a complicated clinical picture where it may be difficult to differentiate the primary underlying pathophysiology. Possibilities include:

- **Thermal burns** to the airway (and body) potentially leading to airway obstruction.
- **Chemical irritation/burns** to the upper and/or lower airways leading to bronchospasm, edema/swelling of the bronchioles and/or non-cardiogenic pulmonary edema.
- Cellular asphyxia due to **cyanide and/or carbon monoxide poisoning**.

TREATMENT



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H-04 CLOSED-SPACE FIRE (SMOKE INHALATION)		First Responder EMT AEMT Paramedic

NOTES:

- Cyanide is one of the most rapidly acting poisons and can be found as a byproduct of combustion, (especially with synthetic materials). Increasingly, cyanide has been recognized as a threat at the scene of a closed space fire and hazardous materials incidents.
- Carbon Monoxide rapidly removes the ability of the blood to carry oxygen.
- The lack of oxygen availability (CO), plus the inability of the body to use oxygen to create energy (cyanide), combined with the swelling of the bronchioles and bronchospasm related to the exposure to respiratory irritants **creates a patient that may rapidly decompensate.**

TREATMENT PEARLS

- All patients should receive 100% Oxygen via non-rebreather mask, or similar. This will help displace CO and ensure as much O2 to the tissues as possible.
- The airway should be monitored closely for signs of thermal burns. Any evidence of intraoral or intranasal burns (or soot) should warn of possible burns to the larynx or trachea. Any change in voice or stridor should prompt the paramedic to consider placement of an endotracheal tube to protect against potential complete airway obstruction.
- Any wheezing, rales or increased work of breathing should be treated aggressively with bronchodilators, steroids and non-invasive positive pressure ventilation (CPAP or BiPAP).
- Hemodynamic instability that is not improved with proper management of the airway, oxygenation and ventilation should be assumed to be due to cyanide poisoning and prompt treatment (when available).

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received received through online Medical Control.

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H-05 CORROSIVE AGENTS/ CHEMICAL BURNS	Also see *Hydrofluoric Acid [H-07]* for specific treatments with Calcium Gluconate	First Responder EMT AEMT Paramedic

Refer to the following individual guidelines regarding:

1. Skin or Mucous-Membrane Injury
2. Eye Exposure
3. Inhalation Injury
4. Ingestion

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H-05 CORROSIVE AGENTS/ CHEMICAL BURNS	Also see *Hydrofluoric Acid [H-07]* for specific treatments with Calcium Gluconate	First Responder EMT AEMT Paramedic

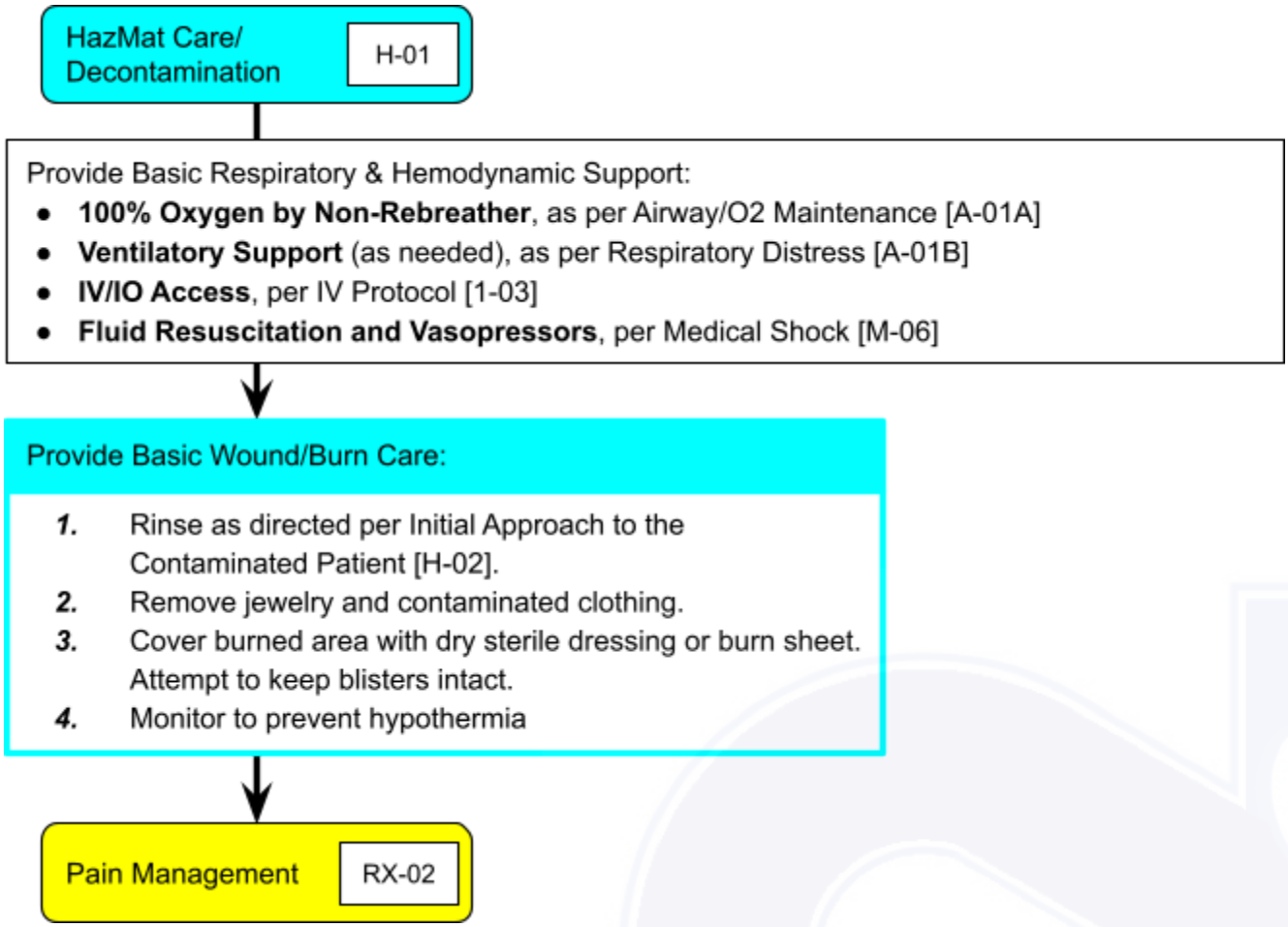
#1: SKIN or MUCOUS-MEMBRANE INJURY

Examples: Acids, Alkalis, Oxidizers, etc.

DECONTAMINATION - see Initial Approach to the Contaminated Patient [E-XX] for more details.

- Any visible solids should be brushed off the skin.
- Irrigate the skin with large volumes of water, and avoid contaminating non-exposed skin if possible.
- Eyes: see “Eye Exposure”, *below*, for specific approach).
- For large exposures, formal decontamination should be performed by a HazMat Team.

TREATMENT



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H-05 CORROSIVE AGENTS/ CHEMICAL BURNS	Also see *Hydrofluoric Acid [H-07]* for specific treatments with Calcium Gluconate	First Responder EMT AEMT Paramedic

SPECIAL CIRCUMSTANCES - SKIN/MUCOUS-MEMBRANE

Hydrofluoric Acid [H-07] → see full guideline for details

- Treatment:
  - *Dermal Injury:* **Calcium Gluconate** injected into and around the burn.
  - *Hemodynamic Instability:* **Calcium Gluconate IV/IO.**

Phenol (also known as Carbolic Acid)

- Found in many household items → commonly used as a disinfectant, germicide, antiseptic, and as a wood preservative.
- Local effects = causes a coagulating necrosis, the same as other acids.
- Systemic effects = central nervous system (CNS) depression, including respiratory arrest.

Treatment:

- Initially, decontaminate with large volumes of water, as per normal.
  - *Warning*: Small volumes of water increase absorption by expanding the surface area of exposure.
- Then, **irrigate burned area with mineral oil, olive oil, isopropyl alcohol or polyethylene glycol** (PEG, go-lytely®, colyte®) if available.
- Alternate washes of soap/water and oil (or PEG) a minimum of two times each before transport.

NOTES

- Injury is caused by direct tissue irritation/injury–generally by denaturation of proteins.
- In general, acids cause a coagulative necrosis and alkalis cause a liquefactive necrosis. Alkalis are generally worse/deeper due to a lack of protection from further destruction by an eschar (necrotic scab).
- The degree of injury (irritation) is based on concentration of the substance and duration of exposure.

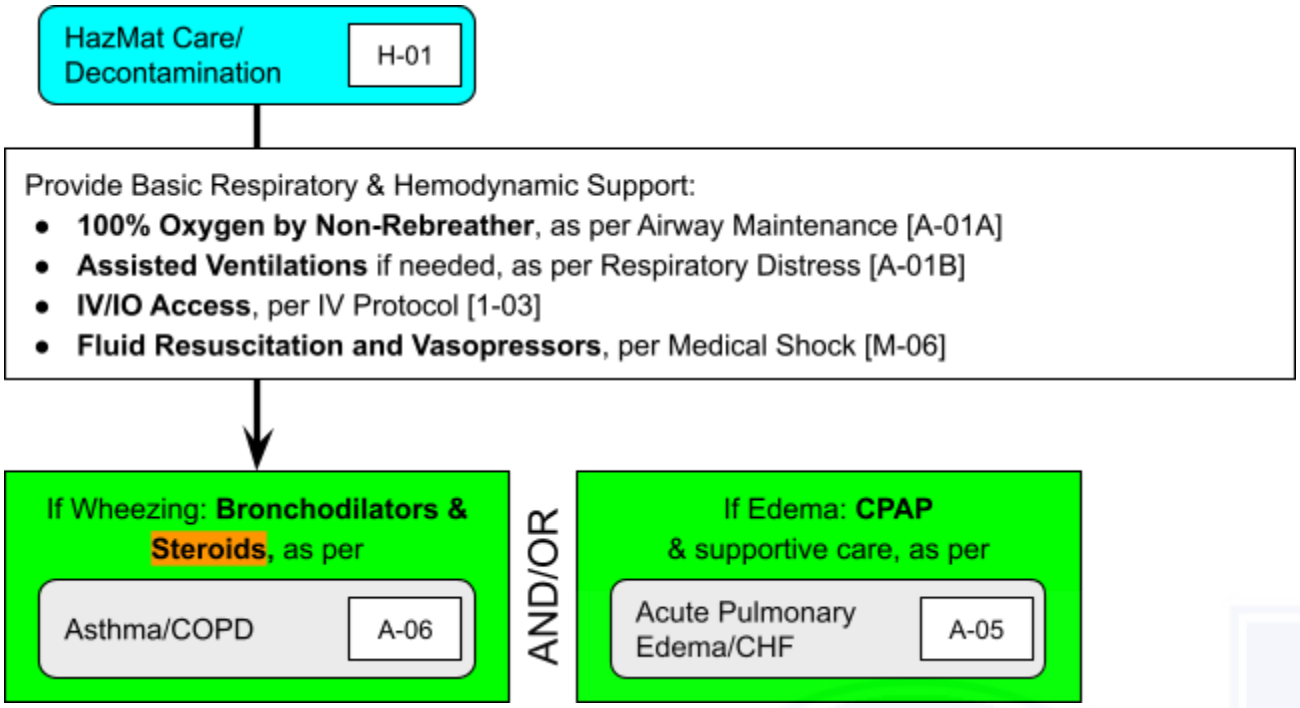
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#2: INHALATION EXPOSURE

Examples:

- Acids & Alkaline compounds
- Ammonia (liquids and gases)
- Chlorine Gas
- Blister agents - sulfur mustard (HS), nitrogen mustard (HD) and lewisite (L)
- Phosgene, Isocyanate and diisocyanate compounds (Methylene biphenyl isocyanate, ethyl isocyanate, methylene diisocyanate, toluene isocyanante, TDI, MDI)

TREATMENT



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H-05 CORROSIVE AGENTS/ CHEMICAL BURNS	Also see *Hydrofluoric Acid [H-07]* for specific treatments with Calcium Gluconate	First Responder EMT AEMT Paramedic

SPECIAL CIRCUMSTANCES - INHALATION

Hydrofluoric Acid [E-XX] → see specific guideline
- Decontamination: as per Initial Approach to the Contaminated Patient [E-XX]
- Treatment (see full guideline for details)
  - *Inhalation Injury:* **Nebulized Calcium Gluconate**
  - *Hemodynamic Instability:* **Calcium Gluconate IV/IO**

Chlorine and Chloramine
- Decontamination: as per Initial Approach to the Contaminated Patient [E-XX]
- Treatment:
  - Administer **5 ml of Sterile Water via Nebulizer**
  - If burning persists:
    - Administer **5 mL of HALF-STRENGTH Sodium Bicarb via Nebulizer**
    - MIX: 2.5 mL of Sodium Bicarbonate (8.4%) with 2.5 mL of NS
  - Otherwise, provide supportive care, bronchodilators and steroids as per General Inhalation Injury Guideline (*above*)
- Notes:
  - Chloramine gas is produced by the mixture of household bleach and household ammonia.
  - Chloramine and Chlorine is an irritant that converts to hydrochloric acid in the lining of upper airway.

Lacrimators - e.g. OC (Oleoresin Capsicum) pepper spray and other lacrimators
- These agents do not cause significant tissue damage.
- Treatment is aimed at relieving the pain (see “Eye Exposure”, *below*) and monitoring for any signs of anaphylaxis (Allergic Reaction [M-02]) or bronchospasm (Asthma/COPD [A-06]) potentially triggered by the irritant.

Phosgene
- An irritant gas that causes a **delayed onset of pulmonary edema** (dyspnea, tachypnea, and violent coughing).
- A mild and transient cough is the only symptom at the time of exposure to most agents.
- Severe symptoms are typically not seen for 12-24 hours (potentially up to 72 hours).
- Treatment is mostly respiratory support with CPAP/BiPAP or intubation/mechanical ventilation.

NOTES - INHALATION

- Injury is caused by direct damage/inflammation to the airways.
- A key consideration concerning the effects of respiratory irritants is water solubility.

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- Water-soluble materials (e.g acids/chlorine) tend to irritate upper airway passages resulting in cough reflex, wheezing and bronchospasm.
- *Non* Water-soluble irritants (or in cases of massive exposure to water soluble irritants), generally affect the lower airways and lead to non-cardiogenic pulmonary edema. This can have a delayed onset of 6 – 10 hrs or more (e.g. Phosgene).

- Symptoms
  - Pulmonary symptoms (cough, dyspnea, etc.) are generally associated with concurrent rapid onset of eye, nose and throat (i.e. mucous membrane) irritation.
  - Symptoms from most exposures tend to improve with fresh air and good ventilation unless there is a triggering of underlying lung disease (i.e. asthma exacerbation).
  - Moderate exposure:
    - Can lead to a persistent bronchospasm and bronchial swelling/edema.
    - Similar to asthma/COPD and treated similarly with bronchodilators and steroids (antiinflammatories).
  - In severe exposure (high concentrations):
    - Severe, life-threatening non-cardiogenic pulmonary edema can occur.
    - End-stage symptoms may *resemble organophosphate poisoning* due to profound fluid involvement, however, patients will have NORMAL OR DILATED PUPILS whereas an organophosphate or nerve agent patient will pinpoint pupils.

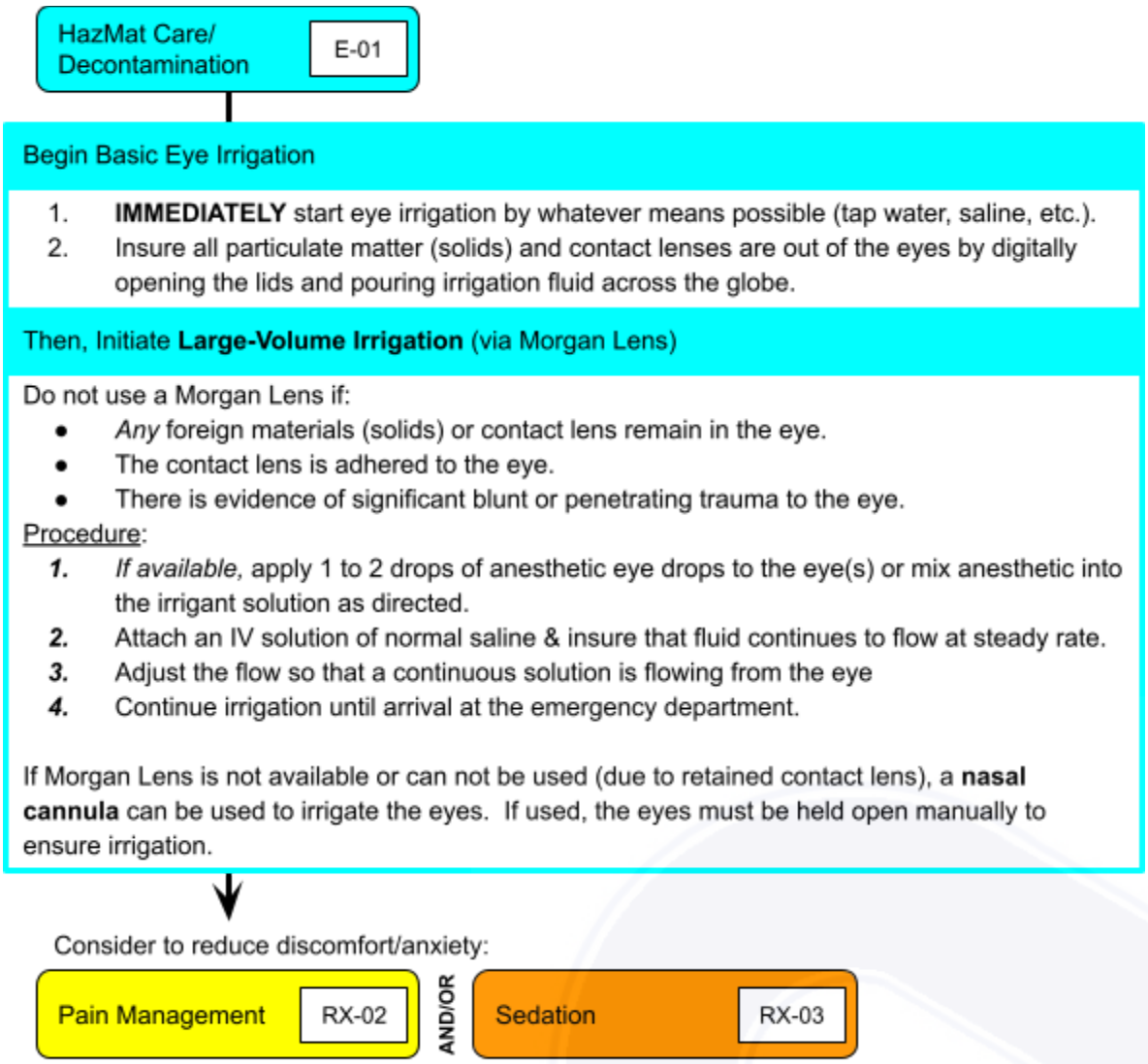
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#3: EYE EXPOSURE

Examples: This may be direct inoculation by a solid, liquid/droplet or vapor, or may be the result of mucous membrane exposure to a gas (e.g. chlorine).

TREATMENT

Focus: extensive irrigation of the eyes and pain control.



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H-05 CORROSIVE AGENTS/ CHEMICAL BURNS	Also see *Hydrofluoric Acid [H-07]* for specific treatments with Calcium Gluconate	First Responder EMT AEMT Paramedic

NOTES - EYE EXPOSURE

- Watch water run off so other parts of the body do not become contaminated (especially other parts of the face, ears, and back of neck).
- Eye burns are almost always associated with contamination of other parts of the face or body.

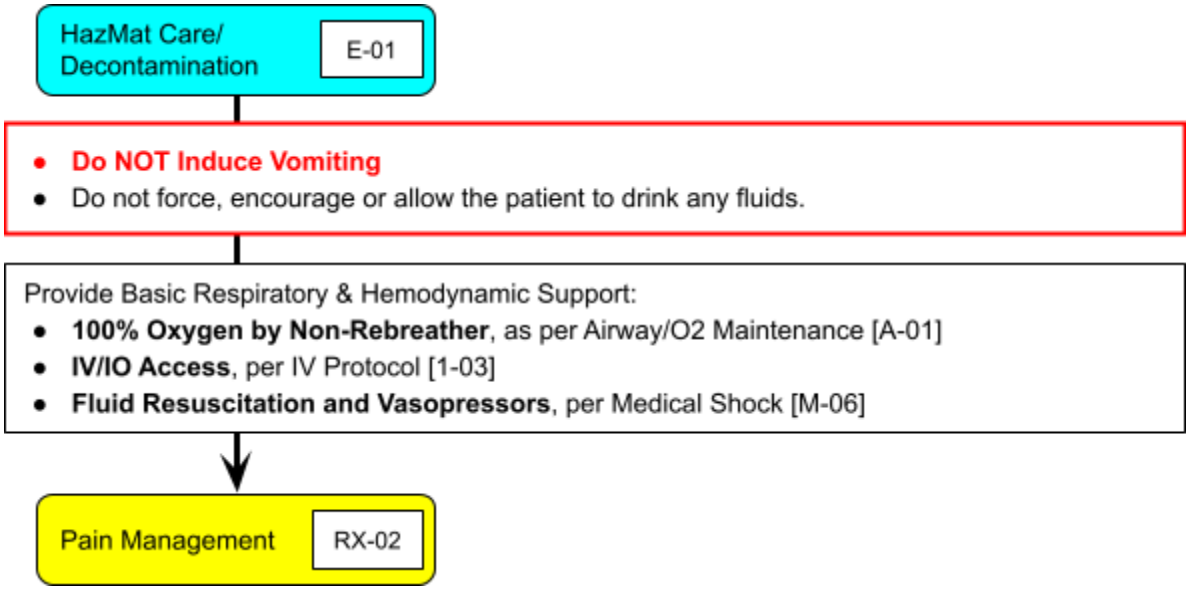
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#4: INGESTION

Examples: Usually seen with intentional ingestion in adults (suicide attempt), or accidental ingestion with pediatrics.

TREATMENT

Focus: maintaining and monitoring the airway for signs of obstruction due to edema of injured tissues, and monitoring for signs of circulatory collapse.



NOTES

- Ingestion of acids and alkalis can result in severe injury to the upper airway, esophagus and stomach.
- Most care is supportive unless there are severe upper airway (pharyngeal and/or laryngeal) burns.
- Severe exposures may lead to circulatory collapse.

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received received through online Medical Control.

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H-06 CYANIDE & HYDROGEN SULFIDE		First Responder EMT AEMT Paramedic

CYANIDE

Examples: Hydrogen cyanide, cyanogen chloride, potassium cyanide, sodium cyanide

Indication for concern/treatment:

- Possible exposure (**closed space fire**, occupational/industrial exposure, suicide attempt, etc.) AND
- Persistent hemodynamic instability (from severe acidosis) that **does not respond to typical resuscitation** (i.e. fluids & vasopressors).

HazMat Care/ Decontamination — H-01

Aggressive Respiratory & Hemodynamic Support:

- **100% O_2**, **Ventilatory Support** & early **Endotracheal Intubation** if significantly altered mental status, per Airway/O2 Maintenance [A-01A] and Respiratory Distress [A-01B].
- **IV/IO Access**, **Fluid Resuscitation and Vasopressors**, per IV Protocol [1-03] and Medical Shock [M-06].

HazMat

Hydroxocobalamin (CyanoKit) 5 grams IV/IO over 15 minutes

Peds: 70 mg/kg (recommend discussion with Medical Control prior to administration)

- Reconstitute each vial (2.5 grams) with 100 ml sodium chloride → administer both vials in the kit.
- **Use a dedicated IV/IO line**. Not compatible with many drugs.
- For ingested or absorbed cyanide, additional doses may be required.

Alternative: Lilly or Pasadena Kit

Amyl Nitrite Pearls crushed and inhaled (or placed in a BVM), ***and/or***
Sodium Nitrite 300 mg IV/IO (10 mL of a 3% solution) over 2 minutes

THEN

Sodium Thiosulfate (50 ml of a 25% solution) over 10 minutes

Peds: **Amyl Nitrite**: same as adult, **Sodium Nitrite:** 0.33 mL/kg over 10 minutes, **Sodium Thiosulfate** 1.65 mL/kg *(recommend discussion with Medical Control prior to administration)*

STOP! Do NOT administer Amyl or Sodium Nitrite in cases of smoke inhalation (structure fires) or carbon monoxide poisoning. Administer only Sodium Thiosulfate or Hydroxocobalamin (as above).

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H-06 CYANIDE & HYDROGEN SULFIDE		First Responder EMT AEMT Paramedic

CYANIDE NOTES:

- Cyanide is one of the most rapidly acting poisons.
- Reported to smell like “bitter almonds” (to those that are capable of detecting the odor)
- Interferes with cellular (mitochondrial) metabolism (disruption of oxidative phosphorylation through inhibition of cytochrome oxidase a3). This leads to cellular asphyxia, impaired adenosine triphosphate (ATP) production, and an anaerobic metabolism with lactate accumulation and metabolic acidosis.
- As oxygen is available but not able to be used, the patient will appear pink (i.e. not cyanotic) and pulse oximetry will indicate an unusually/unexpectedly high (i.e. normal) saturation.

TREATMENT NOTES:

- Hydroxocobalamin, a form of vitamin B_{12} binds cyanide to form the harmless cyanocobalamin form.
- Alternative (Methemoglobin Formers)
    - Methemoglobin binds cyanide (releasing it from the cell).
    - Methemoglobin (with or without bound cyanide or hydrogen sulfide) cannot carry oxygen and excessive methemoglobinemia lead to hypoxemia and acidosis.
    - Amyl Nitrite Pearls
        - Convert 3-5% of hemoglobin to methemoglobin
        - Administration: pearls should be broken and held on a gauze pad under the patient’s nose. Allow the patient to inhale the material for 15 to 30 seconds of every minute.
        - In general, give pearls first and then attempt IV/IO access.
    - Sodium Nitrite
        - Converts about 20% of hemoglobin to methemoglobin
    - Amyl Nitrite and Sodium Nitrite are a temporizing measure only, as Sodium Thiosulfate is then needed to convert cyanide into the relatively harmless thiocyanate.

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H-06 CYANIDE & HYDROGEN SULFIDE		First Responder EMT AEMT Paramedic

HYDROGEN SULFIDE

Examples: Hydrogen sulfide, thioethers Hydrogen sulfide Sulfides, Thioethers, Mercaptans & Thiols

Indication for concern/treatment:	
• Possible exposure (**confined space accident involving sewers and wastewater systems**, occupational/industrial exposure, suicide attempt, etc.) AND • Persistent hemodynamic instability similar to Cyanide (above)	
Hydrogen Sulfide Treatment	
For patients <u>still conscious</u>: • Symptoms should resolve with supportive care.	For patients with <u>altered mental status or impaired cardiovascular function</u>: • Treat *as per Cyanide (above)* with **Amyl Nitrite and/or Sodium Nitrite** • Hydroxocobalamin and Sodium Thiosulfate have <u>not</u> been shown to……

HYDROGEN SULFIDE NOTES:

- High concentrations lead to a rapid loss of consciousness, seizures, and death occur after only a few breaths. H2S is the leading cause of death in confined space accidents involving sewers and wastewater treatment systems.
- Formed naturally by the decomposition of organic substances, and is heavier than air.
- It has also been used as an agent for a **chemically induced suicide**. Hydrogen sulfide can be made by mixing common household products.
- Same clinical effects as cyanide (interferes with cellular respiration), but unlike cyanide, the inhibition of cellular metabolism reverses rapidly when hydrogen sulfide exposure ceases.
- Treatment is similar to cyanide in that low-level methemoglobin formation may enhance conversion of sulfide to the less toxic sulfmethemoglobin.
- Sodium thiosulfate and hydroxocolalbumin are generally not necessary, and there is little evidence of benefit (though no evidence of harm).

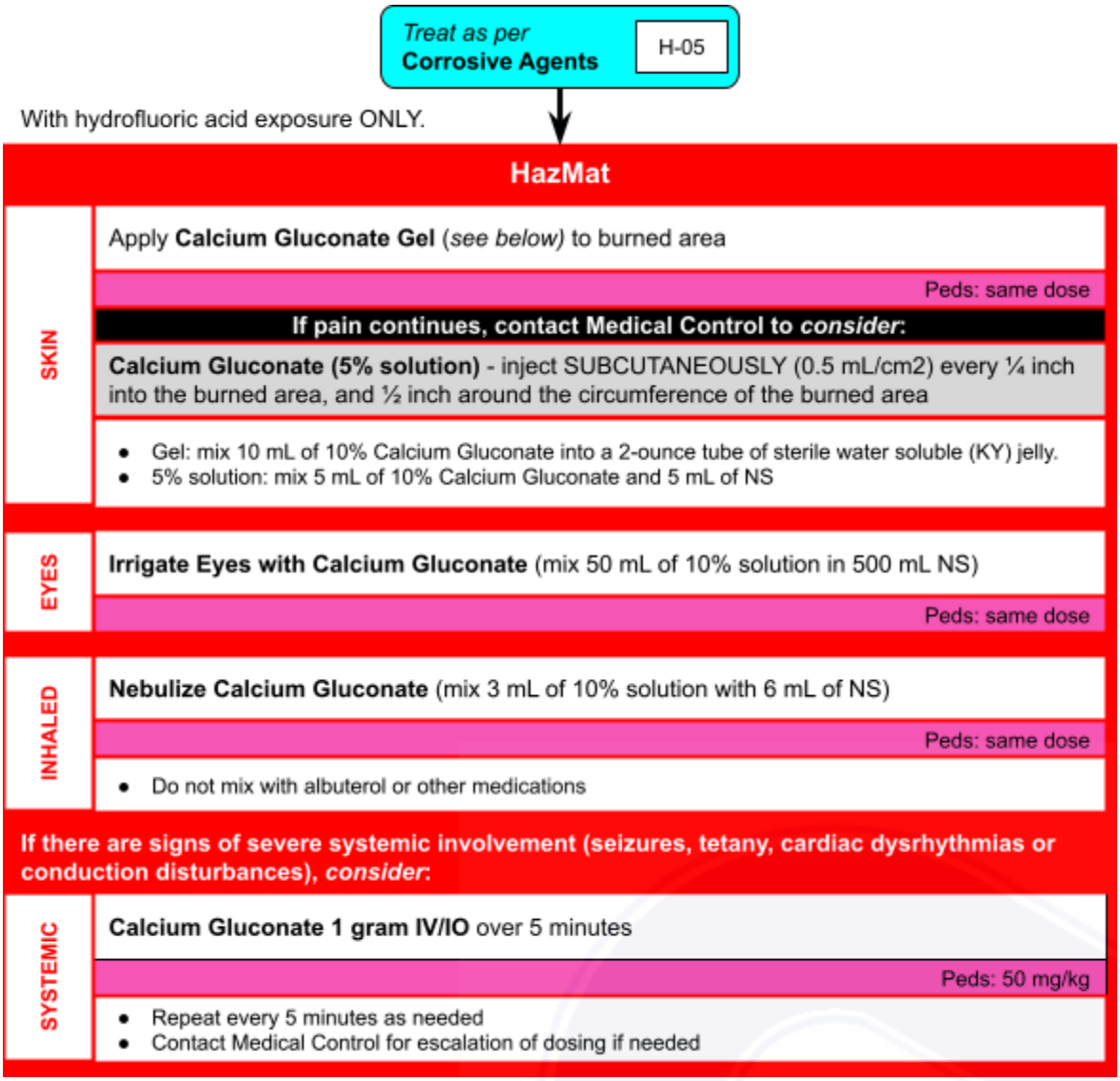
NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received received through online Medical Control.

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H-07 HYDROFLUORIC ACID	See **Corrosive Agents [H-05]** for general approach to decontamination and treatment.	First Responder EMT AEMT Paramedic

DESCRIPTION:

- Causes corrosive burning of the skin and deep underlying tissue, and also binds with calcium and magnesium from the nerve pathways, bone, and blood stream.
- The results are spontaneous depolarization producing **excruciating pain**, and hypocalcemia, resulting in **tetany and cardiac dysrhythmias**, which may degenerate to cardiac arrest.
- Systemic effects may be delayed.
- Skin may look deceptively normal at the surface. **Pain is an indication for treatment**, and that it's managed through the administration of calcium not analgesic.



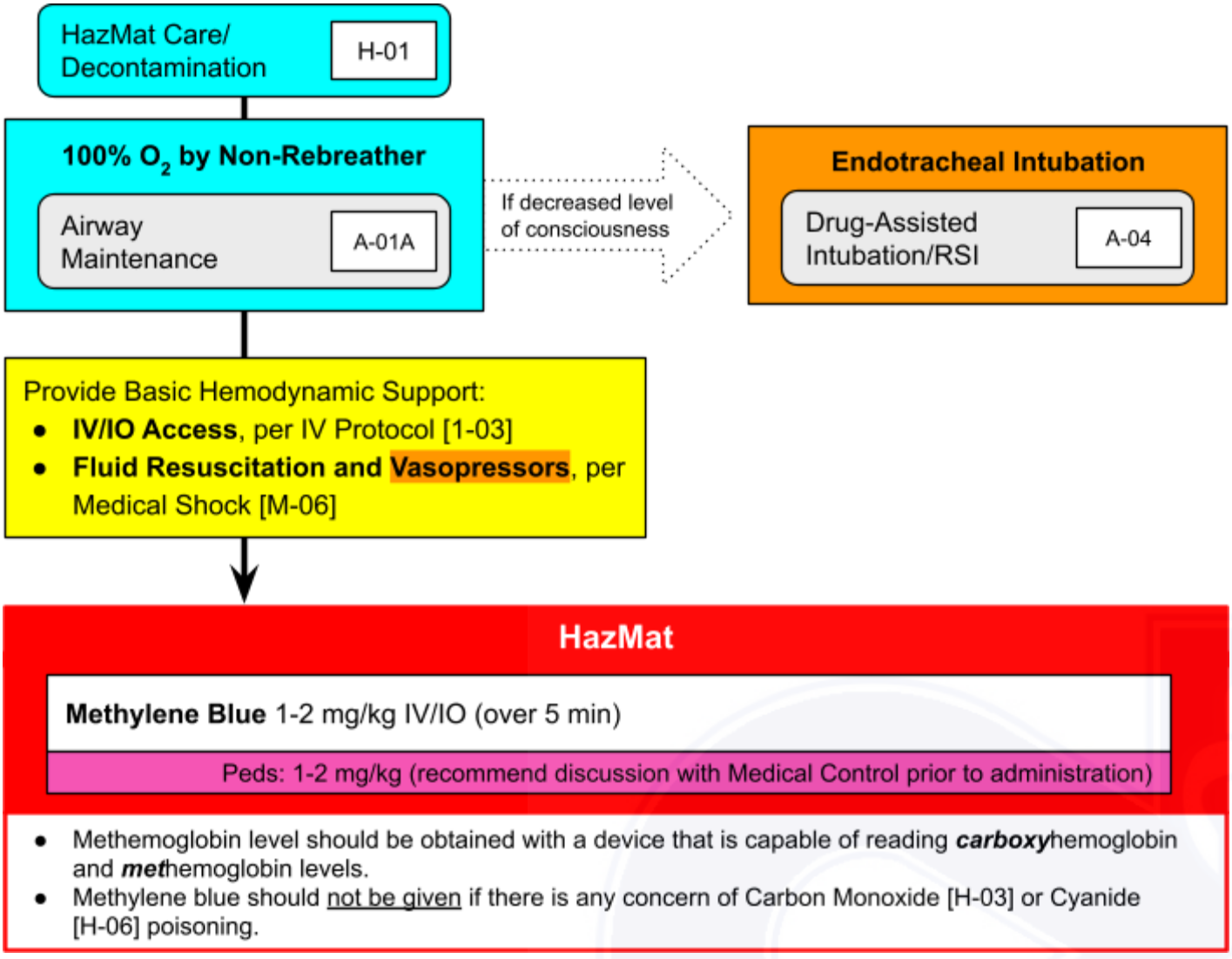
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H-08 METHEMOGLOBIN FORMERS		First Responder EMT AEMT Paramedic

Examples: Aniline dyes, nitrites, nitrates, nitrobenzene & nitrogen dioxide

Indication for concern/treatment:

- Possible exposure → commonly found in fertilizers, paints, inks & dyes) AND
- Evidence of methemoglobinemia:
  - "Chocolate Brown" blood on exam
  - Methemoglobinemia on co-oximetry



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H-08 METHEMOGLOBIN FORMERS		First Responder EMT AEMT Paramedic

KEY POINTS:

- Changes hemoglobin into a non-oxygen carrying compound, methemoglobin.
- Pulse oximetry will indicate an inaccurately low reading due to the opaqueness of the compound.
- Pulse oximetry should be obtained with a device that has the ability to read carboxyhemoglobin and methemoglobin levels

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received received through online Medical Control.

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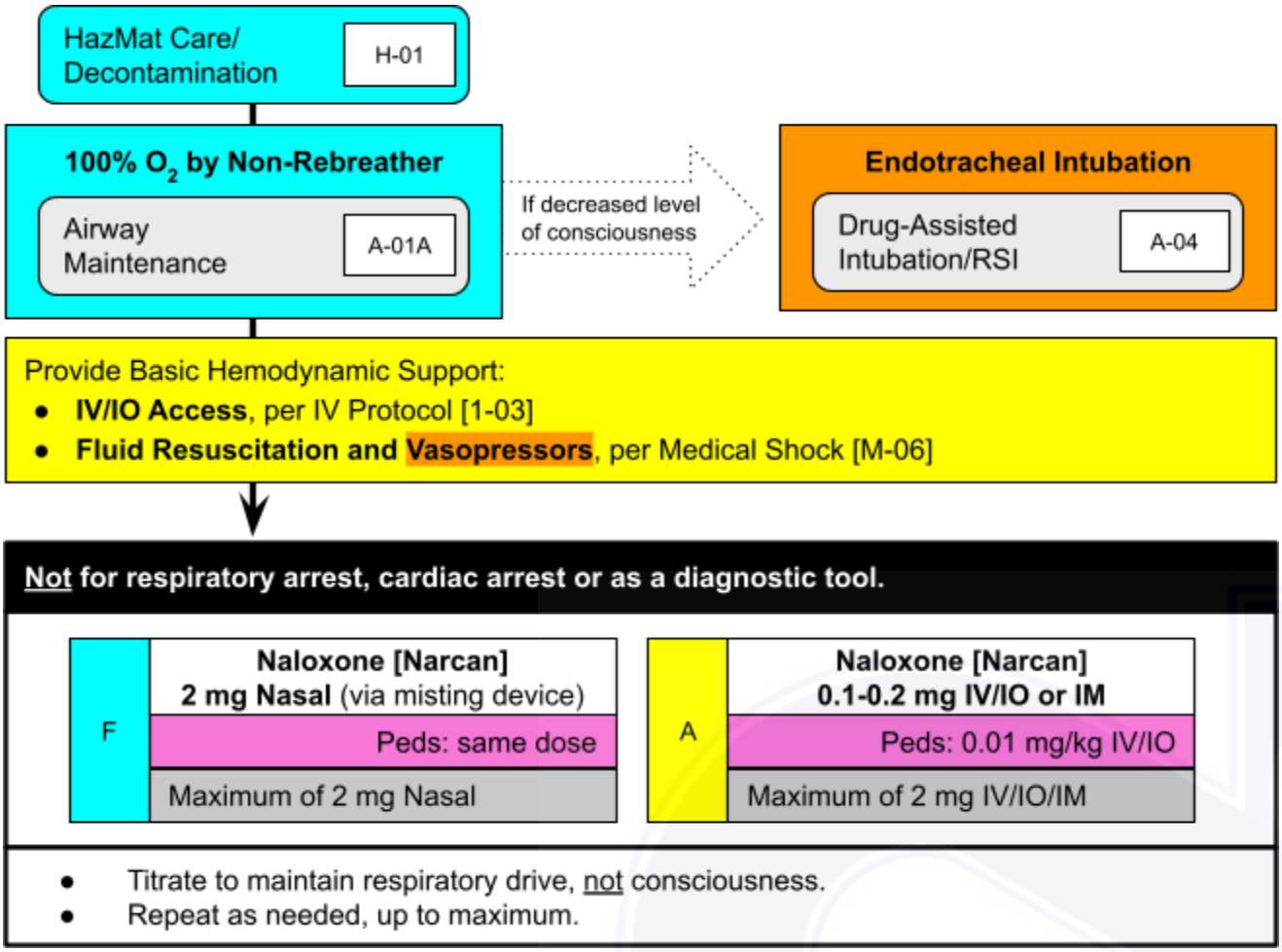
Initial and DEFINITIVE Treatment of Overdose is with Oxygenation & Ventilatory Support, NOT NALOXONE [NARCAN]!

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TOXIDROME → Indication for concern/treatment:

- Central Nervous System (CNS) depression (i.e. decreased LOC/coma, respiratory depression).
- Pupillary Changes
  - Opiates = pinpoint pupils (miosis)
  - Other sedatives will have variable-sized pupils.

Examples:
- Opiates - heroin, fentanyl, morphine, oxycodone, etc.
- Benzodiazepines - diazepam [Valium], alprazolam [Xanax], clonazepam [Klonopin], etc.
- Alcohols - ethanol, isopropyl alcohol, methanol, ethylene glycol, etc.
- Others - chloral hydrate, antihistamines, etomidate, barbiturates (phenobarbital)



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H-09 OPIATES & SEDATIVE AGENTS	**Initial and DEFINITIVE Treatment of Overdose is with Oxygenation & Ventilatory Support, NOT NALOXONE [NARCAN]!**	First Responder EMT AEMT Paramedic

KEY POINTS:

- Exposure:
  - First responders have been exposed to and required treatment for opiate overdose after inhalation and/or dermal exposure (absorbed through the skin) of powdered fentanyl.
  - Simple facemask and gloves should be worn at all times, and should adequately protect providers against accidental exposure.
- Treatment Pearls:
  - Opiates and other sedative medications cause illness/injury/death thru respiratory depression, hypercarbia and hypoxia. This leads to an acidosis which can lead to cardiac arrest.
  - **Initial treatment should always be to initiate supplemental O2 and ventilatory support.**
  - Assisted ventilations should be started on any patient with respiratory depression or respiratory arrest. An advanced airway (BIAD or endotracheal intubation) should be placed on all apneic patients and any patient whose respiratory drive does not quickly improve with basic BVM management.

NALOXONE (NARCAN)

- Should ONLY be used on patients who continue to have some respiratory effort, as a way to attempt to increase the patient's intrinsic respiratory drive.
- **Should <u>not</u> be administered in cardiac arrest.**
- **Once an advanced airway has been placed, Naloxone (Narcan) is CONTRAINDICATED.**
- No more than one dose of nasal naloxone (2-4 mg) should ever be administered if airway management equipment is available. This includes any naloxone given by bystanders or first responders.
- Intramuscular (IM) administration is strongly discouraged, but may be considered in isolated circumstances, and no more than 2mg should ever be administered IV/IO or IM.
- High doses of naloxone have reportedly been required for potent opiates (e.g. fentanyl). The basis of treatment, however, is unchanged (oxygenation and ventilation), and as long as these are maintained, the patient should remain stable.

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H-09 OPIATES & SEDATIVE AGENTS	**Initial and DEFINITIVE Treatment of Overdose is with Oxygenation & Ventilatory Support, NOT NALOXONE [NARCAN]!**	First Responder EMT AEMT Paramedic

QI Review Parameters:

1. Time til first dose of Narcan. *(From patient contact)*
2. Route of first dose?
3. Number of Narcan doses given?
4. Ventilatory Support given?
5. Primary airway support used?
6. Airway management at final disposition?

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received received through online Medical Control.

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H-10 ORGANOPHOSPHATES & CARBAMATES	Includes: Nerve Gas Exposure	First Responder EMT AEMT Paramedic

Examples: Malathion, parathion, ethion, bendiocarb, aldicarb, sarin & VX nerve agents

Indication for concern/treatment:

- Possible exposure → commonly found in **insecticides** or possible WMDs, and
- Cholinergic toxidrome: **Pinpoint pupils, slow heart rate & drowning in their own secretions**

HazMat Care/ Decontamination — H-01

Aggressive Respiratory & Hemodynamic Support:

- **100% O_2**, **Ventilatory Support** & early **Endotracheal Intubation** if significantly altered mental status, per Airway Maintenance [A-01A], Respiratory Distress [A-01B].
- **IV/IO Access**, **Fluid Resuscitation and Vasopressors**, per IV Protocol [1-03] and Medical Shock [M-06].

Paramedic

Atropine 1-2 mg IV/IO (repeat every 5 minutes & escalate dose as needed)

Peds: 0.02 mg/kg (repeat & escalate as needed)

- Endpoint of escalation/treatment is **control of secretions**
- May need VERY large doses

HazMat

Pralidoxime (2-PAM) 1 gram IV/IO over 2 minutes

Peds: 20-50 mg/kg (recommend discussion with Medical Control prior to administration)

- May use IM route if no access.
- Not necessary with carbamate poisonings

Alternative: DuoDote® or Mark I Kit

Moderate Symptoms	Severe Symptoms
• Administer **ONE kit** • Repeat every 5 minutes if needed	• Administer **THREE kits** • Repeat as needed

Peds: <40kg do not use kits *(discuss with Medical Control if needed)*

- Duodote® (single autoinjector): 2.1 mg atropine 2.1 mg & 600 mg pralidoxime
- Mark I Kit (two auto injectors): 2 mg atropine & 600 mg pralidoxime

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H-10 ORGANOPHOSPHATES & CARBAMATES	Includes: Nerve Gas Exposure	First Responder EMT AEMT Paramedic

Cholinergic Toxidrome (commonly seen symptoms):	
DUMBELS	**SLUDGE-M**
D – Diarrhea U – Urination M – Miosis (Pinpoint pupils) B – Bronchospasm, bradycardia, bronchorrhea E – Emesis L – Lacrimation S – Salivation	S – Salivation L – Lacrimation U – Urination D – Diarrhea G – Gastro-intestinal pain & hyperactivity E – Emesis M – Miosis (Pinpoint pupils)
Essentially: **Pinpoint pupils, slow heart rate & drowning in their own secretions**	

KEY POINTS:

- May be inhaled, ingested, or absorbed through the skin..
- Binds with the acetylcholinesterase, initially causing excitation of nerve conduction and then paralysis.
- Not all pesticides are considered organophosphates or carbamates. In addition, Carbamates tend to be less severe and self limiting and requires less aggressive treatment.
- Atropine should be titrated to clinical effect.

SPECIAL SITUATIONS:

- **Seizures**: Treat with Versed (midazolam) or Ativan (lorazepam) as per Seizure guideline [M-09].

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received received through online Medical Control.

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HazMat Care/ Decontamination H-01

With radioactive material exposure (*different from chemical exposure*) once the patient is removed from the environment, medical care supersedes decontamination.

Provide Basic Respiratory & Hemodynamic Support:

- **100% Oxygen by Non-Rebreather**, as per Airway Maintenance [A-01A]
- **Ventilatory Support** (as needed), as per Respiratory Distress [A-01B]
- **IV/IO Access**, per IV Protocol [1-03]
- **Fluid Resuscitation and Vasopressors**, per Medical Shock [M-06]

Monitor for signs of **Acute Radiation Sickness**

- Document time of exposure and onset time of GI Symptoms (vomiting).
- Antiemetics (Zofran) per Abdominal Pain/Vomiting [M-01]

Basic Decontamination/Wound/Burn Care:

1. Brush off any solids/particulates.
2. Remove jewelry and contaminated clothing.
3. **Wipe off** any wounds or potentially affected skin using towels with soap and warm water (or baby wipes).
   a. *Irrigation of wounds/skin/eyes should only be initiated if the fluid (effluent) can be collected in appropriate containers for proper disposal.*
4. Collect all particulates, clothing and dirty towels/effluent in plastic bags for proper disposal.
5. Cover burned/exposed areas with dry sterile dressings/ burn sheet. Dress any wounds as per usual fashion.

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H-11 RADIATION		First Responder EMT AEMT Paramedic

INITIAL RESPONSE

- If there is concern over continued exposure, the patient(s) should be removed from the source/ environment (or have the source removed) in as rapid and safe manner as possible.
- If there is ever a question a HazMat Team should be requested to evaluate the scene and develop an extrication and treatment approach.
- ALARA (As Low As Reasonably Achievable) is the underlying philosophy associated with protecting patients and providers from ionizing radiation. *Minimize the time around the source, increase the distance from the source, put "stuff" between the target and the source (shielding), and/or simply remove the source.*
- Once removed from the source, lifesaving interventions take priority over contamination concerns.
    - **A non-contaminated patient who has only been irradiated poses no radiological hazard to the healthcare provider, and**
    - **The use of universal precautions by healthcare professionals has been shown to mitigate clinically-significant exposure from radioactive contamination.**
- MCI: Multiple casualties should be managed based on current MCI Triage (START) standards.
- *Dose estimation*: HazMat Specialists should safely obtain an estimate of the exposure in order to prepare an effective treatment plan. Measurements/calculations of the source activity (A), the isotope and corresponding gamma constant (Γ), the distance the victim was from the source (m or cm), and the time in the area (t) are needed if possible.

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ACUTE RADIATION SICKNESS/SYNDROME (ARS)

- ARS results from whole-body, external exposure to radiation doses >1 Gy delivered over a short time period (i.e. acute, high dose exposure). Onset of symptoms varies from a few hours to weeks, depending on the degree of exposure.
- *Pathophysiology*: radiation damage to cells occurs within microseconds of exposure. This is most severe in rapidly reproducing cell types → stem cells in the bone marrow, intestinal crypt cells, and the basal layer of skin.

Clinical Syndromes

Acute = Gastrointestinal Syndrome

- Symptoms generally begin with nausea/vomiting and diarrhea. Severe acute symptoms can lead to significant fluid and electrolyte shifts, malabsorption of nutrients, GI bleeding, and eventually sepsis.
- The **time to onset** of signs/symptoms is dose-related, with a more rapid onset indicating a higher dose. "Biological Dosimetry" = estimated radiation dose utilizing clinical signs and symptoms.
- Time to emesis: <1 hour = >6-8 Gy; 2 hours = 4 Gy; 4 hours = 2 Gy. *The absence of vomiting does not preclude a significant exposure.*

Subacute = **Hematopoietic Syndrome** (Bone Marrow Suppression)

- Mature lymphocytes and cells in the bone marrow are highly sensitive to radiation. Exposure (damage) leads to lymphopenia followed by anemia and thrombocytopenia.
- Clinical manifestations typically occur over a few weeks with morbidity and mortality related to bleeding and infection.
- *Thresholds*: >1 Gy = laboratory detection of hematopoietic changes (decreased lymphocyte count) and >2 Gy causes clinically significant hematologic-related illness.
- Modern supportive care (including blood products, hematopoietic growth factors, and antimicrobials) is capable of significantly improving survival, and is intended to maintain the patient until surviving islands of stem cells can be stimulated to resume blood cell production.

Lethal Exposure = **Neurovascular Syndrome**

- Occurs at doses of >8 Gy or greater with irreversible, non-survivable state at doses > 10 Gy.
- Nausea and vomiting occur *within minutes*.
- Early transient incapacitation (loss of consciousness) can occur. There may be a short (latent) period of the return of some functionality from a few hours up to a few days, followed by a deterioration of the patient's status. Cerebral edema and multiple organ pathology are often seen during autopsy.

Injury to Other Organs

- Ionizing radiation may cause injury to the lungs, liver, kidneys, and other organs.
- Multi-organ failure (MOF) results from maldistribution of blood flow that occurs after radiation-induced systemic inflammatory response syndrome (SIRS). The pathogenesis of MOF is not fully known.

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MEDICAL MANAGEMENT

- Prehospital Care:
  - Other than gastrointestinal symptoms (i.e. vomiting), there are rarely other immediate emergent medical concerns directly related to the radiation.
  - Treatment should focus on *supportive care, decontamination* and the evaluation of secondary injury or illness.
  - EMS personnel should obtain a complete history, including timing/duration of exposure as well as documenting any loss of consciousness and any vomiting episodes as these two historical markers will provide future healthcare providers with an estimate of the degree of exposure and subsequent likelihood of deterioration/death.
- Additional Evaluation/Treatment:
  - The overall management of ARS is focused mainly on physiologic support while awaiting the recovery of the hematologic system.
  - Routine labs allow calculation of the *absolute lymphocyte count (ALC)* with a rapid and deep decrease in the ALC indicating a high dose.
  - The goals of medical management are aimed at preventing, monitoring for, and treating sepsis, and providing appropriate respiratory and hemodynamic support.

Radiation Burns (Local Injury)

- The pathophysiology for erythema includes arteriolar constriction, capillary dilation and local edema. Over time, endothelial cell damage and fibrinous necrosis can lead to radionecrosis and ulceration.
- There may be some immediate erythema of the skin, but radiation burns develop 2-4 weeks post-exposure. **Immediate burns should be assumed to be related to thermal or chemical injury and treated as such.**
- Thresholds are as follows:
  - 3 Gy: Epilation, typically 2-4 weeks post-incident
  - 6 Gy: Immediate but transient erythema in a few hours post-accident (primary erythema) with secondary erythema 2-4 weeks thereafter.
  - 10-15 Gy: Dry Desquamation (first-degree burn/sunburn) of the skin is usually seen approximately 2-4 weeks post-incident.
  - 15-25 Gy: Moist Desquamation (partial thickness/2nd-degree burns with blisters and denuded skin) is seen at least 2-4 weeks post-exposure, depending upon dose.
  - > 25 Gy, overt radionecrosis (i.e. full thickness/3rd-degree burn), extending to deep structures and with likely whole body radiation illness.
- *Treatment*: standard wound/burn care, infection control and appropriate pain management.

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DECONTAMINATION

- **Radiologically contaminated patients generally pose no danger to healthcare personnel.**
- Perform all immediate life-/limb-saving actions without regard to contamination.

- *Radiological decontamination,* that is, the removal of radioactive materials from surfaces, *demands significant resources/time, and should generally be deferred to a HazMat Specialist.*
- Unlike chemicals, radioactive materials cannot be “neutralized”, they can only be moved from one point to another. Therefore, the challenge is to remove the radioactive material from one area and transfer it to where you want it to be without spreading it to points in between.
- Decon is performed similar to chemical decontamination, the main difference is in *timing*: Chemical decon is often an emergency, but *radiological decontamination is not an emergency.*

PROCESS

- A quick head-to-toe survey should provide sufficient evidence of the presence or absence of gross contamination with appropriate instrumentation.
- First, brush off particulates, and remove clothing.
- Then → formal decontamination:
    - **1st = Wounds:**
        - The intact skin immediately adjacent to the wound should be quickly decontaminated using a moist towel/baby-wipe (wipe away from the wound).
        - Irrigation using sterile saline or water may be considered *<u>if</u> the effluent can be collected and the runoff will not cross-contaminate clean areas of the body*. The goal is gentle irrigation to remove the bulk of the contamination and avoid splashing. Drapes and/or absorbent pads should be applied and any runoff should be directed into a receptacle (e.g. a lined garbage can).
        - The wound should then be covered and clean, absorbent towels/pads should be placed under the affected area prior to resurvey.
    - **Mouth & Nose** (prevent ingestion): Have the patient blow their nose for particulates. Mucous membranes may be wiped with most towels, similar to skin, but irrigation of the airway should generally be avoided.
    - **Eyes**: Irrigation (i.e. with a morgan lens) may be considered if effluent can be collected.
    - **Intact Skin/Hair**: Once wounds have been addressed, other contaminated intact skin should be wiped (and/or washed/irrigated) similar to a wound.
- All waste and effluent (irrigant) should be kept for later collection and disposal.
- Repeat contamination surveys (measurements) to determine the effectiveness of the decontamination attempts, and the process should be repeated until no further progress is made.

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H-11 RADIATION		First Responder EMT AEMT Paramedic

NOTES/DEFINITIONS

- "Irradiation" = the patient is exposed to ionizing radiation/radioactive environment, but no material is transferred. This means that an irradiated patient *has no radioactive material on them and poses no radiological hazard to the treatment team*.
- "Contamination" = the patient has radioactive materials on/in them (i.e. a material that emits radioactive particles or waves).

- *Activity/Radioactivity* = the amount (*quantity*) of radioactive material present.
  - Measured in Curies (Ci) in the U.S., and is defined as 3.7 x 10^{10} becquerels (37 giga-becquerels (GBq))--the becquerel is the basic SI unit for one disintegration per second.
  - Conventional units such as ounces, grams, etc. are not used.
- Exposure = the potential to create ionization in air = danger of the environment.
  - The units are the Roentgen (R) in the U.S. (Coulombs per kilogram in SI units).
- *Absorbed dose* = energy deposited into tissue = *damage*
  - Measured in **Rads** in the U.S. One rad is equal to 100 ergs (10^7 joules) of energy deposited into one gram of tissue.
  - The SI unit is the gray (Gy), which is equal to one joule of energy deposited into one kilogram of tissue → 1 Gy = 100 Rads.
  - The absorbed dose is the most common and most appropriate measurement used in patients as it correlates with the acute injury/effects from radiation.
- Dose-equivalency = differences in the future risk between the different radiation types.
  - Use a quality factor (QF, in the U.S.) or a radiation weighting factor (wR, internationally).
  - Basically, the QF/wR represent how much more risk (i.e. risk of future cancer) is associated with one radiation type versus the standard (gamma/x-ray where the wR and QF = 1).
  - SI = measured in Sieverts (Sv) the equivalent dose = the dose in Gy times the wR.
  - US = measured in rem = the dose in Rads times the QF.

Types of Radiation

- Alpha (α) particles:
  - Charged particles made up of two protons and two neutrons emitted from heavy nuclei.
  - Cannot travel far (about an inch in air) and cannot penetrate the skin.
  - Thin clothing or even a sheet of paper are effective shields for alpha particles. Radionuclides that emit alpha particles are therefore a *negligible external hazard but can be more dangerous in an inhalation or ingestion incident.*
- Beta (β) particles:
  - Electrons emitted from isotopes such as tritium and 90Sr.

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  - Can travel a short distance in tissue (a few millimeters) and up to a couple of meters in air.
  - Most beta particles can be shielded by a thin layer of plastic–such as the clear face-piece of a full-face respirator.
  - Large quantities of beta-emitting radioactive materials deposited on the skin can cause relatively superficial damage (radiation burns). Like alpha-particles, they are also important if inhaled or ingested.
- Gamma (γ) rays:
  - Highly energetic non-particulate electromagnetic radiation (i.e waves not particles) capable of creating ionization.
  - They can pass through matter easily, and can result in exposure and damage to the internal organs from external sources. Dense materials (such as lead are needed to shield gamma rays.
- X-rays: Different from gamma rays *only* in their point of origin: outside of the nucleus for xrays as opposed to within it for gamma rays.
- Neutrons: Uncharged particles, important because they are emitted during the fission process and in some nondestructive testing procedures. They are very uncommon but more dangerous than gamma rays, and they are the only type of the five discussed that have the ability to make something else radioactive (neutron activation).

Common Radioisotopes

- “University Five” – 14C, 32P, 125I, 131I, 252Cf: used for isotopic labeling in biochemistry laboratories, and in medicine.
- “Industrial Three” – 192Ir, 137Cs, 60Co: 192Ir is widely used in industrial radiography to photograph large objects such as oil pipes, airplane wings, etc. 137Cs and 60Co are used in industry and are considered to be prime agents for terrorism incidents.
- “Military Five” – Tritium (3H), 235U, 238U, 239Pu, and 241Am: primarily used in the weapons complex (DOE and military).
- Fission/Activation Products – encountered in response to a nuclear detonation, a reactor accident, or a waste transportation incident. Some are volatile and, depending on the activity, can pose a significant risk to the populace.

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Additional Info

Table 4 – Quick Triage Using Time to Vomiting

Dose in Gray (Gy)	Time to Vomiting (hours)	% of victims	Survivability LD 50/60
0	0	-	
1	N/A	19	
2	4.63	35	
3	2.62	54	
4	1.74	72	With intense treatment
5	1.27	86	
6	0.99	94	
7	0.79	98	
8	0.66	99	
9	0.56	100	
10	0.48	100	

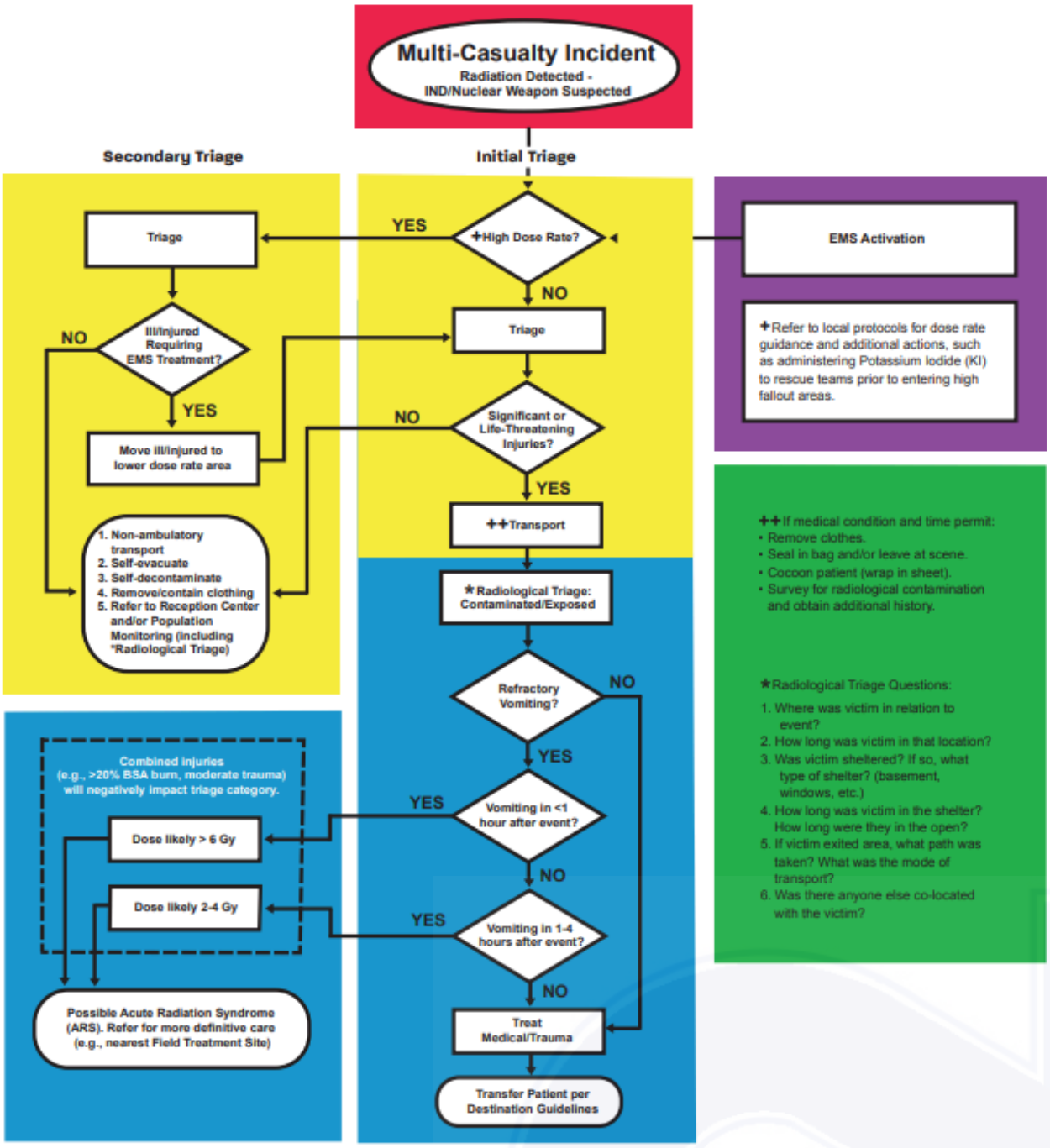
Biodosimetry Based on Acute Photon-Equivalent Exposures; Waselenko, JK, "Medical Management of the Acute Radiation Syndrome: Recommendations of the Strategic National Stockpile Radiation Working Group", Ann Intern Med, 2004.

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Prehospital Radiological Triage

Version 1.1, March 2020



Radiation Emergency Assistance Center/Training Site (REAC/TS)
After Hours Emergency Assistance
US Department of Energy Oak Ridge Operations Center: 865.576.1005
Phone: 865.576.3131 · orise.orau.gov/reacts

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PROCEDURES

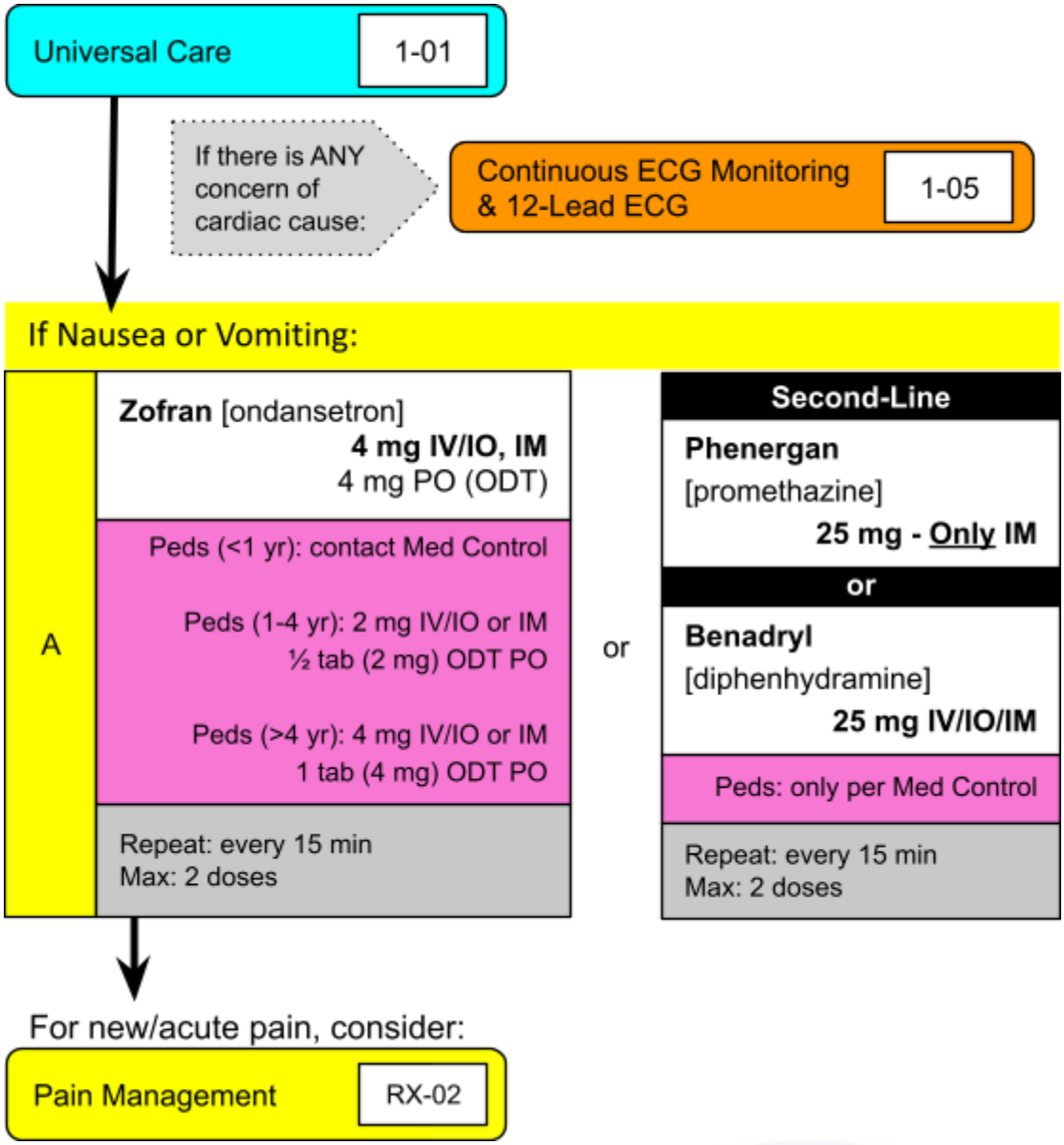
(None)

REFERENCE

M-R1 C-STAT Stroke Scale
M-R2 Cincinnati Stroke Screen
M-R3 Terminally Ill Patients

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M-01 ABDOMINAL PAIN/ VOMITING		First Responder EMT AEMT Paramedic



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M-01 ABDOMINAL PAIN/ VOMITING		First Responder EMT AEMT Paramedic

KEY POINTS:

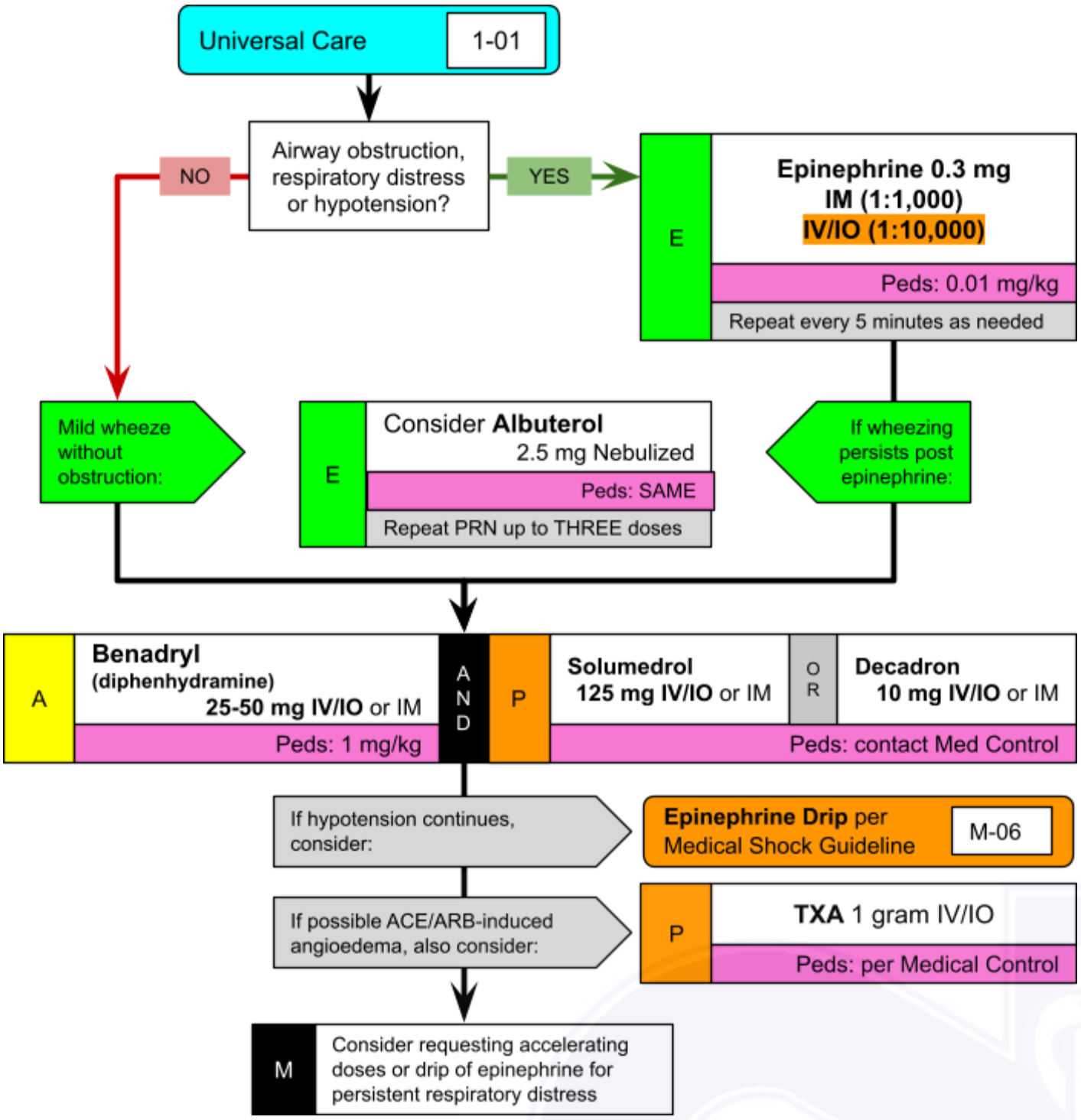
- Always consider non-GI life-threatening causes of abdominal pain:
  - **Cardiac/STEMI:** Consider 12-lead EKG for any upper abdominal pain or nausea/vomiting as they can be symptoms of an Acute Coronary Syndrome, even in the absence of chest pain or shortness of breath.
  - **Aortic Aneurysm/Dissection:** Especially consider with hypotension or syncope with abdominal pain. Treat as potential hemorrhagic shock with fluid resuscitation and possibly needing vasopressors.
  - **Pregnancy:** Ectopic pregnancy until proven otherwise (if US not done before). Can have large volume of blood loss if ruptures. Treat hypotension as hemorrhagic shock.
  - **Diabetic Ketoacidosis (DKA):** Consider with vague abdominal pain and vomiting with evidence of dehydration (tachycardia, hypotension, etc.). Glucose can be only mildly elevated but is generally >300. Treatment is with fluid resuscitation and pressors if needed in the field, and insulin drip in the ED.

QI Review Parameters:

1. {PENDING}

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M-02 ALLERGIC REACTION/ ANAPHYLAXIS		First Responder EMT AEMT Paramedic



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M-02 ALLERGIC REACTION/ ANAPHYLAXIS		First Responder EMT AEMT Paramedic

KEY POINTS:

- **Anaphylaxis**:
  - Severe allergic reaction that is rapid in onset and potentially life threatening.
  - Multisystem signs and symptoms are generally present including skin rash (hives/urticaria) and angioedema (face, throat, extremities, etc.), with or without signs of vasodilation/shock.
- **Angioedema**:
  - Deep mucosal edema causing swelling of mucous membranes of upper airway or face.
  - May occur in the absence of anaphylactic or allergic reaction.
  - Isolated angioedema (i.e. lips or tongue) is likely due to a drug-related reaction--most commonly ACE inhibitors (e.g. lisinopril).

- Acute treatment is with antihistamines (Benadryl) and fluid resuscitation.
- **Epinephrine should always be given if there are any signs of airway obstruction (intraoral edema, stridor, wheezing, etc.), or signs of hemodynamic compromise (hypotension, decreased cap refill, etc.).**
- If there is any concern over anaphylaxis, **the first dose of epinephrine should be given intramuscular (IM)** so as to not delay time to Epi administration.
- The mainstay of treatment is steroids, but these will take several hours to kick in, even if given IV.
- The shorter the onset from exposure to symptoms, the more severe the reaction.

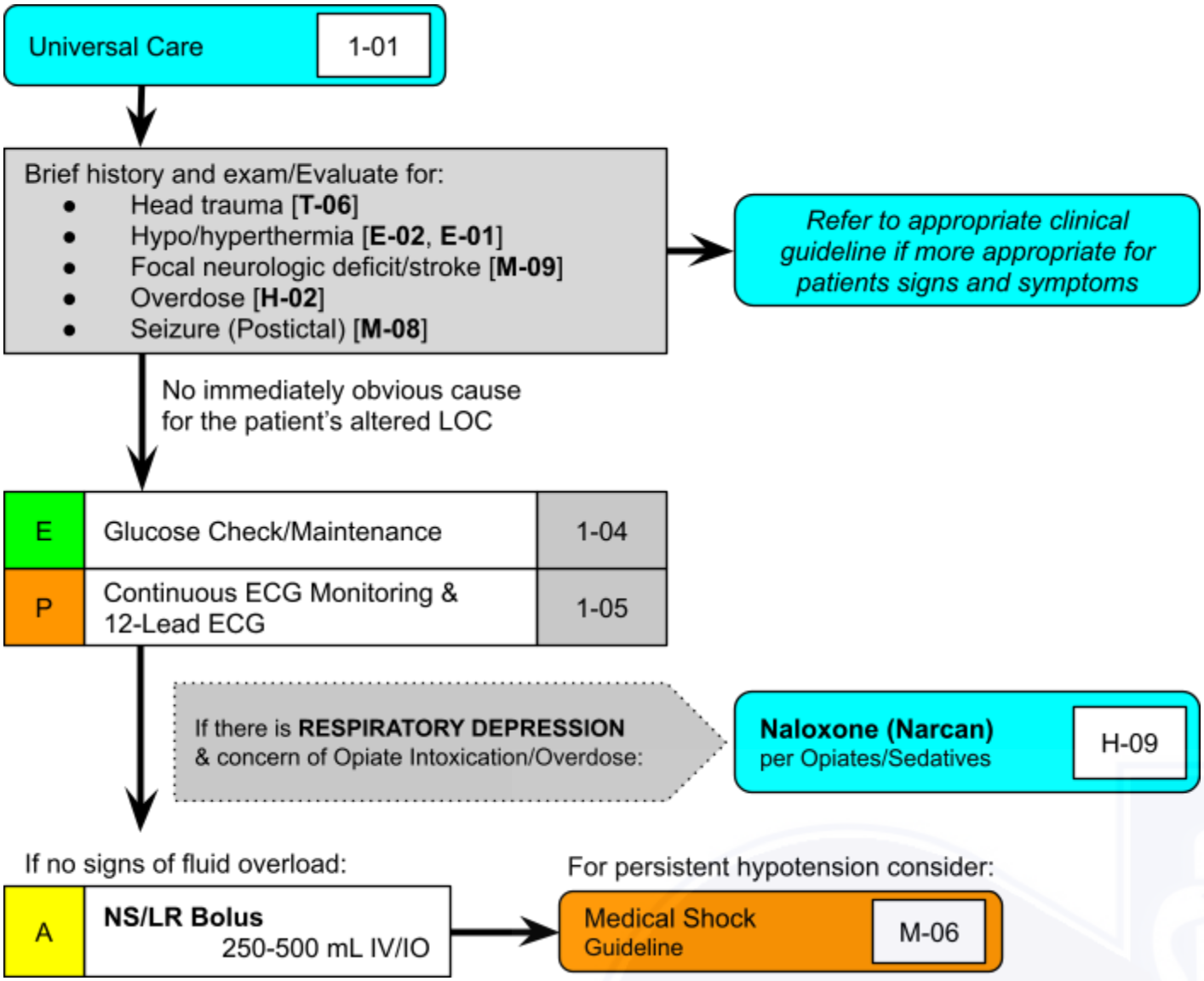
QI Review Parameters:

1. Trigger for (exposure) and timing of (onset/duration) reaction documented?
2. Patient meets criteria for Anaphylaxis? *(Rash/angioedema PLUS signs/symptoms of airway obstruction, respiratory distress or hypotension?)*
3. Epinephrine indicated & given?
4. Time to epinephrine administration? *(From patient contact)*
5. Benadryl (diphenhydramine) given?
6. Steroid (Solumedrol or Decadron) given?

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

- This guideline is for any patient who is unconscious/unresponsive or altered level of consciousness/mental status WITH vital signs.
- It *also* includes patients who were altered/unresponsive, but have since resumed a normal or near normal level of consciousness--i.e. “syncope”.



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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

ALTERED MENTAL STATUS CAUSES:

- There are various mnemonics used to help remember the causes for altered mental status. The *next page* uses a version of **"TIPS-AEIOU"**, but others may work as well.
- Never assume that there is only one cause of a patient's altered LOC, look for and reevaluate for other causes.
- There are basically two general "mechanisms" with AMS. Problems directly involving the neurons/brain and general "metabolic" problems leading to neuron dysfunction.

- Direct neurologic (brain/neuron) problems: cause a direct loss of neuron function in the brain tissue.
  - Direct damage to the brain tissue (i.e. head trauma)
  - Focal ischemia/hypoperfusion (i.e. stroke)
  - Direct depletion of neuron metabolic resources (e.g. seizure).
- Indirect ("metabolic") problems causing neuron dysfunction: cause a general lack of perfusion/nutrients or some global substance which is inhibiting the neuron's ability to function properly.
  - *Lack of perfusion* is generally indicated by hypotension and/or signs of decreased peripheral perfusion (i.e. cool, mottled extremities). This can be caused by multiple entities as discussed in the Medical Shock [M-06] Guideline, but commonly is due to hypovolemia or septic shock.
  - *Lack of needed nutrients* is commonly due to hypoxia or hypoglycemia, although other metabolic derangements are occasionally involved.
  - *Intrinsic "poisons"* (made within the body) include things like carbon dioxide (CO2), ammonia, or metabolic acidosis (e.g. DKA or sepsis).
  - *Extrinsic poisons* (put into the body) are drugs or illicit substances affecting nutrient delivery (i.e. hypoxia with opiates) or utilization (e.g. cyanide), or directly affecting the nerves ability to conduct impulses (many illicit substances).

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

"**TIPS-AEIOU**" Mnemonic for Altered Mental Status:

T	Trauma (Head Injury [**T-05**]) Temperature (Hypothermia [**E-06**] or Hyperthermia [**E-05**])
I	Insulin (hypo/hyperglycemia, see Glucose Management [**1-04**])
P	Psychosis
S	Seizure [**M-09**] Stroke [**M-08**] Space-occupying lesion (brain tumor, hydrocephalus, head bleed, etc.)
A	Acidosis (respiratory or metabolic) Ammonia (hepatic encephalopathy)
E	Endocrine (hypothyroidism/myxedema coma) Electrolytes (low sodium)
I	Infection (i.e. sepsis)
O	Oxygen (hypoxia, see Airway/O2 Management [**A-01**]) Overdose [**E-03**]
U	Uremia (renal failure)

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

AMS Causes

Trauma (Head Injury):

- AMS can be due to bleeding (i.e subdural hematoma) or non-bleeding (i.e. concussion) causes. Generally history and/or physical exam will generally suggest the diagnosis.
- Loss of consciousness or recollection of event may or may not be present.
- Repetitive questioning (i.e. short term memory loss or amnesia to event) is very common and should not be regarded the same as confusion.
- Brief seizure activity or myoclonic jerks are common with a loss of consciousness.
- But, **NEVER assume that a head injury (bleed) is the primary cause of AMS in patients who fell from standing** (equal or less than body height) and have persistently altered LOC. Always evaluate for other causes (CVA, STEMI, sepsis, overdose, etc.).

Temperature:

- Hypo or hyperthermia may present with decreased or altered LOC.
- History of exposure to extreme ambient temperatures may or may not be present.
- Profound hypothermia can occur in temperatures that seem warm to bystanders (e.g. indoors at 75 degrees) if the patient's body loses the ability to regulate temperature.
- Stimulant medications/drugs can increase metabolism and elevate temperature.
- Certain substances also inhibit the body's ability to regulate temperature (e.g. OTC antihistamines).

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

Insulin (Hypo or Hyperglycemia):

- Blood glucose should **always be checked as soon as possible** with any AMS.
- If any doubt (i.e. the glucometer will not work), it is safer to assume hypoglycemia than hyperglycemia and give oral or IV glucose.
- Hypoglycemia most commonly presents with a decreased level of consciousness rather than an alter/confused state.
    - **Alcoholics** frequently develop hypoglycemia.
    - *Never assume AMS is just intoxication*.
    - If hypoglycemic patients have returned to baseline and wish to refuse care, make certain that they eat and there is someone to observe them.
- Hyperglycemia alone does not cause an alteration in mental status. AMS is caused by volume depletion/dehydration and ultimately due to the development of a **metabolic acidosis** (diabetic ketoacidosis, DKA).
- Non-DKA hyperglycemia is primarily treated with fluids. These patients are volume depleted, glucose will begin to clear with adequate hydration.

Psychosis:

- Psychiatric disease can present with a wide variety of alterations in mental status and/or level of consciousness.
- The diagnosis of psychosis is only made after excluding all other possibilities.

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

Stroke/CVA:

- Maintenance of consciousness is a brainstem function, and brainstem strokes are rare.
- Almost all strokes only affect one side of the brain and should not affect the *level of consciousness*.
- With stroke, confusion or apparent decreased LOC is often really misinterpreted **aphasia** (trouble finding words or getting words into organized sentences) or unrecognized **hemi-neglect** (where the patient does not respond to the provider on the affected side of the stroke).

Seizures/Postictal State:

- History and/or physical exam (e.g. tongue biting or incontinence) should generally provide evidence of the diagnosis.
- Unless there are repetitive seizures, there should be a gradual increase in the LOC.
- Treat as per Protocol [**M-09**].

Space-Occupying Lesion:

- With the exception of acute head trauma (epidural or subdural), most space occupying lesions are chronic processes with gradual worsening over time.
- Most pathologies like tumors, subacute/chronic SDH, and hydrocephalus (i.e VP shunt malfunction) cause AMS from increased intracranial pressure (ICP).
- Generally these patients present with signs of increasing ICP: headache, nausea/vomiting, decreasing level of consciousness.
- Signs of herniation include: hypertension, bradycardia and agonal respirations.

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

Acidosis: Respiratory, Metabolic, or both (a.k.a. "Mixed acidosis")

- Respiratory acidosis = CO2 retention in the lungs (elevated EtCO2), usually from hypoventilation (most commonly seen with COPD)
  - Also called "CO2 narcosis", generally presents with gradually decreasing LOC.
  - Treatment is to improve ventilation (CPAP or intubation/ventilation).
- Metabolic acidosis = increased acid production abnormal cellular metabolism.
  - Most commonly this is a **lactic acidosis** due to anaerobic metabolism--usually this is due to a state of hypoperfusion, commonly seen with **sepsis**.
  - **Diabetic Ketoacidosis (DKA)** - cells do not have enough or cannot use insulin. This causes them to start metabolize fatty acids instead of glucose.
  - **Carbon Monoxide (CO)** or **Cyanide** - direct inhibitors of cellular metabolism. Most commonly seen with fires/combustion in enclosed spaces.

Alcohol: Never assume that alcohol is the only problem with a patient.

- Look for evidence of non-ethanol alcohol intoxication: **Isopropyl alcoho**l (rubbing alcohol, hand sanitizer, etc.), **Methanol** (washer fluid), or **Etylene Glycol** (antifreeze).
- Alcohol withdrawal can lead to seizures (generally in the first 24 hours) as well as delirium tremens (hemodynamic instability with erratic or psychotic behavior.

Ammonia:

- Known as *Hepatic Encephalopathy*, the liver's inability to metabolize ammonia due to acute or chronic liver failure (cirrhosis, hepatitis, etc.) leads to the accumulation of ammonia and other waste byproducts.
- Confusion usually presents gradually over several days to weeks. Often the patient has a fairly normal LOC, but has confusion, unusual affect or even bizarre behavior.

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

Endocrine:

- Not usually diagnosed prehospital unless prior history of similar events is known.
- Presentation of these problems is generally gradual and most often nonspecific.
- *Myxedema Coma* (hypothyroidism) and ***Acute Adrenal Insufficiency*** (Addisonian Crisis) are the most common.
    - Prehospital treatment is generally supportive.
    - If Acute Adrenal Insufficiency is known or suspected and patient has hypotension refractory to standard care, consider giving a corticosteroid (**Solu-Medrol** or **Decadron**) if available.
    - Preferred treatment is *hydrocortisone (Solu-Cortef) 100 mg IV*.

Electrolytes:

- Most electrolyte issues (such as sodium, potassium, calcium, and/or magnesium) present with general weakness and vague/nonspecific complaints (dizziness, balance issues, etc.)
- Most are treated with normal saline (increases sodium and “flushes out” calcium).
- Hyperkalemia should be suspected with spiked T-waves or wide and flat QRS (“sine wave”), and should be treated with Bicarb and Calcium if available.

Infection:

- While direct infection of the central nervous system (meningitis or encephalitis) should always be considered with AMS and fever, it is rare.
- Fever with AMS is generally due to substances released by the infective organisms causing direct CNS suppression or by the chemotoxins causing a state of vasodilation and/or cardiac dysfunction leading to a state of hypoperfusion.
- Treatment is supportive with fluid resuscitation and pressors as needed.

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

Oxygen:

- 'Nuff said…..
- If any doubt in SpO2, always err on giving extra O2.

Overdose:

- Wide variety of presentations depending on substance and amount ingested.
- See Overdose Guideline [**E-03**] for more specific presentations, evaluations and treatments.

Uremia:

- Failure of the kidneys to clear intrinsic products of metabolism can lead to accumulation of substances that will cause alterations in mental status.
- Exact mechanisms are unknown, although drugs or medications normally cleared by the kidneys can accumulate over time ("relative overdose").
- Prehospital treatment is supportive.

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M-03 ALTERED MENTAL STATUS	Includes/Incorporates: **Syncope**	First Responder EMT AEMT Paramedic

SYNCOPE:

- Definition: *Transient loss of consciousness accompanied by loss of postural tone.*
- Episodes are generally very brief with a rapid recovery and no postictal confusion.
- Convulsive movements called **myoclonic jerks are common with syncope**. This is often confused with seizures, but should not be accompanied by a post-ictal phase, incontinence or tongue biting.
- Elderly syncope has a high risk of morbidity and mortality, and cardiac dysrhythmias (especially ventricular dysrhythmias) should be ruled out (i.e. ECG) as soon as possible.

PEDIATRIC Considerations:

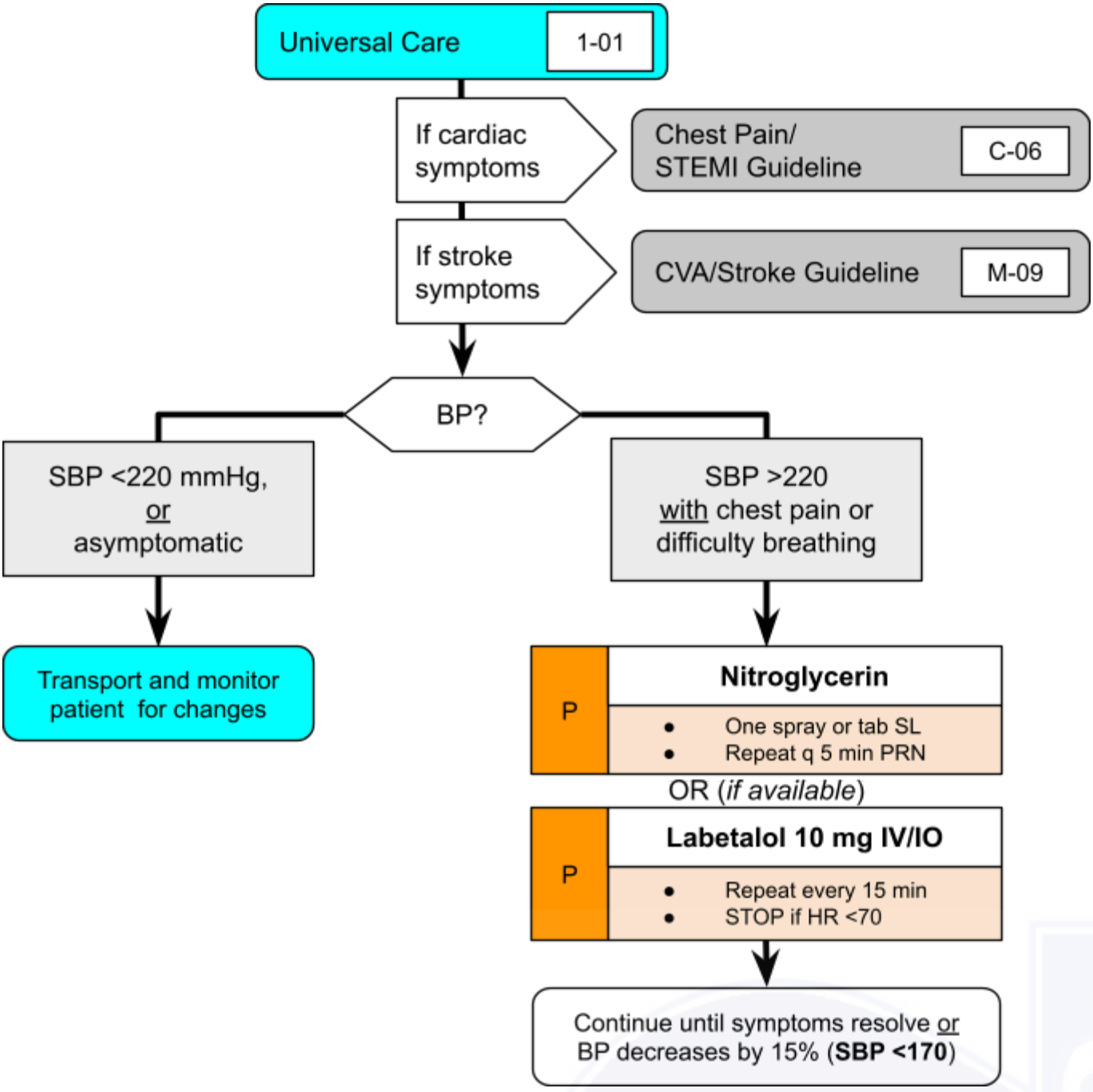
- Life-threatening causes of pediatric syncope are usually cardiac in etiology (arrhythmia, cardiomyopathy, myocarditis, or previously unrecognized structural lesions)
- In addition, consider the following in the pediatric patient:
  - Seizure
  - Breath holding spells
  - BRUE (Brief Resolved Unexplained Events/formerly ALTE)
  - Toxins (marijuana, opioids, cocaine, CO, etc.)
  - Child abuse (head trauma)
- Important historical features of pediatric syncope include: color change, seizure activity, incontinence, post-ictal state, and events immediately prior to syncope event.

QI Review Parameters:

1. {PENDING}

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M-04 HYPERTENSIVE CRISIS		First Responder EMT AEMT Paramedic



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M-04 HYPERTENSIVE CRISIS		

KEY POINTS:

- <u>Always treat the patient's symptoms, NOT the number!</u>
- Signs or symptoms of end-organ damage:
  - *Cardiac*: chest pain or discomfort, shortness of breath, pulmonary edema, etc.
  - *Neurologic* (stroke): positive Cincinnati Stroke Scale (unilateral weakness or difficulty speaking), headache, vision changes, vertigo ("spinning" dizziness)
- Evidence does not support lowering a blood pressure that is not symptomatic. In fact, evidence shows more adverse events in these patients than those who are simply observed.
- *Chest Pain/CHF*:
  - Reduction of blood pressure (afterload) will decrease workload on the heart (help potential angina) and improve cardiac output (help pulmonary edema).
  - If any of these symptoms are present AND the blood pressure is > 200 systolic or >120 diastolic, then consider initiating treatment with available medication(s).
- *Stroke*:
  - **For patients with possible stroke, reduction of blood pressure is NOT generally recommended.**
  - If BP is extremely elevated, **contact medical control to discuss treatment** versus observation/rapid transport.

- <u>Note</u>: If the SBP > 220 or DBP > 140 and patient has only vague complaints, you may consider a single dose of antihypertensive medication or continue to observe and transport.

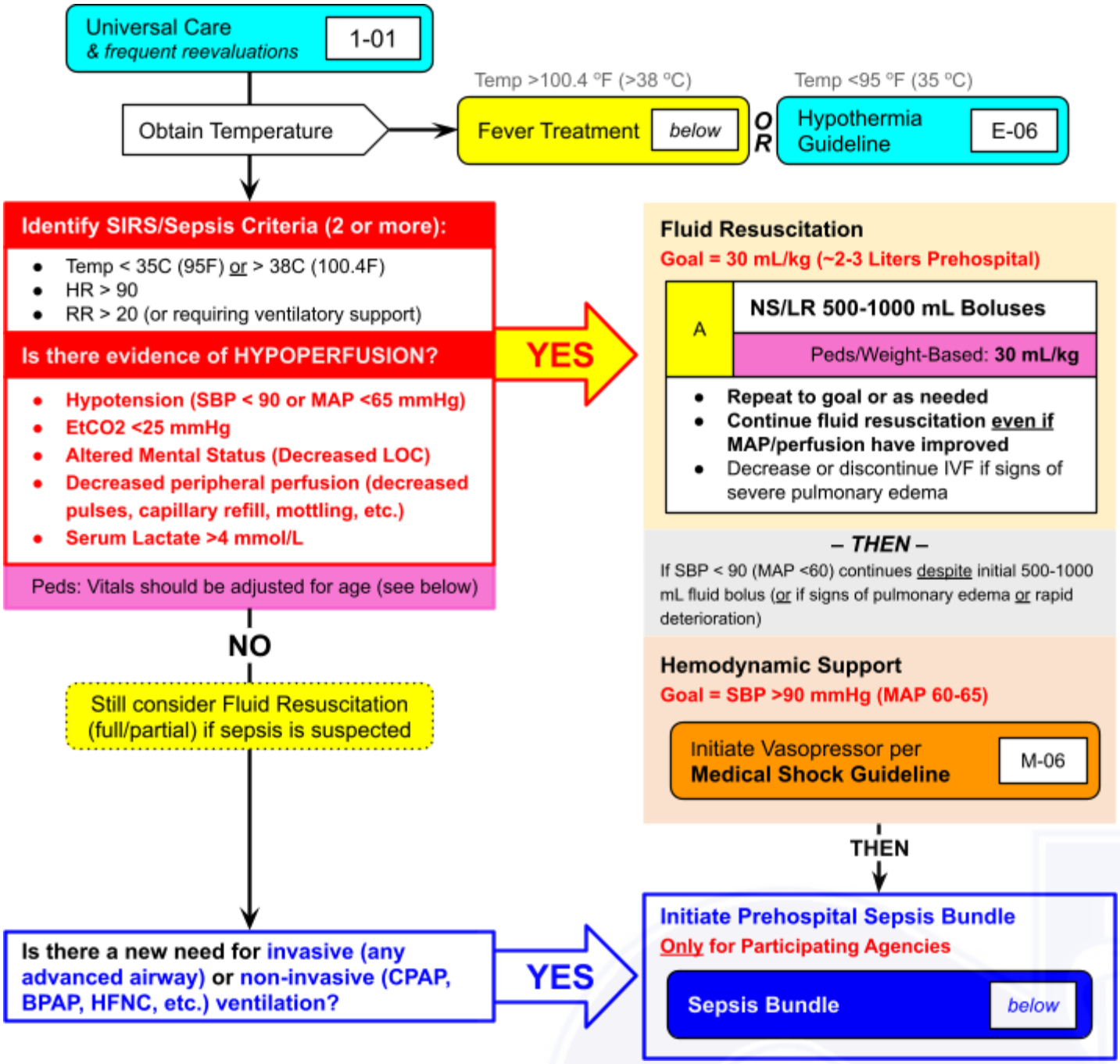
QI Review Parameters:

1. {PENDING}

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M-05 FEVER/SEPSIS		First Responder EMT AEMT Paramedic

Note: This guideline is only to be used in patients with a suspected infection.



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M-05 FEVER/SEPSIS		First Responder EMT AEMT Paramedic

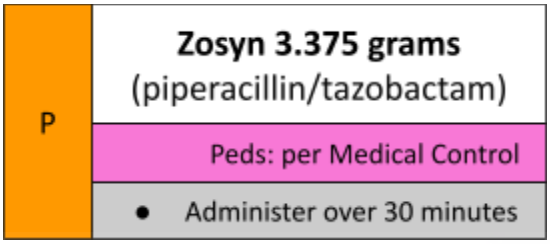
Prehospital Sepsis Bundle - ADULTS ONLY

1. Stabilize the patient's airway as per Airway Maintenance [A-01A] and breathing as per Respiratory Failure [A-01B].
2. Initiate **Fluid Resuscitation** (and vasopressors if needed), as per above.
3. **Collect Blood Cultures** and any other blood (phlebotomy) tubes
    a. Draw culture and lab tubes (as per agency protocol)
    b. Date, time and sign tubes
4. **Administer Prehospital Antibiotic** *(see below)*
    a. Do not administer if there is any known allergy to the specific class of antibiotics, as per 'Antibiotic Allergies' below.
    b. Do not administer the antibiotic unless blood cultures can be obtained.
    c. If there is any question, contact Online Medical Control
5. Monitor for signs of allergic reaction
    a. Immediately discontinue the infusion if there are any signs of systemic (more than local) involvement.
    b. Treat systemic reactions as per Allergic Reaction [M-02]
6. Notify the destination facility of a suspected **"Code Sepsis"** as soon as possible.

Prehospital Antibiotics

Zosyn (piperacillin/tazobactam)

Prepare solution: Reconstitute powder with 10 mL of NS. Swirl until mixed. Draw up and mix in a 250 ML bag of NS.



Antibiotic Allergies

Zosyn - Do not administer Zosyn if the patient has a **known or suspected penicillin allergy** or **cephalosporin allergy** that has caused more than a simple rash (i.e. any difficulty breathing, swelling, etc.) or other common non-allergy side effects (e.g. nausea, diarrhea, etc.).

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M-05 FEVER/SEPSIS		First Responder EMT AEMT Paramedic

Medications for Fever >100.4 °F (38 °C):

A	**Acetaminophen [Tylenol]** 650-1000 mg PO 1 gram IV/IO	or	**Ibuprofen [Motrin]** 400 mg PO	or	**Toradol (ketorolac)** 7.5-15 mg IV/IO *or* 30 mg IM		
	Peds: 15 mg/kg		Peds: 10 mg/kg		Peds: 0.5 mg/kg		
	Repeat: None		Repeat: None		Repeat: None		

Pediatric Vital Signs

Hypotension for Age		Abnormal **Heart Rate** for Age	
< 1 year	< 70 mmHg	< 1 year	> 160
1-10 years	< 70 mmHg *plus* (2 * age in years)	1 - 2 years	> 150
		2 - 5 years	> 140
		5 - 12 years	> 120
> 10 years	< 90 mmHg	> 12 years	> 100

Principles of Sepsis

- Multiple studies demonstrate the benefit of early recognition and treatment of sepsis, including in the prehospital setting. **Notify the receiving facility of a "Sepsis Alert" when encoding and when reporting at bedside.** Early hospital notification of sepsis leads to shorter time to IV fluids and antibiotics and increases survival.
- Patients with septic shock require aggressive IV fluid resuscitation. Starting dose should be 30mL/kg of IV fluid, ideally within the first 30 minutes.

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- EtCO2 has been demonstrated to correlate with serum lactate levels and predictive of severity of sepsis. **A sustained EtCO2 <25 mmHg may indicate hypoperfusion.**

Sepsis Definitions

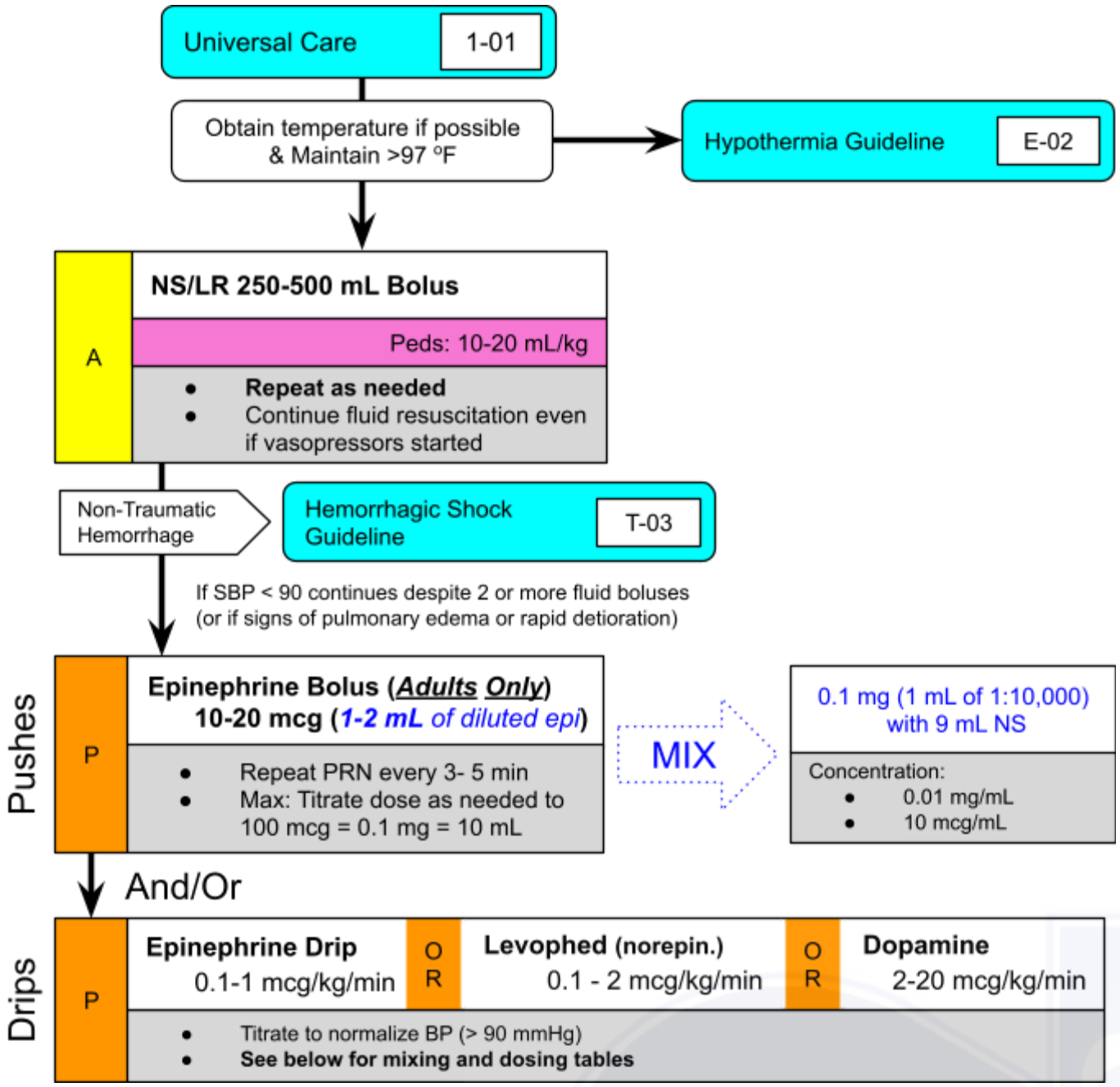
- Systemic Inflammatory Response Syndrome (SIRS) = 2 or more of the above criteria
- *Sepsis* = SIRS with a microbial source
- *Severe Sepsis* = Sepsis with more than one organ system dysfunction (hypotension, AMS, acidosis, oliguria, ards, etc.)

QI Review Parameters:

1. Were fluid start/stop times documented?
2. Were antibiotics indicated and administered per guidelines?
3. Was antibiotic start/stop times documented?
4. Was culture/lab draw time documented?
5. Vital signs documented, as per policy?
6. Was the amount of fluid administered appropriate and documented?

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M-06 MEDICAL SHOCK		First Responder EMT AEMT Paramedic



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M-06 MEDICAL SHOCK		First Responder EMT AEMT Paramedic

250 mL Vasopressor Drip Mixing Guide:

	Epinephrine 0.1 - 1 mcg/kg/min	Norepinephrine 0.1 - 2 mcg/kg/min	Dopamine 5 - 20 mcg/kg/min
Med/Dose:	1 mg	4 mg	400 mg
Volume (NS/D5W):	250 mL	250 mL	250 mL
Concentration:	**4 mcg/mL**	**16 mcg/mL**	**1600 mcg/mL**

Drops per minute (displayed in **BOLD**) on a 60-drop set
(*drops/second ALSO displayed in italics if > 60 gtt/min*)

	Epinephrine 4 mcg/mL		**Norepinephrine (Levophed)** 16 mcg/mL		**Dopamine** 1600 mcg/mL	
Broselow Color/ Weight (kg)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)
Gray (3-5)	**6**	**60**	**1.5**	**30**	**0.8**	**3**
Pink (6-7)	**11**	**105** (*1.7*)	**2.6**	**52.5**	**1.3**	**5**
Red (8-9)	**14**	**135** (*2.2*)	**3.5**	**67.5** (*1.1*)	**1.7**	**6.7**
Purple (10-11)	**17**	**165** (*2.7*)	**4**	**82** (*1.4*)	**2**	**8.2**
Yellow (12-14)	**21**	**210** (*3.5*)	**5**	**105** (*1.7*)	**2.6**	**10.5**
White (15-18)	**27**	**270** (*4.5*)	**7**	**270** (*4.5*)	**3.4**	**13.5**
Blue (19-23)	**35**	**345** (*5.8*)	**9**	**172** (*2.8*)	**4.3**	**17**
Orange (24-29)	**44**	**435** (*7.2*)	**11**	**218** (*3.6*)	**5.4**	**22**
Green (30-36)	**54**	**540** (*9*)	**14**	**270** (*4.5*)	**7**	**27**
Small Adult (50)	**75** (*1.2*)	**750** (*13*)	**19**	**375** (*6.2*)	**10**	38
Large Adult (100)	**150** (*2.5*)	**1500** (*25*)	**38**	**750** (*13*)	**19**	75 (*1.2*)

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M-06 MEDICAL SHOCK		First Responder EMT AEMT Paramedic

500 mL Vasopressor Drip Mixing Guide:

	Epinephrine 0.1 - 1 mcg/kg/min	Norepinephrine 0.1 - 2 mcg/kg/min	Dopamine 5 - 20 mcg/kg/min
Med/Dose:	1 mg	4 mg	400 mg
Volume (NS/D5W):	500 mL	500 mL	500 mL
Concentration:	**2 mcg/mL**	**8 mcg/mL**	**800 mcg/mL**

Drops per minute (displayed in **BOLD**) on a 60-drop set
(*drops/second ALSO displayed in italics if > 60 gtt/min*)

	Epinephrine 2 mcg/mL		**Norepinephrine (Levophed)** 8 mcg/mL		**Dopamine** 800 mcg/mL	
Broselow Color/ Weight (kg)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)	START (**gtt/min**)	Max (**gtt/min**)
Gray (3-5)	**12**	**120** (*2*)	**3**	**60**	**1.5**	**6**
Pink (6-7)	**21**	**210** (*3.5*)	**5**	**105** (*1.8*)	**2.5**	**10**
Red (8-9)	**27**	**270** (*4.5*)	**7**	**135** (*2.3*)	**3.5**	**13**
Purple (10-11)	**33**	**330** (*5.5*)	**8**	**165** (*2.6*)	**4**	**16**
Yellow (12-14)	**42**	**420** (*7*)	**11**	**210** (*3.5*)	**5**	**21**
White (15-18)	**54**	**540** (*9*)	**14**	**270** (*4.5*)	**7**	**27**
Blue (19-23)	**69** (*1.1*)	**690** (*11.5*)	**17**	**345** (*5.8*)	**9**	**34**
Orange (24-29)	**87** (*1.4*)	**870** (*14.5*)	**22**	**435** (*7.3*)	**11**	**43**
Green (30-36)	**108** (*1.8*)	**1080** (*18*)	**27**	**540** (*9*)	**14**	**54**
Small Adult (50)	**150** (*2.5*)	**1500** (*26*)	**37**	**750** (*13*)	**19**	75 (*1.2*)
Large Adult (100)	**300** (*5*)	**3000** (*50*)	**75** (***1.2***)	**1500** (*25*)	**38**	150 (*2.5*)

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M-06 MEDICAL SHOCK		First Responder EMT AEMT Paramedic

Pediatric Abnormal Vital Signs			
Hypotension for Age		Abnormal **Heart Rate** for Age	
< 1 year	< 70 mmHg	< 1 year	> 160
1-10 years	< 70 mmHg *plus* (2 * age in years)	1 - 2 years	> 150
		2 - 5 years	> 140
		5 - 12 years	> 120
> 10 years	< 90 mmHg	> 12 years	> 100

KEY POINTS:

- Hypotension can be defined as a systolic blood pressure (SBP) of < 90 mmHg, or mean arterial pressure (MAP) < 60 mmHg.
  - Automatic measurements should be approached with suspicion if they do not appear consistent with clinic context
  - Always verify (or disprove) with manual blood pressure as soon as possible.
- Blood pressures less than 90 do not always correlate with clinical shock
  - They should be interpreted in context with the patients typical blood pressure if known and with clinical symptoms if they do not correlate with a shock state.
  - **Conversely**, clinically significant low perfusion/shock states can occur with “normal” blood pressures--especially early on, and can often deteriorate rapidly.
  - In the early stages of shock, alterations in mentation and/or tachycardia may be the only symptoms.

- Always ensure that patients have adequate intravascular fluid load prior to the use of vasopressors .
  - Adequate treatment of shock commonly requires multiple 20 mL/kg (adults = 1 Liter) fluid boluses.
  - At least 1 full bolus (and preferably 2) should be attempted prior to initiating vasopressor therapy (unless profound pulmonary edema).
- Treatment goal is normalization of vital signs in the first hour.

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M-06 MEDICAL SHOCK		First Responder EMT AEMT Paramedic

SHOCK TYPES

HYPOVOLEMIC SHOCK

- Main treatment goal is to restore/maintain intravascular volume to allow for adequate perfusion/oxygenation of tissues.
- Hemorrhagic Causes: traumatic (internal or external bleeding) or non-traumatic (i.e GI bleeding, ruptured aortic aneurysm, pregnancy-related bleeding, etc.)
    - Tx: per Hemorrhagic Shock Guideline [**TA-03**]
    - Goal: SBP 90-100 mmHg to perfuse organs but minimize additional bleeding
- Non-Hemorrhagic Causes: vomiting, diarrhea, sweating/hyperthermia, etc.
    - Tx: Focus on repleting fluid losses with NS/LR boluses as needed

DISTRIBUTIVE SHOCK

- Vasodilation (due to loss of vascular tone) leads to decreased preload (blood returning to heart) which leads to decreased cardiac output.
    - This creates a **"warm shock"** state (vasodilation → **pink, warm skin**), which can distinguish distributive shock from the typical cool and mottled appearance of other low-flow shock states.
- Causes:
    - **Septic Shock** (most common)
    - Anaphylaxis (**Anaphylactic Shock**)
    - Loss of neurovascular control (**Neurogenic Shock**) -- although this is generally seen later in the course (>24 hrs) of brain or spinal injuries.
- Treatment is <u>both</u> with **fluids and vasopressors**.
    - Start as usual with 1-2 boluses of NS/LR as the patient is relatively hypovolemic (dilated blood vessels = more fluid required to maintain a "full tank").
    - Vasopressors should be started if blood pressure and/or clinical symptoms do not improve after the fluid bolus. This will help combat the vasodilatory effect seen during distributive shock. Vasopressors will also improve the decreased cardiac output (Cardiogenic Shock) that may be part of the clinical picture in sepsis or similar processes.

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CARDIOGENIC SHOCK

- Left ventricular (left-sided) dysfunction will generally cause fluid to back up from the left side/left atrium into the lungs causing acute pulmonary edema/CHF.
    - Most commonly this is seen with an **Anterior STEMI**.
    - Other problems that affect generalized cardiac contractility may cause left-sided failure as well (i.e toxins, sepsis, myocardial contusion, etc.).
    - Problems with obstruction of left ventricular outflow (i.e. valve stenosis or aortic dissection) or regurgitation of blood into the left side of the heart (i.e valve failure or chordae tendineae rupture) will present and are treated similarly.
- Treatment = improve cardiac contractility/cardiac output = **needs vasopressors**
    - If breath sounds are relatively clear, you may consider a fluid challenge (250-500 mL) before using vasopressors to correct hypotension.
- Start CPAP or more advanced ventilatory support as needed per Airway [**A-01**] and CHF [**A-05**] guidelines.
- Caution: Vasopressors also increase vascular tone which leads to increased afterload. This creates more pressure for the heart to pump against and can worsen cardiac output or cardiac ischemia.

- Right ventricular (right-side) dysfunction will generally cause fluid to back up into the body. This decreases cardiac output due to a drop in preload (decreased left ventricular filling) and generally should not cause pulmonary edema.
    - Most commonly this is seen with an **Inferior STEMI**.
    - Other problems that obstruct right ventricular outflow (i.e. pulmonary embolism) will present and are treated similarly.
- Treatment = increase preload = **needs fluids**
- Fluid resuscitation (potentially 1 liter or more) is the primary goal, although vasopressors can be used if shock does not respond to fluids or if CHF develops.

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OBSTRUCTIVE SHOCK

- This is due to something physically obstructing blood flow to the left side of the heart, leading to decreased cardiac output.
- This can be caused by problems that inhibit blood return to the right side of the heart (i.e tension pneumothorax), inhibit the ability of the ventricles to adequately fill with blood (i.e. pericardial tamponade), or block flow out of the heart (i.e. pulmonary embolism or aortic dissection).
- This generally leads to signs of right-sided heart failure with distended neck veins (JVD) and tachycardia, as well as cause-specific history or symptoms (trauma, cancer, leg swelling, etc.).
- Prehospital **treatment is mostly supportive**.
    - Ensure that the patient has adequate intravascular volume by providing typical fluid resuscitation/boluses.
    - Vasopressors may be used for fluid-resistant shock similar to other etiologies.
- *Tension Pneumothorax* → Needle Decompression [**T-P2**] per guidelines.
- Other obstructive pathologies generally require interventions only available in the emergency department.
    - *Pericardial Tamponade* → Pericardiocentesis (almost never done in the field or without ultrasound verification).
    - *Pulmonary Embolism* → generally supportive, although can be given TPA (clot-busting drug) in cases with hemodynamic instability.

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ADRENAL INSUFFICIENCY (“Adrenal/Addisonian Crisis”)

- Is due to primary (inability of the body to produce steroids) or secondary (suppression of normal production of steroids) adrenal insufficiency.
    - May be precipitated by an injury or illness creating a scenario where the body needs more glucocorticoids or mineralocorticoids than can be provided.
    - This can also be seen in cases of patients who **suddenly stop taking a steroid** (without tapering it off and allowing the body to resume normal steroid production).
- Usually presents with hypotension, abdominal pain, nausea, vomiting and dehydration.
- Commonly this is difficult to discern from other causes of shock, but should be suspected with
- Any patient on long term steroids, or
- Any case of shock that is not responding as expected to fluids and vasopressors.
- Treatment (if suspected):
    - *Hydrocortisone (Cortef or Solu-Cortef) 100 mg* in adults is preferred
        - Generally not carried prehospital, but may be given if carried by the patient and discussed with online medical control.
    - May consider **methylprednisolone (Solu-Medrol) 125 mg** or **dexamethasone (Decadron) 10 mg IV/IO/IM**
        - Should be discussed as well with online medical control if possible.

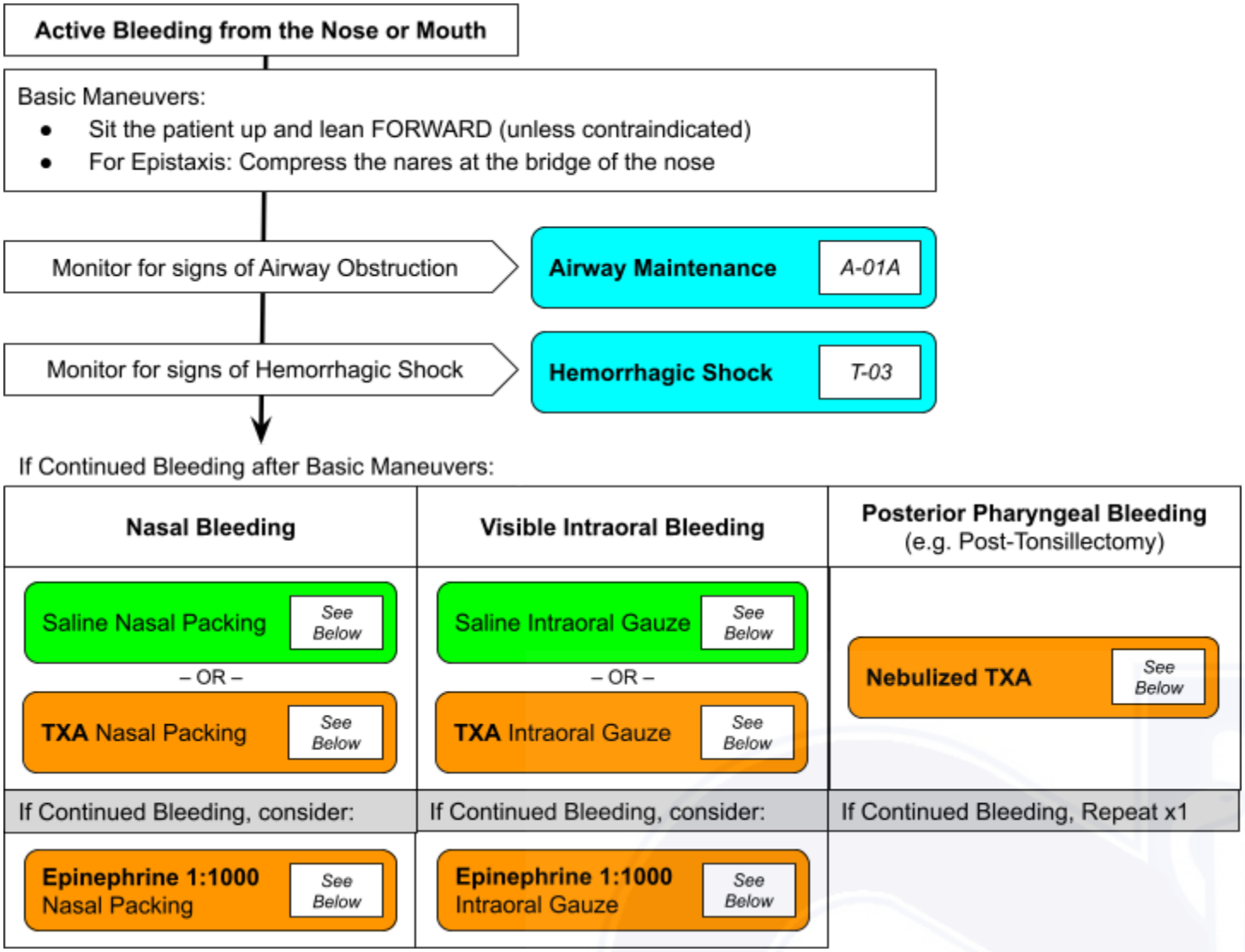
QI Review Parameters:

1. {PENDING}

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M-07 NASAL & ORAL BLEEDING (EPISTAXIS)		First Responder EMT AEMT Paramedic

Indications	Contraindications
Active Bleeding from the Nose; *or* Active Oropharyngeal Bleeding (e.g. Dental Extraction, Post Tonsillectomy Bleeding, etc.)	Known Allergy/Hypersensitivity Major Facial Trauma Suspected Basilar Skull Fracture



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M-07 NASAL & ORAL BLEEDING (EPISTAXIS)		First Responder EMT AEMT Paramedic

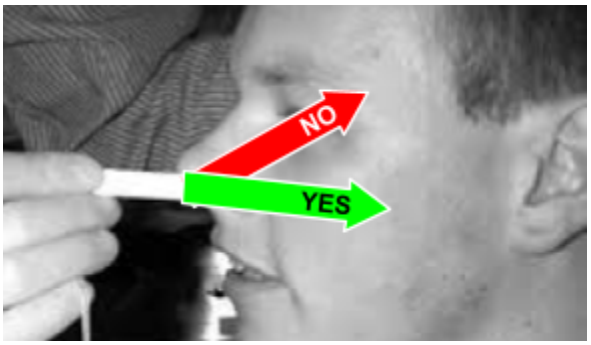
TOPICAL MEDICATIONS:

P	**Tranexamic Acid (TXA)** 1 gram Topical	P	**Epinephrine (1:1000)** 1 mg Topical

Pediatric Dosing: The topical dose is the same as adults

Procedure - **NASAL PACKING:**

1. Soak 4x4 gauze (or cotton balls if available) with either **saline**, **TXA** or **1:1000 Epinephrine**
2. Have the patient blow their nose (clearing as much clotted blood as possible)
3. Fold or roll the gauze into a cylindrical shape
4. Gently push the gauze into the nare, aiming straight back (flat along the roof of the mouth, *see right*). Do not direct the gauze upwards (towards the eyes).



Procedure - **INTRAORAL GAUZE (DIRECT PRESSURE):**

1. Soak 4x4 gauze (or cotton balls if available) with either **saline**, **TXA** or **1:1000 Epinephrine**
2. Clear any clots from the area of bleeding
3. Place the gauze directly against the area(s) of bleeding
4. Maintain direct pressure on the site (the patient may maintain pressure if able, e.g. 'bite down')

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M-07 NASAL & ORAL BLEEDING (EPISTAXIS)		First Responder EMT AEMT Paramedic

NEBULIZED MEDICATIONS

Procedure:

1. Place 1 gram of **TXA** (1 vial) in nebulizer
2. Dilute to 5-10 mL with saline (if needed)
3. Administer treatment as per usual

P	**Tranexamic Acid (TXA)** 1 gram Nebulized

Pediatric Dosing: ≥25 kg: 500 mg or <25 kg: 250 mg

KEY POINTS:

- Never lean the patient backwards as there is a high likelihood of aspiration.
- If the patient is unable to sit up/forward, attempt alternative position techniques and provide aggressive suctioning to prevent aspiration.
- IV Tranexamic Acid (TXA) should be considered if the patient meets hemorrhagic shock indications (**T-03**).
- Topical and Nebulized TXA may be administered *in addition to* IV TXA.
- Nasal packing may be considered with isolated nasal trauma, but should be avoided in severe head injuries with any concerns of basilar skull fracture or more severe facial fractures.

QI Review Parameters:

1. {Pending}

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FR | Universal Care Protocol | 1-01

E | Glucose Check/Management | 1-04

Universal Seizure Precautions:

1. Ensure airway patency, but do not force anything between teeth
2. Give Oxygen and suction as needed
3. Lateral decubitus position if vomiting
4. Protect patient from injury during active seizures
5. C-spine precautions as appropriate

1st: If ACTIVELY seizing (i.e. tonic and/or clonic muscular activity present):

Initial Dose* = Intranasal (**IN**) or Intramuscular (**IM**)

Versed (midazolam)	or	**Ativan (lorazepam)**	or	**Valium (diazepam)**
5 mg IN (or IM)		**2 mg IM** (or IN)		10 mg IM
Peds: 0.2 mg/kg IN or IM		Peds: 0.1 mg/kg IN or IM		Peds: 0.5 mg/kg IM or PR

*If seizure activity begins **after** an IV/IO has already been placed, the initial dose may be given IV/IO

2nd: If ACTIVE seizures longer than (approximately) 5 Minutes:

Second Dose* = Intravenous (**IV**) or Intraosseous (**IO**)

Versed (midazolam)	or	**Ativan (lorazepam)**	or	**Valium (diazepam)**
5 mg IV/IO		**2 mg IV/IO**		5 mg IV/IO
Peds: 0.1 mg/kg IV/IO		Peds: 0.1 mg/kg IV/IO		Peds: 0.2 mg/kg IV/IO

3rd: If ACTIVE seizures continue despite two (2) doses of medications:

OR

Option 1:
Abortive Ketamine (then DAI)

Ketamine
100 mg IV/IO
Peds/WB: 1-2 mg/kg IV/IO

Then

If Active Seizures Continue

Option 2:
Drug-Assisted Intubation

Drug-assisted Intubation — A-04

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M-08 SEIZURES		First Responder EMT AEMT Paramedic

KEY POINTS:

- Consider the cause (differential):
  - **Epilepsy**
  - **Hypoglycemia** - history of diabetes?
  - **Substance abuse**
    - EtOH withdrawal or intoxication
    - Benzodiazepine withdrawal
    - Stimulant use
  - **Head Trauma/Intracranial Hemorrhage**
  - **Eclampsia** - pregnant or recent delivery?
  - **Infection (e.g. meningitis)** - fever, recent travel?
  - **Febrile seizure (<6 yo)** - usually not febrile til *after* the seizure
- *Status epilepticus* is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- If available, intranasal (IN) route should be used for the initial dose of Versed.
- Monitor the airway closely and be prepared to address airway and/or breathing problems, especially with patients given medications for the seizures.
- If the patient is in a postictal state, monitor the airway closely and be prepared for further seizure activity.

SPECIAL SITUATIONS:

- Consider **NS bolus** for seizure patients for both potential dehydration and to address potential hyponatremia (rare cause).
- Pregnancy (3rd-trimester or post-partum): Administer **Magnesium Sulfate 4 grams IV/IO,** and goto the **Eclampsia Protocol** [in OB Emergencies, **OB-03**].

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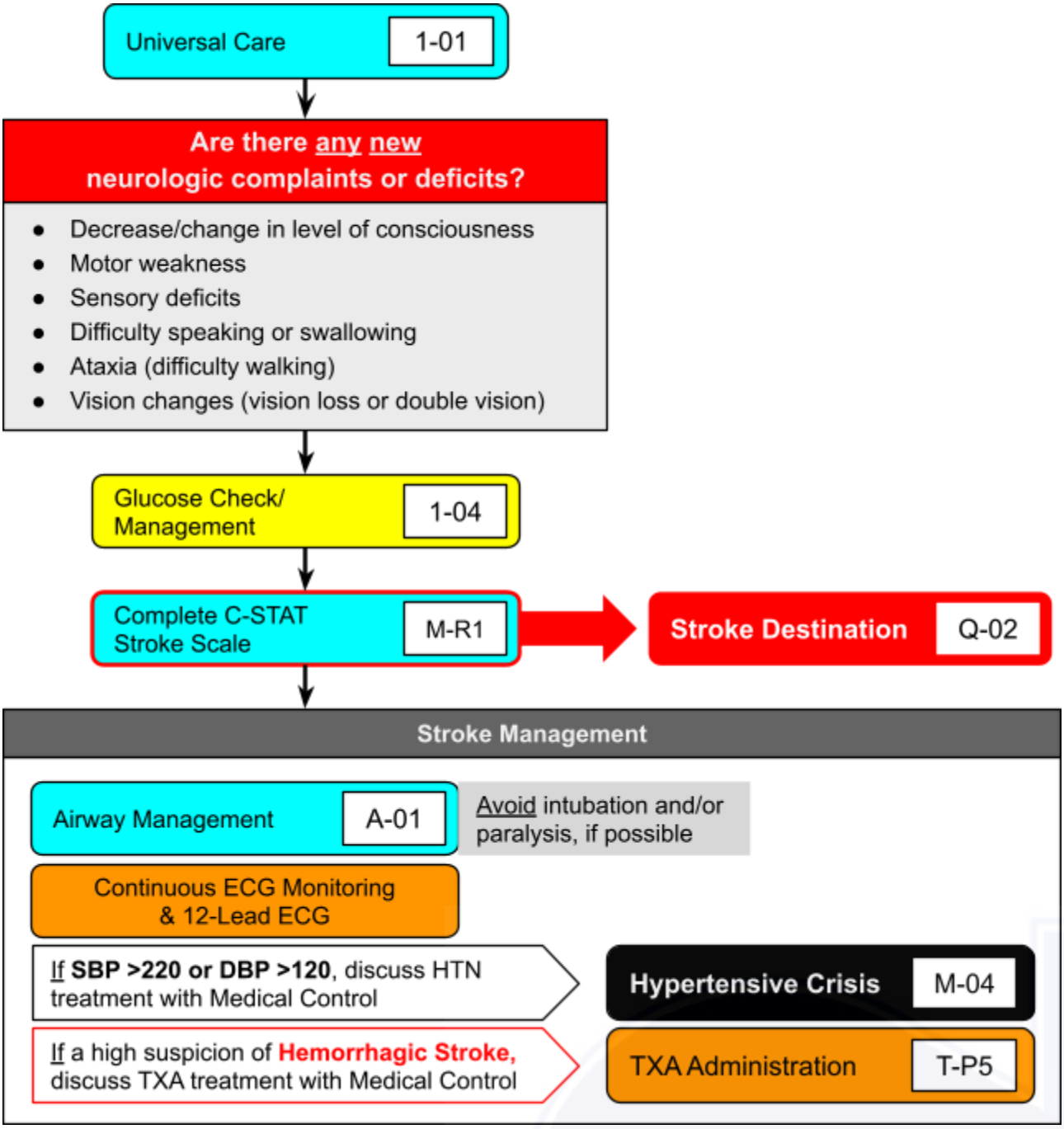
M-08 SEIZURES		First Responder EMT AEMT Paramedic

QI Review Parameters:

1. Glucose Checked and Documented?
2. Level of Consciousness Documented?
3. Duration and Number of Seizures Documented?
4. Cause of Seizure Identified/Documented? (Seizure Hx, Trauma, Fever, etc.)
5. Relevant Exam findings documented? (Incontinence, tongue biting, head trauma, etc.)
6. Appropriate Medication given *(If actively seizing)?* (Includes Dose, Route and Necessity.)

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M-09 STROKE/CVA		First Responder EMT AEMT Paramedic



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M-09 STROKE/CVA		

KEY POINTS:

- Perform the C-STAT Stroke Scale on any patient with any neurologic complaint: weakness, numbness/tingling, vision changes, difficulty speaking or swallowing, dizziness (specifically vertigo/spinning), or balance/coordination issues.
- Always document the last known normal (LKN) time: this is the last time seen with normal/baseline neuro function.
    - For “wake up strokes”, document the time awake/found as well as the LKN.
- Always attempt to document contact information for any family/witnesses if possible.
- *Treatment window*:
    - Thrombolytic medication (tPA, TNK, etc.) can be given up to 4.5 hours from onset.
    - For large-vessel occlusion (LVO) strokes, interventional radiology can potentially intervene up to 6 to 24 hours in certain situations.
- For patients in the window for either intervention, they should be transported as quickly as possible to a comprehensive stroke center if possible.
- Treatment of hypertension in stroke patients is generally avoided except in extreme elevations. **If considering anti-hypertensive treatment, first discuss with online medical control.**

THROMBOLYTIC CONTRAINDICATIONS:

<u>Absolute</u>

- Any prior intracranial hemorrhage
- Known structural cerebral vascular lesion (e.g. AVM)
- Known malignant brain tumor
- Ischemic stroke within 3 months
- Significant head injury or intracranial/ intraspinal surgery within 3 months
- Active bleeding (e.g. GI bleeding, but <u>not</u> including menstrual bleeding)

<u>Relative</u>

- Severe uncontrolled HTN (SBP >180 or DBP >110 mmHg)
- History of ischemic stroke >3 months
- Prolonged CPR (>10 min)
- Recent internal bleeding (2-4 weeks)
- Noncompressible vascular punctures
- Pregnancy
- Current use of anticoagulants

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OBSTETRICS/ GYNECOLOGY

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TOC/NOTES: OBSTETRICS/ GYNECOLOGY		First Responder EMT AEMT Paramedic

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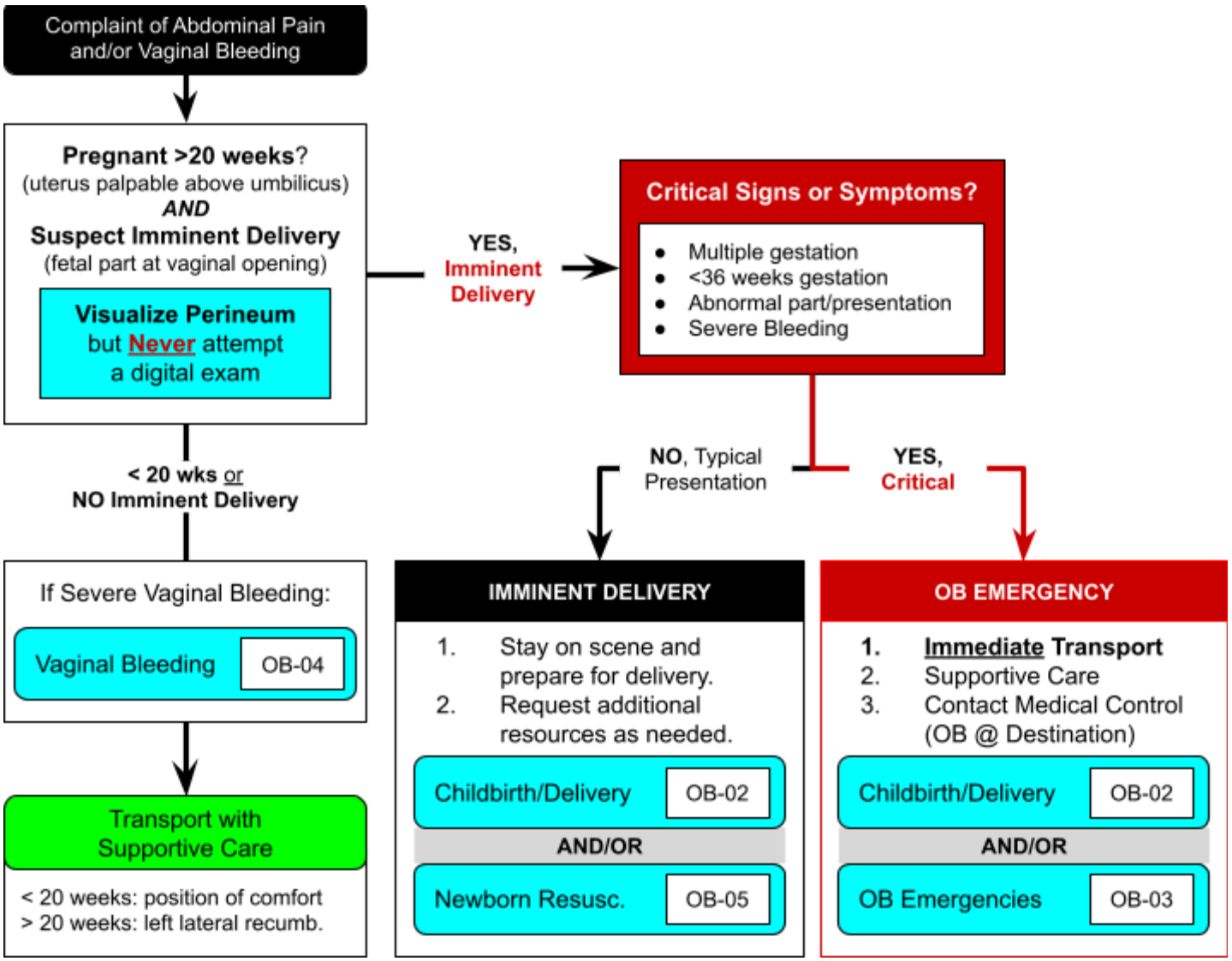
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REFERENCE

(None)

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OB-01 INITIAL OB/GYN		First Responder EMT AEMT Paramedic



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OB-01 INITIAL OB/GYN		First Responder EMT AEMT Paramedic

NOTES:

- Document all times: contraction frequency and length, delivery (infant and placenta if applicable), etc.

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OB-02 CHILDBIRTH/ DELIVERY		First Responder EMT AEMT Paramedic

- Always remember you will likely have TWO patients (mother and infant), and
  - Be prepared for multiple births
  - Call for additional resources if any concern
- If delivery is imminent (fetal part visualized at vaginal opening), **STAY ON SCENE** and prepare for delivery.

For **any** of the following refer to the **OB Emergencies Guidelines [OB-03]**:

- Nuchal Cord: Umbilical cord around the infant's neck or protruding from vaginal opening ahead of the presenting part.
- Abnormal Presenting Part: Fetal part other than the head presenting at the vaginal opening.
- Shoulder Dystocia: Delivery does not progress after head is delivered (i.e. shoulder gets stuck).
- Eclampsia: Mother presents with severely altered LOC or seizing.



For uncomplicated labor and delivery of the infant(s), see:

- See *Delivery of the Infant (below)*

For care of the newborn once the body has delivered, see:

- *Care of the Neonate (below)*, or
- **Neonatal Resuscitation [OB-05]**

For vaginal bleeding or delivery of the placenta, see:

- *Postpartum Care of the Mother (below)*

Images courtesy of:

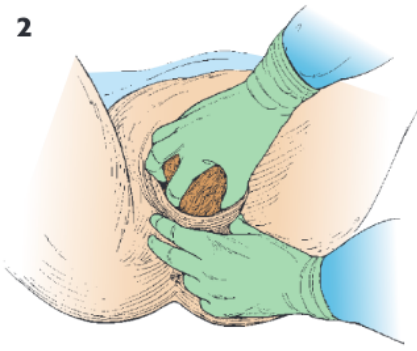
Lew, G.H. & Pulia, M.S. **Chapter 56: Emergency Childbirth**. *Roberts and Hedges' Clinical Procedures in Emergency Medicine - Sixth Edition*. Elsevier, 2013.

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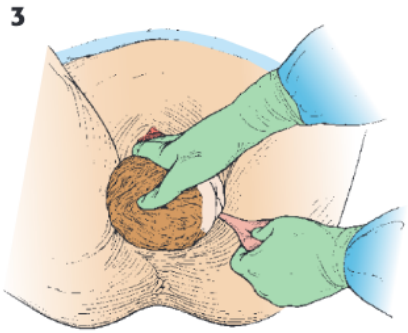
MOTHER: DELIVERY OF THE INFANT

Procedure:

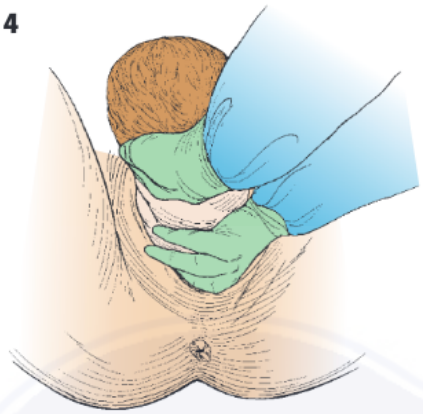
1. Visualize the perineum, if the fetal head is visualized, assist with delivery.
    a. If the fetal part is anything other than the head, initiate rapid transport, contact online medical control, and see *OB Emergencies [OB-03]*.
2. Use gentle pressure on the fetal head and perineum to **control delivery** [*see **#2** on the right*].
    a. The idea is to prevent the head from rapidly "popping" out of the vagina (i.e. prevent an "explosive" delivery leading to tearing of the perineal tissues).
3. When head delivers **check for cord** around the neck, and slip off if possible
    a. See *OB Emergencies [OB-03]*, Nuchal Cord section.
4. Support the head and **guide the infant** (slightly) **to the floor** to allow the anterior shoulder to deliver [*see **#3** on the right*].
5. Once this occurs, **guide/lift the infant anteriorly** (upwards/towards the ceiling, *see **#4** on the right*), and the posterior shoulder and remainder of the infant should rapidly deliver.
6. **HOLD ON!** Please do not drop the infant.
7. Once the entire body has delivered, see:
    a. Care of the Neonate [*below*], and/or
    b. Neonatal Resuscitation [**OB-05]**.



Place one hand over the occiput and provide gentle pressure to control delivery of the head. Use your other hand to exert pressure on the chin of the fetus through the perineum (the modified Ritgen maneuver).



Apply gentle downward (posterior) traction until the anterior shoulder appears beneath the symphysis pubis.

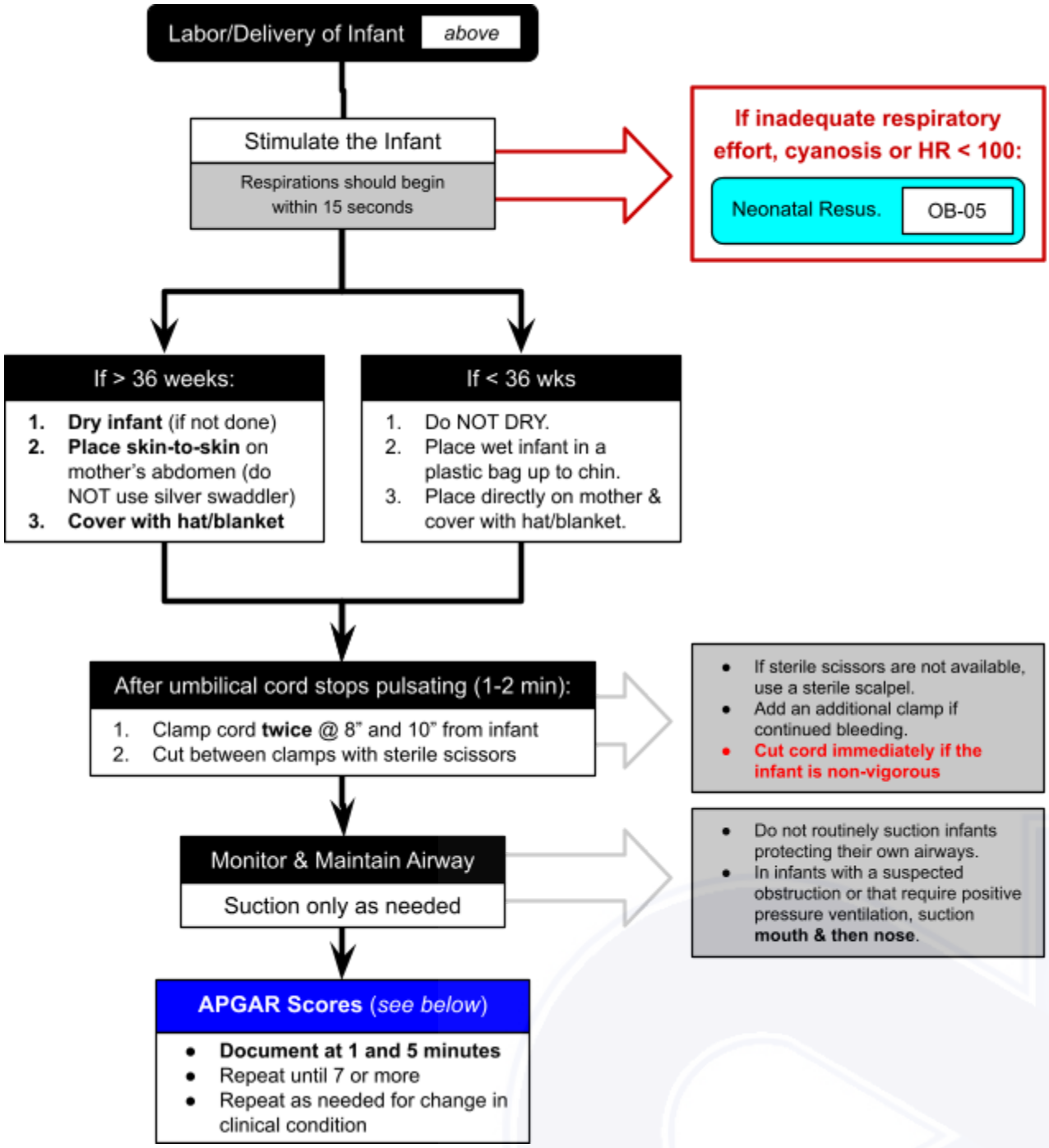


Gently lift the head upward to aid in delivery of the posterior shoulder.

For Postpartum Care of the Mother, *see below*.

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INFANT - CARE OF THE NEONATE (After Delivery)



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MOTHER: POSTPARTUM CARE	
Delivery of the Placenta	**Peri- or Postpartum Hemorrhage**

• Allow the placenta to deliver, but do not delay transport awaiting delivery--placenta should deliver within 20-30 minutes.
• If delivered, collect in a plastic bag & bring to the hospital.
• Never pull the cord to facilitate delivery.
	• If the perineum is torn and bleeding:
	  ○ Apply direct pressure with sanitary or trauma pads.
	• If severe vaginal bleeding, provide supportive care, and see:
	  ○ **Vaginal Bleeding** [**OB-04**], and/or
	  ○ **Hemorrhagic Shock** [**T-03**] Guidelines.
	• Consider allowing the infant to nurse (stimulates uterine contraction).
	• **Uterine Fundal Massage** may be considered only with severe vaginal bleeding.

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APGAR Score:

Note: This is your "vital sign" for newborns

- The APGAR score should always be calculated after birth of the infant if possible.
  - Obtain APGAR at **1 and 5 minutes after delivery**.
  - Repeat every 5 minutes until 7 or more.
  - Repeat as needed for changes in clinical condition
- The five (5) clinical signs are evaluated according to the scoring system detailed below.
  - Two points = normal sign
  - Zero points = absent sign/no response
  - One point = somewhere in between
- Each sign is assigned points to be totaled.
  - A total score of 10 indicates that the infant is in the best possible condition.
  - A score of 4 to 6 indicates moderate depression /need for resuscitative measures.

DO NOT delay resuscitation efforts to obtain APGAR score.

Clinical Sign	0 Points	1 Point	2 Points
Appearance	Blue/Pale	Body Pink Extremities Blue	Completely Pink
Pulse	Absent	Below 100/min	Above 100/min
Grimace	No response	Grimace	Cries
Activity	Limp	Some flexion of extremities	Active motion
Respiratory	Absent	Slow/Irregular	Good strong cry

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Peripartum Complications

- The recommended actions/interventions may not always be feasible, and most OB complications cannot be anticipated or managed in the field.
- This guideline should be considered to be "best advice" for rare, difficult scenarios.
- In every case, initiate immediate transport to definitive OB care.

Umbilical cord around the infant's neck	Nuchal Cord *(below)*
Umbilical Cord at vaginal opening	Prolapsed Cord *(below)*
Abnormal fetal part at the vaginal opening *(head not presenting)*	Abnormal Presenting Part *(below)*
Head gets "stuck" during delivery	Shoulder Dystocia *(below)*

Actively Seizing
(Eclampsia can occur up to 2 months postpartum)

Severe Vaginal Bleeding
(pre- or postpartum)

→ Vaginal Bleeding Hemorrhagic Shock — OB-04 T-03

Eclampsia Treatment

P — **Magnesium Sulfate 4 grams IV/IO**
Give over about 30 min

AND

Seizure Guideline **Including Benzo Use — M-07

M — **If any question, always contact online medical control -- discuss with OB if available.**

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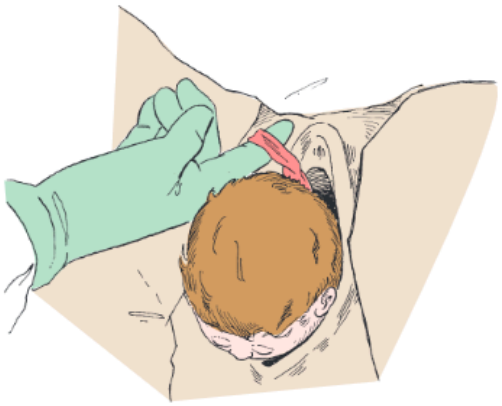
OB-03 OBSTETRICAL EMERGENCIES		First Responder EMT AEMT Paramedic

NUCHAL CORD

Indication: Umbilical cord wrapped around the infant's neck.

Procedure:

1. As the head is delivered, use a finger to determine if the cord is encircling the neck.
2. If able, loosen it and slip the intact cord over the infant's head.
3. If unable to remove the cord:
    a. Clamp the cord (*twice*).
    b. Carefully cut the cord between the clamps.
    c. Proceed with delivery.



Notes:

PROLAPSED UMBILICAL CORD

Indication: Umbilical Cord presenting at the vaginal opening before or without a fetal part.

Procedure:

1. Discourage pushing by mother
2. Position mother supine with hips elevated (knees to chest).
3. Place gloved hand in mother's vagina and elevate the presenting fetal part off of cord until relieved by physician
    a. Do NOT attempt to push inwards.
    b. Feel for cord pulsations.
4. Keep exposed cord moist and warm

Notes:

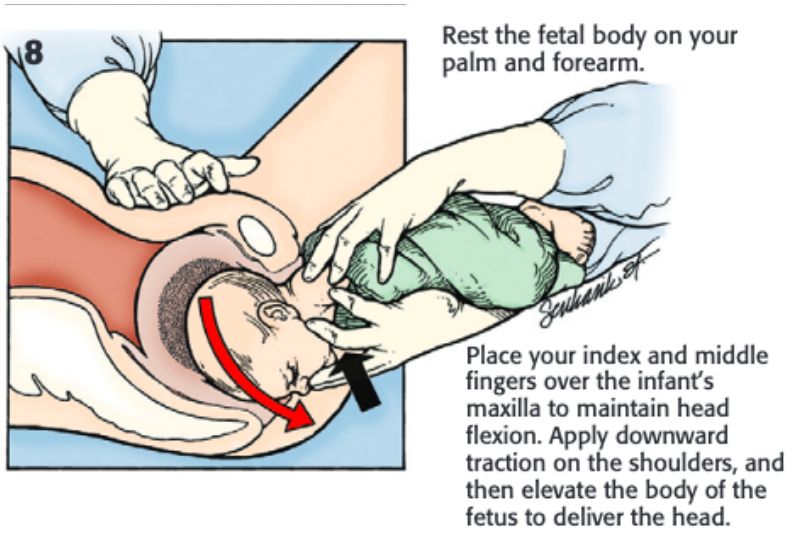
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ABNORMAL PRESENTING PART (i.e. Breech or Limb Delivery)

Indication: Fetal part other than the head presenting at the vaginal opening.

Procedure:

1. **Never attempt to pull the infant**
2. Once legs are delivered, gently *elevate trunk and legs* to aid in the delivery of the head
3. Head should deliver within 30 seconds. **If not:**
    a. Reach 2 fingers into vagina to locate infant's mouth.
    b. Press vaginal wall away from baby's mouth to access an airway
    c. Apply gentle abdominal pressure to uterine fundus



Notes:

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SHOULDER DYSTOCIA

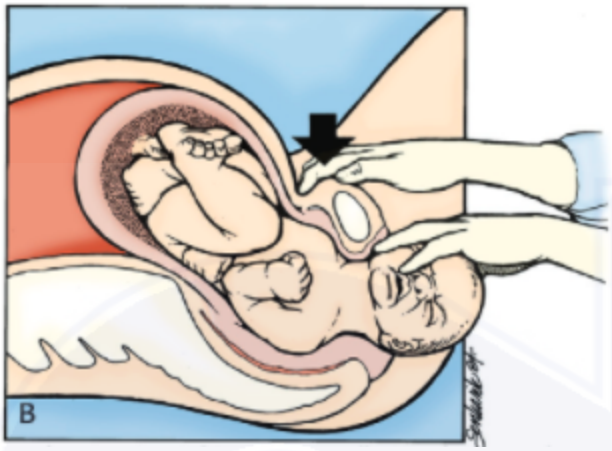
Indication: Normal appearing delivery that does not progress as expected after the head delivers as shoulder gets stuck at the pelvic brim. Commonly associated with the “turtle” sign (head bobs back into the vagina).

Procedure:

1. Support the infant’s head — DO NOT pull on the head
2. Position the mother with buttocks just off the end of bed and flex her thighs upward (knees to chest — a.k.a. McRoberts maneuver, *see right*).
3. Place ***gentle*** pressure above the pubic bone (not fundal pressure).



The McRoberts maneuver is the least invasive maneuver to disimpact the shoulders in shoulder dystocia. Position the patient in the extreme lithotomy position with the hips completely flexed (knee-chest position); this may free the anterior fetal shoulder.



Notes:

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OB-03 OBSTETRICAL EMERGENCIES		First Responder EMT AEMT Paramedic

ECLAMPSIA

Indication: Eclampsia = **Seizures**/severe Altered LOC

Treatment:

- **Magnesium Sulfate 4 grams IV/IO over 30 minutes.** This is utilized to prevent further seizure activity.
- If continuing to actively seize:
  - In general, **proceed directly to intranasal (IN) Versed (midazolam) 5–10 mg,** as per the **Seizure Guideline [M-09].**
  - You may consider IM or IV/IO routes for subsequent dosing, although IV/IO will be required for Magnesium administration.

Notes:

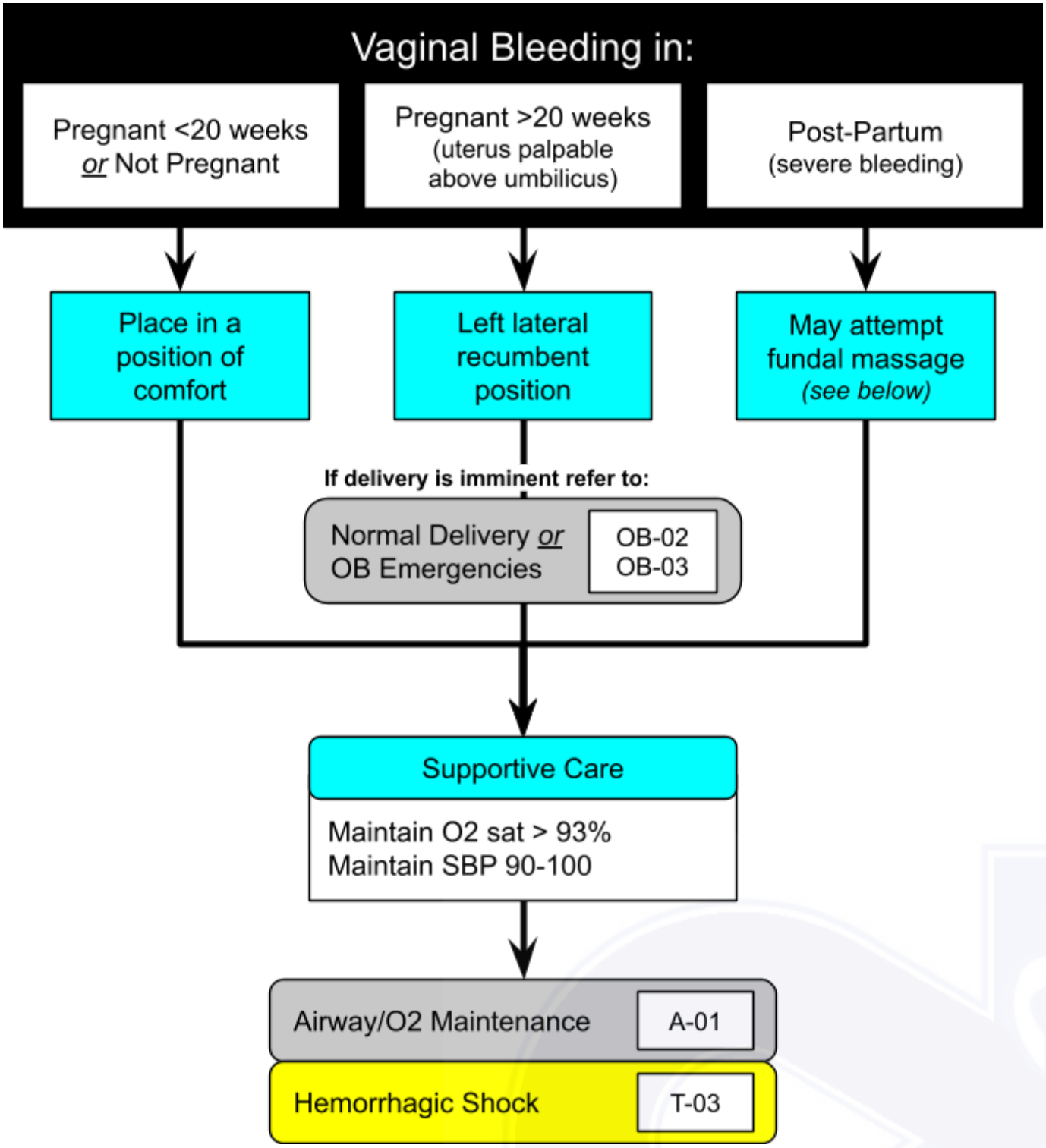
- Preeclampsia signs: Hypertension (SBP > 140), peripheral edema, headache or vision changes. *If a patient has these symptoms, significant hypertension, and appears to be deteriorating,* ***consider Magnesium administration and contact online medical control for approval.***
- Eclamptic seizures may occur up to 2 months postpartum.

Images courtesy of:

Lew, G.H. & Pulia, M.S. **Chapter 56: Emergency Childbirth**. *Roberts and Hedges' Clinical Procedures in Emergency Medicine - Sixth Edition*. Elsevier, 2013.

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First Responder
EMT
AEMT
Paramedic



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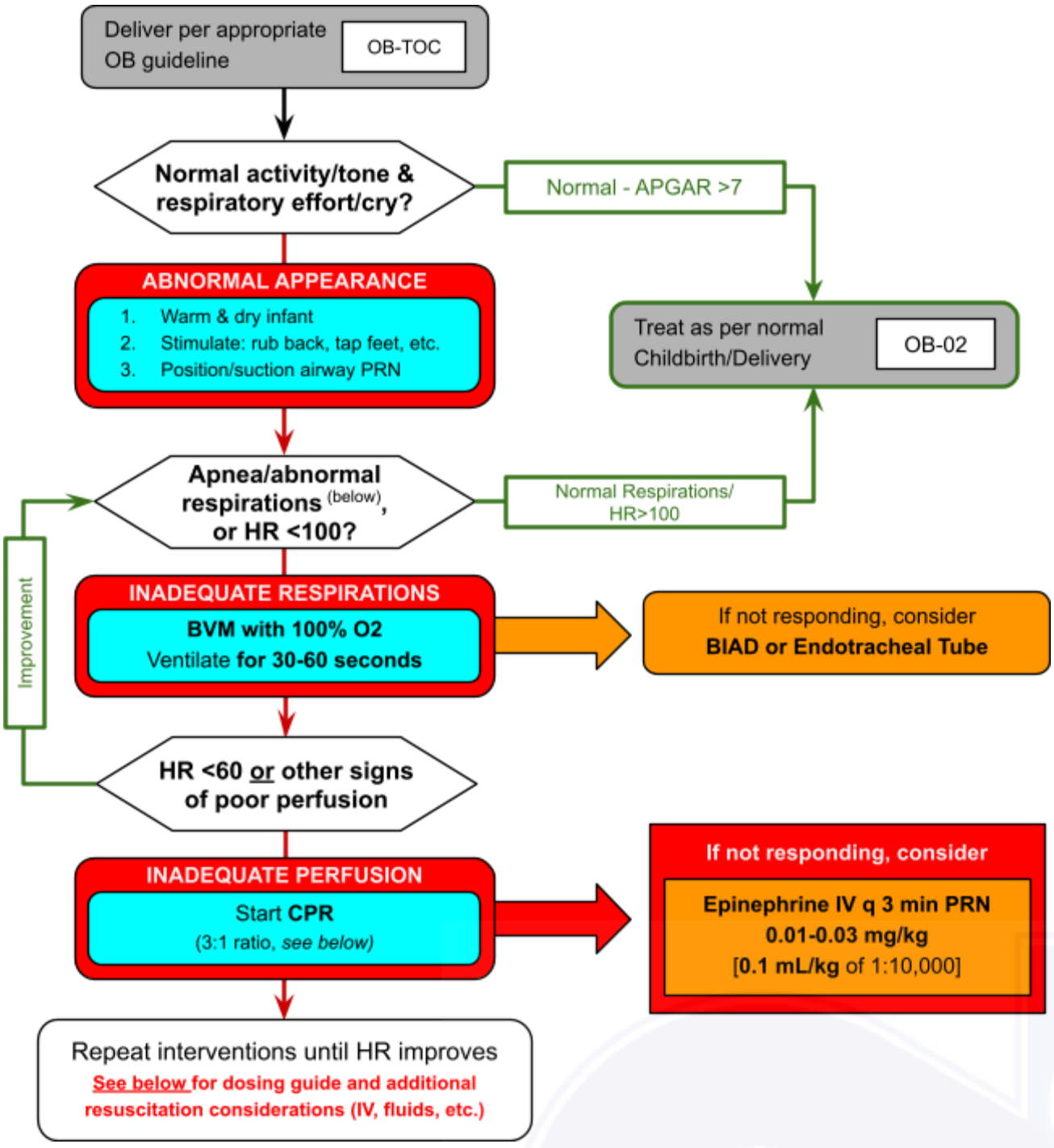
OB-04 VAGINAL BLEEDING		First Responder EMT AEMT Paramedic

NOTES:

- Some perineal bleeding is normal with any childbirth. **Large quantities of blood > 500 ml or free bleeding are abnormal.**
    - Traumatic tears of the perineum/vagina should be controlled by direct pressure over the laceration.
    - Never pack nonvisualized vaginal or rectal bleeding, unless directed to by online medical control.
- Common Causes of Vaginal Bleeding
    - Non-pregnancy related: uterine fibroids, dysfunctional uterine bleeding
    - <20 weeks: Miscarriage
    - >20 weeks/Peripartum: Abruptio Placenta (Placental Abruption) = Painful, Placenta Previa = Painless
    - Postpartum: Uterine Atony (most common) - generally due to prolonged labor or multiple gestations.

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First Responder
EMT
AEMT
Paramedic



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First Responder
EMT
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Continued HR <60
despite PPV and CPR

INADEQUATE PERFUSION

Continue **CPR**

Epinephrine IV q 4 min PRN
@0.01 - 0.03 mg/kg
[**0.1 - 0.3 mL/kg** of 1:10,000 (0.1 mg/mL)]

Weight (kg)	Total Volume
1	0.1 - 0.3 mL
2	0.2 - 0.6 mL
3	0.3 - 0.9 mL
4	0.4 - 1.2 mL

Administration Routes/ Considerations

Do not delay administration for IV access: Initial dose may be given via endotracheal tube 0.5-1.0 mL/kg of 1:10,000

IV Placement [1-03]
Note: IO contraindicated <3 kg

Then, if not responding to resuscitation and has signs of shock or history of acute blood loss.

10 mL/kg NS Bolus
over 5 minutes

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OB-05 NEWBORN RESUSCITATION		First Responder EMT AEMT Paramedic

ABNORMAL RESPIRATIONS, include:

- Any *increased* respiratory effort:
  - **Retractions, Grunting or Gasping.**
- Any *decreased* respiratory effort:
  - **RR < 30**
- Any concern of **hypoxia**:

Neonatal (Pre-ductal) **SpO2 Target**	
1 min	60 - 65%
2 min	65 - 70%
3 min	70 - 75%
4 min	75 - 80%
5 min	80 - 85%
10 min	85 - 95%

RESUSCITATION NOTES

- Initial ventilations may be done on Room Air.
- Rescue Breathing (for HR 60-100) should be initially at a *rate of 40-60 breaths per minute* to achieve/sustain a HR >100.
- CPR (chest compressions) in Neonates
  - ***100-120 compressions/minute***
  - ***3:1 compression to ventilation ratio*** (ventilation rate of 30-40 per minute).
  - In neonates, effective ventilations are just as important as compressions, therefore time ventilations between compressions so they are delivered effectively. Limit interruptions of chest compressions.
- Utilize **SpO_2 (place on Right Wrist)** and continuous Cardiac Monitoring for all patients, however, do not delay interventions to place monitoring equipment.

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OB-05 NEWBORN RESUSCITATION		First Responder EMT AEMT Paramedic

MECONIUM STAINING/ASPIRATION

- If the infant appears well, continue observation & supportive care.
- If the infant is not vigorous:
  - **Positive pressure ventilation (PPV) is recommended (BVM, CPAP or advanced airway).**
  - **Endotracheal suctioning is no longer recommended.**

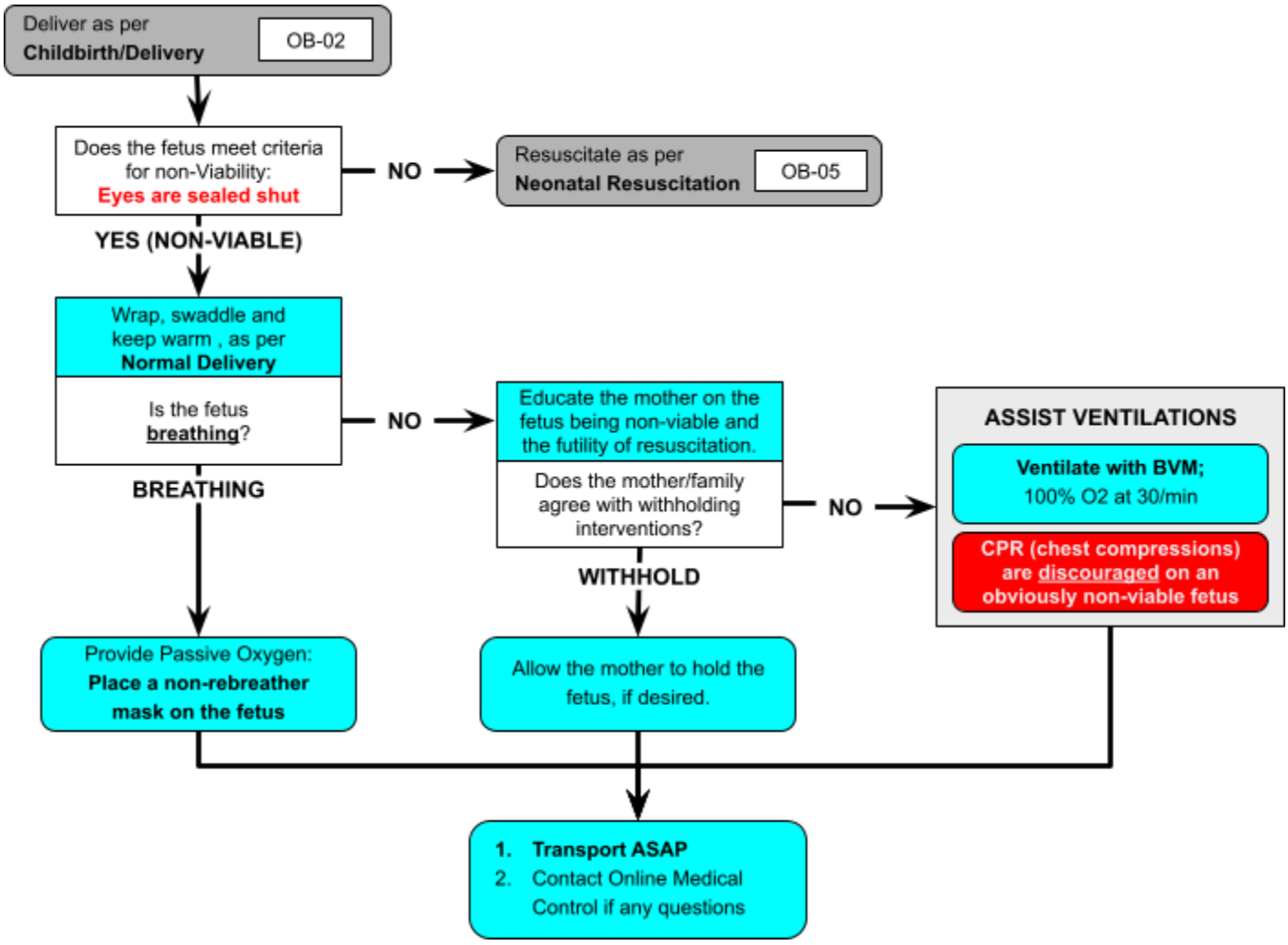
OTHER CONSIDERATIONS

- Consider CPAP for an infant with continued grunts/retractions but appropriate heart rate/respirations otherwise.
- Maternal sedation or narcotics will affect the infant as well.
  - **Avoid Narcan (naloxone) & provide supportive care (O2 & ventilations).**
- If the child is not placed on the mother's abdomen, place on a warming mattress and cover with a blanket as able.

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OB-06 FETAL DEMISE/ NON-VIABLE FETUS		First Responder EMT AEMT Paramedic

This guideline is for NON-VIABLE Fetuses only.



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OB-06 FETAL DEMISE/ NON-VIABLE FETUS		

NOTES:

- All mothers who give birth to an infant/fetus in the field should be transported to the ED/OB Triage for further medical evaluation. This will additionally allow for social/grieving services to be provided to the patient/family.
- **If the fetus' eyes are not sealed shut, treat/resuscitate as per Neonatal Resuscitation Guideline [OB-05].**
- Once a fetus has been designated as non-viable the goals of evaluation and treatment should shift to
    - Evaluating the mother for any life-threatening bleeding or other emergency.
    - Providing (social) support to the mother.
- **Special attention/effort must be given to educate the mother about the non-viable nature of the fetus.** All interventions to a non-viable fetus are medically unnecessary and in the long term will possibly cause more mental anguish to both the mother, the family and the EMS providers.
- If the mother/family cannot be convinced otherwise, **minimal resuscitative efforts may be provided while en route to the ED/OB Triage.**
- The only recommended intervention is BVM ventilations.
    - Avoid any advanced airway.
    - **CPR (chest compressions) are discouraged**, but left to the discretion of the family/EMS personnel.
    - IV or IO placement are not appropriate and should not be performed.
    - Any additional interventions (e.g. medications) should be avoided.

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PSYCHOLOGICAL/ BEHAVIORAL

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TOC/NOTES: BEHAVIORAL/ PSYCHOLOGICAL		

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P-05 Domestic Violence (Adult)/Neglect

P-06 Sexual Assault

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P-P2 Consensual Blood Draw

REFERENCE

(none)

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P-01 SEVERE AGITATION/ DELIRIUM		First Responder EMT AEMT Paramedic

Universal Care 1-01

Determine **Sedation Assessment Tool (SAT)** Score:

SCORE	RESPONSIVENESS	SPEECH
+3	Combative, violent, out of control	Continual loud outbursts
+2	Very anxious and agitated	Loud outbursts
+1	Anxious and restless	Normal
0	Responds easily to name, speaks in normal tone	Normal

SAT +2 or +3

Call for Law Enforcement/ Additional Resources as needed

Reevaluate SAT Score

Verbal De-escalation *below*

Reevaluate SAT Score

Physical Restraint P-02

Reevaluate SAT Score

Chemical Sedation Guideline RX-04

SAT +1 or Less

Continue Monitoring and Supportive Care

If Physical Restraint and/or Chemical Sedation has been performed, the below are mandatory

Continuous Monitoring

ECG, pulse oximetry and EtCO2
(unless a physical threat to the patient/providers)

Glucose Check/ Management 1-04

Supportive Care

Airway/O2 Maintenance **High-flow O2 (NRB)** A-01

IV/IO Insertion **1L NS/LR Bolus** 1-03

Evaluate for a Medical Cause of altered mental status

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P-01 SEVERE AGITATION/ DELIRIUM		First Responder EMT AEMT Paramedic

Post-Resistance Syndrome (PRS)

- PRS is a life-threatening syndrome associated with hyperthermia, hyperkalemia, and rhabdomyolysis that can lead to sudden cardiac death in more than 9% of cases.
- PRS patients have a combination of
  - Non-compliance due to delirium (i.e. failure to recognize police presence),
  - Hyper-aggressive, violent and/or bizarre behavior, and
  - Unusual strength with a lack of tiring and increased pain tolerance.
- The typical presentation of PRS:
  - First responders are called concerning a person with bizarre and/or aggressive behavior.
  - Delirium causes the patient to be non-compliant with EMS or law enforcement efforts to question or control the patient.
  - If restraint is attempted, the patient's agitation and combativeness escalates, often leading to an ongoing struggle--many times associated with physical, noxious chemical (e.g. pepper spray) and/or ECD (Taser®) use.
  - Death is typically preceded by a period of "compliance" in which the patient's behavior improves briefly, followed by sudden cardiac arrest with an inability to be resuscitated.
- The pathophysiology of PRS is complex and poorly understood. Clinical case reports show ventricular arrhythmias are rare with most presentations initially being bradyasystole (PEA). The suspected end mechanism is a profound metabolic acidosis likely due to the loss of mental control of skeletal motor function and the loss of physiologic control of autonomic functions in a state of sympathetic surge.

Goals of Patient Care following Physical Restraint and/or Sedation (expanded below):

- **The primary goal with possible PRS is to get as safely and as quickly as possible to a point where a thorough medical assessment may be performed and appropriate monitoring and interventions can be initiated.**
- The patient's dignity must be protected to the best extent possible.
- Control should be accomplished in the least restrictive manner possible.
  - Verbal de-escalation should <u>always</u> be attempted prior to physical restraint or sedation.

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- Physical restraint should be minimized in an actively combative patient due to the concern of ongoing struggle and the associated metabolic acidosis.
- Pharmacologic sedation should be initiated as soon as possible if a patient is not compliant and continues to struggle despite verbal de-escalation and physical restraint.

- A rapid and thorough assessment should be performed as quickly as possible.
- EMS should be prepared for sudden cardiac arrest and be trained for and capable of providing the appropriate life-saving interventions.

Clinical Interventions

- **As sudden cardiac arrest can arise from a severe metabolic acidosis, the primary treatments for PRS are directed towards clearing the acidosis by supporting perfusion, oxygenation and ventilation.**
- *Patient Assessment*
  - A thorough assessment should be performed as soon as provider safety is assured.
  - Vital signs should be taken immediately and monitored similarly to any critically ill patient.
  - Continuous pulse oximetry, cardiac (ECG) monitoring and EtCO2 should be initiated as soon as safely possible.
- *Perfusion:*
  - All ExDS patients should have at least one and preferably two or more quality peripheral IV lines placed. IO should be utilized immediately if easy peripheral IV access cannot be obtained.
  - ExDS patients should be assumed to have a severe metabolic acidosis and fluid resuscitation with appropriate solution should be administered as soon as possible. Fluid boluses in the range given for severe sepsis (30 mL/kg) are generally recommended.
- *Oxygenation:* High-flow oxygen (via non-rebreather or similar device) should be initiated on any ExDS patient with continued altered mental status, regardless of pulse-oximetry reading.
- *Ventilation:*
  - A state of mild hyperventilation (mildly elevated respiratory rate) should be maintained to balance the possible metabolic acidosis.
  - If the patient is unable to maintain their respiratory rate (i.e. tidal volume) themselves, early ventilatory assistance should be initiated.

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- EMS personnel should be trained, prepared and have the appropriate equipment immediately available for advanced airway procedures to assist/control the patient's ventilatory efforts.

- *Evaluation & Treatment of other Medical Causes of Altered Mental Status:* While substance abuse and psychiatric disease (or likely a combination of the two) play the predominant role in many PRS presentations, other potentially life-threatening medical causes must be assessed for and treated, including hypoxia, hypoglycemia, head Injury and other neurologic disease--including strokes or seizures/postictal state, CNS infection, etc.

Verbal De-escalation (10 key elements)

- Respect personal space
- Do not be provocative
- Establish verbal contact
- Be concise
- Identify wants and feelings
- Listen closely
- Agree or agree to disagree
- Lay down the law and set clear limits
- Offer choices and optimism
- Debrief the patient and staff

Physical Restraint

- Physical restraint should only be used if the patient displays uncontrollable behavior that indicates potential imminent harm to themselves, others and/or damage to the environment, or causes a significant disruption of important medical treatment/evaluation.
- Restraint should be accomplished in the least restrictive manner possible (i.e. never face down).
- Restraint devices should be removed as soon as possible once a patient is compliant.
- Restraint techniques that compromise the airway or restrict respiratory effort (i.e. neck or chest) will be avoided, and continued physical restraint is unsuitable for any patient who needs continued close monitoring (i.e. PRS with hemodynamic instability, overdose with respiratory depression, etc.)

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- If a law-enforcement based restraint intervention (e.g. handcuffs, flex cuffs, zip-ties, etc.) must be continued during patient care and transport, a law enforcement officer should either accompany the patient during transport by ambulance or the intervention, should be discontinued in favor of an EMS-based restraint intervention.

Pharmacologic (Chemical) Sedation - See RX-03 for further

- Early, aggressive pharmacologic sedation should be utilized as physical struggle is a much greater contributor to catecholamine surge and metabolic acidosis than other causes of exertion or noxious stimuli.
- **EMS Practitioners will NOT administer sedating medications to an individual to facilitate arrest or assist law enforcement to take the individual into custody.**
- **Any patient receiving sedating medications must be continuously monitored and treated by EMS practitioners and must be transported to an emergency department for evaluation.**
- In all circumstances, the decision to use pharmacologic management is a patient-specific, healthcare decision that is at the sole discretion of an appropriately trained and credentialed EMS practitioner (paramedic) with oversight by an EMS Medical Director.
- Medications should be administered in the safest and most effective manner possible.

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P-02 DETERMINATION OF CAPACITY		First Responder EMT AEMT Paramedic

Can the patient/surrogate make decisions regarding medical care?

See next pages for more detailed explanations of each step in this chart.



CAPACITY	INFORMED CONSENT	MENTAL HEALTH EXCEPTIONS
Does the patient/guardian have the mental capacity to make an informed decision over care?	Does the patient/guardian understand the risks of refusing evaluation/treatment/transport?	Does the patient meet criteria for a Mental Health Hold? *(see Psychiatric Holds, below)*
• Are they able/willing to communicate with the EMS provider? • Are they generally oriented to person, place and time? • Can they provide a reasonable understanding of the events surrounding EMS response—also see informed consent (*see right)*? • **Intoxication**: Is the patient acutely intoxicated or under the influence of drugs?	• Do they understand the nature of the illness or injury? • Can they verbalize an understanding of the consequences of refusing care or transport?	• Has the patient displayed suicidal or homicidal thoughts/actions? • Have they showed evidence of being a danger to themselves or others? • Do they show signs of acute (new/significantly worsened) psychosis (hallucinations or delusions) that prevent them from being able to take care of their basic needs or put them or others at an unreasonable risk of harm.

STOP

If the patient does <u>not</u> meet **ANY <u>ONE</u> OF** the criteria above, they cannot refuse evaluation and treatment and must be transported.

- If the patient meets **ALL THREE** criteria above, they should be considered to have the capacity to make decisions for themselves or act as a surrogate.
- If there is <u>any</u> question, contact your supervisor or online medical control.

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P-02 DETERMINATION OF CAPACITY		First Responder EMT AEMT Paramedic

Psychiatric Holds - "Title 33" or "6401"

Law Enforcement Officer/Other Healthcare Provider recommends a hold/transport:

- If a law enforcement office, physician, mental health worker, etc. have evaluated a patient and determined that there is **reasonable doubt** that the patient is a threat to themselves or others (suicidal, homicidal, psychotic, etc.) they may place the patient under a temporary psychiatric hold.
- **A paper copy of the hold form is NOT required for EMS to transport a patient.**
- If one of the above providers have recommended the patient be evaluated (i.e. put under a hold), you should always honor that recommendation and transport the patient for evaluation. The only exception is if there is no doubt (at all) of the patient being competent, AND **the case has been discussed with medical control and the physician agrees with the release of the patient.**

For EMS Personnel:

Section § 33-6-402, Detention Without Warrant Authorized, states "If a [law enforcement] officer, a physician, a psychologist, or a [mental health worker] has reason to believe that a person is subject to detention under § 33-6-401, then [that professional] may take the person into custody ***without*** *a civil order or warrant for* ***immediate examination*** *under § 33-6-404 for certification of need for care and treatment."*

- EMS personnel also can evaluate for, enact, and enforce a temporary hold working under the supervision of a physician (medical director), under the authority of this guideline.
- This includes the authorization to use force (i.e. restraints or sedative medications) to allow delivery of a patient to a physician (i.e an emergency department).
- Basically, **you do not need anything signed to hold a patient against their will to allow them to be evaluated.**
- If you utilize this guideline, **you must clearly document the reasons why you are holding/ transporting a patient against their will.** This can include statements directly from the patient or from bystanders with a vested interest in the patient (i.e. "he told me…..") or other evidence of mental illness or serious emotional disturbance (suicide notes, social media posts, text messages, etc.).

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P-02 DETERMINATION OF CAPACITY		First Responder EMT AEMT Paramedic

Review of the Tennessee Annotated Code

- **Title 33** of is the *entire section* on “Mental Health and Substance Abuse and Intellectual and Developmental Disabilities”. It encompasses the entire breadth of state statutes on mental and behavioral health.
- Within the Title 33, involuntary holds are under **Chapter 6 (Mental Health Service), Part 4 - Emergency Involuntary Admission to Inpatient Treatment,** which includes the following sections:
    - § 33-6-401. Emergency Detention
        - States that if a person “poses an immediate substantial likelihood of serious harm”, then they may be detained “to obtain examination for certification of need.”
        - This is the authority of law enforcement and healthcare personnel to hold a patient for the initial (i.e. ED) evaluation.
    - § 33-6-402. Detention Without Warrant Authorized
        - States that “if a [law enforcement] officer, a physician, a psychologist, or a [mental health worker] has reason to believe that a person is subject to detention under § 33-6-401, then [that professional] may take the person into custody without a civil order or warrant for immediate examination.”
        - That is, patients meeting the criteria in Section 401 may be held without the need for a formal (i.e. paper) “certification” or warrant to be signed until they are evaluated by a physician.
    - § 33-6-403. Admission to Treatment Facility
        - States that if less drastic alternatives to placement (i.e. outpatient resources) are unsuitable to meet the needs of the person, they “*may be admitted and detained by a hospital or treatment resource for emergency diagnosis, evaluation, and treatment.*”
        - This is the authority for the ED physician to hold a patient while awaiting transfer/evaluation in an inpatient psychiatric treatment facility.
    - § 33-6-404. Certificate of Need for Emergency Treatment and Transportation
        - This section outlines the process for formal psychiatric evaluation by a “physician, psychologist, or designated professional”, and outlines the requirement for the certification of need (CON) process.

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P-02 DETERMINATION OF CAPACITY		First Responder EMT AEMT Paramedic

Adult or "Eligible Minor":

- Any person aged 18 or older is considered an ADULT.
- Anyone 17 years old or under is considered a MINOR, unless they:
  - Have been emancipated (by a court order)
  - Are in the military service of the United States (*active duty only*)
  - Are married
  - Are seeking treatment for
    - Pregnancy or sexually-transmitted disease
    - Drug or alcohol dependance
  - Or they are seeking treatment for their biological child (for whom they have legal custody)

- These criteria may vary slightly from state to state.
- Some states also designate an individual <18 years old who live apart from their parent/guardian and are financially self-supporting as "adults".

Designation of a Surrogate:

- If the patient does not meet the criteria of an "Adult" or "Eligible Minor", they generally can neither consent to, nor refuse, medical treatment.
- At that point decisions about medical care fall to a surrogate decision maker--generally this will be the parent or legal guardian for a minor, or a spouse or other appointed agent for an adult.
- If the agent or guardian is not reasonably available, the patient's surrogate shall be identified by the supervising healthcare provider and documented in the clinical record.

The patient's surrogate shall be an ADULT that also meets Decision Making Capacity (*as above*) who:

- Has exhibited special care and concern for the patient,
- Is familiar with the patient's personal values,
- Is reasonably available, *and*
- Is willing to serve.

Note: No person who is the subject of a protective order or other court order that directs that person to avoid contact with the patient shall be eligible to serve as the patient's surrogate.

Consideration may be given in order of descending preference for service as a surrogate to:

- The patient's spouse, unless legally separated;
- The patient's "adult" child;
- The patient's parent;

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- The patient's "adult" sibling;
- Any other adult relative of the patient; or
- Any other adult who satisfies the requirements of a "surrogate" as above.

IMPLIED CONSENT:

- It is preferable for minors (or adults who do not meet Determination of Capacity [Z-XX]) to have a parent or legal guardian (or designated surrogate) who can provide consent for treatment on behalf of the individual.
- All states allow health care providers to provide emergency treatment when a surrogate is not available to provide consent. This is known as the "emergency exception rule" or "the doctrine of implied consent".
- For minors, this doctrine means that the prehospital provider can presume consent and proceed with appropriate treatment and transport if the following four conditions are met:
  - The child is suffering from an emergent condition that places his or her life or health in danger.
  - The child's legal guardian is unavailable or unable to provide consent for treatment or transport.
  - Treatment or transport cannot be safely delayed until consent can be obtained.
  - The prehospital provider administers only treatment for emergency conditions that pose an immediate threat to the child.
- As a general rule, when the authority to act is in doubt, EMS providers should always do what they believe to be in the best interest of the minor or incapacitated individual.

CAPACITY:

- The first step is determine if the patient/surrogate has the mental capability to
  - Communicate with EMS providers,
  - Comprehend the risks of illness/injury (as well as the benefits of care), and to
  - Make a rational decision in regards to allowing or refusing medical care.
- Orientation: Is the patient *generally* oriented and able/willing to communicate with the EMS provider?
  - *Person*: They should know their name, birthday, etc.
  - *Place*: They should have a generally understanding of where they are.
    - Should know the city/state/country.
    - They should be able to verbalize a general description of their location (i.e. "I'm at home", at "friend/family's house", at a business, on the street, etc.)

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  - *Time*: They should generally know the month/year, and should know the approximate date/day/time *within reason*. (i.e. It is reasonable if they are off a day due to it being 1:00 AM).
- Event/Circumstances: They should show a reasonable understanding of the events:
  - Why is EMS present, how/who directed the response, etc.
  - Amnesia to the illness or injury due to transient decreased LOC (i.e. hypoglycemia, overdose, or concussion after head injury) is expected and does not affect decision making capacity.
  - Persistent confusion (i.e. repetitive questioning) after redirecting/explanation should be considered a deficiency in capacity.
- **Intoxication**: Is the patient acutely intoxicated or under the influence of drugs?
  - Do they show clinical signs of significant intoxication (e.g. disorientation, abnormal gait/ataxia, slurred speech, etc.).
  - Note: substance use/odor **by itself** does not imply clinical "intoxication".
- If there is any question, perform a full Mini Mental Status Exam (*below*), or contact online medical control.

INFORMED CONSENT:

- The second step is to verify that the patient/surrogate
  - Understands the nature of the illness or injury.
  - Understands the consequences of refusing care/transport.
- The patient/surrogate should **willingly listen** to the provider explaining concerns of and rationale behind:
  - Possible illness and/or injury that surrounds the event.
  - Benefits of on-scene evaluation, treatment and transport to an Emergency Department or other designated facility.
  - Risks of refusing immediate evaluation, treatment and/or transport.
  - Options to re-initiate contact with the 911 provider(s), or to initiate personal contact with an Emergency Department or other healthcare provider.
- The patient/surrogate should be able to **communicate**
  - A reasonable understanding of the risks of refusal, including the possibility of a life or limb-threatening injury that if identified/treated may prevent the loss of life or permanent disability.
  - His/her reasoning for accepting or refusing medical care (i.e. religious beliefs, cost, etc.).

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P-02 DETERMINATION OF CAPACITY		First Responder EMT AEMT Paramedic

MENTAL HEALTH EXCEPTIONS:

- The third step is to determine if the patient/surrogate displays thoughts or behaviors that
  - Prohibit decision-making capacity, or
  - Display a direct threat to the health or welfare of the patient or of others.
- Suicidal/homicidal thoughts or actions:
  - Does the patient admit to thoughts of harming themselves or others?
  - Have they displayed behavior that would reasonably lead to the death or disability of themselves or others?
    - This includes “credible” reports from friends, family, bystanders, etc. of verbalization or actions of the patient indicating SI/HI.
    - Document any intentional action (including notes, social media posts, etc.) that would indicate harm to self or others.
    - NOTE: Self mutilation that is not an attempt to kill oneself--such as “cutting” to relieve anxiety--is not considered a suicidal gesture, but the patient should be transported unless discussed with online medical control or on-site licensed mental health provider.
- Psychosis/Hallucinations/Delusions:
  - Does the patient show signs of **acute** psychosis?
    - “Acute” = new onset or chronic hallucinations/delusions that have significantly worsened.
    - “Psychosis” can include auditory/visual hallucinations or delusions (paranoid, grandiose or other irrational thoughts).
    - For patients with chronic psychosis (schizophrenia), these thoughts/hallucinations are generally considered an “acute” if they are preventing the individual from being able to take care of their basic needs or putting them/others at an unreasonable risk of harm.

Notes:

- **Capacity** is the ability to learn, process, and make decisions based on information given. In EMS, this means the patient has the capacity to understand the risks, burden (financial and otherwise), and the benefits and alternatives to the proposed treatment (called medical decision-making capacity).
- **Competence** is a legal (not medical) term, stating that a court of law has decided whether a person can make their own decisions.
  - Competence is determined by a judge, not an EMS provider.
  - A known legal incompetence ruling can favor a future lack of decision-making capacity, but a

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patient may retain his legal "capacity" regarding medical matters, even if deemed incompetent regarding, for instance, financial decisions.

- A legal declaration of incompetence may be global, or it may be limited (e.g., to financial matters, personal care, or medical decisions). A surrogate should be named and have appropriate paperwork in these situations (i.e. Medical Power of Attorney).

Example: **Dementia**

A patient may carry a diagnosis of dementia, but still, have the capacity for medical decision making. The diagnosis may prompt the EMS provider for a more careful evaluation of capacity, but the diagnosis does not exclude capacity. The provider must assess each situation carefully and always default toward beneficence if there is some question.

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P-02 DETERMINATION OF CAPACITY		First Responder EMT AEMT Paramedic

Mini Mental Status Exam:		
1.	Orientation to time – time of day, day, week, month, year.	5 pts max
2.	Orientation to place – building, street, city, state, country.	5 pts max
3.	Say “boy, dog, ball”, and have the patient repeat it.	3 pts max
4.	Ask the patient to spell “W-O-R-L-D” backward, or do serial 3’s backward from 20 [20,17, 14, 11, etc.].	5 pts max
5.	(*Without repeating the words*) ask them to repeat the previous three words [boy, dog, ball].	3 pts max
6.	Ask the patient to do the following: “stick out your tongue and touch your right hand to your left ear.”	3 pts max
7.	Ask the patient to identify your pen and watch.	2 pts max
8.	Ask the patient to read the following sentence then do as it says: “Shut your eyes”.	1 pt
9.	Ask the patient to write a sentence.	1 pt
10.	Ask the patient to draw two overlapping pentagons (show them an example).	1 pt
A score of **21 or better** is considered mentally competent by most psychiatrists for a patient to make reasonable decisions.		*Total Score (max 29)*

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P-03 PHYSICAL RESTRAINT		First Responder EMT AEMT Paramedic

Safety is of utmost importance • Always assess the scene, and • Involve law enforcement before approaching if there is <u>any</u> concern of personal safety	Consider <u>medical causes</u> of altered mental status: • Hypoxia • Head injury, Stroke, Seizure/Postictal • Metabolic disorders (e.g. hypoglycemia)

Approach:

1. Attempt to calm/de-escalate the aggressive behavior. (see *Verbal Deescalation* in the Excited Delirium protocol [P-01]).
2. Minimize contact and interaction that may escalate the situation, and use the **<u>minimum amount of force</u>** and restraint necessary to safely accomplish patient care and transportation with regard to the patient's dignity.
3. Assure that adequate personnel are present and that law enforcement assistance has arrived before any attempt to restrain patients.
4. Have one person talk to and reassure the patient throughout the restraining procedure.
5. Plan your approach and activities before restraining the patient, and approach with a minimum of four persons, one assigned to each limb, all to act at the same time.

Monitoring

- **<u>Continuous cardiac monitoring and pulse oximetry must be initiated as soon as safely possible</u>** and continue until the patient is at an emergency department.
- Once restrained, the patient should never be left alone.
- Restrained extremities should be monitored for circulation, motor function, and sensory function every 10 minutes and upon transfer of care.

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P-03 PHYSICAL RESTRAINT		First Responder EMT AEMT Paramedic

Procedure - Physical Restraint

1. Use **soft restraints** to prevent the patient from injuring him/herself or others.
   - Padded or leather wrist or ankle straps are appropriate.
   - Kerlex gauze, triangular bandages or other similar resources may be used if formal restraint devices are unavailable.
   - **Handcuffs and plastic ties are *not* considered soft restraints.**
2. Initial take down may be best accomplished in the prone position, BUT after restraining all four extremities, the patient should always be transported in a supine, Fowler's or semi-fowler's position.
   - **Never restrain patient in a hobbled, hog-tied, or prone position.**
   - Never sandwich patient between devices (e.g. spine boards or Reeve's stretchers).
   - If used, devices like backboards should be padded appropriately.
   - A stretcher strap just above the knees decreases the patient's ability to kick.
3. **Never apply restraints in a manner that restricts the patient's airway/respiratory effort.**
   - Restraints must allow for adequate monitoring of pulse and respirations.
   - They should not restrict the patient's or rescuer's ability to protect the airway should vomiting occur.
   - Must provide sufficient slack to take full tidal-volume breaths.
   - Never cover a patient's mouth or nose, except with:
     i. Surgical mask, or
     ii. NRB mask with high flow oxygen.
   - Additional tethering of the thorax (e.g. stretcher strap) may be necessary, but must not restrict chest excursion.
4. **Chemical Restraint - Chemical Sedation [RX-03]**
   - Should be considered in all patients continuing to require physical restraint (either with a device or other first response personnel.
   - Should be administered ASAP to decrease the likelihood of asphyxiation/respiratory compromise from restraints, and the likelihood of sudden cardiac arrest from excited delirium syndrome.
5. Physical restraints should be removed as soon as possible, once a patient has calmed and shown signs of cooperation (either with or without sedation).

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P-03 PHYSICAL RESTRAINT		First Responder EMT AEMT Paramedic

Documentation

- Identification of personnel and agency applying restraint
- The restraint method used (what & where)
- Behavior/reason for restraint (i.e that the restraints were “applied for the patient’s safety”, history/evidence of substance abuse or psychiatric disease, etc.)
- Pertinent clinical information and exam (Neuro/Mental Status, Skin, Heart, Lung)
- Documentation of monitoring/reassessing of restrained extremities

Police/Law Enforcement Responsibilities

- Law enforcement is responsible for the capture and/or physical restraint of actively or potentially violent patients.
- Law enforcement agencies retain primary responsibility for safe transport of patients under arrest or involuntary detention.
    - Patients under arrest or involuntary detention shall be searched thoroughly by law enforcement personnel prior to being placed in the ambulance.
    - EMS and law enforcement personnel should mutually agree on the need for law enforcement assistance during transport of involuntary detention patients.
- **An officer shall always accompany a patient if the patient continues to require physical restraint with handcuffs or other non-EMS supplied/approved equipment.**
- Metal handcuffs (and other restraints applied by law enforcement) for initial restraint should be replaced with soft restraints whenever possible. Only law enforcement personnel may remove metal handcuffs.

NOTES:

- Obtain as much history as possible from the family/bystanders and law enforcement to evaluate for any potential medical causes for the patients delirium/agitation.
- Search/document the surroundings for clues as to the cause of the behavior (drug paraphernalia, medication bottles, etc.).

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P-04 CHILD ABUSE & NEGLECT		First Responder EMT AEMT Paramedic

Purpose

- Child abuse is the physical and mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.
- Assessment of a child abuse case based upon the following principles:
    - **Protect** the life of the child from harm, as well as that of the EMS team from liability.
    - **Suspect** that the child may be a victim of abuse, especially if the injury / illness is not consistent with the reported history.
    - **Respect** the privacy of the child and family.
    - **Collect** as much evidence as possible, especially information.

STAY SAFE!

- Always assess and reassess the scene
- Involve law enforcement before approaching if there is any concern of personal safety
- If possible remove the patient from the situation and transport

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P-04 CHILD ABUSE & NEGLECT		First Responder EMT AEMT Paramedic

Procedure - Assessment

1. With all children, assess for and document **psychological characteristics of abuse**, including excessively passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders.
2. With all children, assess for and document **physical signs of abuse,** including especially any injuries that are inconsistent with the reported mechanism of injury. The back, buttocks, genitals, and face are common sites for abusive injuries.
3. With all children, assess for and document **signs and symptoms of neglect**, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. With all children, assess for and document **signs of sexual abuse**, including torn, stained, or bloody underclothing, unexplained injuries, pregnancy, or sexually transmitted diseases.
5. Immediately report any suspicious findings to both the receiving hospital (if transported). Law Enforcement must also be notified.
6. EMS should not accuse or challenge the suspected abuser. This is a legal requirement to report, not an accusation. In the event of a child fatality, law enforcement must also be notified.

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P-04 CHILD ABUSE & NEGLECT		First Responder EMT AEMT Paramedic

Procedure - Reporting

- Immediately report any suspicious findings to the receiving hospital (if transported). This should occur in person with either the patient's nurse or the facility charge nurse/administrator. This information should not be provided over the radio.
- If the patient (victim) is not transported, or if there are other individuals/bystanders that you have any concern for, contact your Supervisor immediately to notify the Department of Social Services (DSS) or Adult Protective Services (APS).

Procedure - Documenting

1. Clearly document reported histories:
    a. Utilize **exact quotations** as much as possible.
    b. Note who stated what, especially if there are discrepancies in between the different parties involved or if reports of the event change over time.
    c. Document any concerning findings in the scene that may indicate physical altercation or signs of neglect, but **be specific with facts--not opinions/suspicions.**
2. Clearly document physical exam findings.
3. Document clinical decision making and treatments, but never document accusations as a confirmed assessment--this will be decided by the judicial system.
4. Document to whom (and when) and suspicions were reported (hospital staff, law enforcement, supervisor, etc.).

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P-05 DOMESTIC (ADULT) VIOLENCE/NEGLECT		First Responder EMT AEMT Paramedic

Purpose

- Domestic violence is physical, sexual, or psychological abuse and/or intimidation, which attempts to control another person in a current or former family, dating, or household relationship. The recognition, reporting, and referral of abuse is a critical step to improving patient safety and preventing further abuse.
- Elder abuse is the physical and / or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and proper reporting is critical to improve the health and well-being of senior citizens.
- Assessment of an abuse case based upon the following principles:
  - **Protect** the patient from harm, while protecting EMS from harm and liability.
  - **Suspect** that the patient may be a victim of abuse, especially if the injury / illness is not consistent with the reported history.
  - **Respect** the privacy of the patient and family.
  - **Collect** as much information as possible and preserve physical evidence.

STAY SAFE!

- Always assess and reassess the scene
- Involve law enforcement before approaching if there is any concern of personal safety
- If possible remove the patient from the situation and transport

Consider Family Violence if any of the following are noted:

- Fear of household member
- Reluctance to respond when questioned
- Unusual isolation, unhealthy, unsafe living environment
- Poor personal hygiene/inappropriate clothing
- Conflicting accounts of the incident
- History inconsistent with injury or illness

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P-05 DOMESTIC (ADULT) VIOLENCE/NEGLECT		First Responder EMT AEMT Paramedic

Procedure - Assessment

1. Assess the / all patient(s) for any **psychological characteristics of abuse**, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, behavioral disorders, substance abuse, medical non-compliance, or repeated EMS requests. This is typically best done in private with the patient.
2. Assess the patient for any **physical signs of abuse**, especially any injuries that are inconsistent with the reported mechanism of injury. The back, chest, abdomen, genitals, arms, legs, face, and scalp are common sites for abusive injuries. Defensive injuries (e.g. to forearms), and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence.
3. Assess all patients for **signs and symptoms of neglect**, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Assess all patients for **signs of sexual abuse**, including torn, stained, or bloody underclothing, unexplained injuries, pregnancy, or sexually transmitted diseases.

NOTES:

Direct questions to ask when alone with the patient and time available:

1. Has anyone at home every hurt you?
2. Has anyone at home touched you without your consent?
3. Has anyone ever made you do things you didn't want to do?
4. Has anyone taken things that were yours without asking?
5. Has anyone scolded or threatened you?
6. Are you afraid of anyone at home?

Document unspoken warning signs and symptoms:

- Injury to soft tissue areas that are normally protected
- Bruise/burn in the shape of an object
- Bite marks
- Multiple bruising in various stages of healing

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P-05 DOMESTIC (ADULT) VIOLENCE/NEGLECT		First Responder EMT AEMT Paramedic

Procedure - Reporting

- Immediately report any suspicious findings to the receiving hospital (if transported). This should occur in person with either the patient's nurse or the facility charge nurse/administrator. This information should not be provided over the radio.
- If the patient (victim) is not transported, or if there are other individuals/bystanders that you have any concern for, contact your Supervisor immediately to notify the Department of Social Services (DSS) or Adult Protective Services (APS).

Procedure - Documenting

1. Clearly document reported histories:
    a. Utilize **exact quotations** as much as possible.
    b. Note who stated what, especially if there are discrepancies in between the different parties involved or if reports of the event change over time.
    c. Document any concerning findings in the scene that may indicate physical altercation or signs of neglect.
2. Clearly document physical exam findings.
3. Document clinical decision making and treatments, but never document accusations as a confirmed assessment--this will be decided by the judicial system.
4. Document to whom (and when) and suspicions were reported (hospital staff, law enforcement, supervisor, etc.).

RESOURCES

- Sexual Assult Guideline [P-05]
- Domestic Violence Hotline: 1-800-799-SAFE (7233)

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P-06 SEXUAL ASSAULT		First Responder EMT AEMT Paramedic

Procedure

1. Be calm and assuring with sensitivity toward the patient.
2. DO NOT make unnecessary physical contact with the patient.
3. If possible, have a witness the same gender as the victim present at all times.
4. Wrap a plastic sheet around the victim if possible.
5. DO NOT inspect genitals unless evidence of uncontrolled hemorrhage or trauma is present.
6. DO NOT allow patient to shower or douche.
7. Collect patient's clothing when possible:
    a. Place clothing separate plastic/paper bags with ID labels and found location.
    b. Leave all sheets placed in plastic/paper bag with patient at facility.
    c. Notify all staff of clothing samples.
8. Transport patient to appropriate facility for treatment and examination.
9. Contact dispatch to notify Police of possible Sexual Assault

Refer to clinical protocol most appropriate for patients injuries as needed.

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MEDICATIONS

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REFERENCE

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RX-01 OFF-FORMULARY MEDICATIONS		First Responder EMT AEMT Paramedic

Indications

- This guideline is to provide authorization for the use of a patient's home medication(s) not commonly used or included in these EMS Guidelines.
- The patient MUST exhibit the signs and symptoms for which the medication is prescribed.
- Medications will be administered for **EMERGENT (life/limb-threatening) conditions only.**
- Any other application should be discussed with online medical control.

Procedure

1. For medication(s) to be administered as requested by patient's caregiver/school official(s),
    a. Caregiver/school administrator must provide:
        i. The medication(s) to be administered
        ii. A written copy of the physician order and care plan
    b. The order/care plan from the patient's primary physician should list the following:
        i. Name of the patient
        ii. Name and contact information of the primary/ordering physician
        iii. Name of medication(s)
        iv. Signs and symptoms for which the medication(s) is/are prescribed
        v. Dosage of the medication(s) (including repeat doses if applicable)
        vi. Route(s) of administration(s)
        vii. Potential side effects of the medication(s)
        viii. Document must be signed by the primary physician
2. Copies of the care plan and physician order must be attached to the patient care report.
3. If the medication(s) is/are not administered, documentation must include reasons for withholding.
4. If medication is administered under these circumstances transport is mandatory.

Contact Medical Control for any questions on need for or administration of meds

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RX-02 GENERAL PAIN MANAGEMENT	*The administration of opiates by an Advanced EMT is at the discretion of the agency's EMS Director	First Responder EMT AEMT Paramedic

For the treatment of **moderate to severe ACUTE pain** *with*

- Traumatic injury with obvious deformity or significant mechanism *or*
- Concerning non-traumatic acute pain in the appropriate clinical setting.

See '**Non-Pharmacological Pain Control**' (*below*)

Mild to Moderate Pain *(if available)*:

A	**Acetaminophen** 650-1000 mg PO 1 gram IV/IO Peds: 15 mg/kg Repeat: None	or	**Ibuprofen** 400 mg PO Peds: 10 mg/kg Repeat: None
		or	**Toradol (ketorolac)** 7.5-15 mg IV/IO *or* 30 mg IM Peds: 0.5 mg/kg Repeat: None

Severe Pain (≥7/10):

A*	**Fentanyl** 25-100 mcg IV/IO 50-100 mcg IM or IN Peds: 1 mcg/kg (max 2 doses) Repeat: every 10 min Max: 400 mcg (adult)	or	**Morphine** 5-10 mg IV/IO, IM (do not use) IN Peds: 0.1 mg/kg (max 2 doses) Repeat: every 10 min Max: 20 mg (adult)
		or	**Dilaudid** **[hydromorphone]** 0.5-1 mg IV/IO, IM (do not use) IN Peds: 0.01 mg/kg (max 2 doses) Repeat: every 10 min Max: 2 mg (adult)

If Continued/Intractable Pain, *consider*:

Ketamine for Pain RX-03

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RX-02 GENERAL PAIN MANAGEMENT	*The administration of opiates by an Advanced EMT is at the discretion of the agency's EMS Director	First Responder EMT AEMT Paramedic

Administration Notes:

- Consider a **HALF-DOSE in elderly**/opiate naive patients.
- Naloxone [Narcan] must be immediately available [**H-09**]
- Consider coadministration of nausea meds [**M-01**] with Narcotics

Continuous pulse oximetry, continuous end-tidal CO2 ($ETCO_2$) monitoring and continuous ECG (heart rate) monitoring must be used and documented.

Contraindications (in addition to prior allergy/reaction)

Acetaminophen	Liver disease/cirrhosis
Ibuprofen Toradol	NSAID/Aspirin allergy Renal/Kidney dysfunction History of GI bleed Active bleeding/major trauma patient Pregnancy

Non-Pharmacological Pain Control

- Provide a calm and controlled environment. This helps to relieve anxiety and can decrease the response to pain. Examples include: dimming lights, quiet room and soft spoken voice.
- Clear explanation of procedures and calm re-assurance.
- Provide relaxation techniques, distractions and guided imagery
- Splint and stabilize fractures/dislocations. By limiting the spinal reflex, tissue and muscle metabolism is slowed preventing spasms that increase pain reception and transmission.
- Use cold packs for musculoskeletal injury.
- Heat packs may be considered for specific areas of muscle spasm.
- **AVOID unnecessary spinal immobilization.** If the patient is following commands, they should not be on a long spine board.
- Allow patients to remain in a position of comfort, thus minimizing anxiety and reducing pain transmission.

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RX-02 GENERAL PAIN MANAGEMENT	*The administration of opiates by an Advanced EMT is at the discretion of the agency's EMS Director	First Responder EMT AEMT Paramedic

Capnography/End-Tital CO2 Use

- **EtCO2 use is MANDATORY with the use of any sedating medication.**
- A baseline EtCO2 should be obtained prior to medication administration whenever possible.
- A decrease in EtCO2 generally will precede clinically detectable hypoventilation or the development of hypoxemia.
- Over-sedation associated with impending **Respiratory Failure** should be suspected in patients with either:
  - Any elevation of EtCO2 >50 mmHg, or
  - Any increases in EtCO2, especially more than 10 mmHg from baseline
- Any patient with hypoxemia (SpO2 <90%) or any observable decrease in respiratory effort should receive prompt **Rescue Maneuvers**, including:
  - The initiation or titration of supplemental oxygen
  - Verbal and/or physical stimulation of the patient
  - Temporary ventilatory assistance with a BVM
  - Gentle administration of **naloxone (Narcan) in 0.1-0.2 mg increments**, as per H-09
- **AEMT**: A paramedic intercept and/or rapid transport to the closest emergency department should be initiated on any patient with persistent decreases in mental status, respiratory effort, hypoxemia, and/or elevated/elevating EtCO2.

Notes:

- Use good clinical judgment and consider withholding sedating medications or use **extreme caution** (titrating slowly to effect) in patients with/who may develop:
  - Head trauma or decreased/altered LOC
  - Respiratory depression/distress
  - Hypotension or signs of hemodynamic instability
- The objective of pain management is not the removal of all pain, but rather, to make the patient's pain tolerable enough to allow for adequate assessment, treatment and transport
- Reevaluate the patient frequently → Monitor for signs of respiratory depression or decreased level of consciousness, as well as any hemodynamic changes.
- Respiratory depression, including apnea, may occur suddenly and without warning and is more common in children and the elderly.
- **Coadministration of opioids and benzodiazepines (or other sedating medications) is discouraged and may only be done with direct physician verbal order.**
- Chest wall rigidity has been reported with rapid administration of fentanyl.

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RX-02 GENERAL PAIN MANAGEMENT	*The administration of opiates by an Advanced EMT is at the discretion of the agency's EMS Director	First Responder EMT AEMT Paramedic

QI Review Parameters:

1. Supportive Measures performed & documented? (Splinting, position of comfort, ice, etc.)
2. Appropriate Type of Medication given for indication/pain score?
3. Dose and Route of Medication appropriate?
4. Pulse Oximetry used and documented with sedating medications?
5. $EtCO_2$ used and documented with sedating medications?

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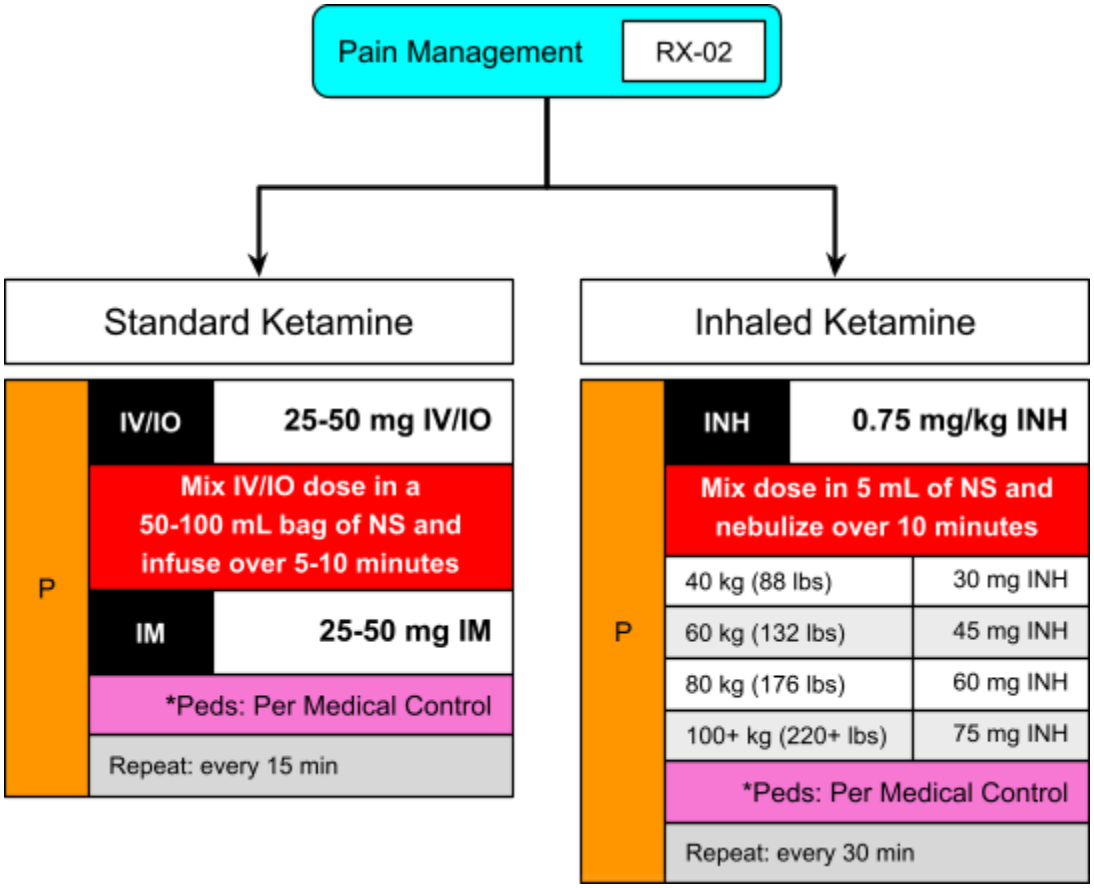
RX-03 KETAMINE FOR PAIN		First Responder EMT AEMT Paramedic

Inclusion Criteria

Intractable Pain (≥7/10)
despite initial narcotic dose

Contraindications

Prior Allergic Reaction
Age <16 Years*



When administering inhaled Ketamine:

- A nebulizing device that is capable of limiting aerosol dispersion must be used, such as a breath-actuated nebulizer (BAN); or
- A regular nebulizer may be used and the EMS providers (and any other individuals within 6-feet of the patient) **must wear a surgical mask.**

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RX-03 KETAMINE FOR PAIN		First Responder EMT AEMT Paramedic

ALL patients who receive Ketamine for Pain must have:

- Documented use of:
  - Continuous ECG monitoring,
  - Continuous pulse-oximetry, and
  - Continuous end-tidal CO2 (ETCO2) monitoring
- Vital signs documented every 5 minutes
- At least two (2) pain scores documented

Notes:

- TBD

]

QI Review Parameters:

1. Supportive Measures performed & documented? (Splinting, position of comfort, ice, etc.)
2. Appropriate Non-narcotic or narcotic pain medication administered prior to ketamine?
3. Dose and Route of Medication appropriate?
4. Continuous ECG, Pulse Oximetry and ETCO2 used and documented?
5. Appropriate documentation of pain before and after interventions?
6. Appropriate documentation of vital signs during and following administration of ketamine?

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RX-04 ANXIOLYSIS/ CHEMICAL RESTRAINT		First Responder EMT AEMT Paramedic

- Maintain scene and personal safety
- Law enforcement assistance should be requested on all calls involving potentially violent patients.
- If sedation potentially needed for Severe Agitation/Delirium
  - Attempt to De-escalate the behavior *(see below)*
  - Temporary Physical Restraint [P-03] if needed

Severe Agitation/ Delirium P-01

Determine **Sedation Assessment Tool (SAT)** Score:

	+3	+2	+1	0
Responsiveness	**Combative**, violent, out of control	Very anxious and **agitated**	Anxious & **restless**	Responds easily to name
Speech	Continual loud outbursts	Loud outbursts	Speaks in normal tone	Speaks in normal tone
General Treatment	**Ketamine**	**Benzodiazepine** (+/- analgesia)	Low-dose Benzodiazepine	None

+3 → **Severe Agitation** *(below)*

+2 → **Moderate Agitation** *(below)*

+1 → **Mild Agitation** *(below)*

SAT = 3: Severe Agitation

(For patients who are a serious threat to EMS personnel or themselves)

	Intramuscular (IM)	Intravascular (IV/IO)
P	**Ketamine** 400-500 mg IM	**Ketamine** 100-200 mg IV/IO
	Adult WB: 4-5 mg/kg	Adult WB: 1-2 mg/kg
	Peds: **ONLY** per Online Medical Control	

- Repeat: every 5-10 min
- **Consider half dose in elderly or smaller patients**
- Contact online medical control for any question of indication or dosage, or if additional/alternative meds may be beneficial

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SAT = 2: Moderate Agitation

First line is generally a benzodiazepine:

P	**Versed (midazolam)** 1-2 mg IV/IO 2-5 mg IN/IM	or **Ativan (lorazepam)** 1-2 mg IV/IO, 2 mg IN/IM	or **Valium (diazepam)** 2-5 mg IV/IO 5 mg IM
	Peds: per Med Control	Peds: per Med Control	Peds: per Med Control
	Max: 10 mg	Max: 2 doses	Max: 2 doses

Then, consider if agitation may be related to PAIN:

P	**Ketamine** 50-100 mg IV/IO	or **Fentanyl** 25-100 mcg IV/IO 50-100 IM or IN	
	Adult WB: 0.5-1 mg/kg	Adult WB: 0.5-1 mg/kg	
	Peds: per Med Control	Peds: per Med Control	

- Repeat: every 5-10 min if SAT 2 (or more)

SAT = 1: Mild Agitation or Anxiety

First, attempt to **De-escalate** or Calm the Patient (*see below*)

Then, consider a l**ow-dose benzodiazepine:**

P	**Versed (midazolam)** 0.5-1 mg IV/IO 1-2 mg IN/IM	or **Ativan (lorazepam)** 0.5-1 mg IV/IO, 1 mg IN/IM	or **Valium (diazepam)** 1-2 mg IV/IO 2 mg IM
	Peds: per Med Control	Peds: per Med Control	Peds: per Med Control
	Max: 10 mg	Max: 2 doses	Max: 2 doses

- Repeat: every 5-10 min if SAT 1 (or more)

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RX-04 ANXIOLYSIS/ CHEMICAL RESTRAINT		First Responder EMT AEMT Paramedic

Administration Notes:

- Consider a **HALF-DOSE in elderly** or smaller patients.
- **Continuous pulse oximetry, continuous end-tidal CO2 ($ETCO_2$) monitoring and continuous ECG (heart rate) monitoring must be used and documented** (unless they pose a safety risk to the patient or EMS personnel).
- Contact Online Medical Control for any question of indication or dosage, or if additional/alternative meds may be beneficial.

INDICATIONS:

For the treatment of:

- Acute agitation/delirium and extreme combativeness (psychosis, overdose/substance abuse, etc.)
- Continued sedation for patients post-intubation

ALWAYS CONSIDER:

Safety is of utmost importance

- Always assess the scene, and
- Involve law enforcement before approaching if there is any concern of personal safety

Consider medical causes of AMS:

- Hypoxia
- Head injury, Stroke, Seizure/postictal
- Metabolic disorders (e.g. hypoglycemia)

Post-Resistance Syndrome [PRS] → see Severe Agitation/Delirium [P-01]

- Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent behavior, and hyperthermia
- Potentially life-threatening emergency
- Associated with the use of physical control measures (restraints, TASER, etc).
- Most common in males with a history of serious mental illness and/or drug abuse.

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RX-04 ANXIOLYSIS/ CHEMICAL RESTRAINT		First Responder EMT AEMT Paramedic

De-escalation Techniques:

- Direct empathetic and calm voice
- Present clear limits and options
- Respect personal space
- Avoid direct eye contact
- Non-confrontational posture
- Dim lights and limit noise

SAFER Technique:

- **S**tabilize the situation (lower/limit stimuli)
- **A**ssess and acknowledge the crisis
- **F**acilitate the identification/activation of resources (family, friends, police, etc.)
- **E**ncourage patient to use resources and take actions in his/her best interest
- **R**ecovery/referral → leave patient in care of responsible person/facility

NOTES on Chemical Restraint:

- Medical (chemical) restraint should be attempted as soon as reasonably possible if:
  - The patient does not respond to de-escalation techniques/basic physical restraints AND he/she presents a risk of significant harm to the themselves, law enforcement, and/or EMS providers
  - OR if physical restraints would impede medical care
- Obtain as much history from the family/bystanders and law enforcement.
- Search/document for clues as to the cause of the behavior (drug paraphernalia, medication bottles, etc.).
- Chemical restraint is to be used only where the patient can be adequately and repeatedly monitored by paramedic providers.

QI Review Parameters:

1. {TBD}

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RX-04 SEDATION FOR BRIEF PROCEDURES		First Responder EMT AEMT Paramedic

Indications:	**Contraindications:**
• Sedation for painful procedures (cardioversion/pacing, extrication, splinting, etc).	• Pediatric Patients (<16 years) • The inability (or predicted inability) to maintain an airway. • On-going breathing issues (hypoxia or suspected hypercarbia) despite appropriate respiratory management. • Ongoing hemodynamic instability despite initial fluid resuscitation. Note: Sedation may be considered if undergoing the painful procedure is expected to improve the patient's respiratory or hemodynamic compromise (e.g. synchronized cardioversion).

If there is any question on the need for sedation and/or the procedure or any question on the drug, route or dose, immediately contact Online Medical Control.

Administration Notes:

- **Continuous pulse oximetry, continuous end-tidal CO2 ($ETCO_2$) monitoring and continuous ECG (heart rate) monitoring must be used and documented** (unless they pose a safety risk to the patient or EMS personnel).
- Consider a **HALF-DOSE in elderly** or smaller patients
- Consider only administering a sedative (i.e. not Fentanyl) if discomfort/pain is expected to be brief and the patient is at risk of complication from over-sedation.
- Continue treating post-procedural pain as per the appropriate pain guideline.

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RX-04 SEDATION FOR BRIEF PROCEDURES		First Responder EMT AEMT Paramedic

Sedation/Analgesia Medications for Brief Procedures

First-line is Ketamine

P	**Ketamine** 50-100 mg IV/IO 100-200 mg IM	
	Adult WB: 0.5-1 mg/kg	

Alternative is a Sedative plus Fentanyl (if significant pain is expected)

P	**Versed (midazolam)** 1-2 mg IV/IO 2-5 mg IN/IM	and	**Fentanyl** 25-50 mcg IV/IO 50-100 mcg IM or IN
	Adult WB: 0.5-1 mg/kg		Adult WB: 0.5-1 mg/kg
	– *OR* –		
P	**Etomidate** 5-10 mg IV/IO	and	**Fentanyl** 25-50 mcg IV/IO 50-100 mcg IM or IN
	Adult WB: 0.1-0.2 mg/kg		Adult WB: 0.5-1 mg/kg

Peds: ONLY per Online Medical Control

- Repeat: every 5-10 minutes if needed'
- If given IM or IV: double the Adult Weight Based (WB) dose

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RX-06 ADVANCED SEDATION & ANALGESIA	**Titratable Medications are only within the scope of a Critical Care Paramedic or Flight Nurse**	First Responder EMT AEMT Paramedic

Indications:

- For the treatment of pain, anxiety and/or agitation in patients with an advanced airway.
- Continuous infusions may be considered in other critically ill patients
  - Who have or may require multiple intermittent doses of sedative or pain medications
  - If started at the sending facility or ordered by the sending physician
  - As directed by Online Medical Control

Administration Notes:

- **Continuous pulse oximetry, continuous end-tidal CO2 ($ETCO_2$) monitoring and continuous ECG (heart rate) monitoring must be used and documented**.
- Contact Online Medical Control for any question of indication or dosage, or if additional/alternative meds may be beneficial.
- Continuous infusions should always be administered via an agency-approved infusion pump. Sedative medications should not be administered via a pediatric or adult drip set.

Approach to Under-Sedation

If the patient requires additional sedation and/or pain control despite the maximum infusion rate:

1. Consider adding a Fentanyl or Ketamine infusion to a sedative-only infusion (if the patient has or is suspected to have pain/discomfort).
2. Provide an **Intermittent (Bolus) Dose** of an appropriate sedative or pain medication.
3. Contact Medical Control for further instructions.

Note: EMS providers may not increase an infusion rate beyond the maximum unless the patient was on the higher dose at the time of transfer or under direction from Medical Control.

Approach to Hypotension

Do not stop a sedative infusion just for hypotension. Sick patients still need sedation or pain control. Balance the reduction in sedation with appropriate hemodynamic support:

1. Provide a Fluid bolus (if appropriate)
2. Decrease the infusion rate of sedative/pain medication
3. Initiate appropriate vasopressor, as per Medical Shock

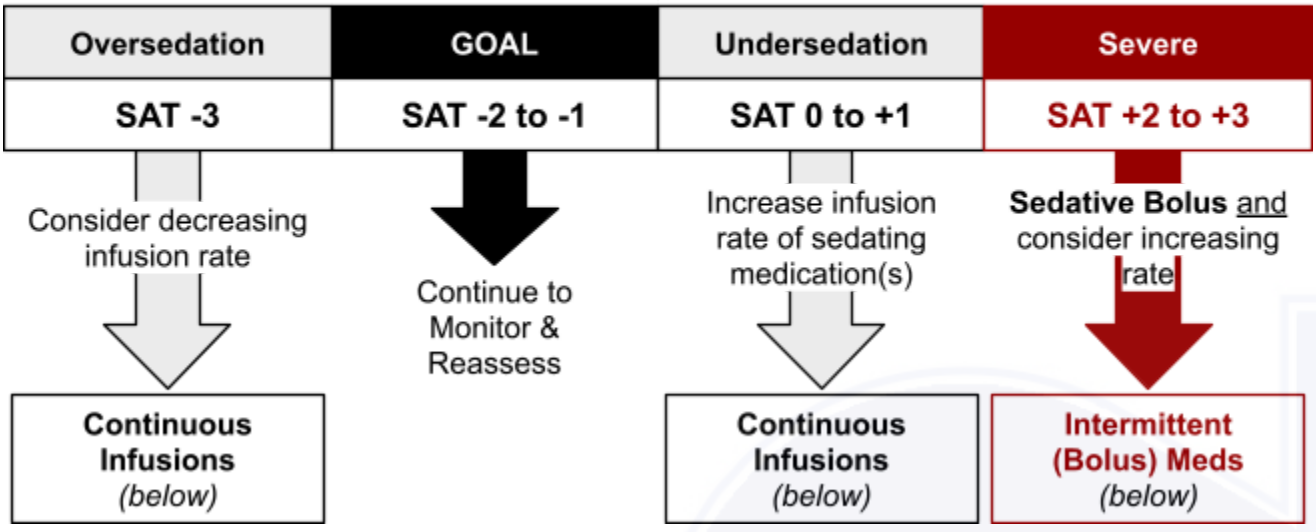
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Sedation Goals

Continuous Patient Reassessment *(as per Universal Care [1-01])* & Evaluation/Reevaluation of Appropriate Level of Sedation:

Determine **Sedation Assessment Tool (SAT)** Score:

SCORE	RESPONSIVENESS	SPEECH
+3	Combative, violent, out of control	Continual loud outbursts
+2	Very anxious and agitated	Loud outbursts
+1	Anxious and restless	Normal / Talkative
0	Responds easily to name, speaks in normal tone	Speaks normally
-1	Responds only if name is called loudly	Slurring or prominent slowing
-2	Physical stimulation	Few recognisable words
-3	No response to stimulation	Nil



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RX-06 ADVANCED SEDATION & ANALGESIA	**Titratable Medications are only within the scope of a Critical Care Paramedic or Flight Nurse**	First Responder EMT AEMT Paramedic

Continuous Infusions

Sedative & Pain

Ketamine
Starting dose: 0.2 mg/kg/hour
Maximum: 2.5 mg/kg/hour

C | **Ketamine** 0.2 to 2 mg/kg/hour

Sedative Only

Midazolam [Versed]
Starting dose: 0.5 mcg/kg/hour
Maximum: 2 mcg/kg/hour

C | **Midazolam [Versed]** 0.5 to 2 mcg/kg/hour

Propofol [Diprivan]
Starting dose: 5 mcg/kg/minute
Maximum: 50 mcg/kg/minute

C | **Propofol** 5 to 50 mcg/kg/minute

Dexmedetomadine [Precedex]
Starting dose: 0.2 mcg/kg/hour
Maximum: 1.5 mcg/kg/hour

C | **Dexmedetomadine** 0.2 to 1.5 mcg/kg/hour

Pain Only

Fentanyl
Starting dose: 0.5 mcg/kg/hour
Maximum: 2 mcg/kg/hour

C | **Fentanyl** 0.5 to 2 mcg/kg/hour

Note: Continuous administration of paralytics (Rocuronium or Vecuronium) may be continued if initiated by the sending facility. The initiation of a paralytic drip by EMS personnel will only be at the direction of Online Medical Control.

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RX-06 ADVANCED SEDATION & ANALGESIA	**Titratable Medications are only within the scope of a Critical Care Paramedic or Flight Nurse**	First Responder EMT AEMT Paramedic

Intermittent (Bolus) Medications

Sedative & Pain

Ketamine
0.5 to 1 mg/kg IV/IO

Standard Adult dose: 50-100 mg IV/IO

P	**Ketamine** 0.5 to 1 mg/kg IV/IO or 2-5 mg/kg IM

Sedative Only

Midazolam [Versed]
0.05 to 0.1 mg/kg IV/IO
or 0.1-0.2 mg/kg IM/IN

Standard Adult Dose: 1-2 mg IV/IO
or 2-5 mg IM/IN

P	**Midazolam [Versed]** 0.05 to 0.1 mg/kg IV/IO or 0.1 to 0.2 mg/kg IM/IN

Pain Only

Fentanyl
0.5 to 1 mcg/kg IV/IO
or 1-2 mcg/kg IM/IN

Standard Adult Dose: 25-100 mg IV/IO
or 50-100 mcg IM/IN

P	**Fentanyl** 0.5 to 1 mcg/kg IV/IO or 1-2 mcg/kg IM/IN

Repeat all intermittent medications as needed (generally every 10-15 minutes)

QI Review Parameters:

1. {TBD}

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TOC/NOTES: TRAUMA		First Responder EMT AEMT Paramedic

TRAUMA

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TOC/NOTES: TRAUMA		

Table of Contents: Trauma

GUIDELINES

T-01 Multi-System/Initial Trauma Assessment & Care
T-02 Traumatic Cardiac Arrest
T-03 Care During Extrication
T-04 Hemorrhagic Shock (Traumatic & Non-Traumatic)
T-05 Thermal Burns
T-06 Electrocution/Lightning Injury

Note: For Chemical Burns, please see Corrosive Agents [H-05]

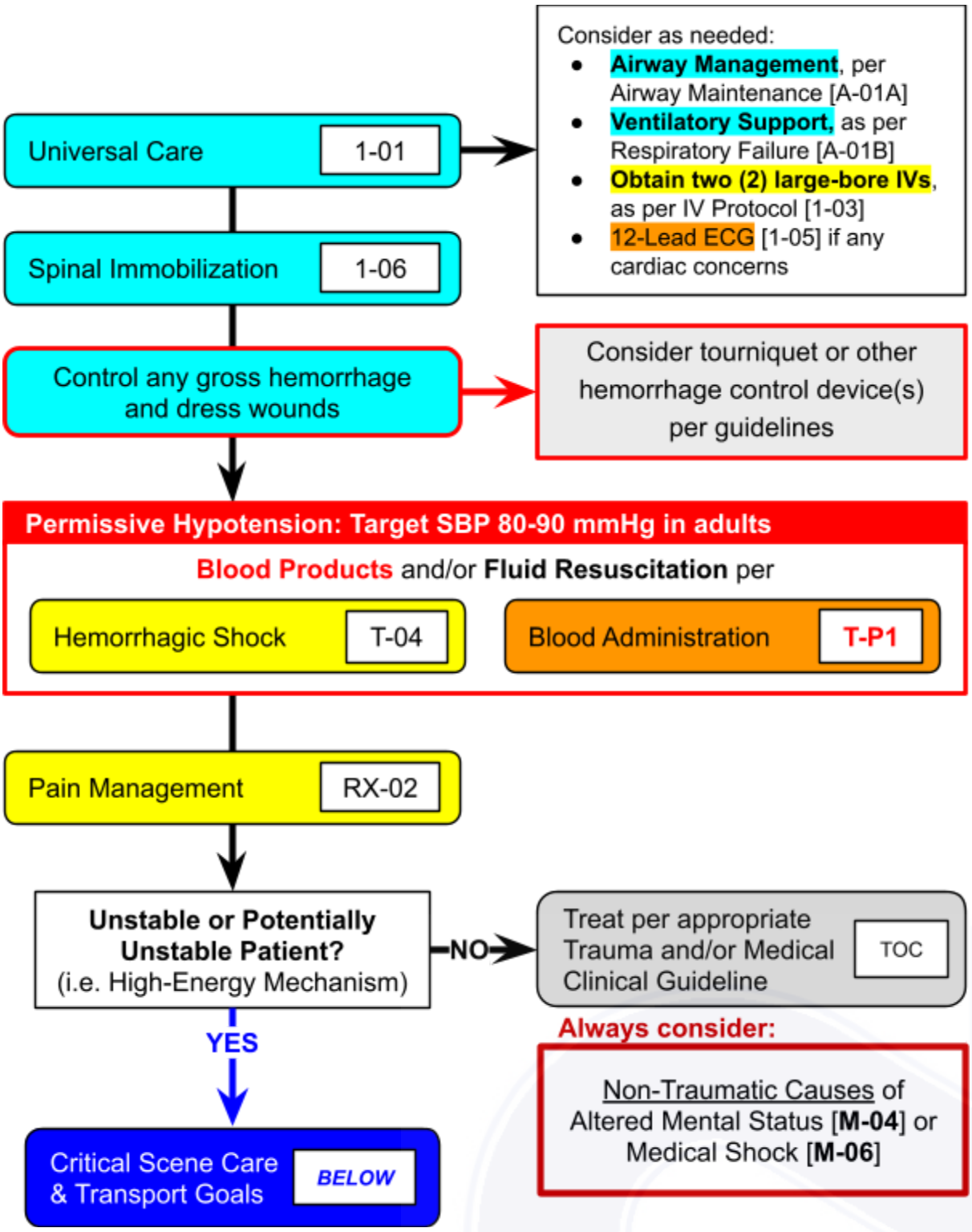
REGIONAL TRAUMA
T-07 Head Trauma (Includes Eye & Tooth Injury)
T-08 Spinal Cord Injury/Neurogenic Shock
T-09 Chest/Abdominal Trauma (Includes Tension Pneumothorax)
T-10 Extremity/Soft Tissue Trauma

PROCEDURES

T-P1 Blood Administration
T-P2 Needle/Finger Thoracostomy (Decompression)
T-P3 Pelvic Binder
T-P4 Tourniquet
T-P5 TXA Administration

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T-01 INITIAL MULTI-SYSTEM TRAUMA CARE		First Responder EMT AEMT Paramedic



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T-01 INITIAL MULTI-SYSTEM TRAUMA CARE		First Responder EMT AEMT Paramedic

Unstable or Potentially Unstable Trauma Patients:

Limited On-Scene Procedures:

X

Control Hemorrhage, use Tourniquet as needed — T-P4

- Control bleeding with direct pressure, wound packing and/or tourniquet.

A

Airway Mgmt/Placement per Airway Maintenance — A-01A

- Provide basic airway maneuvers (e.g. jaw thrust or chin lift) as appropriate.
- Place BIAD if apneic or advanced airway is otherwise indicated.

B

Consider Bilateral **Needle/ Finger Thoracostomy** — T-P2

- Cover open (sucking) chest wounds
- Decompression if any concern over tension pneumothorax

C

Traumatic Cardiac Arrest — T-02

- CPR may be performed or withheld, as per 'CPR in Traumatic Arrest'

GO!

For any potentially viable patient, scene time should **always be less than 10 minutes** (from extrication).

M

Contact Medical Control for further orders or if efforts are felt to be futile

Additional Procedures *(as able)*

- Reinforce dressings
- Provide secondary wound care
- Splint extremities

Monitor airway and provide appropriate interventions to **ensure adequate oxygenation**.

Monitor respiratory status and **repeat decompression** if needed

Blood Products / IV Fluids per Hemorrhagic Shock — T-04

- Start IV/IO (2 large bore peripherals)
- Limit IV fluids as able

Prevent hypothermia: warm patient as able

Blunt Trauma: **Spinal Immobilization** — 1-06

- Penetrating: do not immobilize

Always consider Non-Traumatic cause and treat as appropriate

- Procedures may be performed while awaiting extrication, but these should never delay transport.
- All care during transport must be performed while in appropriate restraints. If this cannot be ensured, defer procedures to destination.

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T-01 INITIAL MULTI-SYSTEM TRAUMA CARE		First Responder EMT AEMT Paramedic

Glasgow Coma Scale (GCS):

EYES	Spontaneous	4
	Opening to voice	3
	Response to pain	2
	None	1
VERBAL	Oriented	5
	Verbal confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	None	1
MOTOR	Obeys commands	6
	Localizes pain	5
	Withdraws (to pain)	4
	Flexion (arms towards head)	3
	Extension (away from head)	2
	None	1

Trauma Score:

Respiratory Rate	10-24/min	4
	24-35/min	3
	>36/min	2
	1-9/min	1
	None	0
Resp. Expansion	Normal	1
	Retractive	0
Systolic BP	>90 mmHg	4
	70-89 mmHg	3
	50-69 mmHg	2
	0-49 mmHg	1
	No Pulse	0
Capillary Refill	Normal	2
	Delayed	1
GCS	14-15	5
	11-13	4
	8-12	3
	5-7	2
	3-4	1

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T-01 INITIAL MULTI-SYSTEM TRAUMA CARE		First Responder EMT AEMT Paramedic

Pediatric Trauma Score (<15 years old):

Component	+2 points	+1 point	-1 point
Size (weight)	>20 kg	10-20 kg	<10 kg
Airway	Normal	Oral/Nasal Airway	Unmaintainable/ Intubated
Systolic BP	> 90 mmHg	50-90 mmHg	<50 mmHg
CNS	Awake	Obtunded/LOC	Coma
Open Wound	None	Minor	Major/Penetrating
Skeletal	None	Closed Fractures	Open/Multiple Fractures
Total Point Values from Physical Presentation of Injury			
Trauma Score _____ Sum of Points			

Pediatric Trauma Pearls

- Trauma is the leading cause of death in children >1 yo
- "*Pediatric*" Definition
  - 14 or younger = Pediatric treatment/destination
  - 15 or older = Adult treatment/destination
- Pediatric Hemodynamics/Shock
  - Circulating blood volume = 80 mL/kg
  - Hypotension = < 70 + (2 x age) mmHg
  - Kids compensate well early for decreased fluid volume
    - **Increased Heart Rate = compensatory mechanism**
    - **Blood pressure does not decrease until <u>just before</u> cardiovascular collapse**
  - Hemorrhagic Shock → limit IV fluids to minimum to maintain pulse/capillary refill (10 mg/kg boluses)
- Pain management

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- Kids pain is undertreated/undermedicated
- Consider **Fentanyl Intranasal (IN)**
- Ketamine IN may be used after discussion with medical control

Traumatic Mechanisms

- High-Energy Mechanisms (a.k.a. “Trauma Criteria”) → see DEST-02
  - Falls = 2-3 times child's height
    - Consider significant head injury with moderate height, such as the parent's shoulder, shopping cart, etc.
  - MVC unrestrained (including car seat not attached to base/seat), child ejected, etc.
  - Kid/Bike vs Auto → Impact considerations:
    - Impact 1 = lower legs (turns towards car)
    - Impact 2 = chest/abdomen/pelvis
    - Impact 3 = projectible → head first
  - Crushed by object (dresser, bookcase, TV, etc.)
    - Head injury common
    - **Chest injury (crush) = asphyxia** (respiratory arrest)
- Non-accidental trauma (Child Abuse) → *See P-03 for more information/examples*
  - Can be physical, emotional, sexual, and/or neglect (usually 2 or more)
  - Pay attention to siblings for signs of abuse
  - Evaluate environment, cleanliness, paraphernalia, interactions, etc.
  - **Suspect If stories do not match**
  - Clearly document reported histories and specific exam findings**, but do not guess/document the cause,** just the evidence.
  - Report to supervisor and receiving hospital so that DCS may be contacted.

Anatomy of Pediatric Injuries

- Head Injury:
  - Infants (<12 months)
    - Fontanelle still open
    - Allows increased swelling/volume before deterioration
    - Monitor for delayed symptoms/decreasing mental status
  - Altered LOC → Child should cry when examined, but should be consolible by family. If not, consider significant pain or change in mental status.

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    - **Vomiting with changed/decreased LOC = BAD**
    - Treatment:
        - Place C-Collar if any suspicion of spinal injury
        - Place head of bed up 30-45 degrees, if possible
- Spinal Injury:
    - SCIWORA
        - Loose ligaments can lead to a spinal cord injury (SCI) without evidence of bony injury (radiographic abnormality, RA)
        - Clinical presentation = **neuro complaints <u>without</u> pain** (paresthesias in hands/feet)
        - Tx: High index of suspicion & **low threshold for C-Collar & ED evaluation**
    - Location
        - <8 yo = higher cervical
        - >8 yo = lower cervical (similar to adults)
- Chest Injury
    - Flexible cartilaginous ribs = less rib fx → less pneumothorax
    - More pulmonary contusions (bruising) → **monitor SpO2**
- Abdomen & Pelvis
    - Liver, spleen and kidneys extend below the rib cage
    - Grunting/splinting may indicate abdominal bleeding
    - Suspect if **improper seat belt use or handlebar injury**
- Ortho
    - Long bone fractures more common
    - Remember pain management and appropriate splinting

Special Situations

- Burns
    - Keep warm thermoregulate
    - Fluid replacement (LR) if >20% BSA:
        - < 5 yo = 125 mL/hr
        - 6 - 13 yo = 250 mL
        - > 13 yo = 500mL/hr

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T-02
TRAUMATIC CARDIAC ARREST

First Responder
EMT
AEMT
Paramedic

1 Is the Mechanism consistent with a **severe injury?**

PENETRATING

Severe injury to the head, neck, and/or torso.

BLUNT

Significant (i.e. high-energy) **mechanism** of injury.

- High-impact MVA/MCC/Car vs Pedestrian
- Unbroken fall >20 feet (or 3 times height)

NO → Atypical/Minor Mechanism

ASPHYXIATION/MEDICAL

Is the cause of arrest likely **medical** in nature? *(i.e. the mechanism does not match the signs/symptoms)*

- **Falls from standing**
- Minor mechanism MVA

OR

Is the mechanism consistent with **asphyxiation** (respiratory arrest)?

- **Hanging**
- **Drowning**
- Chest Entrapment (e.g. trench collapse)
- Choking/Other Airway obstruction

Resuscitate as a Medical Arrest

Discontinuation in Medical Arrest	X-02
OR	
Contact Medical Control if efforts are felt to be futile	M

- Treat on Scene as able
- Transport to Nearest ED if needed

YES

2 Does the patient meeting ANY of the following **"Critical Criteria"**?

- Arrest is witnessed by an EMS provider
- Patient is a **minor** (<18 years old)
- Patient is obviously **pregnant** (can palpate uterus above the umbilicus)
- Any concern for **scene/provider safety**
- Is there ANY doubt in the medics mind about the events surrounding the arrest

OR

Does the patient have a **Potentially Survivable Injury**?

If any question: Contact Online Medical Control *or* Treat & Transport

YES **Continue Resuscitation** → **per Guidelines *(below)***

NO Consider Withholding or Discontinuing Resuscitation → Discontinuation in Traumatic Arrest X-03

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T-02 TRAUMATIC CARDIAC ARREST		First Responder EMT AEMT Paramedic

Treatment Guidelines for Patients in Traumatic Cardiac Arrest:

Limited On-Scene Procedures:

X — **Control Hemorrhage**, use Tourniquet as needed — T-P4

- Control bleeding with direct pressure, wound packing and/or tourniquet.

A — **Airway Mgmt/Placement** per Airway Maintenance — A-01A

- Provide basic airway maneuvers (e.g. jaw thrust or chin lift) as appropriate.
- Place BIAD on scene if pulseless.

B — Consider Bilateral **Needle/ Finger Thoracostomy** — T-P2

- Cover open (sucking) chest wounds
- Decompression if any concern over tension pneumothorax

C — AED AND *consider* CPR — *See below*

GO! — For any potentially viable patient, scene time should **always be less than 10 minutes** (from extrication).

M — Contact Medical Control for further orders or if efforts are felt to be futile

Additional Procedures *(as able)*

- Reinforce dressings
- Provide secondary wound care
- Splint extremities

Monitor airway and provide appropriate interventions to **ensure adequate oxygenation**.

Monitor respiratory status and **repeat decompression** if needed

Blood Products / IV Fluid per Hemorrhagic Shock — T-04

- Start IV/IO (2 large bore peripherals)
- Limit IV fluids as able

Prevent hypothermia: warm patient as able

Blunt Trauma: **Spinal Immobilization** — 1-06

- Penetrating: do not immobilize

Always consider Non-Traumatic cause and treat as appropriate

- Procedures may be performed while awaiting extrication, but these should never delay transport.
- All care during transport must be performed while in appropriate restraints. If this cannot be ensured, defer procedures to destination.

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T-02 TRAUMATIC CARDIAC ARREST		First Responder EMT AEMT Paramedic

CPR (Chest Compressions) in Traumatic Arrest

In patients with a severe traumatic mechanism–clearly consistent with a state of hemorrhagic shock (i.e. not an isolated head injury)--and are pulseless, chest compressions may be withheld at the attending paramedic's discretion in lieu of other treatments directed at bleeding control, resuscitation with blood products, and safe transport to the emergency department for definitive care.

If there is ANY question as to whether to or not to administer chest compressions, they should be initiated and continued until care can be discussed with online medical control.

KEY POINTS:

- If there is a patient with obviously non-survivable injuries (GSW with brain matter exposed, massive trauma to the chest/abdomen/pelvis, etc.) that has any spontaneous movement (e.g. agonal respirations), either:
  - Begin resuscitative efforts, or
  - Contact Medical Control to clarify resuscitative goals
- Resuscitative efforts in these patients should generally be limited to critical interventions only (hemorrhage control, basic airway management and chest decompression).
- Transport of these patients should occur safely with limited additional interventions (e.g. may withhold IV access, fluid administration, etc.) while en route, unless they can be performed with the EMS providers properly restrained.

QI Review Parameters:

1.

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T-03 CARE DURING EXTRICATION		First Responder EMT AEMT Paramedic

TREATMENT PRIORITIES DURING EXTRICATION

Limited Life-Sustaining Care:

X — Control Hemorrhage

- Apply Tourniquet(s)
- Pack trunk/junctional wounds
- Dress any uncontrolled bleeding

A — Place a NRB with 100% O2

Place Airway Adjuncts

- Place NPA/OPA as needed
- Place BIAD (iGel or KingLT) if airway or respiratory effort compromised

B — Support Breathing (as able)

- Cover open (sucking) chest wounds
- **Needle Thoracostomy [T-P2]** if any concern over tension pneumothorax
- Ventilate via BIAD (if needed/able)

*** — Other Considerations**

- Place C-Collar if possible spinal injury
- Consider splinting deformities for hemorrhage control or comfort

For Discontinuation of Resuscitation in Traumatic Arrest, *see below*

Additional Symptomatic Care

Pain Management - See RX-02

- Toradol 30 mg IM
- **Fentanyl 50-100 mcg IM or IN**
- Morphine 5-10 mg IM
- Dilaudid 0.5-1 mg IM

Sedation/Anxiolysis - See RX-04

- **Versed 2-5 mg IM or IN**
- Ativan 2 mg IM
- Valium 5 mg IM

For Severe Pain/Combativeness

- **Ketamine 100-400 mg IM**

Pediatrics (<40 kg) utilize RX-02 & RX-04 and/or contact medical control

Repeat medications as per RX-02 or RX-04

Contact Medical Control for further guidance or if efforts are felt to be futile — **M**

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T-03 CARE DURING EXTRICATION		First Responder EMT AEMT Paramedic

Discontinuation of Resuscitation in Traumatic Arrest (see X-03 for further)

- If a patient
  - **Is pulseless and apneic** (from an obviously traumatic arrest), **DO NOT begin resuscitation** (or extrication).
  - Still has a pulse/respiratory effort, then begin interventions as above.

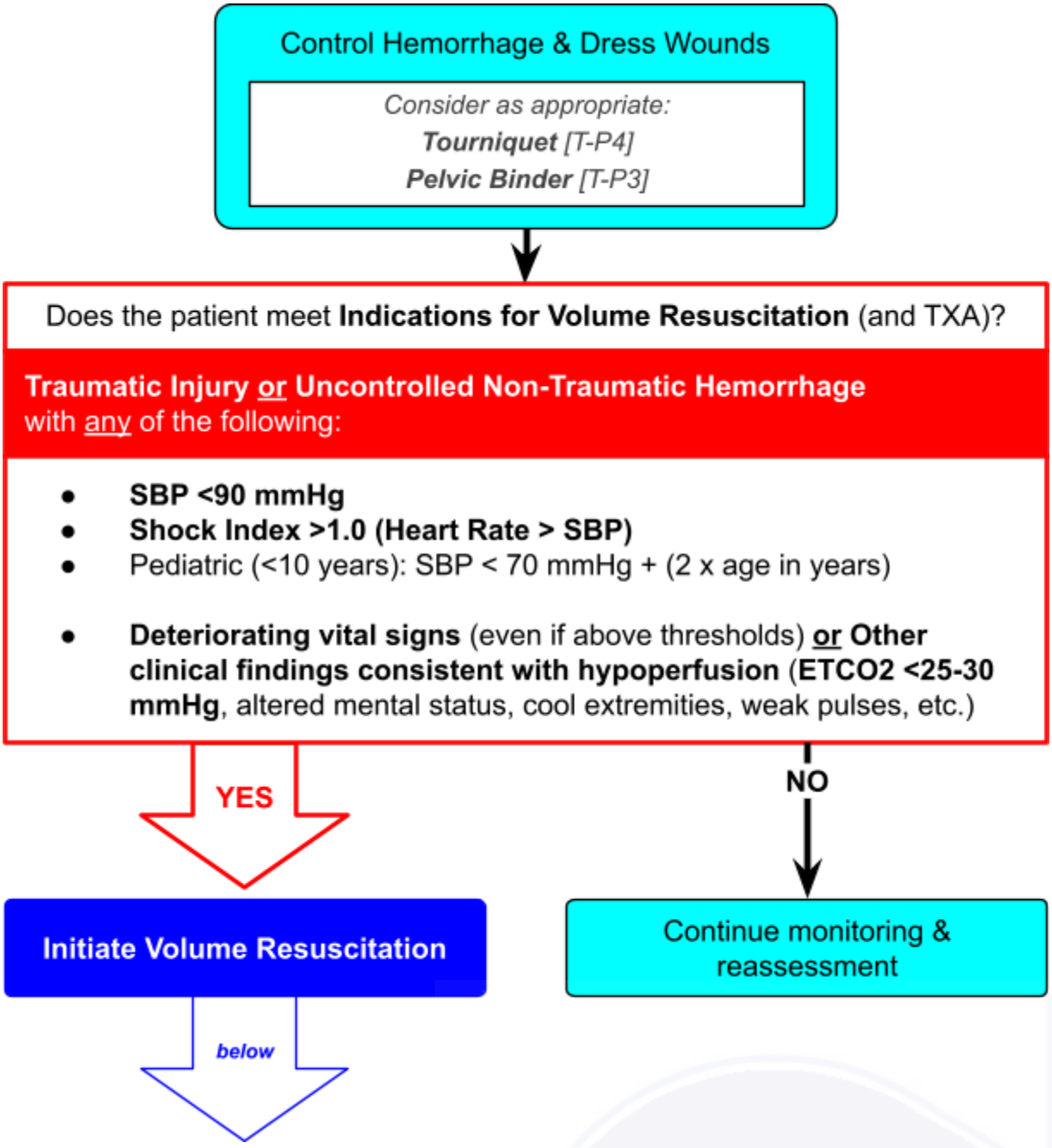
- **Resuscitative (and extrication) efforts may be terminated IF the patient….**
  - Has severe injuries incompatible with life, ***and***
  - Becomes pulseless and apneic, ***and***
  - Has not yet been extricated.

NOTES:

- This protocol is meant as a **guide for goal-directed therapies during the extrication of a patient from entrapment (pinned MVA, trench rescue, etc.)**
- Clinical care should focus on the basics of trauma and medical management, including controlling hemorrhage, maintaining the patient's airway, and providing a reasonable degree of respiratory support.
- **Outside of basic life support, care should be directed at providing basic comfort measures including pain control and sedation as necessary.**
- Each situation is different, and the clinical management of the patient must be balanced with the logistical needs and perceived clinical benefit of the extrication.

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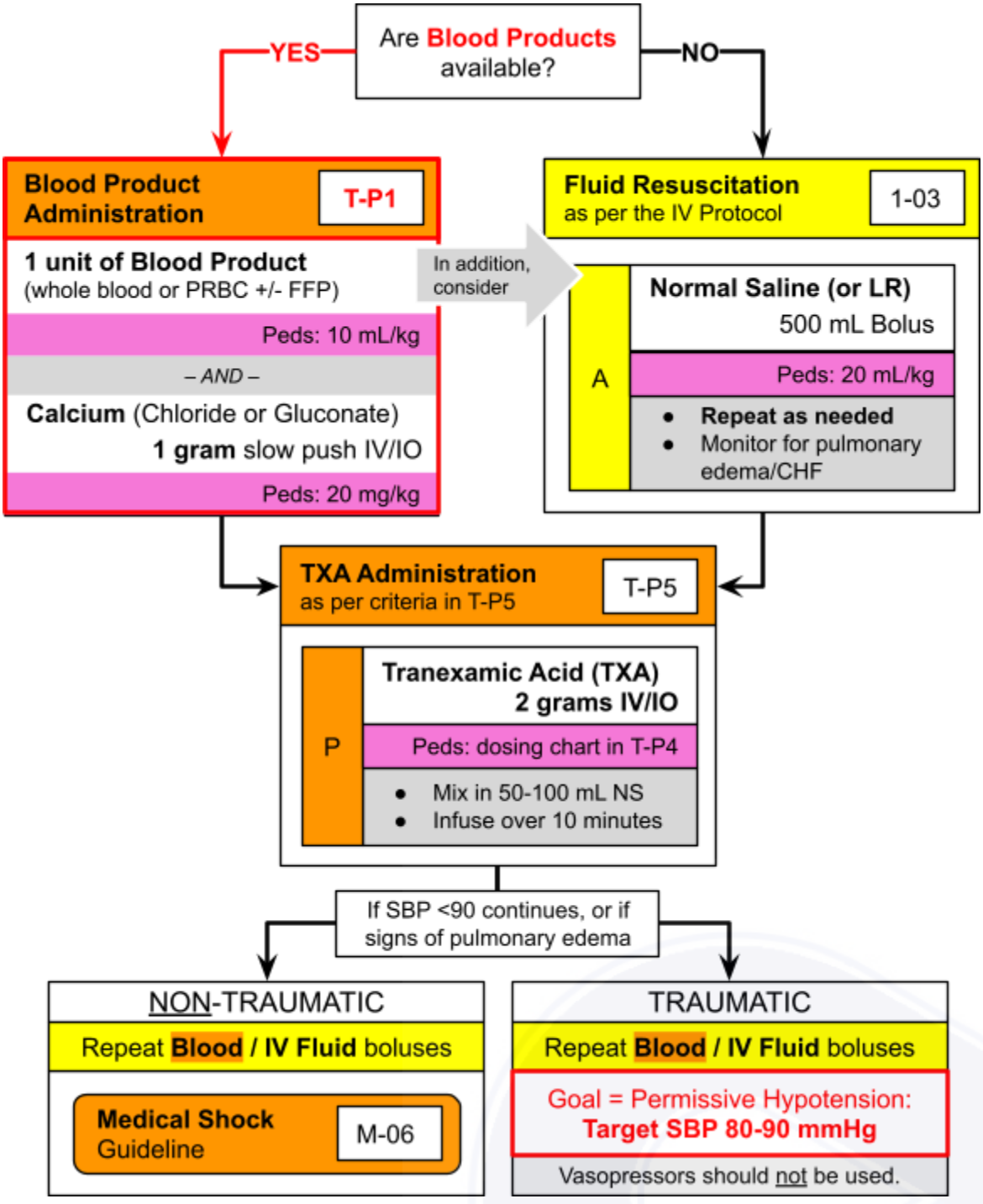
First Responder
EMT
AEMT
Paramedic



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Volume Resuscitation



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T-04 HEMORRHAGIC SHOCK		First Responder EMT AEMT Paramedic

KEY POINTS:

- If a patient presents with relatively minor trauma (i.e. a fall from standing), always consider alternative causes of hypotension (GI Bleed, Sepsis, overdose, etc.)

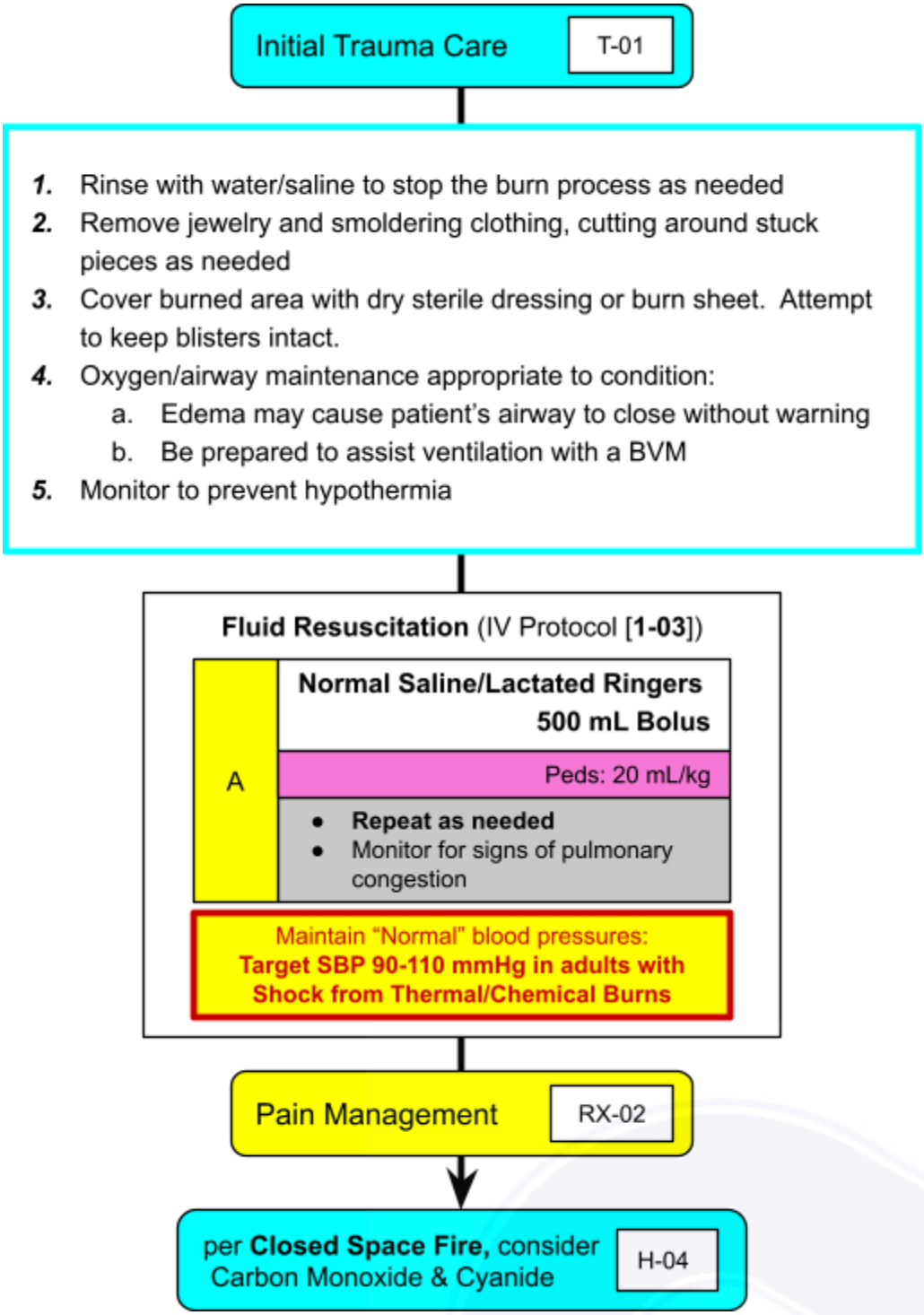
QI Review Parameters:

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**** also see ** Corrosive Agents/ Chemical Burns [H-05] Electrical Burns [T-06]**

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T-05 THERMAL BURNS	**** also see ** Corrosive Agents/ Chemical Burns [H-05] Electrical Burns [T-06]**	First Responder EMT AEMT Paramedic

KEY POINTS:

- Always consider secondary trauma (e.g. internal bleeding) with burns: **If hypotensive on initial presentation, treat as per the Hemorrhagic Shock Guideline [T-03].**
  - Hypotension from burns generally develops later as the fluid shift occurs.
  - Also, consider Cyanide Toxicity [H-06] if persistent, fluid-resistant hypotension with smoke inhalation.
- If hypotensive from extensive burns, fluid resuscitation (with lactated ringers solution) should be titrated to maintain the patient's blood pressure in the *normal* range. Utilization of specific formulas for fluid volume (e.g. Parkland) is no longer recommended.
- If there is *any* concern of Carbon Monoxide [H-03] exposure, treat with 100% O2 via non-rebreather mask.
- Avoid hypothermia:
  - Burn patients lose the ability to thermoregulate.
  - Cover burns with dry dressings and cover the patient with blankets if needed. Increase ambient temperature as able.
  - Never apply ice or cool packs to extensive burns (e.g. >10% BSA)

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T-05 THERMAL BURNS	**** also see ** Corrosive Agents/ Chemical Burns [H-05] Electrical Burns [T-06]**	First Responder EMT AEMT Paramedic

Critical Burns → transport <u>directly</u> to a burn center if no other associated trauma

- Critical Criteria for a Burn Center:
  - >20% BSA second-degree or >10% BSA third-degree
  - >10% BSA in small children or the elderly
  - Significant (i.e. circumferential or near-complete coverage) of second/third-degree burns to the face, hands, feet or genitalia
  - High-voltage electrical (>600 Volts) burns
  - Significant airway burns
    - I.e. facial burns *plus* smoke inhalation (soot) and/or thermal burns in the nares or oropharynx.
    - Simple smoke inhalation (i.e. no thermal burns) does not require evaluation at specialized burn or trauma centers.
  - Extensive chemical burns or chemical burns with known high-potency/high-morbidity substances (e.g. hydrofluoric acid).
- **Traumatic injuries <u>always</u> take priority over burns** → critical burns with evidence or concern for concomitant traumatic injury (falls, blast injury, etc.) should be transported to the nearest appropriate trauma center for evaluation and stabilization prior to transfer to a more distant burn center.
- Mild to moderate burns (i.e. not critical), not complicated by airway compromise or other traumatic injury may be evaluated at most emergency departments,

Destination: <u>Aeromedical transport to a distant burn center is recommended</u> IF they are willing and able to transport directly.

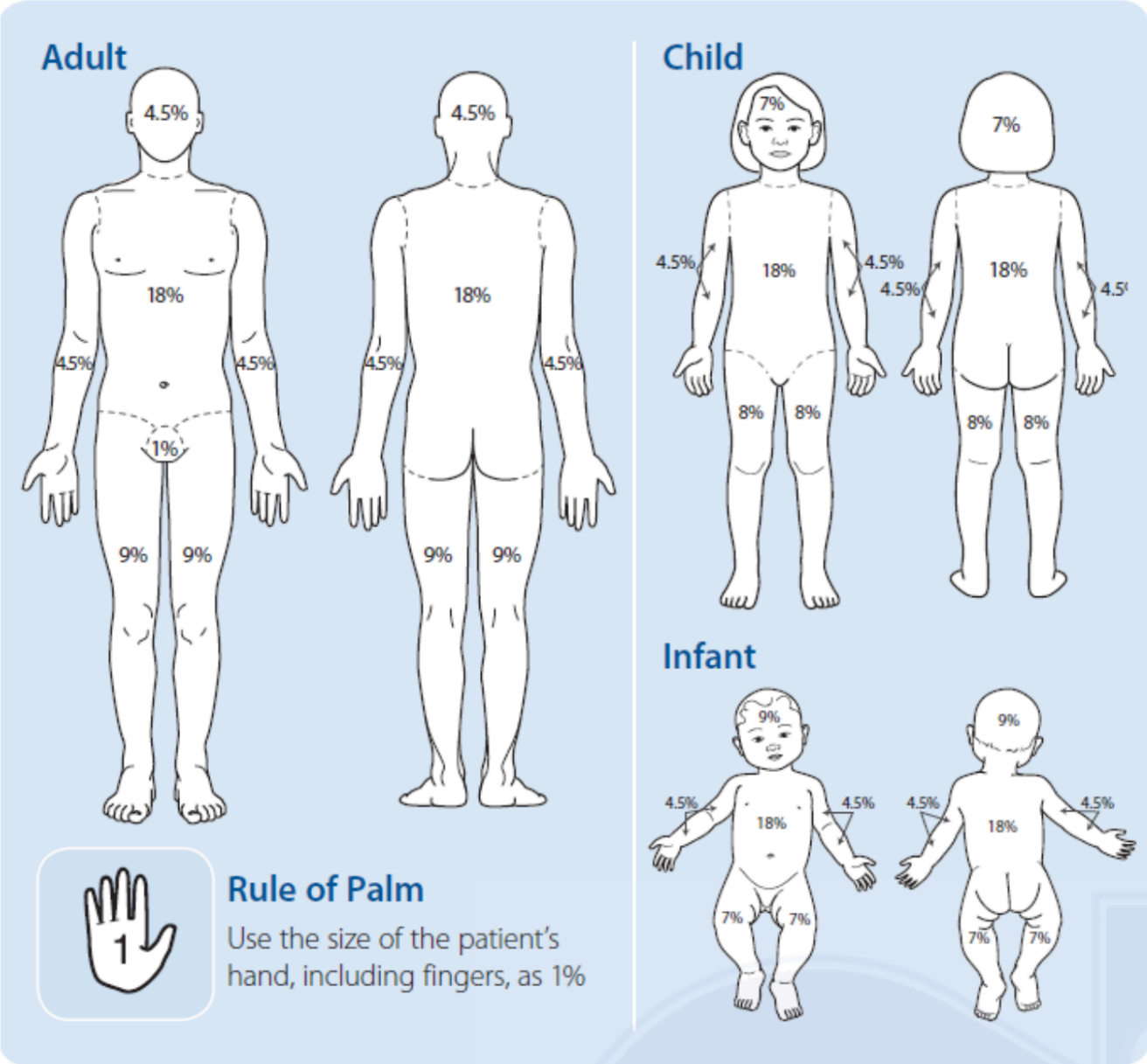
- **You may bypass local trauma centers.**
- If aeromedical will not transport directly to a burn center, transport by ground to a local trauma center for initial stabilization.

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**** also see ** Corrosive Agents/ Chemical Burns [H-05] Electrical Burns [T-06]**

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Body Surface Area (BSA%)



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T-05 THERMAL BURNS	**** also see ** Corrosive Agents/ Chemical Burns [H-05] Electrical Burns [T-06]**	First Responder EMT AEMT Paramedic

Pediatric Burns

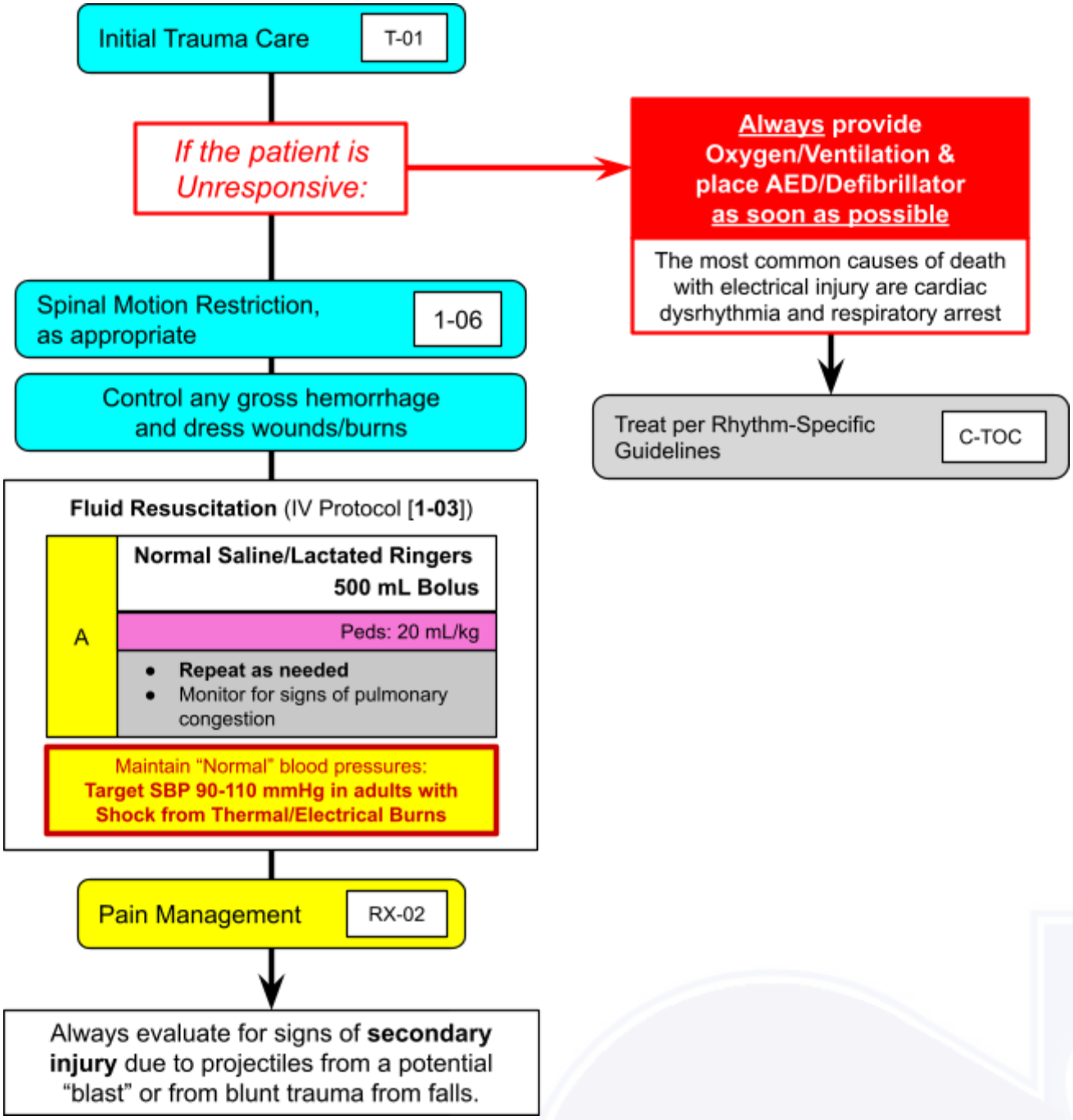
- Keep warm!
- Utilize age-specific diagram (*above*) to estimate BSA%
- Fluid replacement (LR) if >20% BSA:
  - < 5 yo = 125 mL/hr
  - 6 - 13 yo = 250 mL
  - > 13 yo = 500mL/hr

QI Review Parameters:

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T-06 ELECTROCUTION/ LIGHTNING INJURY		First Responder EMT AEMT Paramedic



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T-06 ELECTROCUTION/ LIGHTNING INJURY		First Responder EMT AEMT Paramedic

INJURY MECHANISMS

- Current through high resistance → creates **HEAT!** **= tissue damage**
  - Bone has the highest resistance → deep burns not visible on the surface
  - Dry skin has a high resistance → prevents conduction
  - More water content (e.g. blood, muscle, wet skin) = low resistance → low heat production/damage
- Current can also cause **electrical depolarization** → neurologic dysfunction and <u>interference with cardiac conduction</u>
  - Low voltage (household, <600V) alternating current → V-fib
  - Direct Current (DC) or high-voltage AC (>1000V) → Asystole
    - **Generally transient with spontaneous ROSC**
    - **Also associated with paralysis of the respiratory center in the brain = <u>respiratory arrest despite cardiac ROSC</u>**
- Secondary/tertiary injuries can be caused by
  - **Muscle contractions** →
    - Fractures (e.g. spine) or dislocations due to uninhibited muscle activation.
    - Cause the body to be “thrown” away from the source, causing any type of blunt force trauma
  - Some electrical exposures may be associated with **blast injury**, leading to barotrauma, thermal burns and penetrating injury from projectiles.

TREATMENT APPROACH

- Always start with the ABC’s!!! → Defibrillate, Oxygenate & Ventilate - paralysis of the respiratory center is an easily reversible cause of preventable death with electrocution.
- Basic Burn/Wound Care → Similar to thermal or chemical burns.
- Other Injury Concerns
  - **<u>Rhabdomyolysis</u>** (muscle breakdown) **can lead to (1) compartment syndrome** (swelling of muscles cutting off blood supply to the extremity) **and (2) renal failure.**
    - Prehospital treatment is with bolus and (lots of) maintenance IV fluids
  - Ocular Injury = cataracts can develop over several weeks
  - Neurologic injury - *highly variable* in presentation from peripheral nerve injuries to seizures, spinal cord injury, etc.

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T-06 ELECTROCUTION/ LIGHTNING INJURY		First Responder EMT AEMT Paramedic

ELECTRICITY 101

- Ohm's Law: V = IR
  - Voltage (V) = "pressure" (potential) of electricity
  - Current (I) = flow (i.e. amount) of electricity, measured in amperes ("amps", A)
  - Resistance (R) = hindrance to current, measured in Ohms
- Voltage
  - High Voltage - typically >1000 volts (technically >600 V)
    - >1000 V associated with a high incidence of internal injury even with minimal external signs
    - Any exposure should be evaluated in an ED
  - Low Voltage - <600 volts
    - Generally safe at household voltages (110/220 V)
- Current Type
  - Alternating Current (AC)
    - Can cause tetanic contractions due to repeated muscle stimulation (i.e. on-then-off-then-on) leading to inability to let go of a wire/source.
  - Direct Current (DC)
    - High voltage with sudden muscle activate can cause a patient to be "thrown" from the source

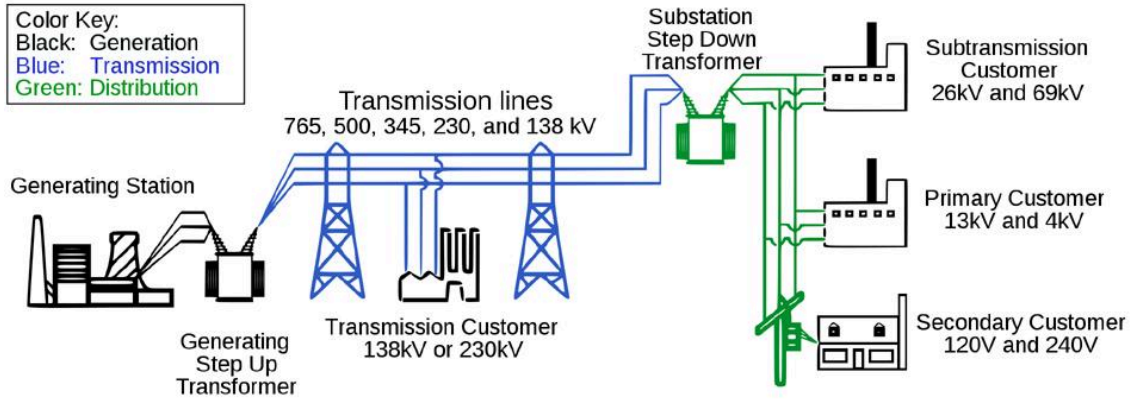
Notes:

- Power lines are almost never insulated (corrosion = dark appearance)
- Reapplication of voltage (through circuit breakers) can make the lines "jump"
- Victims and other objects (e.g. vehicles) may transmit current → never tell a patient to exit a vehicle or approach a vehicle with downed power lines nearby.
- Voltage may be transmitted through the ground via "voltage gradients" or "step voltage", discussed below.

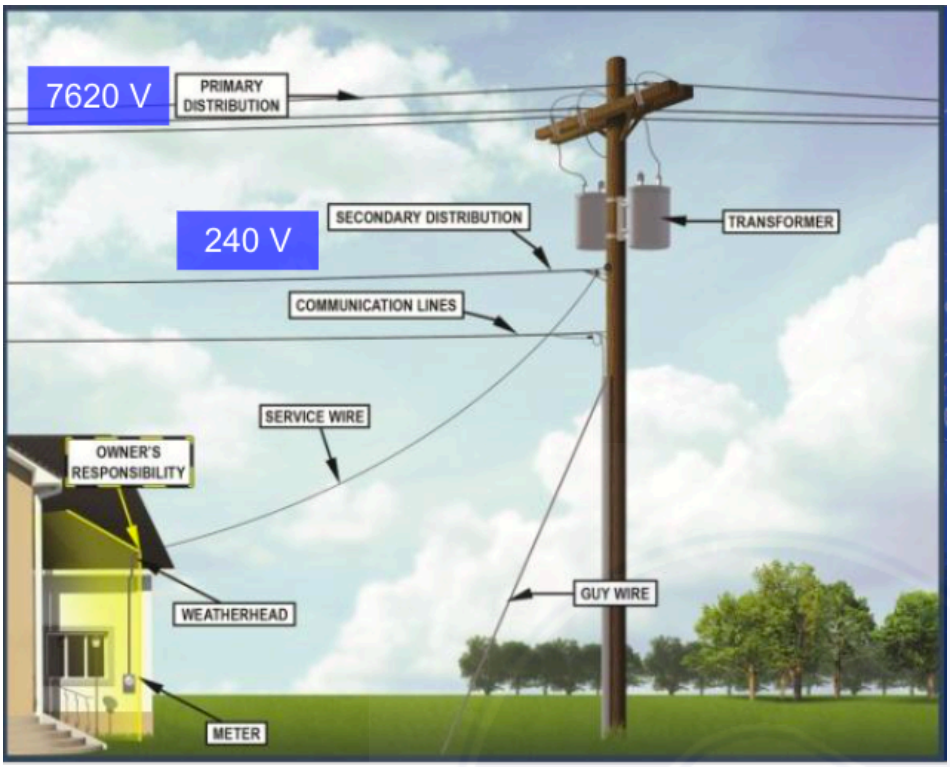
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T-06 ELECTROCUTION/ LIGHTNING INJURY		First Responder EMT AEMT Paramedic

Electrical Generation/Distribution



Household



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T-06 ELECTROCUTION/ LIGHTNING INJURY		First Responder EMT AEMT Paramedic

OTHER TYPES OF ELECTRICAL INJURY/SPECIAL SITUATIONS

LIGHTNING INJURY

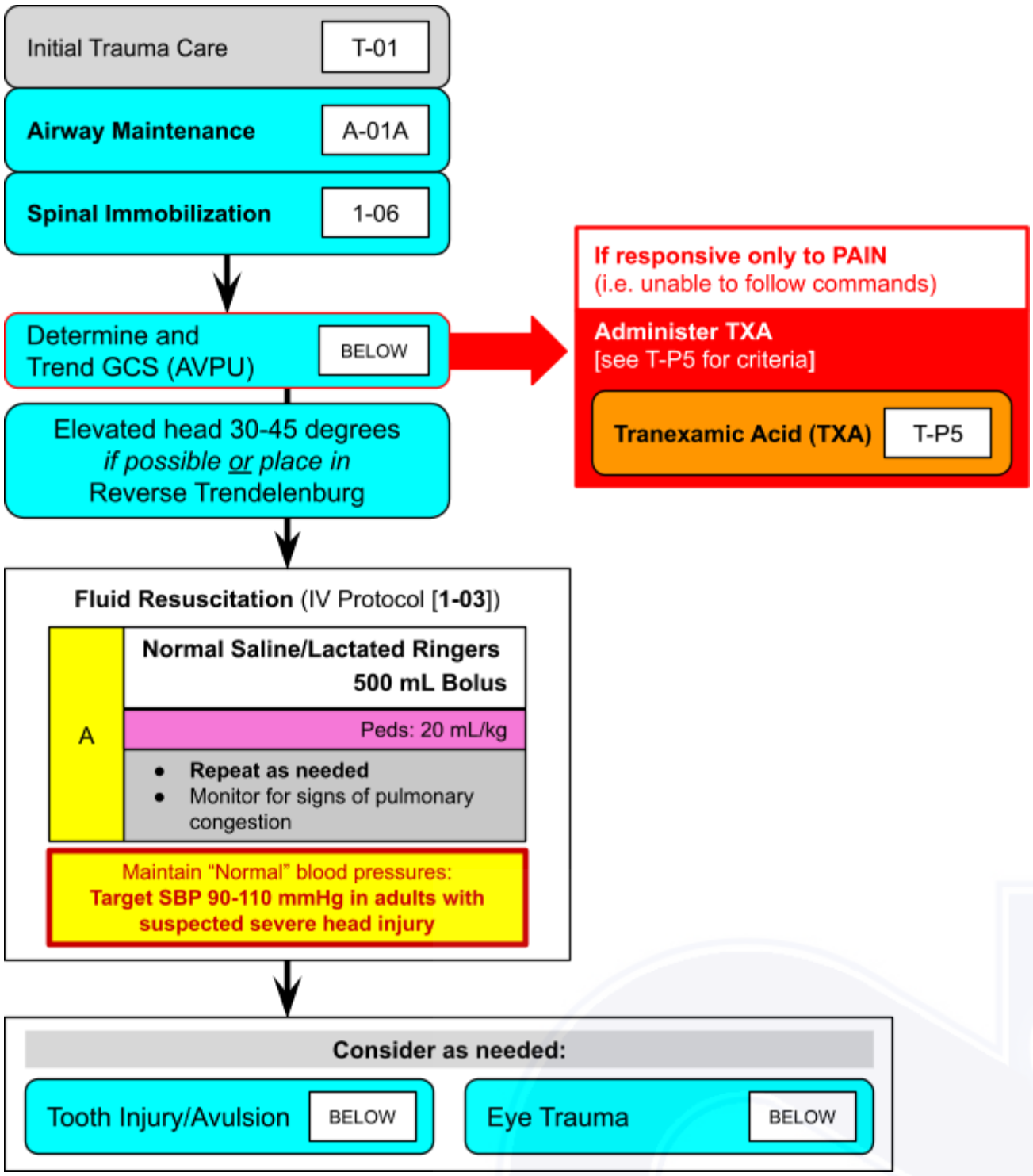
- VERY high voltage (~50,000 V), <u>but</u> very short duration.
    - "Flashover" → often travels over the surface of the body (especially if the skin is wet/damp), rather than entering the body (i.e. less likely to cause internal injury or burns)
    - Superheating of water on the skin can cause a rapid vaporization causing an "explosion"
    - Also creates the pathognomonic "ferning pattern" (Lichtenberg figures)
- **Injury = <u>transient asystole with persistent paralysis of the respiratory center,</u> ultimately leading to respiratory arrest in most patients who do not survive (10-30%).**
- **If the patient survives the strike they are very unlikely to have any substantial problems.**
- Electrical current from lightning can be transmitted through multiple mechanisms:
    - Directly…simple enough.
    - From other struck objects such as a nearby tree ("side flash").
    - Indirectly through a conducting medium such as a telephone line ("contact strike").
    - Through **"ground current" or "step potential"**
        - This occurs when the electrical current flows through the ground → as it gets further from the source, resistance causes the voltage to decrease.
        - If each foot is in an area of differing voltage, the potential difference between the two will create a current up one leg and down the other.

ELECTRICAL CONTROL DEVICES (e.g. TASER)

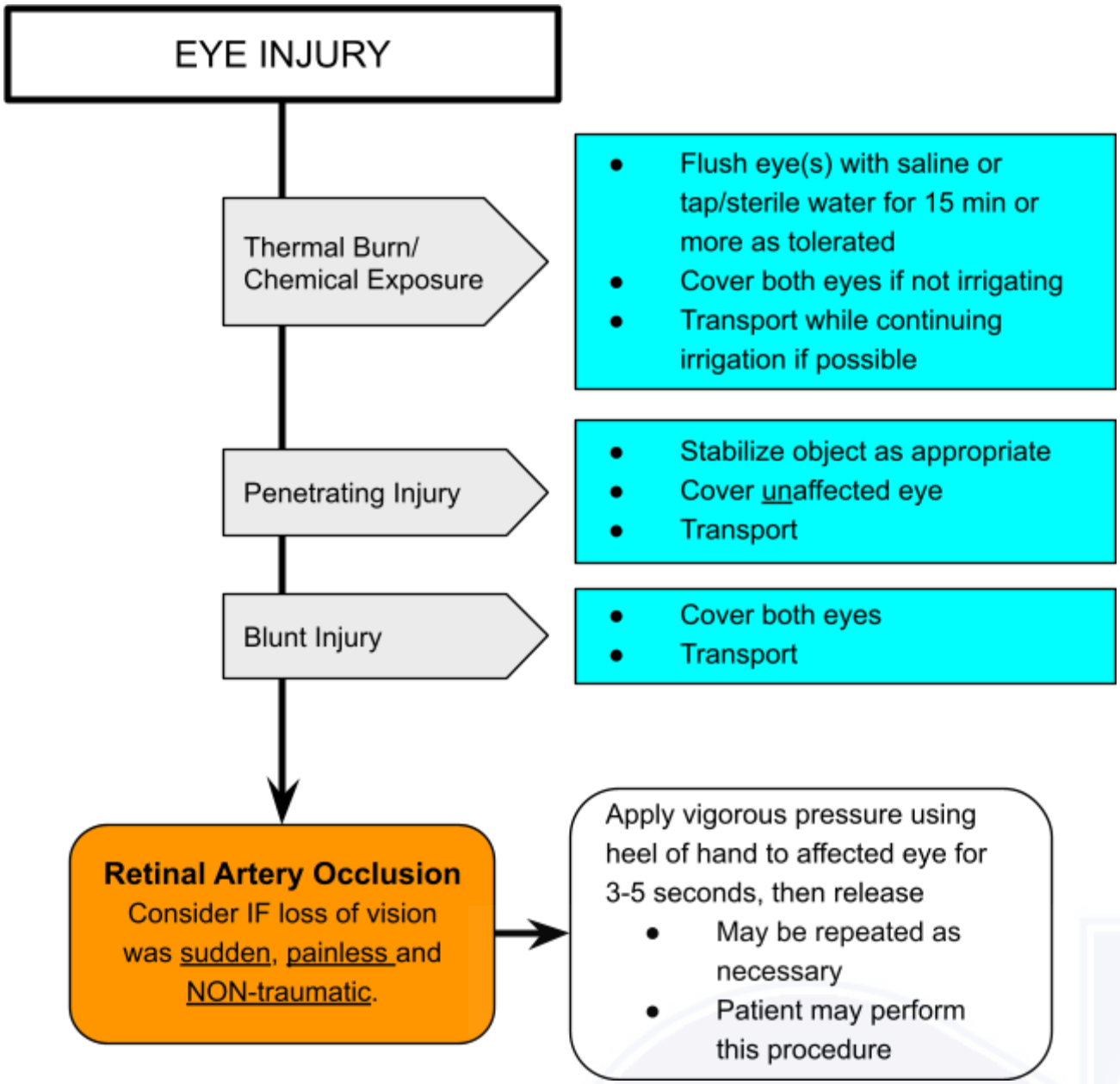
- Like lightning, high-voltage but **very low amperage** (current) = little threat of electrical injury
- Oscillates at 10 Hz (times/second), inducing brief involuntary muscle contractions, leading to temporary incapacitation.
- Barbs on the terminals should generally be removed, unless in the eye or genitals.
- Deaths due to individuals being subdued with these devices are **<u>not</u> due to electrical injury.** All altered patients should be assumed to be related to Excited Delirium syndrome [see P-01] with underlying acidosis and potential cardiovascular collapse.

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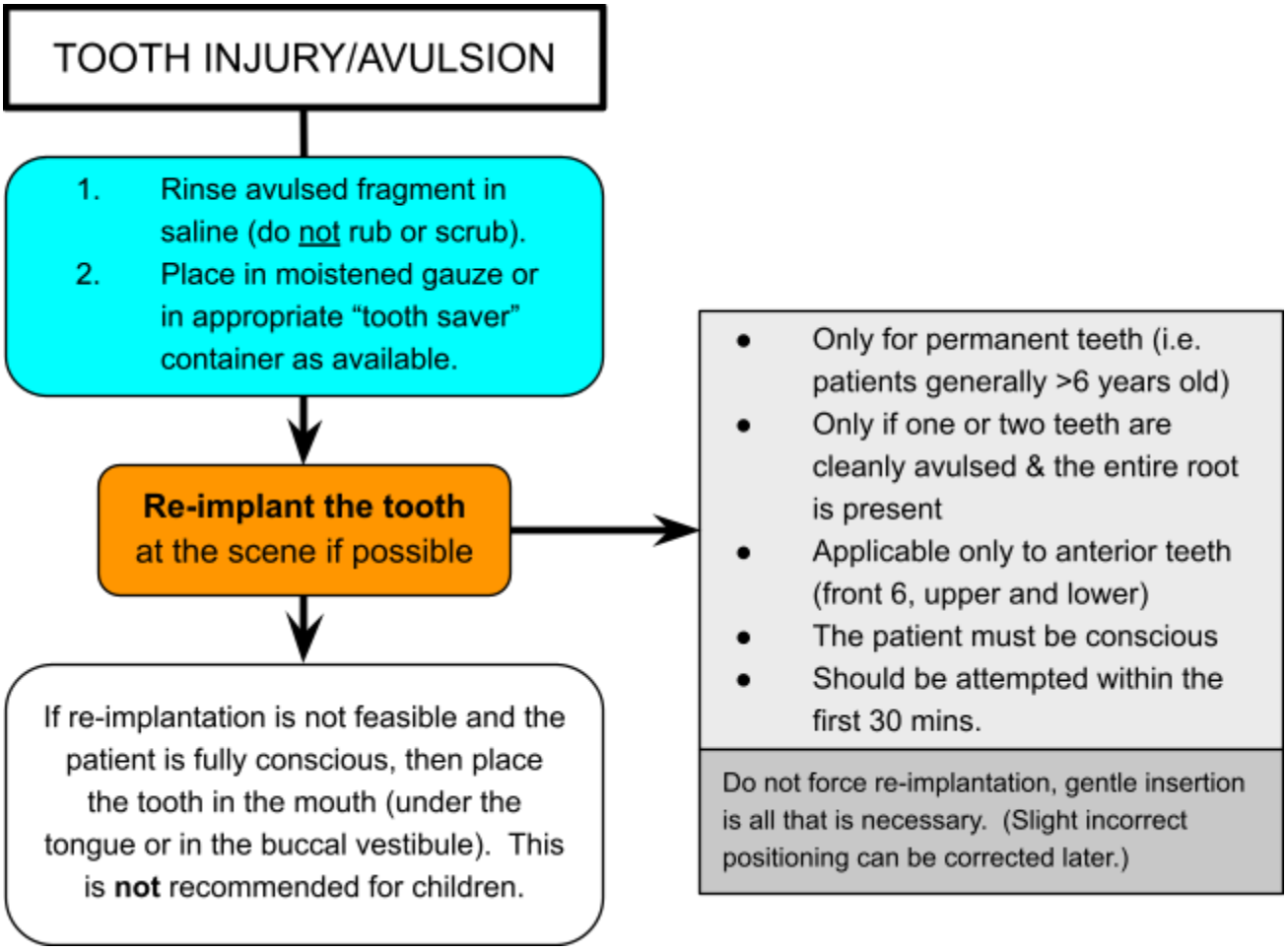
T-07 HEAD TRAUMA	Includes: **Eye Trauma & Tooth Injury/Avulsion** ***For Epistaxis: see M-07***	First Responder EMT AEMT Paramedic



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T-07 HEAD TRAUMA	Includes: **Eye Trauma & Tooth Injury/Avulsion** ***For Epistaxis: see M-07***	First Responder EMT AEMT Paramedic

KEY POINTS

- Always consider other injuries or medical problems for patients with low-energy mechanisms (e.g. falls from standing)
  - Stroke - look for localized weakness, gaze deviation, etc.
  - Sepsis - eval for SIRS sxs (hypotension, tachycardia, fever, etc.
  - Overdose
  - Hypoglycemia - **check blood glucose on all altered patients**
- Injury
  - Primary brain injury = immediate (damage is done)
    - Concussion = continued neuro symptoms with no abnormalities on CT scan
    - Epidural = middle meningeal artery
      - Rapid collection (arterial)
      - Lucid interval (classic presentation) followed by rapid deterioration
      - Dilated pupil on affected side (ipsilateral) + hemiparesis on contralateral (opposite side)
    - Subdural
      - Slow venous bleeding
      - May be rapid (immediate) or may be delayed (occult) by days or weeks
    - Subarachnoid = smaller arterial bleed
      - May be Aneurysm (non-traumatic) or Traumatic (more peripheral)
      - Generally see meningeal sxs - HA, stiff neck, etc.
    - Intraparenchymal/Intracerebral
      - Trauma may cause “bruising” within the brain
      - Hypertension may cause a spontaneous bleed
  - Secondary = PREVENT further injury
    - **Hypotension (<90 mmHg) or Hypoxia (<90%) = 50% Mortality increase**

Management of Head Injuries

- Management = AVOID H-Bombs!
  - Hyperventilation → normal ventilatory rate/ETCO2 35-45 mmHg
  - Hypotension → *see below*
  - Hypoxia → supplemental O2/maintain sats >94%

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- Hypoglycemia → check blood glucose
- Approach to Maintaining **Blood Pressure** (i.e. hemorrhagic shock vs isolated head injury)
  - Multisystem Injury: treat as hemorrhagic → permissive hypotension
  - Isolated head Injury = treat as medical → aggressive fluids +/- vasopressors
- Approach to Maintaining Airway/**Oxygenation**
  - Early O2 placement (non-rebreather)
  - Early airway management
    - NPA/OPA with BVM or BIAD (iGel or KingLT) for any compromise
    - ET Tube placement for GCS < 9
    - *Be concerned if GCS decreases by 2 or more points*
  - Avoid hyperventilation → Goal EtCO2 of 35-45 mmHg
- Approach to managing increase Intracranial Pressure (ICP)
  - Monro-Kellie Doctrine
    - Intracranial volume does not change
    - Pressure will increase unless volume can increase
  - Autoregulation processes can compensate to an extent
    - Increased ICP → hypertension and bradycardia (Cushing's Response)
    - Excessive pressure → herniation
  - Cerebral Perfusion Pressure (CPP) = MAP (Mean Arterial Pressure) - ICP (Intracranial Pressure)
  - Treatment:
    - Elevate HOB 30-45 degrees if able
    - Maintain blood pressure in normal range

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T-07 HEAD TRAUMA	Includes: **Eye Trauma & Tooth Injury/Avulsion** ***For Epistaxis: see M-07***	First Responder EMT AEMT Paramedic

AVPU Scale	
A	**Awake/Alert** = Normal mental status (awake or awakens easily)
V	**Verbal** = wakes up with encouragement & follows commands
P	**Pain** = responds only to pain; does not follow commands (i.e. localizes)
U	**Unresponsive**

Glasgow Coma Score (GCS)

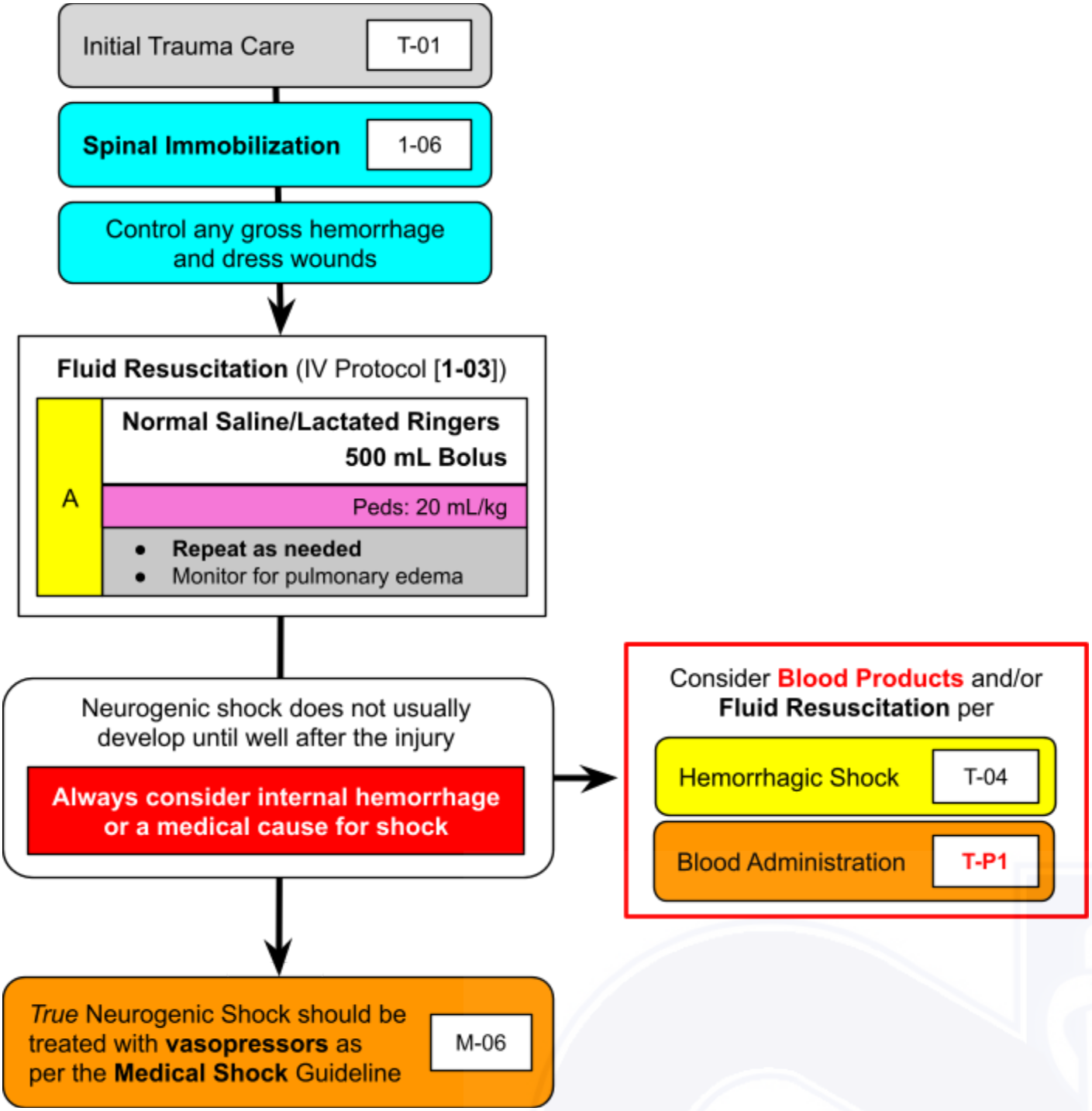
Score	**Eyes** (Max of 4)	**Verbal** (Max of 5)	**Motor** (Max of 6)
6			Follow Commands
5		Oriented	Localizes Pain
4	Spontaneous	Confused	Withdraws from Pain
3	To Verbal	Inappropriate Words	Flexion (Decorticate)
2	To Pain	Incomprehensible Sounds	Extension (Decerebrate)
1	No Response	No Response	No Response

GCS Score = Total of Eyes + Verbal + Motor

QI Review Parameters:

1.

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T-08 SPINAL CORD INJURY/ NEUROGENIC SHOCK		First Responder EMT AEMT Paramedic

KEY POINTS:

- Signs of Spinal Cord Injury (Typically Bilateral):
  - Sensory loss -- will generally corresponding to the level of the injury
  - Motor weakness and/or paralysis
  - Numbness, tingling or painful burning in the extremities
- *Central cord syndrome* is an incomplete spinal cord injury and causes painful burning or sensory changes in bilateral upper extremities and spares the lower extremities.
- Unilateral (one-sided) neurologic symptoms are generally due to a peripheral nerve injury in trauma, but always consider a stroke (CVA) or increased ICP (herniation--if significantly decreased LOC).

QI Review Parameters:

1.

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First Responder
EMT
AEMT
Paramedic

Initial Trauma Care T-01

Control any gross hemorrhage and dress wounds

Penetrating object:
Stabilize object(s) & place supine with legs elevated and flexed at knees and hips if possible, position of comfort otherwise

Evisceration → Place supine with legs elevated and flexed at knees and hips. Cover evisceration(s) with saline soaked trauma dressing

Place **Occlusive Dressing** if sucking chest wound present

If pelvis is unstable, apply **Pelvic Binder (or Wrap)** T-P3

Blood Products and/or **Fluid Resuscitation** per

Hemorrhagic Shock T-04

Blood Administration T-P1

Consider Tension Pneumothorax

Are at least THREE of the following present?

A. Acute chest trauma, ecchymosis or obvious rib fractures
B. Subcutaneous Emphysema
C. Acute respiratory distress, hypoxia, cyanosis, and/or hypotension
D. Unilaterally decreased/absent breath sounds (may have hyperresonance)
E. Tracheal deviation (away from the PTX)

Consider **spontaneous** tension pneumothorax IF history of COPD/chronic lung disease and unilateral findings as above

If YES to 3 or more, consider unilateral or bilateral:

Needle/Finger Thoracostomy T-P2

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T-09 CHEST/ABDOMINAL TRAUMA		First Responder EMT AEMT Paramedic

KEY POINTS:

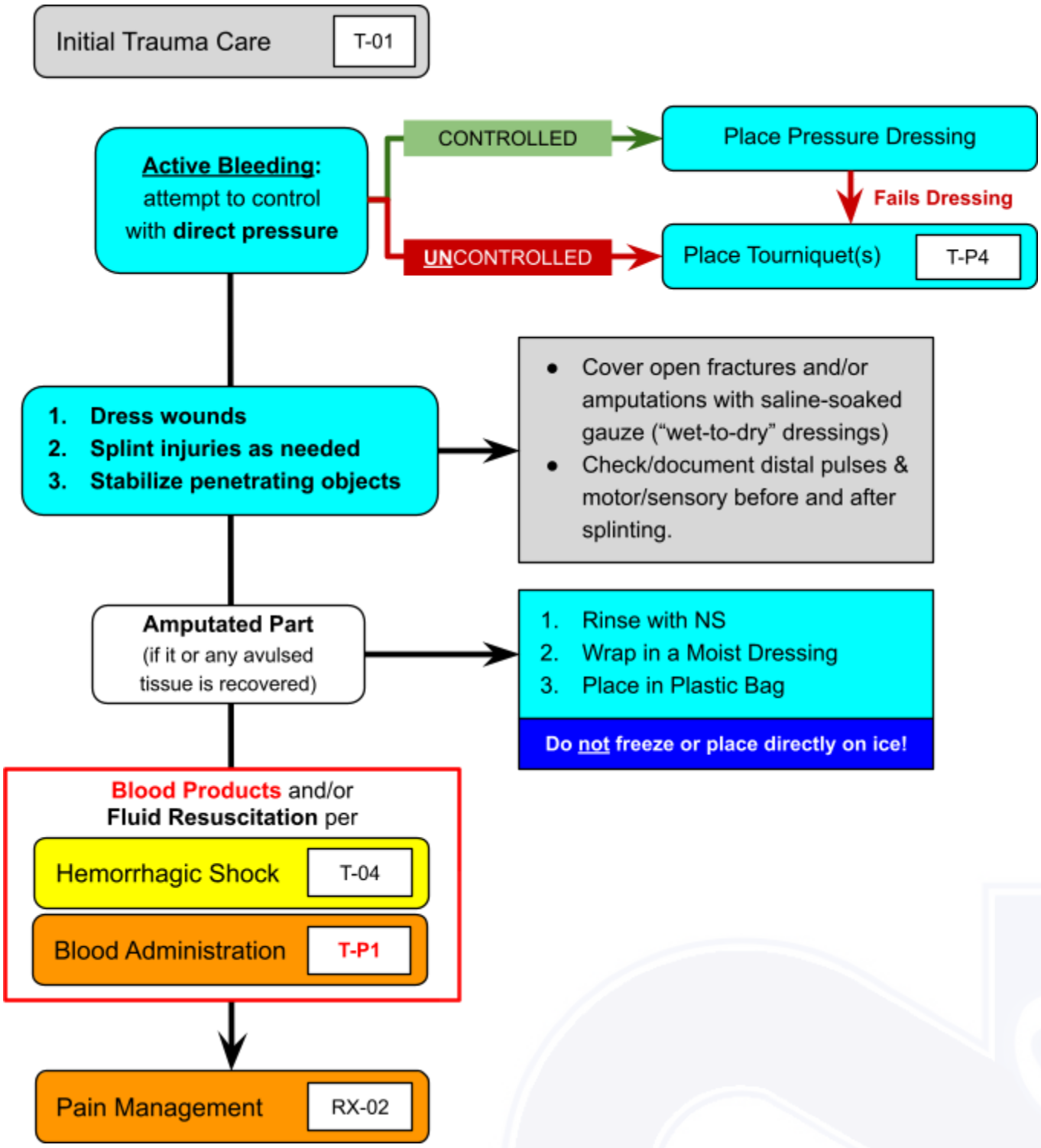
- Needle/finger thoracostomy (decompression) should generally be performed in the 4th-5th intercostal space in the mid-axillary line.

QI Review Parameters:

1.

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T-10 EXTREMITY/SOFT TISSUE TRAUMA		First Responder EMT AEMT Paramedic

NOTES:

- Peripheral neurovascular status should be documented on all extremity injuries and before and after splinting procedures.
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- If an amputation is incomplete/partial, splint the affected digit or limb in physiologic position.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of neuro-vascular compromise.
- Urgently transport any injury with vascular compromise

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TOC/NOTES: DEATH		First Responder EMT AEMT Paramedic

DEATH

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TOC/NOTES: DEATH		First Responder EMT AEMT Paramedic

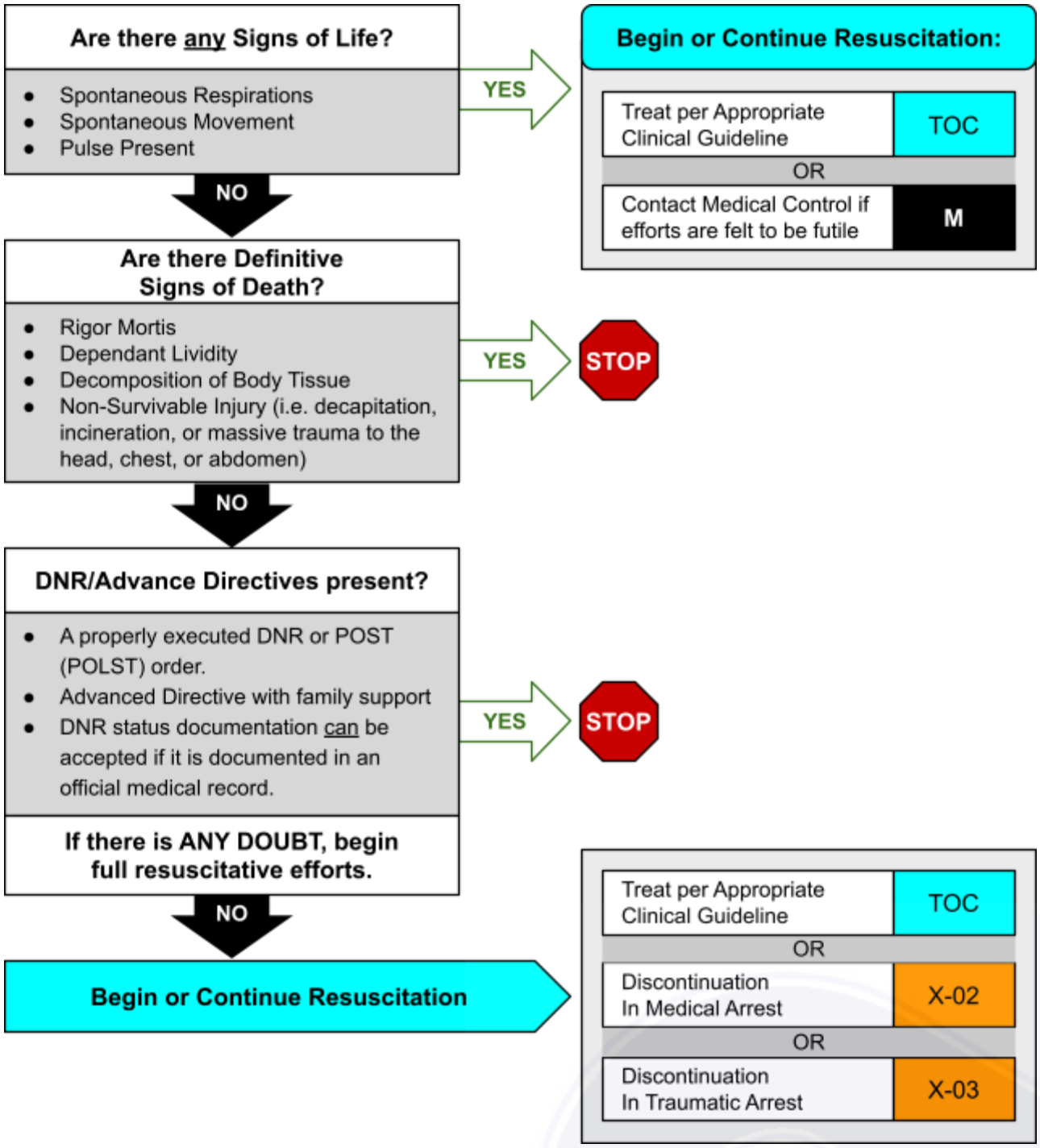
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X-01 Presumed Death on Arrival (DOA)
X-02 Discontinuation in Medical Arrest
X-03 Discontinuation in Traumatic Arrest

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X-01 PRESUMED DEATH ON ARRIVAL (DOA)		First Responder EMT AEMT Paramedic



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X-01 PRESUMED DEATH ON ARRIVAL (DOA)		First Responder EMT AEMT Paramedic

Do Not Resuscitate (DNR) Orders

When confronted with a cardiac arrest patient, the following conditions must be present in order to honor the DNR request and withhold CPR and listed therapies:

- A licensed physician (on scene/confirmed by telephone) orders that no resuscitation efforts are to take place;
- OR, The EMS provider is presented with a valid legal document/advance medical directive [*see below]* from any (US) state, AND it is clear to the prehospital provider from the document that resuscitation is refused by the patient or by the patient's surrogate who has signed the document.
- OR, The EMS provider has been approached by a person with Decision Making Capacity for the patient, and there has been a reasonable request to withhold or terminate resuscitative efforts.

If resuscitative efforts have started, **always** continue full resuscitation while treatment or termination decisions are being discussed.

NOTE: A DNR request is NOT a permanent and unchangeable document, and may be overridden IF the patient (or person with Decision Making Capacity for the patient, see **Z-02**) requests the EMS Providers perform some or all available interventions for the patient.

Generally, if there is **ANY QUESTION** as to the validity of the document(s) or the instructions themselves, or if there is **ANY QUESTION** as to the patient's wishes or family's requests, then FULL RESUSCITATION should be initiated until a physician can review the document or field personnel can discuss the patient's situation with online medical control.

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X-01 PRESUMED DEATH ON ARRIVAL (DOA)		

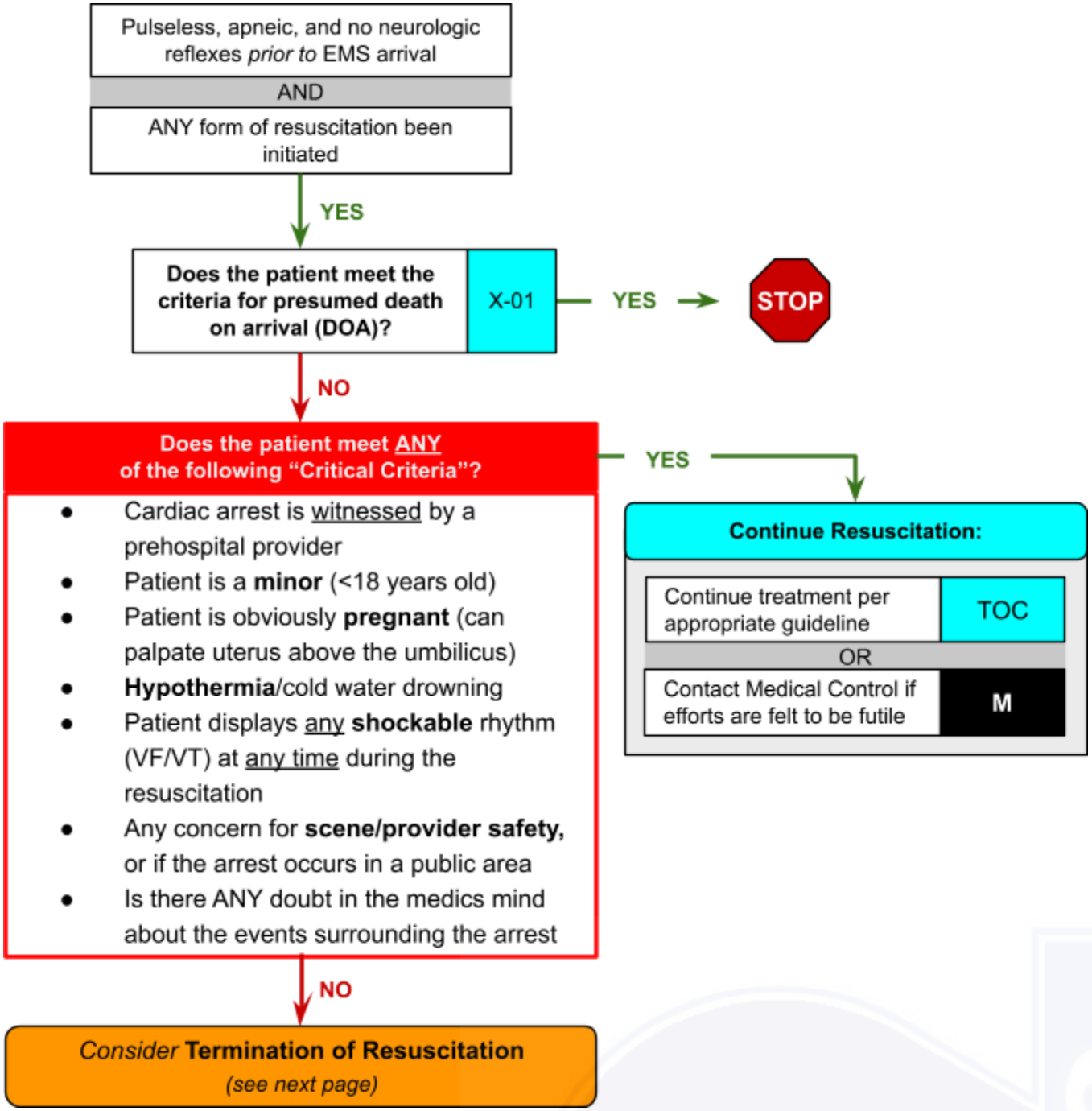
Advance Medical Directives:

There are several types of advance medical directives (documents in which a patient identifies the treatment to be withheld in the event the patient is unable to communicate or participate in medical treatment decisions).

- Specific physician orders on a Physician Orders for Scope of Treatment (POST) form
- A **Living Will** ("Declaration as to Medical or Surgical Treatment") requires a patient to have a terminal condition, as certified in the patient's hospital chart by two physicians.
    - *Note: a Living Will generally only applies to non-reversible subacute to chronic conditions and not to acute and reversible conditions/injuries.*
- Other types of advance directives may be a "Durable Medical Power of Attorney," or "Health Care Proxy", but each of these documents can be very complex and require careful review and verification of validity and application to the patient's existing circumstances.

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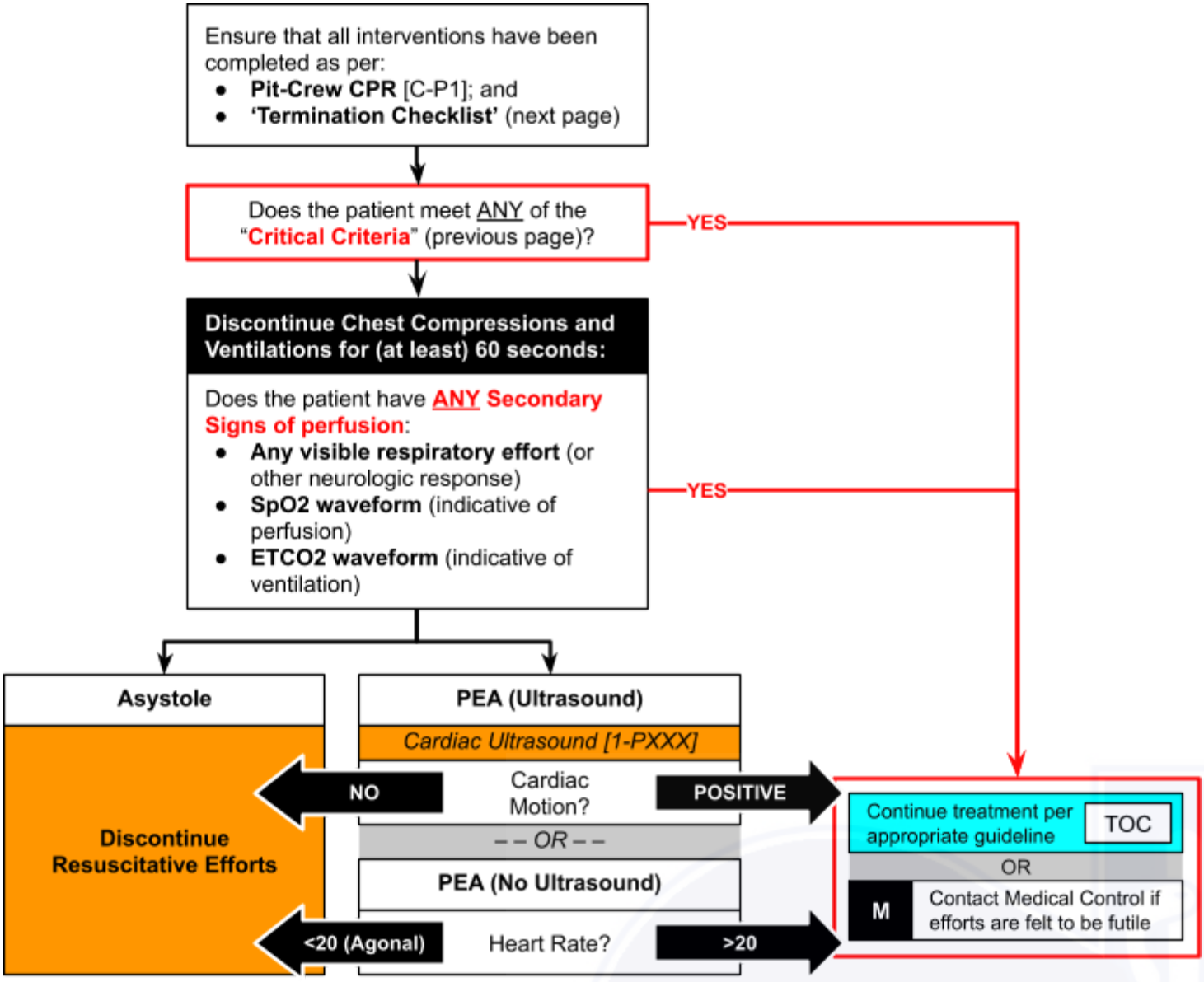
X-02 DISCONTINUATION IN MEDICAL ARREST		First Responder EMT AEMT Paramedic



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Termination of Resuscitation

Following (at least) **25 minutes** of Resuscitation



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X-02 DISCONTINUATION IN MEDICAL ARREST		First Responder EMT AEMT Paramedic

Procedure:

Termination Checklist
1. Ensure **ALL** of the following <u>interventions</u> have been completed:
❑ **High quality CPR** is being performed. ❑ **AED or Continuous ECG monitor** has been used throughout the resuscitation. ❑ **Advanced airway** has been placed (ET Tube, King LT, iGel, etc.), <u>and</u> the placement has been confirmed by appropriate means. ❑ Patient has been adequately **oxygenated and ventilated** with 100% O2. ❑ An **IV/IO line** has been placed, with infusion of appropriate fluids and resuscitative medications.
2. If all the above have been completed, then resuscitative efforts may be abandoned **IF**:
❑ Appropriate pulseless arrest guideline has been followed, including **<u>three</u> administrations of epinephrine**; ❑ **No shockable rhythm** has been detected (i.e. only asystole/PEA) throughout the resuscitation; <u>AND</u> ❑ Patient has **remained pulseless** (i.e. no ROSC at any point) throughout the resuscitation.
Termination may be considered in other situations when the above conditions are <u>not</u> met <u>ONLY</u> when approved by online Medical Control
3. To Discontinue (*continue resuscitative efforts until the following steps have been completed)*

• Approach the family (and/or relevant bystanders) and notify them that all resuscitative have failed to restore a pulse and that transport to the hospital is not going to change the patient's overall outcome.
  ○ Bring the family (*if they desire*) to the patient's side if they are not already present.
  ○ Actively engage the family, answer their questions as appropriate, and if needed, contact the medical director or online medical control physician to directly converse with the family.
• Once there is agreement (or at least acceptance) by the family/bystanders to discontinue resuscitation efforts, stop chest compressions, ventilations and any other resuscitative

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measures.

- Once efforts have been discontinued:
  - Explain that the scene will be turned over to the appropriate law enforcement agency.
  - ALL artificial devices should be left in place for the medical examiner.
  - Assume every scene is a crime scene and document all interventions to the patient's body as well as any activities that may have disturbed the scene itself.

EMS Transport of Patients with Ongoing Cardiopulmonary Resuscitation (CPR)

EMS Personnel shall not transport patients who meet criteria for termination of resuscitation, unless:

- The resuscitation takes place in a public setting,
- The EMS providers' personal safety may be endangered by non-transport of the patient, or
- The family *strenuously* objects.

If any of the above situations occurs, attempt to stabilize the situation by:

- Contacting law enforcement (if not already present on scene).
- De-escalating the situation by talking to family/bystanders and explaining that the patient's best chance of survival is to resuscitate them on scene.
- Move the patient to a nearby private location (e.g. an adjacent room).
- Evacuate the patient to the ambulance and continue the resuscitation while remaining on scene.

Transport with ongoing CPR should be a last resort, and preferably should only occur after critical interventions have been performed and 15-20 minutes of ALS resuscitation has been attempted.

If transport is necessary, and the patient meets criteria for termination of resuscitation, see "CPR During Transport" in the Initial Cardiac Arrest Guideline [C-01].

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X-02 DISCONTINUATION IN MEDICAL ARREST		

KEY POINTS:

- The purpose of this guideline is to allow for discontinuation of prehospital resuscitation after the delivery of adequate and appropriate ALS therapy.
- Once life support has been initiated, **Non-**Paramedics **CAN NOT** discontinue resuscitative measures unless directed to do so by a on-scene/online control physician, EMT-Paramedic or if presented with a valid Physician Orders for Scope of Treatment (POST/DNR).
- Upon termination in the field any tubes, needles and lines should be left in place (IV lines to be tied off and cut with catheter left in place), and the body should not be altered in any way.

SPECIAL SITUATIONS:

Palliative/Comfort Care:

- An advanced directive does not imply that a patient refused supportive or palliative care.
- These patients should receive appropriate supportive care as needed for comfort (e.g. meds by any route, any measures to relieve pain and suffering, oxygen or suction of an airway obstruction).

Contact Online Medical Control if:

- If there is disagreement at the scene about what care should be provided (between family members, family and EMS providers, or amongst on-scene medical providers).
- The family requests resuscitation measures opposed to those documented on the patient's advance directives, or if no such directives exist.

If the EMS provider is unable to contact medical control:

- The EMS provider must use his/her best judgment in deciding what is reasonable and appropriate, including transport, based on the clinical and environmental conditions.

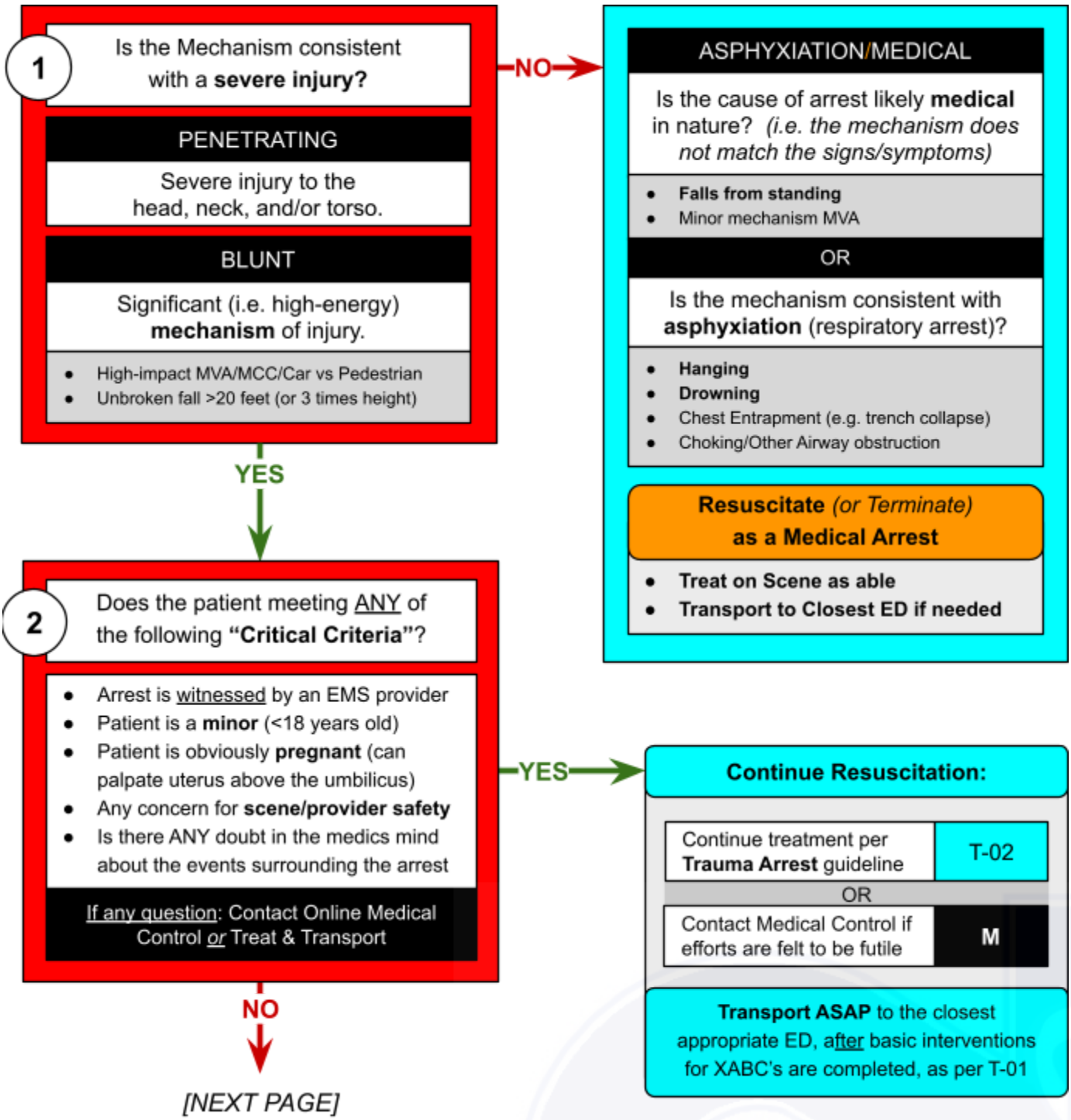
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X-02 DISCONTINUATION IN MEDICAL ARREST		First Responder EMT AEMT Paramedic

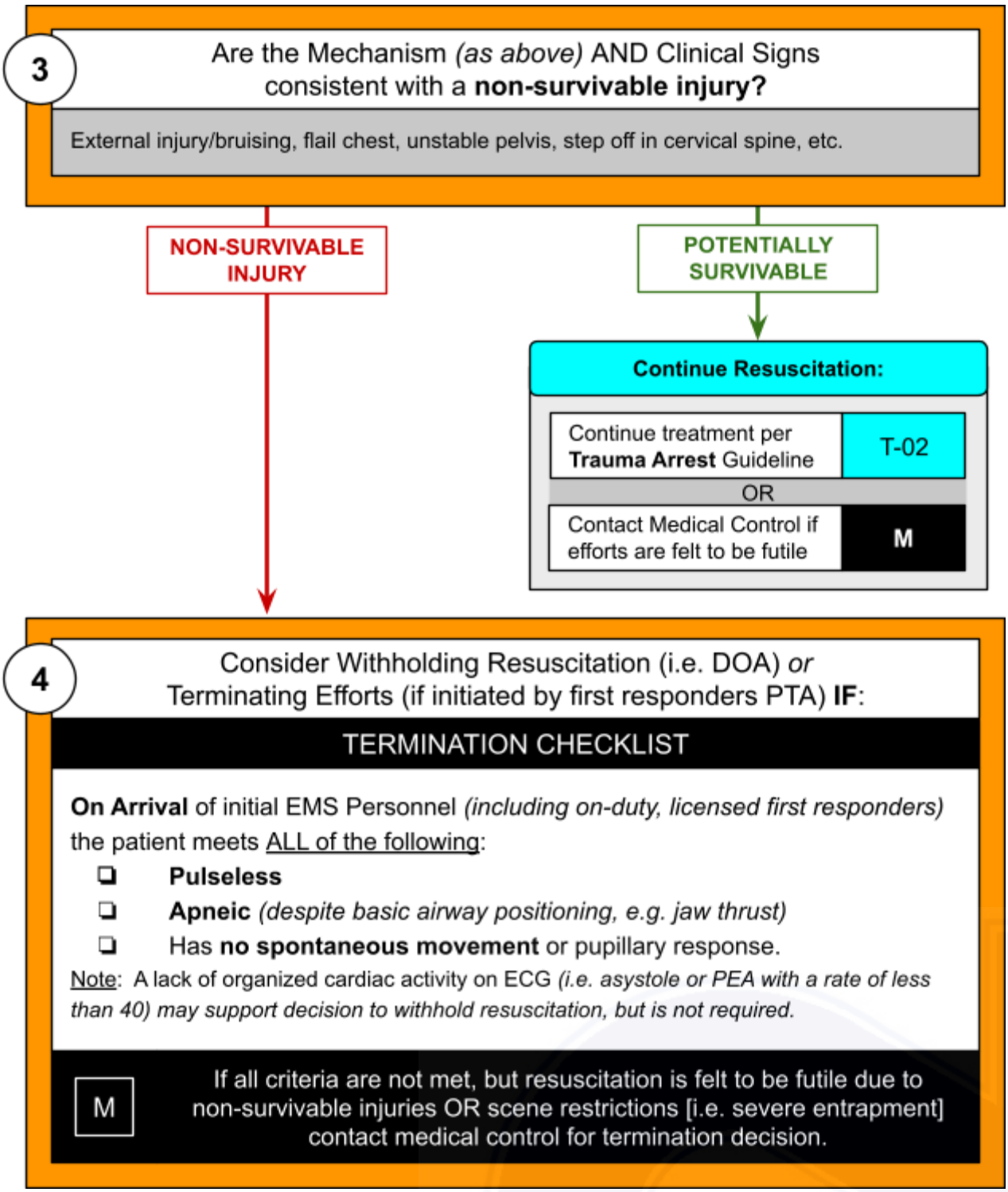
QI Review Parameters (Medical Arrest):

1. Does patient meet DOA Criteria?
2. Was an advanced airway placed and adequate oxygenation and ventilation provided?
3. IV/IO Access achieved and patient provided appropriate fluid resuscitation and medications?
4. Was online medical control contacted, and was this necessary?
5. For “Offline” termination, did the patient meet criteria for field Discontinuation of Resuscitation?

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X-03 DISCONTINUATION IN TRAUMATIC ARREST		

KEY POINTS:

- Once life support has been initiated, **Non-**Paramedics **CAN NOT** discontinue resuscitative measures unless directed to do so by an on-scene or online control physician, EMT-Paramedic, or if presented with a valid Physician Orders for Scope of Treatment (POST/DNR).
- Upon termination in the field any tubes, needles and lines should be left in place (IV lines to be tied off and cut with catheter left in place), and the body should not be altered in any way.

SPECIAL SITUATIONS:

Contact Online Medical Control if:

- If there is disagreement at the scene about what care should be provided (between family members, family and EMS providers, or amongst on-scene medical providers).
- The family requests resuscitation measures opposed to those documented on the patient's advance directives, or if no such directives exist.

If the EMS provider is unable to contact medical control:

- The EMS provider must use his/her best judgment in deciding what is reasonable and appropriate, including transport, based on the clinical and environmental conditions.

Potential Crime Scene:

- Suspected suicide does not necessarily negate an otherwise valid advanced medical directive.
- EMS providers should attempt to disturb the scene as little as possible (while still providing appropriate patient care), and inform law enforcement of any items that are moved/removed from the scene.

QI Review Parameters (Traumatic Arrest):

1. Pending

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TRANSPORT / GENERAL CARE

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Z-06 Air Ambulance Transport

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Z-07 Infection Control/PPE
Z-08 Scene/Transport Safety

PROCEDURES

Z-P1 ED Offloading

REFERENCE

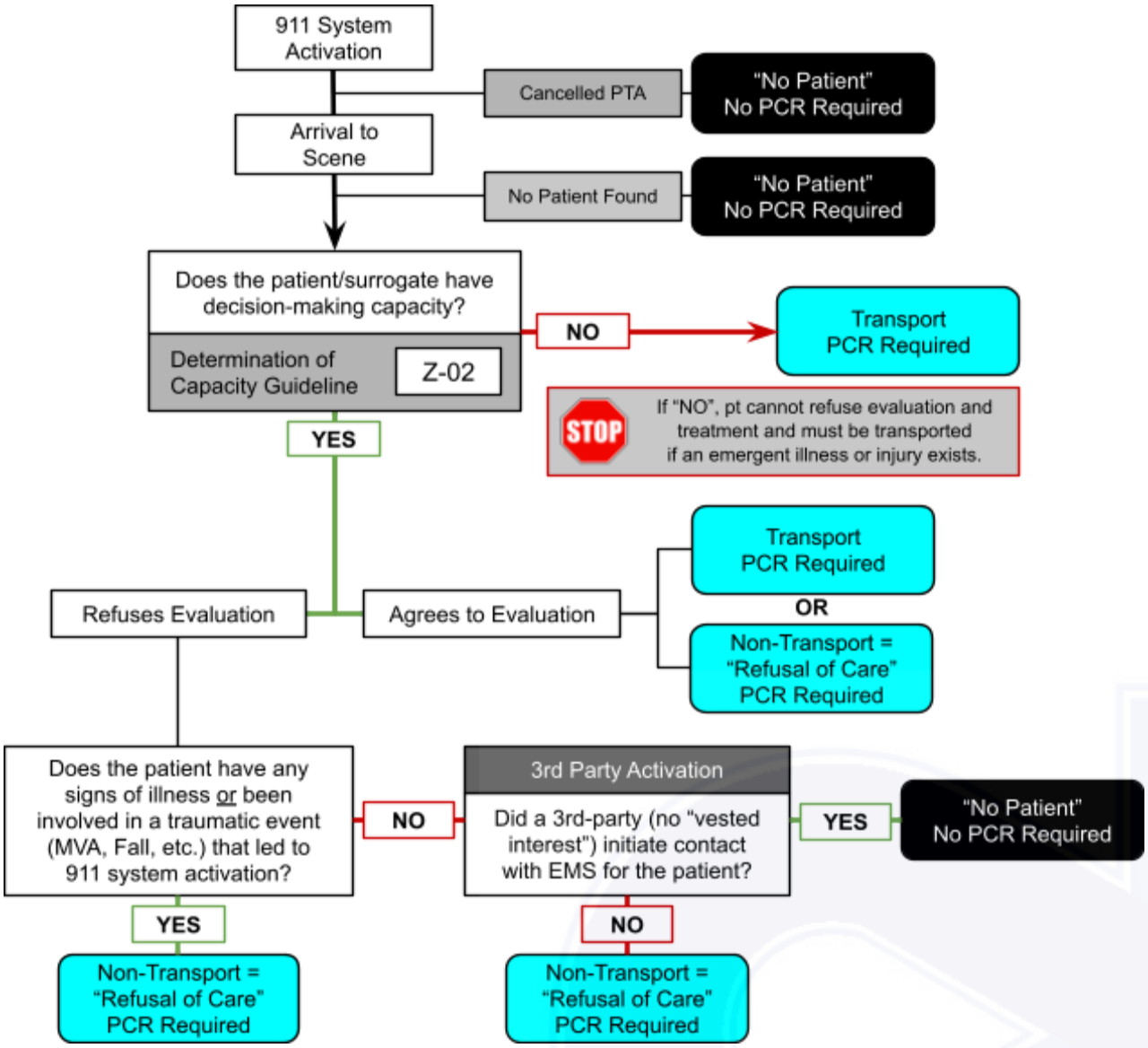
Z-R1 Common Abbreviations
Z-R2 Definitions

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Z-01 PATIENT OR NO PATIENT		First Responder EMT AEMT Paramedic

Contact Online Medical Control for ANY question about the capacity of a patient to make decisions, or any question of designation of a surrogate.

- This protocol is intended to refer to individual patient contacts.
- Multiple Party/Mass Casualty Incident (i.e. multi-vehicle collision):
  - A reasonable effort should always be made to identify parties with acute illness or injuries.
  - Adult patients indicating that they do not wish assistance for themselves or dependent minors in such a multiple party incident do not necessarily require documentation as patients.



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Z-01 PATIENT OR NO PATIENT		

PROCEDURE:

1. Anyone that fits the definition of a patient must:
   a. Be properly **evaluated** by a credentialed system provider,
   b. Appropriate treatment and **transportation offered**, and a
   c. **PCR completed**.
2. If a patient wishes to refuse treatment and/or transport, refer to Non-Transport/Refusal of Care [**Z-03**].
   a. NOTE: Any patient who has visible signs of illness or injury, or has been involved in an event or circumstance that is likely to cause illness or injury should **always** have a PCR/refusal completed.
3. Providers must always use *and document* best judgment, and (when in doubt) always err on the side of caution and perform a full assessment and documentation.

NOTES:

- "**Activation**" Includes:
  - 911 Activation
  - Non-Emergency Dispatch Activation
  - EMS Provider indirectly activated by bystander (i.e. flagged down)
  - EMS Provider directly discovers patient/event (i.e. driving up on accident)
- "**Vested Interest**" = The individual activating the 911 system has an established relationship with the patient (such as family, friend, coworker, etc.).

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Z-01 PATIENT OR NO PATIENT		

QI Review Parameters (EMD Review for "No Patient Found" Calls):

- 911 System activated by the patient or a person with documented "vested interest"?
- 911 System activated for a witnessed event that would likely lead to a significant injury or illness (i.e. MVA, fall, HazMat exposure, etc.)?
- Documented arrival to scene before "cancellation"?
- Alternate agency documentation suggesting questionable Decision Making Capacity [Z-02] for the patient or surrogate?

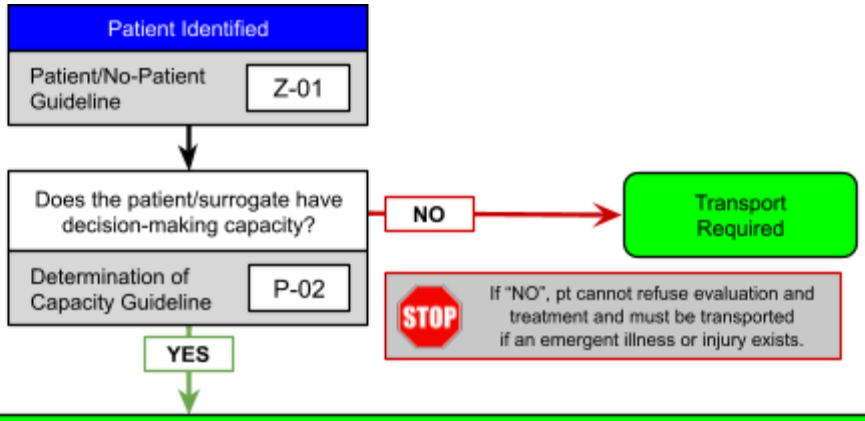
NOTE: If the answer to any of these Parameters is "YES", a PCR should have been completed and the call will be reviewed with the crew in question.

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Z-02 NON-TRANSPORT/ REFUSAL OF CARE		First Responder EMT AEMT Paramedic

Refusals should always be completed by the highest trained/licensed provider on scene.

- This should generally be a Paramedic in situations with a single patient.
- For mass casualty events (i.e. multi-vehicle MVA) the highest trained/licensed provider should delegate evaluation and refusal responsibilities to best utilize available resources.



If the patient/surrogate refuses EMS transport to an Emergency Department or other designated facility:

Standing Orders for Refusal:

1. Verify and document that the patient/surrogate met decision-making capacity standards [as per guideline **Z-02**] to be mentally capable of refusing medical care, including:
   a. The absence of alcohol/drug use causing clinical intoxication/inebriation.
   b. The absence of serious illness/injury inhibiting their mental capacity.
   c. Confirm patient is an adult (or meets criteria for an emancipated minor).
2. Document the events/circumstances surrounding the activation of the 911 service, including:
   a. Mechanism of injury (if traumatic).
   b. Signs/symptoms of illness/injury.
   c. Individual(s) who activated the 911 service, as well as all individuals on scene.
3. Perform and document as full of an Initial Assessment & Exam [1-02] as the patient/surrogate will allow:
   a. Primary Assessment (at minimum), including a detailed exam of mental status and a problem-directed exam,
   b. Secondary Assessment, including an "AMPLE" history and full exam, and a
   c. Full set of vital signs.
4. Document discussion and understanding of "Informed Consent" [as per Z-02].
5. Document various options given to the patient for evaluation, treatment and transport.
6. Document any evaluation or care given at the scene, prior to the refusal of care or transport.

Always attempt to have the patient/surrogate sign the refusal/AMA (Against Medical Advice) form (relating to the refusal of specific assessments, treatments, destinations, or transport recommendations *and* have a third party witness the signature, OR document the circumstances of refusing to sign.

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Z-02 NON-TRANSPORT/ REFUSAL OF CARE		First Responder EMT AEMT Paramedic

The EMS Provider should:

- **Never put themselves in danger** by attempting to treat and/or transport an individual who refuses care.
- Always *offer transport* regardless of complaint or circumstances.
- Always act in the best interest of the patient.
- Always inform the patient/surrogate that:
    - That transport is indicated for further evaluation and care by an emergency
    - department physician, and that the patient has not been evaluated by a physician.
    - That significant medical problems may exist and that these potential problems cannot be fully described at the scene, but may possibly lead to significant disability or even death.
    - If they refuse transport, they should seek follow-up medical care as soon as possible.
    - 911 may be called at any time should they change their mind and wish to be transported.
- Always involve online medical control if there is any question on evaluation, treatment, destination or transport/refusal situations.

Notes:

- Transportation of the patient for additional evaluation and care should always be the goal of EMS providers regardless of the patient's complaint.
- Attempt to identify any patient perceived obstacles to treatment/transport and make reasonable efforts to address these obstacles (cost/insurance issues, child or pet care, etc.).
- Any fears or concerns over medical treatments, equipment, etc. the patient might have should be discussed.
- Enlist the aid of the patient's friends and family members present to encourage the patient to agree to additional treatment and transportation.
- Provide patients who refuse transport with alternative evaluation and treatment options, including self-transport to an ED, Urgent Care Center, Mental Health Crisis Center, Primary Care Physician or other Specialist.

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Z-02 NON-TRANSPORT/ REFUSAL OF CARE		

QI Review Parameters:

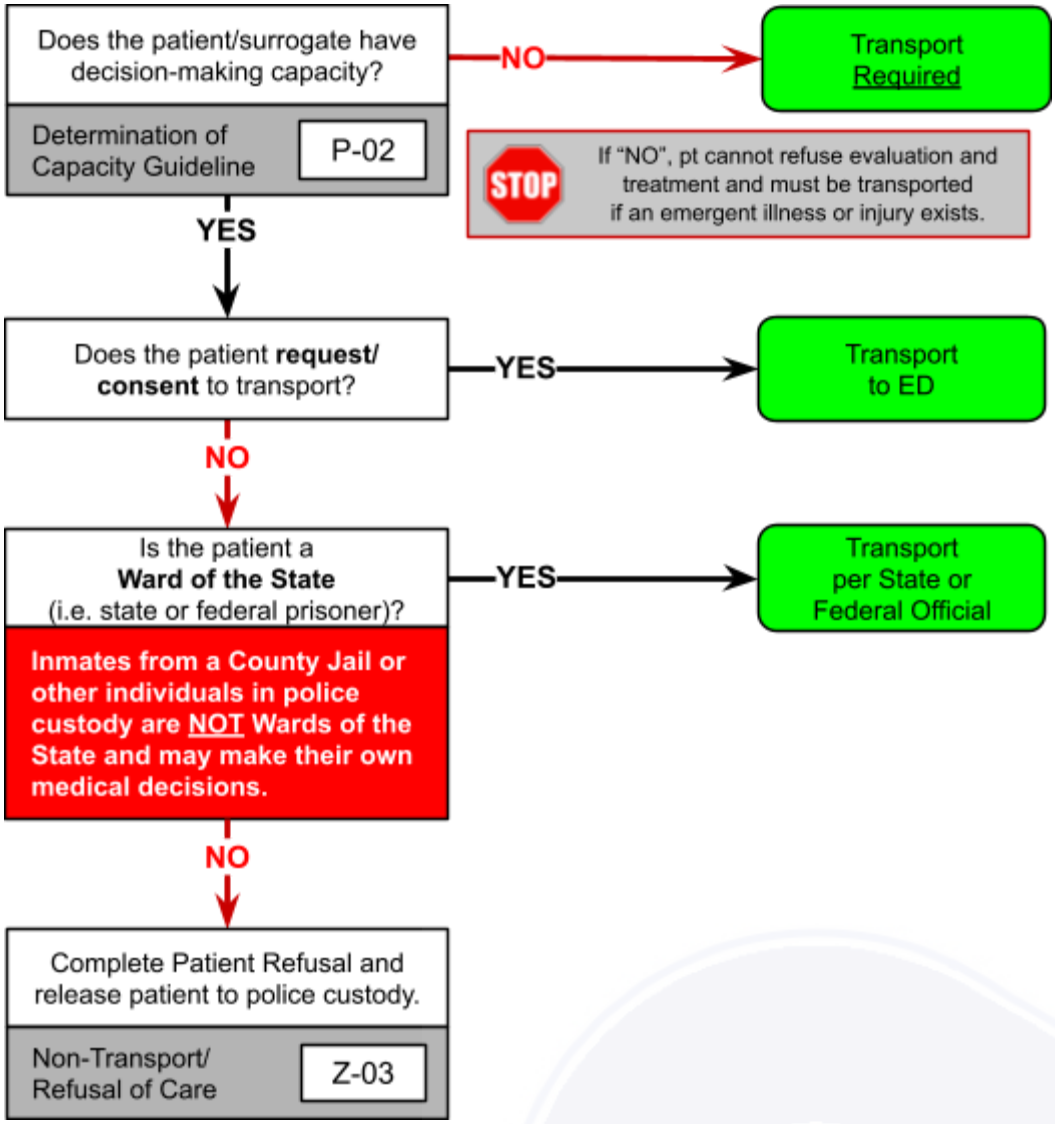
1. Decision Making Capacity is documented for patient or surrogate?
2. EMS Treatment & Transport was offered?
3. Risks of refusal explained to and understood by the patient/surrogate?
4. Names and contact information of surrogate(s) with whom care was discussed documented (*if applicable*)?
5. Discussion with online medical control documented (*if contacted*)?
6. Signed refusal of care included in PCR, *or otherwise documented*?

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Z-03 Medical Clearance		First Responder EMT AEMT Paramedic

DEFINITION

"Medical clearance" is the determination by a physician, made with reasonable medical certainty, that a patient does not have a medical condition that would prevent him or her from being able to participate in an event or contest.



EMS Providers do NOT provide "Medical Clearance" for any patient.
They must be transferred to an Emergency Department to be cleared by an ED Physician.

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Z-03 Medical Clearance		First Responder EMT AEMT Paramedic

PROCEDURE:

1. Any patient encountered for Medical Clearance must have:
    a. A **full evaluation** by a credentialed system provider,
    b. Appropriate treatment and **transportation offered**, and a
    c. **PCR completed**.
2. All patients must:
    a. Be transported to an emergency department by EMS, or
    b. Sign a Refusal of Care/AMA.
3. Law enforcement will not transport a patient to an ED once contact with an EMS provider has been made. Any patient felt to be too combative for transport by ambulance should be chemically sedated and the EMS crew should be accompanied by one or more law enforcement officers.

NOTES:

- Medical evaluation in the prehospital setting is only to evaluate for the immediate need for stabilizing therapy. **Further evaluation to "clear" a patient for jail, psychiatric facility, or other location is beyond the scope of any EMS Provider.**
- Any patient requiring medical clearance must be transported to an Emergency Department. The only exception is if a patient has decision making capacity [see **Z-02**] and makes an informed decision to refuse transport [see **Z-03**].
- Law Enforcement does not have the right to make medical decisions (i.e. treatment, transport, etc.) for a patient in their custody. The only exception to this is for prisoners (state or federal) who are wards of the state--this does not account for county inmates or individuals under arrest by another agency.
- EMS Personnel are not responsible for the law enforcement hold on a patient.
- Any request from an outside agency requesting an EMS provider to "clear" or to "check out" an individual is an inappropriate usage of the 911 System.
- If there is any question or disagreement with a representative of a law enforcement or other requesting agency, contact your EMS Supervisor immediately.

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Z-03 Medical Clearance		

- For every patient encounter, the patient should be offered transport to an Emergency Department. *(Note: for patients meeting ET3 criteria, transport to an alternative destination or evaluation by a telehealth provider may be offered where available.)*

QI Review Parameters

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Z-04 PHYSICIAN/ BYSTANDER ON SCENE		First Responder EMT AEMT Paramedic

Physician (intervening) may:

1. Assist EMS Personnel, and allow you to operate under normal EMS standing orders/guidelines or orders as otherwise directed by Medical Control
   - i.e. *continue "normal" treatment*, or
2. Talk to online Medical Control to offer advice/assistance
   - i.e. *change normal treatment at the direction of online medical control*, or
3. Take responsibility for the patient's care if okayed by online Medical Control, then **physically accompany the patient** to the Emergency Department where responsibility is assumed by the receiving physician;
   - The physician must sign for all instructions given to the EMS Provider;
   - EMS personnel should contact online Medical Control as soon as possible.

- If private physician intervenes by phone the EMS personnel shall request the physician contact Medical Control and relay any orders through them.
- NO ORDERS should be taken over the phone from the private physician.

Standing Orders:

1. No one will be recognized as a physician without proof of license. This must be in the form of a wallet card or visual personal recognition.
2. NO ORDERS will be accepted until proof of license is verified.
3. Consider the need for Law Enforcement if any difficulty with a person occurs.

EMS Personnel shall:

1. Inform the physician that they must contact Medical Control.
2. Inform Medical Control of the presence of a physician on scene.

Online Medical Control may:

1. Speak to the physician to determine the qualifications.
2. Request the EMT, AEMT, or Paramedic verify licensure of the physician.
3. Relinquish total responsibility for the patient to the on-scene physician.

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Z-04 PHYSICIAN/ BYSTANDER ON SCENE		First Responder EMT AEMT Paramedic

Bystanders On Scene

1. Bystander participation – You may use them at **your** discretion.
2. In any situation you need assistance, you may utilize their expertise and skills.
3. However, YOU will be responsible for their actions and treatment. (This includes other medical professionals.)

- Request proof of licensure by visualization of their current license, if possible.
- If any by-stander is trying to take over direction of patient care (other than a physician on scene as noted above) you may have law enforcement remove the person for “Obstruction of Emergency Services”.
- Contact Medical Control with any question or concern.

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Z-05 ALS RESPONSE/ PARAMEDIC INTERCEPT		

NOTE: Individual agencies may elect to have Paramedic (ALS) attend on <u>all</u> patients.

- This is at the discretion of the Operations Director/Manager and Medical Director.
- The agency's policy supersedes this guideline except in Mass Casualty Incidents.

Response/Evaluation Level

- An ALS resource (AEMT or Paramedic) will be dispatched to every 911 request for EMS service for any High-Priority (i.e. Priority 1 or Priority 2) complaint.
  - Priority 1 Dispatches: both medical first responders (where available) <u>and</u> a Paramedic resource (first responder and/or ambulance provider) will be dispatched. Mutual aid or Paramedic-Intercept (PI) should be arranged if a primary responder is not immediately available.
  - Priority 2 Dispatches: an AEMT ambulance (or quick-response vehicle) may be dispatched as the primary responder if a paramedic ambulance is not available.
- A BLS resource may be dispatched to lower priority (i.e. Priority 3) calls if the EMS System and EMS Medical Director have agreed to dispatch a BLS resource to these calls, <u>AND</u> an ALS resource (or process for dispatching an ALS resource) is available to intercept the BLS crew should the patient not meet criteria for BLS Attending either on initial evaluation or if deterioration occurs during transport.
- The highest credentialed provider will complete and document a thorough detailed assessment prior to making the decision to transfer care (attending responsibility) to a lower credentialed provider.

Transfer of Care

If the higher-leveled provider determines that the patient's condition is stable and ALL patient care needs can be managed by a provider with a lower level credential, patient care may be transferred to a provider of lower certification for care while en route to the hospital.

- The determination of who attends should be based upon:
  - The patient's immediate treatment needs, and
  - Any reasonably anticipated treatment needs while en-route to the hospital.
- The highest-credentialed provider is responsible for making the decision for which patients

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can be safely transported by a provider with lower credentials.

- The highest-credentialed provider on scene (including first response agency providers) retains the right to attend to any patient transported based on his/her impression of the patient's clinical condition or needs.
- If the lower-credentialed provider is not comfortable assuming the attending role, the paramedic (or highest credentialed provider) should attend during transport, or the providers should await a Paramedic Intercept from the transporting agency.
- As a general rule, if providers are questioning or do not agree on who should attend the patient, the highest-credentialed provider should attend the patient.



The care of the following patients <u>cannot</u> be transferred to a lower-credentialed provider (i.e. Paramedic to an EMT/AEMT) :

- Any **unstable or potentially unstable patient** should always be attended by the highest credentialed EMS provider on scene (generally Paramedic) .
- Any patient who is requiring or might reasonably require additional or ongoing medications, procedures and/or monitoring beyond the scope of practice of the lower-credentialed provider.
- Any patient with significantly **abnormal vital signs**:
  - Hypotension (SBP <90 mmHg in adults) at *any time* during evaluation.
  - Any of the following that do not improve with basic comfort/calming measures:
    - Heart Rate >120 <u>or</u>
    - Respiratory Rate >20 <u>or</u>
    - Systolic Blood Pressure >220 (with no symptoms of stroke, chest pain or SOB).
  - Any patient with *new/increased oxygen demand* (oxygen saturation <94% on room air/baseline home oxygen).
    - <u>NOTE</u>: Any EMS provider may attend patients with O_2 given by nasal cannula when it is used as a *comfort measure only*, and not used for hypoxia as above.
  - Any patient not at their baseline mental status (e.g postictal seizure patients).
    - EXCEPT when there is definitive evidence of mild to moderate substance abuse/ intoxication that can be verified, wholey explains the altered LOC, and the patient is otherwise stable.

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- Any patient that received interventions (medications or treatments) prior to transport beyond the EMS Provider's scope of practice, EXCEPT:
  - A patient who has received a **single dose** of non-opioid pain medication and/or an antiemetic as the only medication/fluid outside of the EMS provider's formulary.
  - Assessment tools that do not have significantly abnormal findings that have been performed by a higher-credentialed provider (i.e. Continuous/12-lead ECG).

Paramedic Intercept

Indication: A Paramedic will be dispatched for intercept if:

- The patient's status changes (deteriorates) and they meet any of the criteria noted in the "Cannot be Transferred" section above, OR
- There is any other change in patient condition that is concerning to the EMT/AEMT, and the EMT/AEMT does not feel comfortable in their ability to assess and/or treat a patient for any reason.

ALS Intercept Procedure:

- *EMT/AEMT attending with paramedic driving*:
  - The paramedic will drive to the nearest safe area and assume care of the patient.
- *EMT/AEMT attending with non-paramedic driver:*
  - The nearest/most appropriate Paramedic resource, including mutual aid resources when needed, will be dispatched to rendezvous with the crew.
  - The EMT/AEMT crew will **not remain on scene unless** the Paramedic has a response time of **less than 5 minutes.**
  - The EMT/AEMT crew will begin transport as quickly as possible to the nearest appropriate emergency department, and **if transport time is less than 10 minutes, the ALS intercept will be aborted** or may occur at the destination facility.
  - If transport time is expected to be >10 minutes, the BLS crew will communicate directly with the ALS resource to arrange a rendezvous point.
  - A delay of >10 minutes waiting on scene or at a rendezvous point is not acceptable.

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Z-05 ALS RESPONSE/ PARAMEDIC INTERCEPT		First Responder EMT AEMT Paramedic

Documentation

- All providers are responsible for the documentation of their evaluations and treatments.
- The content of the report is ultimately the responsibility of the highest-credentialed provider evaluating/treating the patient.
- The ePCR should always reflect the decision making process to determine which provider attends in the back of the ambulance.



ATTENTION:
EMT/AEMT Attending with Continuous ECG Monitoring:

- Any patient transported by an EMT or AEMT with Continuous ECG monitoring WILL HAVE a 12-Lead ECG performed and interpreted by the Paramedic prior to transport.
- The patient may remain on continuous ECG monitoring while transported by a provider not trained on rhythm strip interpretation, BUT it may only be used as a surrogate for monitoring heart rate, AND **treatment decisions** based on the rhythm strip **may only be made by Paramedics**.
- The patient's rhythm MUST be their baseline rhythm (normal sinus rhythm or atrial fibrillation), and must be within vital sign parameters listed above.
- If during transport the EMT/AEMT notes ANY Heart Rate >120 or <50:
  - Immediately print a rhythm strip.
  - Notify the paramedic of the change in rate and any change in patient status.
  - Document the rate and any additional evaluations or interventions performed.
- Attach or scan ALL rhythm strips to the chart.

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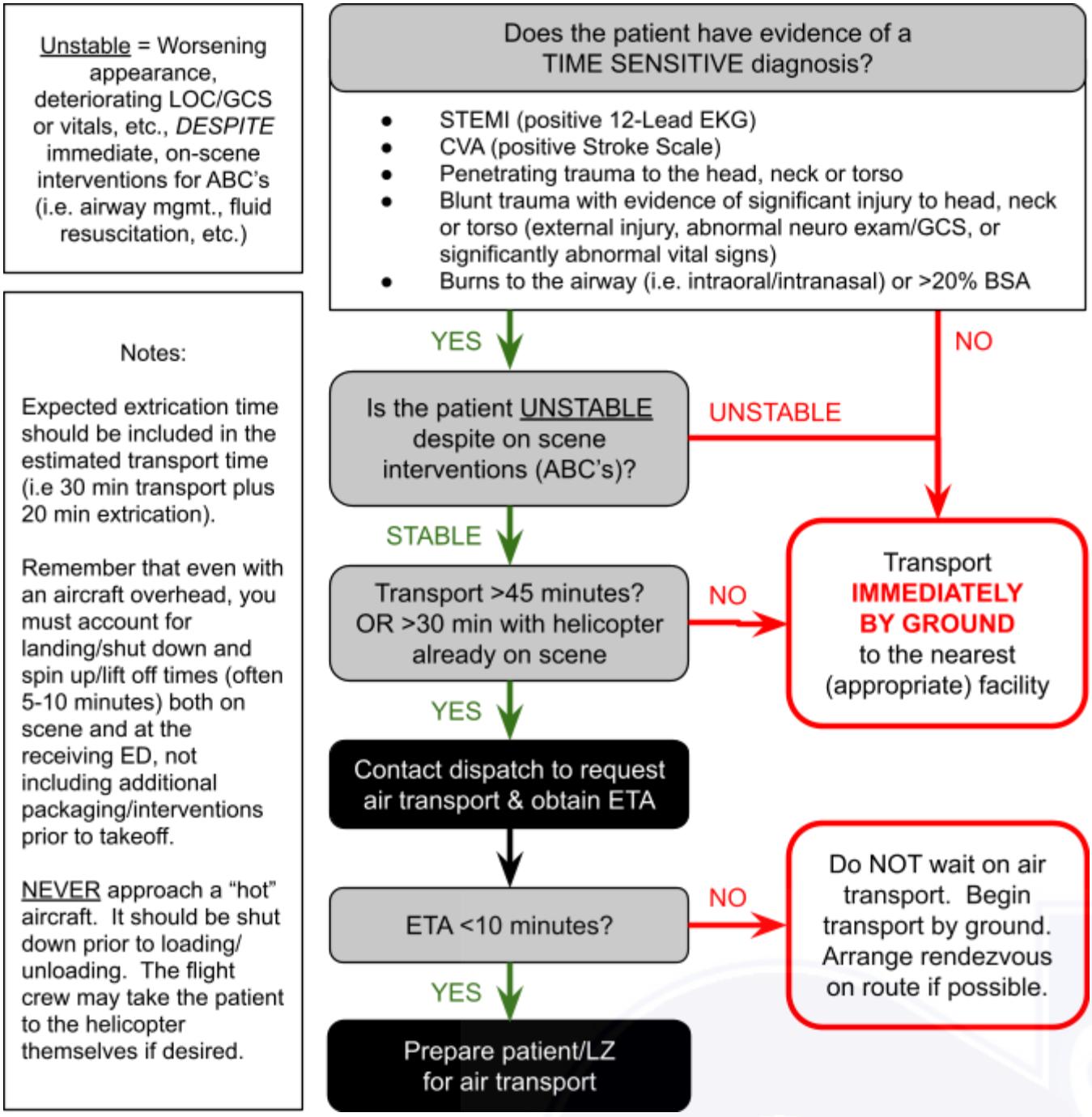
Z-05 ALS RESPONSE/ PARAMEDIC INTERCEPT		First Responder EMT AEMT Paramedic

ATTENTION:
Concerning Chief Complaints:

- In general, an *actively* unstable patient should be quickly and easily determined during the initial ALS assessment and should ALWAYS be attended by the most experienced provider on scene.
- The ultimate decision of whether a patient has signs or symptoms that may indicate a potentially unstable patient who may deteriorate or require ALS interventions en route is always the responsibility of the Paramedic.
- The following complaints may often appear stable, BUT should be considered potentially unstable and should always be attended by the Paramedic:
  - **As noted above**: any abnormalities in vital signs or mental status.
  - Acute chest pain, dyspnea or other anginal-equivalent symptoms that are consistent with a potential cardiac cause.
  - Unexplained syncope in patients >35 years old.
  - Acute neurologic symptoms (including those that have that resolved, i.e. TIA) that are concerning for stroke.
  - Acute and severe sudden-onset headache concerning for aneurysm rupture.
  - Overdose of any medication that has cardiac effects (slowing heart rate or lowering blood pressure) or potential sedative effects, regardless of quantity or timing of ingestion.

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First Responder
EMT
AEMT
Paramedic



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Z-06 AIR AMBULANCE TRANSPORT		First Responder EMT AEMT Paramedic

Consider air transport in the following situations:

Penetrating Trauma	● Significant head, neck or torso penetration ● Isolated extremity penetration with no pulse
Blunt Trauma	● Significant (i.e. high-energy) mechanism of injury to the head, neck or torso ○ High-speed MVA/MCC/Car vs Pedestrian ○ Ejection or prolonged entrapment/extrication ○ Casualties in the same vehicle ○ Unbroken fall >10 feet *WITH* ● Signs of significant injury ○ External injury/bruising ○ Abnormal neuro exam (paralysis) ○ GCS <13 (i.e. responds to pain only) ○ (*Significantly*) abnormal vital signs ○ Amputation proximal to ankle or wrist ○ Extremity injury with no pulse ○ Flail chest
Burns	● Airway burns (intraoral or intranasal, change in voice) ● Burns to >25% BSA
STEMI	● 12 lead with confirmed ST elevation
Stroke/CVA	● Symptoms <24 hours ● C-STAT = 2 or More
Shock/Sepsis	● Unstable vital signs not responding to basic airway/O2 interventions and fluid resuscitation with prolonged transport

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Z-06 AIR AMBULANCE TRANSPORT		First Responder EMT AEMT Paramedic

Limitations of air transport:

Note: These will vary some based on individual aircraft, weather conditions, etc.

A. Adults who have traction splint(s) applied, or any splint or device that exceeds the boundary of the long spine board/stretcher
B. Patients over 6’4”
C. Patients whose girth exceeds 27”

Clinical Situations

- **DO NOT** request an air ambulance transport if the patient is in cardiac arrest, OR if significant deterioration of the patient’s appearance and/or vital signs despite ongoing treatments suggests impending cardiac arrest.
- Short of carrying blood for transfusion, air transport provides essentially the same evaluation and treatments that ground units can already provide.
- The only true benefit of air transport is in decreasing transport time.
- Air transport is extremely expensive (tens of thousands of dollars) and should not be used for patients that do not have evidence of disease or injury that requires immediate *intervention* (not evaluation) at an emergency department.

Interactions with HEMS Personnel

- The attending **ground** medic always has the choice whether to utilize air transport for his/her patient, and has the authority to disregard the response of the air ambulance.
    - You have NO OBLIGATION to utilize a flight crew unless the above guidelines are met.
    - Ground EMS is as capable of taking care of the patient as a flight crew--you just can’t go as fast.
- The ground medic will coordinate with the Incident Commander (*when applicable*) to ensure the helicopter receives patient information and landing zone location.
- Medical responsibility will be assumed by the medical flight crew upon their arrival at the patient only when their assistance is requested by the attending ground medic.
    - If a flight crew arrives on scene without being requested (being put on standby or

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"auto-launching" DOES NOT mean they were requested to transport) and the patient does not meet criteria for air transport, kindly explain the situation and allow them to go back into service.

- If the above air transport criteria are not met, the flight crew may be allowed to assist with care based on these clinical guidelines and as directed by the attending ground paramedic.

- Do not cause a disturbance on scene or in front of the patient or family.
  - IF the flight crew still refuses to allow you to treat your patient in accordance with these guidelines, politely step aside and **immediately** contact your supervisor, online medical control or contact your medical director directly so the incident can be forwarded to the proper local and state authorities.
- Mostly, document, document, document.

QI Review Parameters:

1. Documented Clinical Findings support a "Time Sensitive" Diagnosis? *(STEMI, Stroke, Sepsis/Medical Shock, Appropriate Trauma)*
2. Documentation shows stable (i.e. non-deteriorating) vitals and clinical picture?
3. Estimated transport time >45 minutes (or >30 min with helicopter nearby)?
4. Unnecessary wait time >10 minutes? *(On scene or at LZ)*

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Z-07 INFECTION CONTROL/ PPE		First Responder EMT AEMT Paramedic

Infection Prevention Basics

- **Expect to be routinely exposed to infectious agents.**
  - A commitment to employing basic infection prevention measures on every single incident will provide the simplest and best protection against infectious diseases.
  - All EMS Providers must be aware of well-known (Hepatitis B, influenza, etc.), as well as emerging/new pathogens (Avian Flu, SARS, etc.) that present risks to Providers.
- Immunizations
  - Immunizations are an extremely important weapon against infectious disease, and updated immunizations protect the provider and decreases overall disease transmission ("herd immunity").
  - For healthcare workers, recommended immunizations include: *Hepatitis A & B, Measles, Mumps, & Rubella (MMR), Varicella (chickenpox), Tetanus, Diphtheria, & Pertussis (Tdap), & Influenza.*
- Hand Washing
  - Hands should be washed as soon as is feasible after each patient contact, the removal of gloves/PPE, and after cleaning all equipment.
  - Waterless, alcohol-based hand cleaners are an acceptable alternative to soap and water provided there is no gross organic material present.
- Cleaning and Disinfection of Equipment and Work Areas
  - First, Remove Gross Contamination.
    - Failure to remove organic material provides a continuing breeding ground for organisms.
  - Then, Disinfect any potentially contaminated surfaces:
    - After applying disinfectant, always permit the equipment to air dry. Wiping dry the wet disinfected surface will negate the effects of the agent and render it useless.

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Z-07 INFECTION CONTROL/ PPE		First Responder EMT AEMT Paramedic

Personal Protective Equipment (PPE)

- Gloves:
  - Wear gloves during all patient interactions, and remove gloves after contact with a patient and/or the surrounding environment (including medical equipment).
  - **Never** wear the same pair of gloves for the care of more than one patient.
- Gowns
  - Wear a gown to protect skin and prevent contamination of clothing when contact with significant amounts of blood (e.g. childbirth/trauma) or other body fluids (e.g. diarrhea/vomitus) is anticipated.
- Respiratory/Mucous Membrane (Mouth, Nose & Eye Protection):
  - Respiratory protection should be considered with any patient presenting with an **acute febrile respiratory illness** (fever plus nasal congestion/rhinorrhea, sore throat, and/or cough).
  - Select masks/eye protection to protect mucous membranes during procedures and activities that are likely to generate splashes or sprays of blood, body fluids, secretions and excretions.

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Z-07 INFECTION CONTROL/ PPE		First Responder EMT AEMT Paramedic

Standard Precautions = All Patient Interactions:

- Standard Precautions are intended to be applied to the care of all patients, regardless of the suspected or confirmed presence of an infectious agent.
- This is based on the principle that all blood, body fluids, secretions/excretions, non-intact skin, and mucous membranes may contain transmissible infectious agents
- Always conduct a self-check of your skin (particularly hands and exposed surfaces) prior to any potential patient contact. Identify and cover scrapes, wounds, or other non-intact surfaces with bandages.
- **Personal Protective Equipment (PPE)** is designed to stop the transmission of an infectious agent by preventing contamination of a Provider's skin, mucous membrane, or clothing. While it reduces the risk, PPE does not completely eliminate the possibility of infection, and is only effective if used correctly.
    - The application of various pieces of PPE during patient care is determined by the nature of the provider-patient interaction and the extent of anticipated blood, body fluid, or pathogen exposure.
    - It is often difficult to determine the appropriate level of protection/PPE needed in certain situations. An informed decision can't be made until a patient assessment is completed and/or a history is obtained. By then, it's too late! **When in doubt, always use maximal rather than minimal PPE.**
- Do not reuse gloves, masks, gowns or other pieces of PPE.
- Providers must be familiar with PPE application (*donning*) and removal (*doffing*) procedures.
- Always exercise caution in the removal of PPE to prevent inadvertent self-inoculation if the PPE has been contaminated with infectious materials,and dispose of PPE in an appropriate biohazard waste receptacle.

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Z-07 INFECTION CONTROL/ PPE		First Responder EMT AEMT Paramedic

Contact Precautions = Standard Precautions (Gloves) + Gowns:

- Use in situations where contamination of the provider with blood or other bodily fluids may occur beyond just the providers' gloved hands--large amounts of diarrhea, vomitus, etc., or
- Use with a known infective organism that is transmitted by direct contact with secretions or bodily fluids or from environmental surfaces: I.e. any drug resistant organism, Clostridium difficile, Scabies, etc.

Procedure:

- Everyone involved in direct patient care should wear **clean gloves and gowns.**
- Gloves and gowns should be removed and placed in appropriate biohazard waste receptacle.
- Hands should be washed with soap and water upon completion of patient transfer.
- Consider additional protection (e.g. masks, face protection, goggles) depending on the patients symptoms or procedures done. (e.g. masks and eye protection for suctioning, intubation, or nebulized medication).

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Z-07 INFECTION CONTROL/ PPE		First Responder EMT AEMT Paramedic

Droplet Precautions = Standard Precautions (Gloves) + Mask +/- Eye Protection:

- Droplet precautions should be employed for patients with *febrile* respiratory illness: Meningitis, Pertussis, Influenza, as well as common respiratory viruses (e.g. adenovirus and rhinovirus).

Procedure:

- Utilize pre-arrival information provided by dispatch to a possibly symptomatic patient (when applicable).
- Patient(s):
  - Option 1: Provide **surgical masks** to all patients with symptoms of a respiratory illness who can tolerate its placement.
  - Option 2: For patients who cannot wear a surgical mask (due to symptoms, required medical interventions, or refusal) consider application of oxygen via **non-rebreather face mask** to limit dissemination of airborne particles (in addition to any medical treatment being provided).
- Providers:
  - All providers should wear a **surgical mask** and adhere to Standard Precautions.
  - **Consider additional use of a gown and eye protection** if contact with bodily secretions or a contaminated environment is anticipated,
  - When performing **high risk respiratory procedures** (i.e. intubation, deep tracheal suctioning, nebulized respiratory treatments), use a **fitted N95 respirator** mask.
- Continue droplet precautions until it is determined that the cause of symptoms is not an infectious agent that requires precautions beyond standard precautions.

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Z-07 INFECTION CONTROL/ PPE		First Responder EMT AEMT Paramedic

Airborne Precautions = Standard Precautions (Gloves) + N95 Mask:

- Airborne precautions should be employed when the infectious agent is spread via a vector which forms small particles that may remain airborne for an extended period of time: i.e. tuberculosis, measles, chicken pox, small pox and other pandemic illnesses when the exact mechanism of transmission is unknown.
- **Includes Standard Precautions, Contact Precautions and Droplet Precautions as outlined above.**

Procedure:

- Utilize pre-arrival information provided by dispatch to a possibly symptomatic patient (when applicable).
- Limit the number of EMS personnel who have contact with the patient.
- *Provider(s)*: Use a **fitted N95 mask** for all patient contact (and always perform a "fit check" by molding the mask to the face and checking for air leaks after donning).
- *Patient(s)*: Provide surgical masks or non-rebreather similar to “Droplet Precautions” (*above*) to all patients with symptoms of a respiratory illness who can tolerate its placement.
- Continue to use airborne precautions until it is determined that the cause of symptoms is not an infectious agent that requires precautions beyond standard precautions.

Sharps Hazards:

- The greatest risk for an occupational exposure to blood occurs with the use of needles and other sharp implements.
- The most common occupational blood exposure occurs when needles are **recapped**.
    - Needles that have contact with human tissue should <u>never</u> be recapped, re-sheathed, bent, broken, or separated from disposable syringes.
- Used needles and other sharps shall be disposed of in approved sharps containers as soon as possible.
- Providers should ensure that no sharp is used in a manner inconsistent with its intended purpose or attempt to circumvent the safety features of the device.

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Post Exposure Evaluation Procedure:

- If a Provider is exposed to blood, bodily fluids, or airborne particles, appropriate action must be taken.
- Many of these actions are time-dependent so it's important to initiate the reporting/evaluation process as soon as possible. If a provider has experienced a confirmed or suspected exposure to blood or other infectious material:
    - Withdraw from patient care as soon as it is appropriate--this is usually at the completion of care but may need to occur sooner in some cases.
    - Cleanse the wound (or irrigate the membranes) with the appropriate solution immediately after any exposure to a patient's bodily fluids.
    - Don't attempt to "milk" any needle stick injuries as this does not appear to be useful in removing source patient material.
    - **Report any suspected exposure to communicable diseases to your supervisor or the appropriate designated individual in your agency as quickly as possible.**
- In the case of a blood exposure due to needle stick (or other sharps), bodily fluid spray to mucous membrane, or patient blood contacting non-intact skin, the EMS Provider should travel to the closest appropriate facility for evaluation as soon as possible.

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Z-08 SCENE SAFETY & SAFE TRANSPORT		First Responder EMT AEMT Paramedic

Scene Safety:

- Scene Evaluation
  - Assess potential hazards to medical responders.
    - Prior to exiting vehicle, ensure ingress/egress routes are clear and safe.
    - Get a general overview of the scene including obstacles to care, potential threats and note anything that appears out of the ordinary.
  - Assess present or potential hazards to patient(s).
  - Assess potential hazards to bystanders.
  - **Never enter unsafe scenes.**
- Notify Dispatch as soon as possible if additional resources are needed:
  - Law Enforcement
  - Rescue/Extrication
  - Fire
  - Additional Medical/Transport Units
  - Helicopter Transport
- Patient assessment should generally be performed on scene whenever possible, though you may transfer the patient to the back of the unit for assessment and treatment, if any of the following conditions exists:
  - Poor weather conditions affect an out-of-doors scene
  - Poor lighting or other environmental conditions interfere with patient care
  - Difficult crowd conditions
  - Unsafe scene
  - Discretion warrants that you not expose the patient to bystanders
  - Other environmental conditions interfere with patient care
- Transport should be initiated as soon as the patient is loaded into the unit when possible, unless extenuating circumstances exist.

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Z-08 SCENE SAFETY & SAFE TRANSPORT		First Responder EMT AEMT Paramedic

Minimal Equipment to Patient/Scene:

- Bring all basic equipment (“D.R.O.P.S.”) in close proximity to the patient:
  - Defibrillator (LifePak, A.E.D., etc.),
  - Radio,
  - Oxygen/airway equipment,
  - Primary Medical Kit, and
  - Suction.
- Consider special circumstances where additional equipment should be immediately carried:
  - Safety Glasses, Gown, Mask or other additional PPE as indicated
  - OB Kit for possible delivery.
  - Scoop stretcher or stair-chair into a high-rise or other difficult ingress/egress.
  - C-collar and other packaging devices in an entrapment case.

Safe Transport:

- Drive cautiously at safe speeds observing traffic laws unless patient condition requires emergent transport in accordance with operational standards on emergency response/transport.
- Tightly secure all monitoring devices and other equipment.
- Ensure that all EMS personnel use the available provider restraint systems during transport when not otherwise engaged in patient care activities.
- Ensure that all adult patients are restrained appropriately to the cot with straps.
  - Although not encouraged routinely, if multiple patients are being transported in a single transport vehicle (i.e. MCI such as an MVA), ensure that adults (not on a cot) are secured into the bench seat by the appropriate restraints.
- Ensure that all pediatric patients (less than 40 lbs) are restrained with an approved child restraint device secured appropriately to the stretcher or captain’s chair.
  - Do not allow anyone (parents, caregivers, etc.) to be unrestrained during transport.
  - NEVER attempt to hold or allow the parents/caregivers to hold the patient.
- Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle, whenever possible.

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Z-08 SCENE SAFETY & SAFE TRANSPORT		First Responder EMT AEMT Paramedic

Transport BY (Vehicle/Mechanism):

- In general, all patients will be transported only by the designated transport agency in designated transport vehicles (i.e ambulances). Exceptions are only made under direction from EMS administration or under the standing orders of a specific guideline and include:
  - Unusual circumstances (such as severe weather or disaster/MCI situations) where transport in other vehicles may be more appropriate.
  - If specific alternative destination guidelines are in place, transport to alternative destinations by ambulance or other specifically designated transport method is allowed.
  - Law Enforcement may transport certain mental health, trauma or medical patients when specific guidelines have been adopted or when directly approved by the EMS administration.

Mandatory Stretcher Transport

The following conditions require patients to be transported by stretcher or stair chair. Other patients may be ambulated to stretcher/vehicle if their clinical condition permits.

1. Pregnant greater than 20 weeks
2. Possible cardiac chest pain
3. Shortness of breath (Asthma, COPD, etc.)
4. Stroke
5. Patients requiring spinal immobilization
6. Penetrating trauma to the torso, neck, or head
7. Lower extremity, pelvis, or low back trauma
8. Unconscious, unresponsive patients
9. Seizures within past hour or actively seizing
10. Generalized weakness
11. Patients unable to ambulate secondary to pain or weakness
12. Altered level of consciousness, except psychiatric patients
13. Psychiatric patients requiring restraint

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Transport TO (Destination):

- All sick or injured persons requesting transport shall be transported without delay **to an appropriate local emergency department of the patient's preference**.
  - An "appropriate local emergency department" includes hospitals in the transporting agency's county and hospitals in contiguous counties.
  - In general, patients should be taken to the hospital at which they have a pre-existing patient-provider relationship unless the patient expressly requests otherwise.
  - All sick or injured persons requesting transport who do not express a preference should be transported to the closest appropriate local ED at the discretion of the EMS Provider based on complaint and available hospital resources.
  - A patient who meets determination of capacity guidelines has the authority to request a destination preference for themselves or their surrogate, regardless of the illness or injury or the ability of the destination facility to provide adequate care.
- The ability to pay or insurance status if known shall not be a factor.
- *System Status*: If the unit availability status of the 911 system is a concern, contact your supervisor prior to patient-requested out-of-county transport where applicable.

Specific Destinations (see Destination Section [0-TOC] of these Clinical Guidelines):

- **Specialty/Tertiary Care Destinations**: Patients whose conditions (Pediatric, STEMI, Stroke, Trauma, etc.) qualify them for a specific intervention at a specialty facility should be transported in accordance with those specialty algorithms to the appropriate destination.
- **Alternative Destination Guideline** (*where applicable*): patients who meet the criteria of an alternative destination guideline should be transported to an appropriate destination outlined in the guideline.
- **Patient-Specific Care Plan**: Select patients may have a plan developed with the patient, his/her health care providers, the EMS System, and one or more local hospitals.
  - The patient should be treated and transported in accordance with the Care Plan, unless the patient meets criteria to be transported to a specialty receiving center.
  - Regardless of the existence of a Care Plan, patients known to be discharged from an emergency department within the last 48 hours should generally, but not always, be transported back to the same emergency department, unless they meet specialty destination criteria as noted.

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Z-08 SCENE SAFETY & SAFE TRANSPORT		First Responder EMT AEMT Paramedic

Rapid Transport ("Load-and Go"):

- The patients/situations below should be considered "load and go" criteria, with minimal on scene time (ideally *less than 10 minutes* once criteria identified). Clinically speaking, these are patients who require some type of emergent treatment (*not just evaluation*) that is not available in the prehospital setting.
  - Severe **Multisystem Trauma** patients with a significant mechanism and clinical evidence of significant injury (vitals and/or deformity, hemorrhage, or other clincal signs of trauma). The scene time should be minimized--ideally 10 minutes or less.
  - **Stroke** patients with positive Cincinnati Stroke Scale (or other approved stroke scale).
  - ST-Elevation Myocardial Infarction (**STEMI**) patients. 12-lead EKG should be run as soon as possible on scene if any symptom concerning for cardiac chest pain or equivalent atypical symptoms.
- All other patients should have assessment performed and any emergent treatments initiated on scene.
  - Transported in the most efficient manner possible considering the medical condition.
  - Unstable patients (not responding to basic interventions i.e. airway/O2, IV fluids and basic medications) should be transported emergently to the nearest appropriate emergency department for stabilization.
  - Advanced life support therapies should be provided at the scene if it would positively impact patient care: CPAP or RSI/intubation with acute respiratory failure, CPR and ACLS interventions with non-traumatic cardiac arrest, etc.

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Z-08 SCENE SAFETY & SAFE TRANSPORT		First Responder EMT AEMT Paramedic

Decontamination:

Consider the need with any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons

Procedure:

1. Fire/HazMat Command will establish hot, warm and cold zones of operation.
2. Ensure that all personnel assigned to each zone have proper PPE and training.
3. Assure that each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
   a. Removal of patients from Hot Zone
   b. Simple removal of clothing
   c. Irrigation of eyes
   d. Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids.
   e. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
4. **Initial triage** of patients should occur **after step #3**. Immediate life threats should be addressed (*now*) prior to technical decontamination.
5. Assist patients with technical decontamination (unless contraindicated based on #3 above).
   a. This may include removal of all clothing and gentle cleansing with soap and water.
   b. All body areas should be thoroughly but gently cleansed--overly harsh scrubbing can break or abrade the skin should be avoided.
6. Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personnel affects for law enforcement.
7. Monitor all patients for environmental illness (hypothermia).
8. Transport patients per protocol.

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These Guidelines may or may not be adopted by at the discretion of the Agency's EMS Director

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Special Events/ Operations

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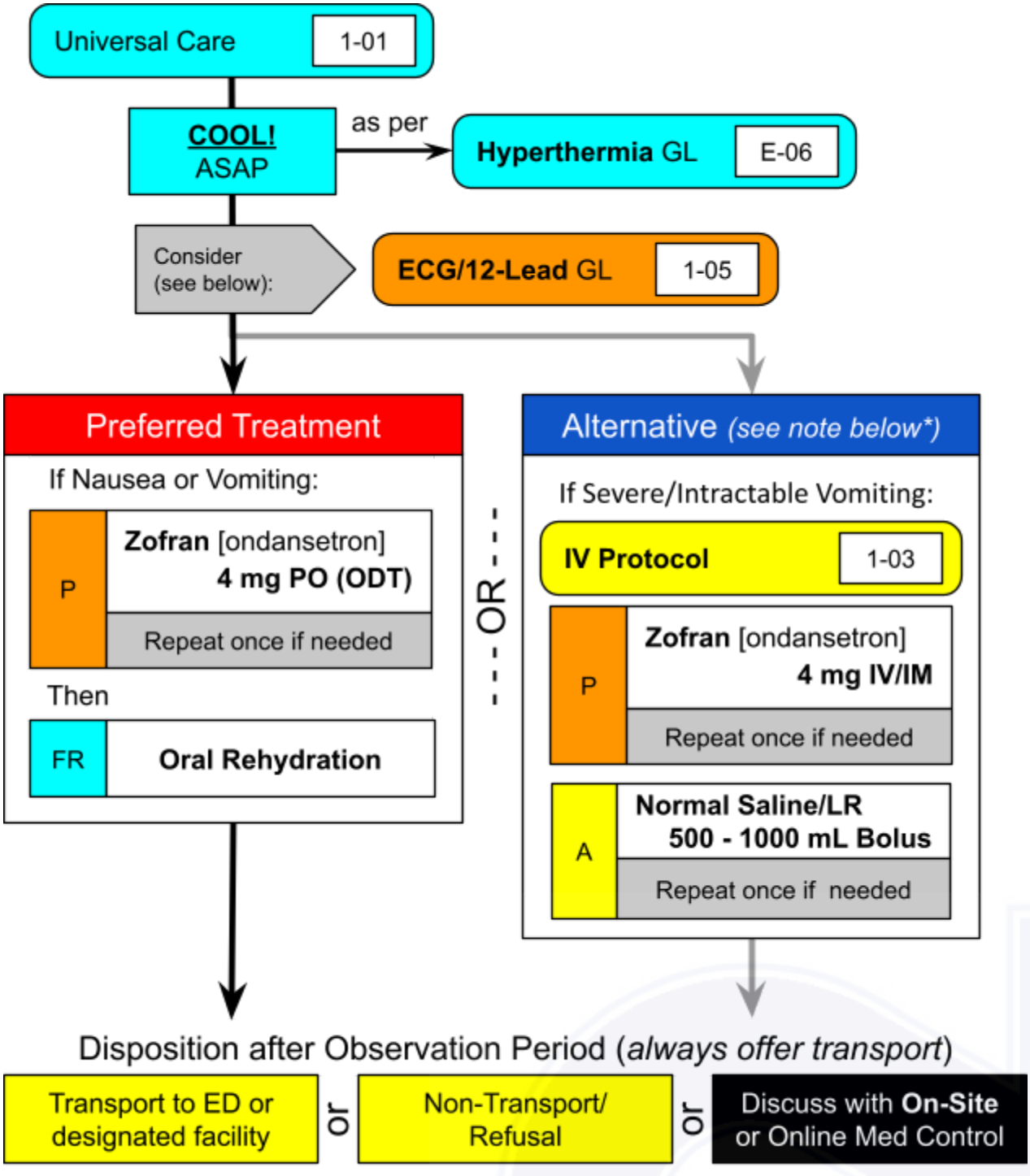
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GUIDELINES

SPEC-01 Heat/Intoxication
SPEC-02 Secret Safe Place (Newborns)

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SPEC-01 MASS GATHERING HEAT/INTOXICATION	**This Guideline may or may not be adopted by at the discretion of the Agency's EMS Director**	First Responder EMT AEMT Paramedic



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ECG Strip/12-Lead Indications:

In the setting of a mass event with heat, dehydration and/or substance abuse issues, 12-Lead ECG should be performed with any patient with:

- *Any* syncope, chest pain, shortness of breath or other similar anginal equivalents with a history of coronary artery disease or cardiac dysrhythmia.
- Any symptom felt to be a possible anginal equivalent concerning for cardiac ischemia.
- *Unexplained* chest pain, shortness of breath or other potential anginal equivalents.
- *Unexplained* weakness or syncope.
- Irregular pulse
- Any heart rate (pulse):
  - >150 at any time
  - 100-150, not improving with interventions, or
  - Any HR higher than expected based on events and evaluation.
- Any other situation where there is any question in the medics mind that cardiac ischemia or dysrhythmia may be involved.

Intermittent or Continuous ECG monitoring should not be used in the event setting, unless:

- Transporting the patient to the Emergency Department or other designated facility, or
- At the request of On-Site or Online Medical Control

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SPEC-01 MASS GATHERING HEAT/INTOXICATION	**This Guideline may or may not be adopted by at the discretion of the Agency's EMS Director**	First Responder EMT AEMT Paramedic

KEY POINTS:

While providing medical care at mass gathering events, interventions should only be used in situations where immediate treatment or stabilization is needed, or when more conservative measures fail.

Hyperthermia

- For severe hyperthermia, i.e. "heat stroke", with significantly altered mental status:
  - Submerge the patient to the neck in an ice bath (if available) while protecting his/her airway.
- If an ice bath is not available or in milder cases of hyperthermia (i.e. "heat exhaustion" or heat cramps):
  - Move patient to a protected environment (shade, A/C, etc.)
  - Expose to circulating air (fan, mister, etc.)
  - Remove restrictive clothing
  - Provide oral rehydration with cool fluids
  - Apply wet/cool pads or ice to the neck, groin and axillae.
- **DO NOT** cool the patient to the point of shivering, and cooled IV fluids should never be used.

Dehydration

- Oral Rehydration should always be attempted first, unless actively vomiting.
- If the patient has nausea/vomiting, the **preferred treatment is with Zofran ODT, followed by oral fluids**.
- If profoundly dehydrated or severe/intractable vomiting, IV placement with Zofran IV and a fluid bolus (Normal Saline or Lactated Ringers) can be used.

Disposition

- If the patient responds cooling and oral rehydration, they do not necessarily need to be transported to an Emergency Department, but if any intervention has been provided by an EMS provider:
  - A PCR should be filled out.
  - Transportation to an ED (or other designated medical facility) should be offered.
- A "Refusal of Care" may be signed if the patient meets criteria for Determination of Capacity [Z-02].

Note: On-Site Medical Control may disposition the patient or request/direct additional treatments by the EMS responder. Document these treatments and record the name of the medical provider and have them sign the PCR if possible.

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SPEC-07 SECRET SAFE PLACE [NEWBORNS]	**This Guideline may or may not be adopted by at the discretion of the Agency's EMS Director**	First Responder EMT AEMT Paramedic

A.K.A. "Safe Haven"

This program follows the requirements of the Safe Haven Law, Public Chapter 388 of the Acts of 2001, which requires all information regarding surrender be kept confidential. The law grants complete anonymity to the mother of the infant and promises that she will not be prosecuted as long as the child is **72 hours old or less and unharmed**.

Procedure:

1. Take possession of the newborn and encourage the mother to follow you to a private area.
2. Ask the mother if she is "**surrendering her infant with the intent to terminate her parental rights and allow the infant to be placed for adoption"**.
3. Determine if the mother and the newborn currently have a medical emergency.
   - Immediately render emergent treatment per clinical guidelines for the infant AND the mother, if she so chooses (inform her that her confidentiality may be compromised).
4. Place an **identification bracelet** from the packet on the infant's wrist and one on the ankle.
5. Give the others to the mother stressing the need to keep them, and inform the mother that she should take the packet of information before she leaves the facility.
6. Inform her that, legally, questions **have to be asked**, **but** she is **not required to answer them**.
   - Inquire about the medical history the mother and infant
   - Seek the identity of the mother, infant, and the father. Informed the mother this information will facilitate the adoption of the child.
   - If she does not answer any of the questions, urge her to **complete the health history form and mail it in the self addressed and stamped envelope**.
7. Explained the purpose of the identification bracelet and number:
   - If the mother later changes her mind and wishes to reclaim the newborn prior to the termination of parental rights (30-90 days), she will be asked to present this ID bracelet.
   - It is very important that the mother notify the proper authorities **immediately** that she has changed her mind because she can lose her rights to the to parent her child as soon as 30 days from the date the baby was surrendered to the facility.
   - She would need to notify the Juvenile, Chancery or Circuit Court, or the Department of Children's Services.
8. Encourage the mother to read the information concerning DCS, counseling, and related services.
9. Hand the mother the packet of information, and she is free to leave.
10. **Once the mother has left the premises**:
    - Transport the newborn to the closest, most appropriate facility.
    - Advised them of the situation and that DCS has not yet been notified.
    - Follow all applicable patient care protocols during transport.

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SPEC-07 SECRET SAFE PLACE [NEWBORNS]	**This Guideline may or may not be adopted by at the discretion of the Agency's EMS Director**	First Responder EMT AEMT Paramedic

Special Situations:

If > 72 hours old:	**1. Accept the child** 2. Collect any information possible on the mother 3. Call the designated DCS contact person. DCS is the cognizant agency for all children. If the child is older than 72 hours, the mother *may not have legal immunity*, but the community service agency should always accept the child.
If infant appears harmed or abused:	1. Treat injuries and/or illness as per guidelines 2. **Contact DCS as soon as possible after stabilizing care**. 3. DCS will contact local law enforcement agency.
Mother immediately returns to claim the child:	If the mother leaves and immediately returns because she is changed her mind **do not return the child to the mother**. 1. Contact DCS immediately and explain the situation. 2. Protect the newborn's health and safety until someone arrives from the Department of Children's Services. That person will assist the situation and take over from there.

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Emergency Medical Services



2026 Clinical Guidelines

Release: 7/1/2026

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Legend:

SLT: Service-Level Training Required (EMT, AEMT, Paramedic)
NEW: New Protocol
2026: Significant 2026 Updates

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UNIVERSAL CARE

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1-P1 IO PLACEMENT	AFTER INSERVICE TRAINING: AEMT's may insert IOs in adult and pediatric patients.	First Responder EMT AEMT Paramedic

Indications

- See IV Protocol [**1-03**]
- IV Access is preferred, however, IO may be considered prior to peripheral IV attempts in the following situations:
  - Cardiac Arrest (Medical or Trauma)
  - Profound hypovolemia with altered mental status/shock

Contraindications

- Fracture of the tibia or femur (for tibia insertion) – Consider alternate tibia
- Fracture of the humerus (for humeral head insertion) – Consider alternate humerus
- Previous orthopedic procedures (e.g. IO within previous 24 hrs, knee replacement, shoulder replacement, etc.)
- Infection at the insertion site
- Significant edema or excessive tissue at insertion site
- Inability to locate landmarks

Pain Management Following IO Placement

Prior to IO bolus in a conscious patient:

- **Lidocaine 2% 50 mg** SLOWLY
- Peds: 0.5 mg/kg of 2% Lidocaine slowly

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1-P1 IO PLACEMENT	AFTER INSERVICE TRAINING: AEMT's may insert IOs in adult and pediatric patients.	First Responder EMT AEMT Paramedic

Technique

1. Locate the proper insertion site (*see instructions below*).
2. Clean the insertion site with alcohol.
3. Prepare the EZ-IO driver and needle set.
4. Stabilize the leg (or arm) -- use non-dominant hand to grasp either side of the bone.
5. Position the driver/needle at a 90° angle to the bone at the insertion site.
6. Push or drill the needle through the skin until you feel the needle encounter the bone, then apply firm steady pressure and drill through the cortex of the bone. **Stop on the POP** (sudden loss of resistance)**.** This indicates entry into the bone marrow cavity.
7. Grasp the hub firmly with one hand and remove the driver from the needle set.
8. While continuing to hold the hub firmly, rotate the stylet counterclockwise and remove it from the needle set. Dispose of the stylet properly in a sharps container.
9. Confirm proper placement of the EZ-IO catheter tip:
   a. The catheter stands straight up at a 90° angle and is firmly seated in the bone.
   b. Blood is sometimes visible at the tip of the stylet.
   c. Aspiration of a small amount of marrow with a syringe.
10. Attach a primed extension set to the hub.
11. If at all responsive, administer **Lidocaine 2% 50 mg** slowly **PRIOR** to the initial bolus.
12. Flush the IO space with 10 cc of Normal Saline.
13. Initiate the infusion per standing orders. Use of a pressure infuser or blood pressure cuff is recommended to maintain adequate flow rates.
14. Apply the wristband and a dressing.

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1-P1 IO PLACEMENT	AFTER INSERVICE TRAINING: AEMT's may insert IOs in adult and pediatric patients.	First Responder EMT AEMT Paramedic

IO Needle Size & Location

Adult patient (BLUE or YELLOW cap): Defined as a patient weighing 40 kg or greater

- Preferred Insertion Site
  - **Cardiac Arrest: Humeral Head**
  - Non-Arrest Situations: Tibial Plateau

Pediatric Patient (PINK or BLUE cap): Defined as a patient weighing 3-39 kg

- Use the length based assessment tape to determine pediatric weight
- The **tibial plateau** is the only approved site for pediatric IO insertion

Notes:

- The IO is not for prophylactic use/a substitute for difficult sticks in stable patients
- The IO infusion system requires specific training prior to use
- Proper identification of the insertion site is crucial

Special Considerations:

- Pain:
  - Insertion of the IO device causes moderate discomfort and is usually no more painful than a large bore IV.
  - *However*, fluid infusion into the IO space is **very painful**
- Flow rates: Due to the anatomy of the IO space, will be slower than those with IV. Use a pressure bag or pump for fluid challenge.

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1-P1 IO PLACEMENT	AFTER INSERVICE TRAINING: AEMT's may insert IOs in adult and pediatric patients.	First Responder EMT AEMT Paramedic

IO Insertion Landmarks

Landmarks - Tibial Plateau



- When the tibial tuberosity can be appreciated:
  - Insert IO **one finger** width ***below*****,** &
  - **One finger** width ***medial to*** *(inside of)* the tibial tuberosity
- Pediatrics: The tibial tuberosity is often **difficult to palpate** on very young patients! Instead, identify the insertion site [*see figure right*]:
  - **TWO fingers below THE PATELLA** &
  - **One finger medial to** the midline.

- Morbidly obese: to improve your ability to visualize and access the tibial insertion site.
  - Consider rotating the foot to the midline position (foot straight up and down).
  - With the knee slightly flexed, grab/lift the foot allowing the lower leg to "hang".
  - This may improve your ability to visualize and access the tibial insertion site.

Landmarks - Humeral Head (Adults Only)



- Place the patient supine, expose the shoulder, and place the patient's hand on the abdomen.
- Identify the **greater tubercle** of the humerus:
  - With your non-dominant hand "pinch" (stabilize) the anterior and inferior aspects of the humeral head.
  - This will ensure that you have identified the **midline of the humerus**, where the greater tubercle will be located.
  - Verify location by palpating on the lateral (outside) mid-humerus and palpating up towards the humeral head.
- Insertion site is approximately **two finger widths below the acromion**.

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1-P2 HELMET/EQUIPMENT REMOVAL		First Responder EMT AEMT Paramedic

In general, **ALL Equipment should be removed** prior to transport

Rationale:

- Allows access to the patient for full evaluation and treatment, especially with airway emergencies or needing access to the chest (i.e. CPR/AED).
- Allows for the best/most appropriate application of spinal motion restriction (SMR) per protocol [**1-06**], and attempting SMR with athletic equipment on is difficult.
- Individuals with the most expertise with the equipment (i.e. certified athletic trainers [ATC] are generally at the scene of the event, not in the ambulance or at the hospital.
- The equipment is generally expensive and likely to be lost or destroyed during removal.

Equipment removal may be deferred if:

- There are not an adequate number (4 or more) of appropriately personnel (including EMS, athletic trainers, or coaches) with experience with the sport-specific equipment removal.
- Objective neurologic findings consistent with spinal cord injury (i.e. *bilateral* arm weakness/numbness).

Note! As per Spinal Immobilization Guideline [**1-06**]: If a patient/player is neurologically intact and able to cooperate, they may both **self-extricate** to the cot (or sideline), and **may sit or stand and assist with removal of their own equipment**.

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1-P2 HELMET/EQUIPMENT REMOVAL		First Responder EMT AEMT Paramedic

1 Stabilize/Restrict Movement of the Cervical Spine



The **first** provider should position themselves at the head of the patient:

- Immobilize the cervical spine by placing both palms on the ear holes (outside of the helmet).

NOTE: if a **Certified Athletic Trainer (ATC)** is present, they are trained in spinal assessment, protection and immobilization. Also, they are more highly trained than any EMS provider on the removal of athletic equipment.

2 Prepare the helmet for removal:

- First, remove the facemask
- Second, remove or release the chinstrap

2A: Release the Facemask Clips:

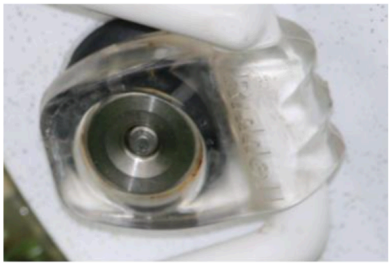
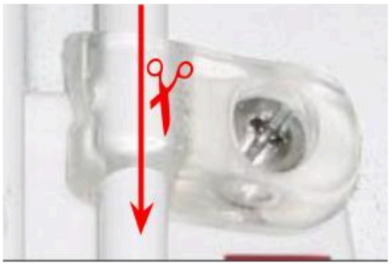


- While the first provider maintains c-spine, a second provider starts from the head down, preparing the helmet and shoulder pads.
- The **second** provider should then loosen/release the clips attaching the facemask to the helmet:
  - Use a screwdriver (*preferably electric)*
  - Newer helmets may use various types of quick-release clips (*see below*).
  - Once the (usually) four clips have been released, the facemask should fall off.

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1-P2 HELMET/EQUIPMENT REMOVAL		First Responder EMT AEMT Paramedic

Attachment Types

Option 1: Standard Screw Clip .	Option 2: Quick-Release Clip (Riddell®, pictured above)	Option 3: CUT the plastic clip
An electric screwdriver is preferred due to less torquing on the player's helmet/neck. *Note*: Most ATC's will carry an electric screwdriver, or one can often be found in an equipment box on the sideline.	Several "quick-release" clips are on the market to facilitate rapid removal of the facemask. • Riddell® uses a central button that must be depressed. • Shutt® has a half-turn spring loaded screw. • Most can be released using a screwdriver, multi-tool or even a ballpoint pen.	In the past, the fastest way to remove the facemask was to cut the plastic clip over the metal bar of the facemask. This can be accomplished with a "Trainer's angel" or similar type device or Heavy pruning shears. **Trauma shears generally will NOT cut these.**

2B: Remove or Release the Chin Strap:



- **Most often, this is 4 quick snaps.**
- Riddell has a Speedflex™ chin strap (see left) that looks like a big zip tie. For this:
  - Cut the black tip off as close as possible to the black plastic stop (*see left*).
  - **Note**: Please do not cut the chin strap *except* at this distal point.
  - Then, depress the silver tab which allows the strap to be reversed.

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3 Prepare the shoulder pads for removal:

- First, expose the pads (cut or remove the jersey)
- Second, cut the front binding & release the side straps

3A: Expose the Pads

- Modern jerseys are generally tight-fitting and will require cutting.
  - CUT: This should be done in a “T”-pattern (*see right)*, similarly to other clothing.
  - Note: If the jersey is loose, you may try and bunch it up over the shoulder pads.



3B: Prepare the Shoulder Pads

First, release (i.e. CUT) the front/breastplate binding (*see below right*):

- Almost always, this will be a shoelace tied to bind the breast plate together. This is easily replaceable and should be cut.
- Several other types of bindings are used and can be cut if possible–as they almost always can be replaced with a shoelace.
- Note: If the binding cannot be cut, spinal stabilization can still be held from below by reaching up through the collar.

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Then, **release** the side straps (*see above left*) → **DO NOT CUT THESE**

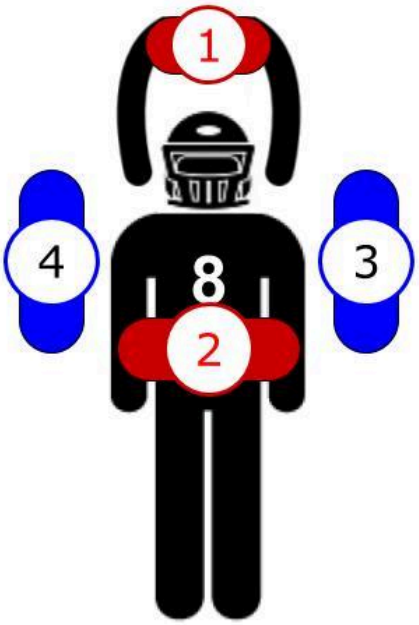
- They are usually a simple belt-type attachment.
- Older models utilize a “T-hook” or similar attachment.
- New models also utilize more modern clips that are straightforward and should be easily released.

4 Use the Elevated Torso Technique to Remove the Helmet & Pads

REQUIRES FOUR PEOPLE

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1-P2 HELMET/EQUIPMENT REMOVAL		First Responder EMT AEMT Paramedic



- The **first** (**#1**, *see left*) provider continues to maintain control of the cervical spine from above.
- The **second** (**#2**) provider should then:
  - Straddle the player's torso,
  - Reach up under/through the shoulder pads and take control of the cervical spine from below (similar to removing any helmet (i.e. motorcycle, baseball, etc.).
  - **This second provider now becomes the lead to direct patient movement.**
- Two other providers (*or bystanders if needed*, **#3 & #4**) then assist the second provider by gently lifting the player's torso a couple inches off the ground on the direction of #2.
  - Simply reach under the pads and place your hands between the pads and the shoulder blades.

- The **first** provider then:
  - Removes the helmet by pulling the cheek/ear portion outwards, away from the ears and gently pulling or rocking the helmet off.
  - Removes the shoulder pads.
  - Places a c-collar.
- The **second** (**lead**) provider then directs the player to be lowered back to the ground.



Example Video: https://www.youtube.com/watch?v=hvxSSdvlos0&t=556s

5 Immobilize Player as per Spinal Immobilization Guideline **[1.06]**

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1-P2 HELMET/EQUIPMENT REMOVAL		First Responder EMT AEMT Paramedic

Notes:

- If you are at a sporting event on standby, locate on-site medical personnel, introduce yourself and if time allows try and familiarize yourself with equipment, medical capabilities, ingress and egress routes, and other issues pertaining to scene safety and medical resources.
- With football players and other athletes with similar helmet/shoulder pad combinations:
  - It is preferable to remove **both** the shoulder pads and the helmet.
  - Never remove one or the other, either remove both or leave both.
- For sports or accidents (e.g. motorcycle/bike, baseball, etc.) where there is only a helmet involved, the helmet must always be removed.
- Other sports (e.g. lacrosse and hockey) have similar type helmets and pads.
  - If questions exist, always ask for assistance from certified athletic trainers, coaches, parents or other bystanders with knowledge of the sport-specific equipment and removal.

Other Pads and Braces:

There are a large variety of adjunctive padding and braces that may be encountered on an athlete.

- Pads attached to the shoulder pads:
  - Can be removed concurrently with the shoulder pads
- Pads or medical braces worn underneath the shoulder pads:
  - Are attached by straps (usually velcro) that can easily be undone.
- Again, please DO NOT CUT these as they are expensive and easily removable.
- Pads incorporated into undershirts or underpants are going to be difficult to remove and may be left on in most cases.



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1-P3 INDWELLING PORT ACCESS	Port Access requires service-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

Indications

- Intravenous fluid or medications **emergently** needed AND
- Peripheral IV cannot be established AND
- Patient exhibits one or more of the following:
  - Altered mental status (P or U on AVPU Scale)
  - Respiratory compromise (SaO2 of 80% or less following appropriate oxygen therapy and/or respiratory rate <10 or >40/min)
  - Hemodynamically unstable

Contraindications

- Infection, significant edema or excess tissue at insertion site
- Inability to locate landmarks

Procedure/Technique (*next page*)

Notes:

- Port-A-Cath access in the field should only be utilized in **EMERGENCY** situations.
- Access should only be attempted by those who have documented competency.
- You may utilize the patient's supplies if necessary and appropriate.
- **Always access under sterile conditions.**

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1-P3 INDWELLING PORT ACCESS	Port Access requires service-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

Technique for Accessing the Port

1. Assemble Supplies:
   a. 10 cc NS Syringe
   b. Chloraprep
   c. Masks & Sterile Gloves
   d. Huber needle with attached extension tubing & IV/fluid setup
   e. Transpore tape
2. Cleanse hands and place PPE (including mask)
3. Peel open one corner of the Huber needle package; Extend end of extension tubing only out the opening, attach 10 cc NS flush, and prime tubing and needle with NS.
4. Place Huber needle package on a secure flat surface and peel back package open.
5. Put on sterile gloves (**Do NOT touch Huber needle until sterile gloves are on).**
6. Use repeated back and forth strokes of the Chloraprep applicator for approximately 30 seconds. Allow the area to air dry. Do not blot or wipe away.
7. Pick up Huber needle with NS syringe attached--touch *only* the Huber needle as this is sterile and the syringe is not--grip securely and remove clear protective sheath.
8. Locate and stabilize the port site with your thumb and index finger, creating a “V” shape.
9. Access the port by inserting the Huber needle at a 90° angle into the reservoir. Once accessed, the needle must not be twisted; this will cut the septum and cause leakage.
10. Insert gently, flush the port with 2-5 cc NS and then attempt to aspirate a blood return. This confirms proper placement; if the port is difficult to flush **DO NOT FORCE.**
11. Slowly inject the remaining 10 cc NS; observe for resistance, swelling or discomfort. If present, assess needle placement. If still present remove the Huber and re-access.
12. Attach IV Solution tubing and initiate flow.
13. Hold slight pressure with a 2x2 if bleeding. (There should never be excessive bleeding.)

Technique for Dressing the Site

1. Assemble CVC dressing kit on a flat clean work surface.
2. Open the package of 2x2s if extra padding is needed.
3. Place one 2x2 *under* the needle to provide padding if Huber is not flush with chest.
4. Tear a 3” piece of tape; split it lengthwise; tape over Huber needle in a “X” format.
5. Cover site with transpore tape.
6. Secure the extra tubing with tape to prevent catching on clothes.

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1-P4 OROGASTRIC TUBE PLACEMENT	STOP: This guideline is only to be used after completion of service-specific training & when appropriate equipment is available.	First Responder EMT AEMT Paramedic

Indications

- Gastric decompression in the intubated patient
- Gastric decompression with placement of BIAD (i.e. King LT airway)
- Only for situations where time and conditions allow gastric decompression without interruption of routine care

Contraindications

- Known esophageal varices

Procedure

1. Determine length of tube for insertion.
   a. Measure from tip of nose, to earlobe, then down to the xiphoid process.
2. Liberally lubricate the distal end of the orogastric tube.
3. Suction airway and pre-oxygenate with BVM ventilations.
4. Insert tube:
   a. For orotracheal and nasotracheal intubation: insert tube into patient's mouth, continue to advance the tube gently until the appropriate distance is reached.
   b. For BIAD: insert tube through gastric access lumen, and continue to advance tube till appropriate distance is reached.
5. Confirm placement by injecting 30cc of air and auscultate for the swish or bubbling of the air over the stomach.
6. Aspirate gastric contents to confirm proper placement.
7. Secure with tape to inserted airway and attach to low continuous suction if indicated

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1-P5 ULTRASOUND: BASIC CARDIAC	Ultrasound use requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

INDICATIONS:

- As per Asystole/PEA [C-02], or other cardiac arrest guidelines
- As per Discontinuation of Resuscitation in Medical Arrest [X-02]
- As per Discontinuation of Resuscitation in Traumatic Arrest [X-03]

CONTRAINDICATIONS:

- Any use impeding high-performance CPR or other interventions during an ongoing cardiac arrest resuscitation.

Procedure (CARDIAC ULTRASOUND):

- Assemble necessary equipment, including ultrasound cover and gel.
- Position the ultrasound probe in the subxiphoid space, prior to pausing chest compressions.
- Obtain appropriate visualization (as noted below), primarily looking for (significant) cardiac motion (i.e. “squeeze”)
- Continue resuscitative efforts, as per referenced clinical guideline(s).
- Save images to the device and upload them to the PCR, as per agency policy.
- Document utilization, timing, findings/interpretation, and any clinical decision making based on the ultrasound in the PCR.

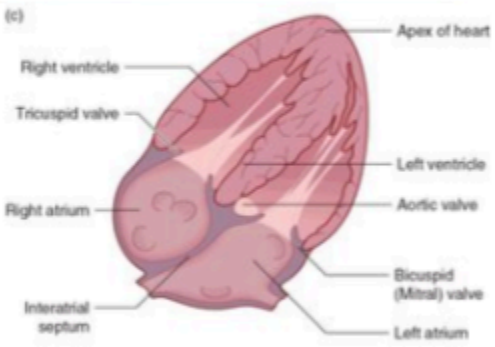
Note: Other views may be utilized if the subxiphoid view is unsatisfactory, as long as they do not interfer with other necessary interventions.

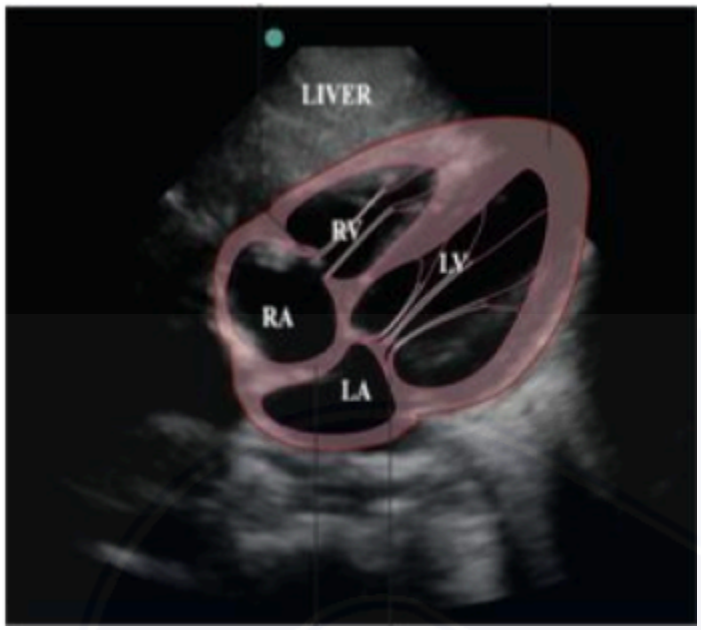
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Subxiphoid View:









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1-P6 ULTRASOUND: E-FAST	Ultrasound use requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

INDICATIONS:

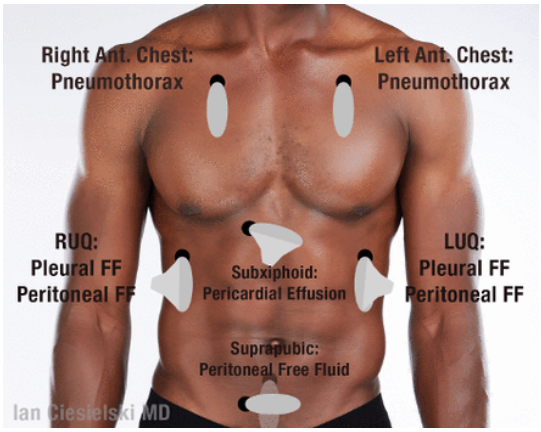
- As per Traumatic Cardiac Arrest [T-02], Chest/Abdominal Trauma [T-09], or other trauma guidelines

CONTRAINDICATIONS:

- Any use impeding or delaying other critical interventions during an ongoing trauma resuscitation.

Procedure (E-FAST ULTRASOUND EXAM):

- Assemble necessary equipment, including ultrasound cover and gel.
- Position the ultrasound probe in the appropriate anatomical locations.
- Obtain appropriate visualization of the six (6) recommended views, and determine the presence or absence of positive findings:
    a. Subxiphoid (Cardiac)
    b. Right Upper Quadrant (Liver)
    c. Left Upper Quadrant (Spleen)
    d. Suprapubic (Pelvis)
    e. Right Anterior Chest (Right Lung)
    f. Left Anterior Chest (Left Lung)



- Continue resuscitative efforts, as per referenced clinical guideline(s), utilizing the ultrasound findings to determine appropriate prehospital interventions, destination/method of transport, and prenotification of the appropriate trauma center.
- Save images to the device and upload them to the PCR, as per agency policy.
- Document utilization, timing, findings/interpretation, and any clinical decision making based on the ultrasound in the PCR.

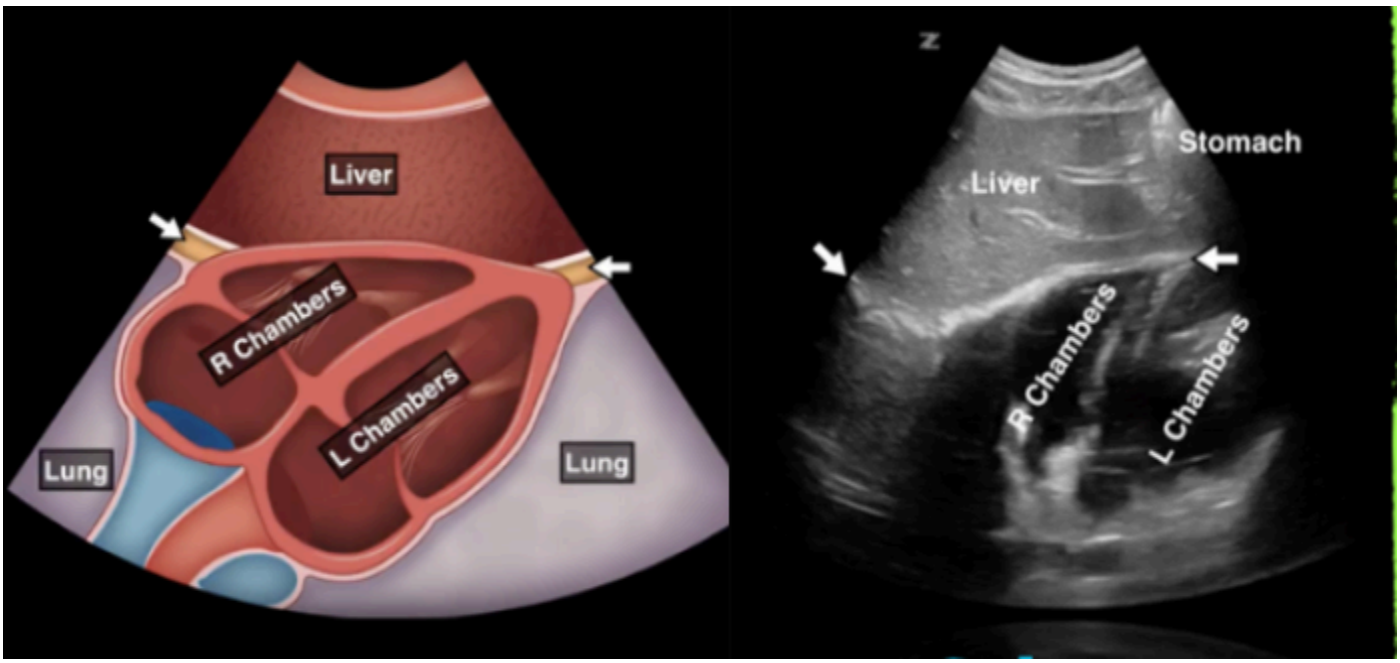
Note: Other views may be utilized if the subxiphoid view is unsatisfactory, as long as they do not interfer with other necessary interventions.

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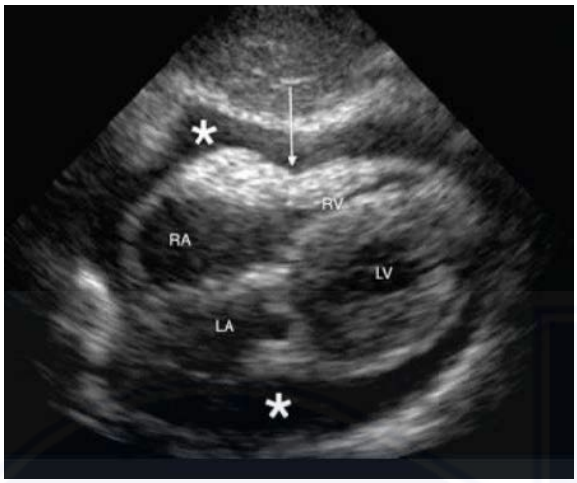
1-P6 ULTRASOUND: E-FAST	Ultrasound use requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

#1 Subxiphoid (Cardiac) View:



Positive Findings:

- **Pericardial Effusion** (fluid/blood around the heart), as demonstrated on the image to then right.

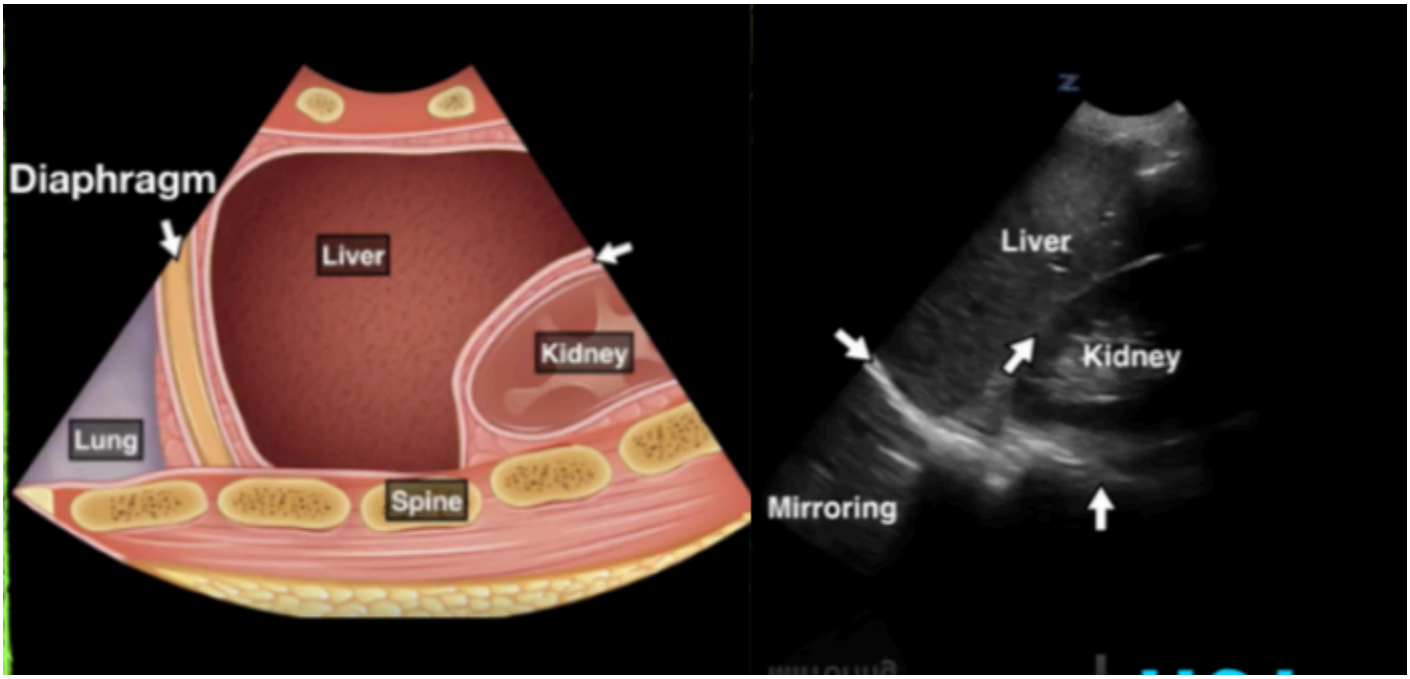


Other Notable Findings:

- Cardiac motion (i.e. squeeze)

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#2 Right Upper Quadrant (Liver) View:



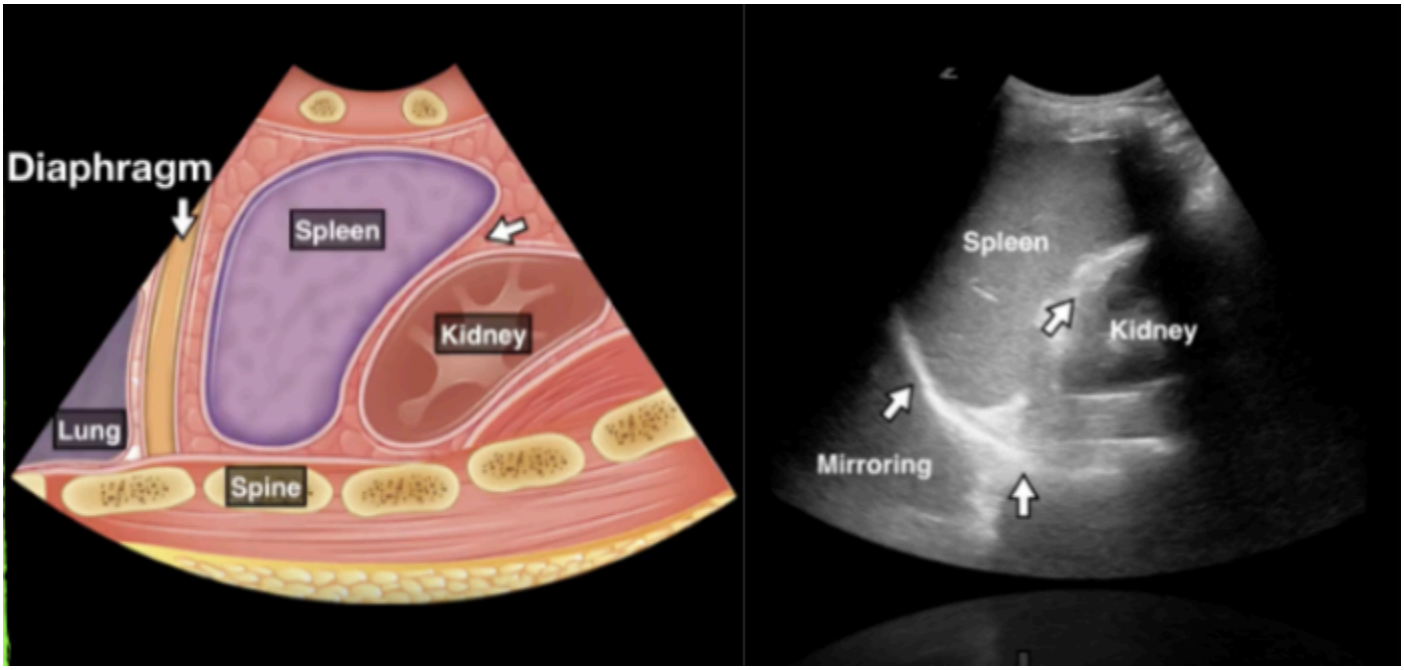
Positive Findings:

- **Peritoneal Fluid** (fluid/blood between the liver and kidney, i.e. Morrison's Pouch), as demonstrated on the image to the right.



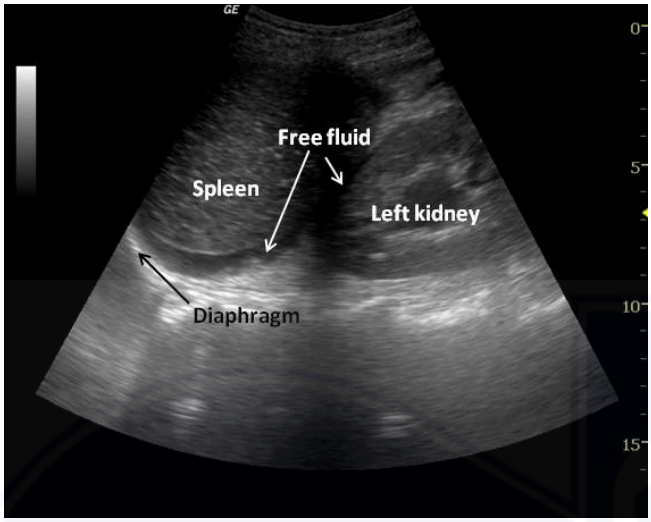
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#3 Left Upper Quadrant (Spleen) View:



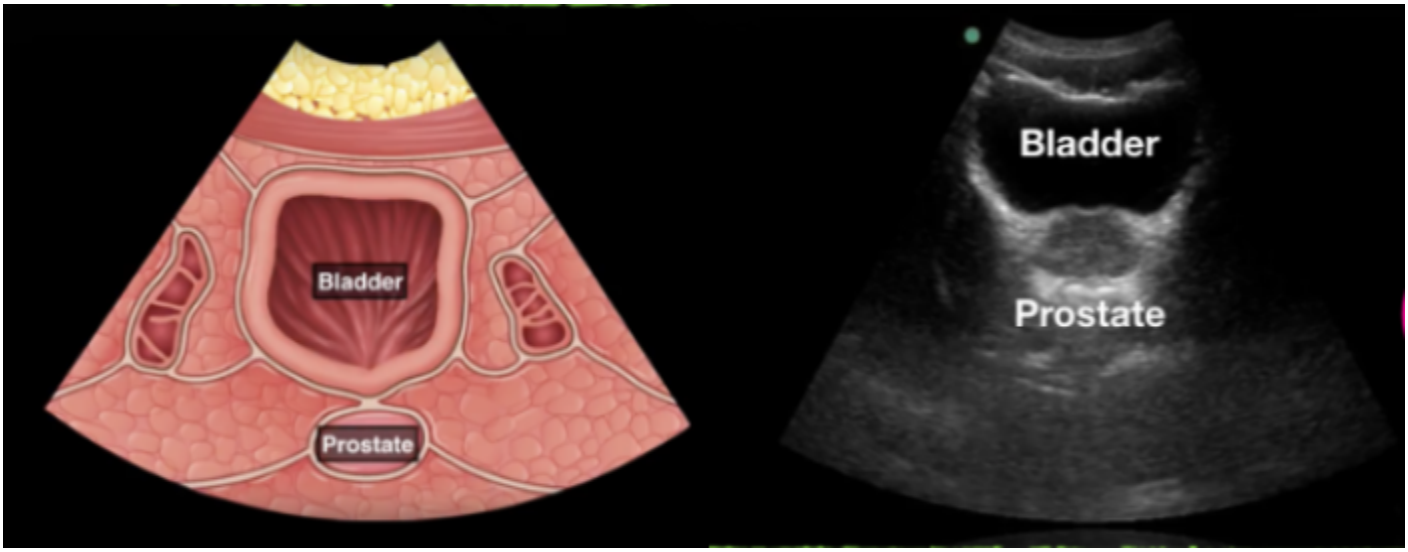
Positive Findings:

- **Peritoneal Fluid** (fluid/blood between the spleen and kidney), as demonstrated on the image to the right.



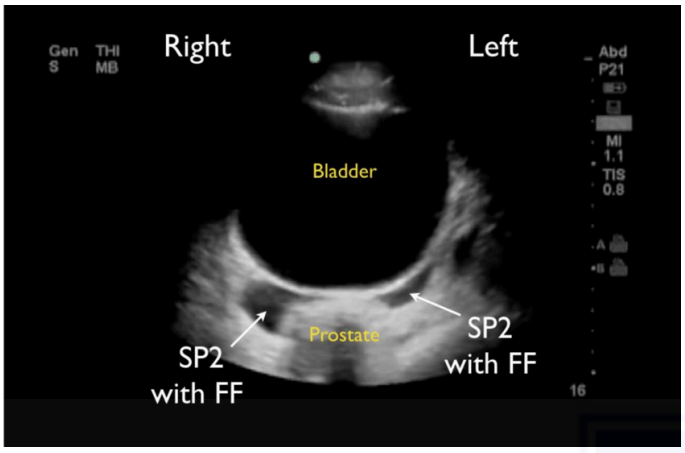
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#4 Suprapubic (Pelvis) View:



Positive Findings:

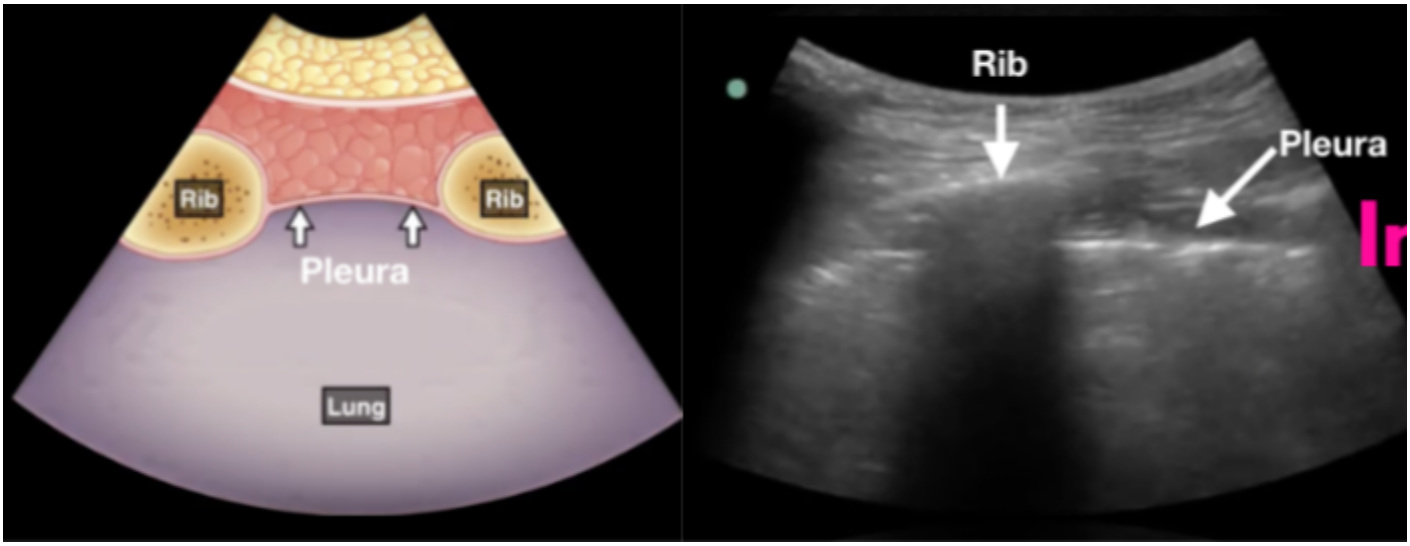
- **Peritoneal/Pelvic Free Fluid** (fluid/blood in the pelvis, generally behind the bladder), as demonstrated on the image to the right.



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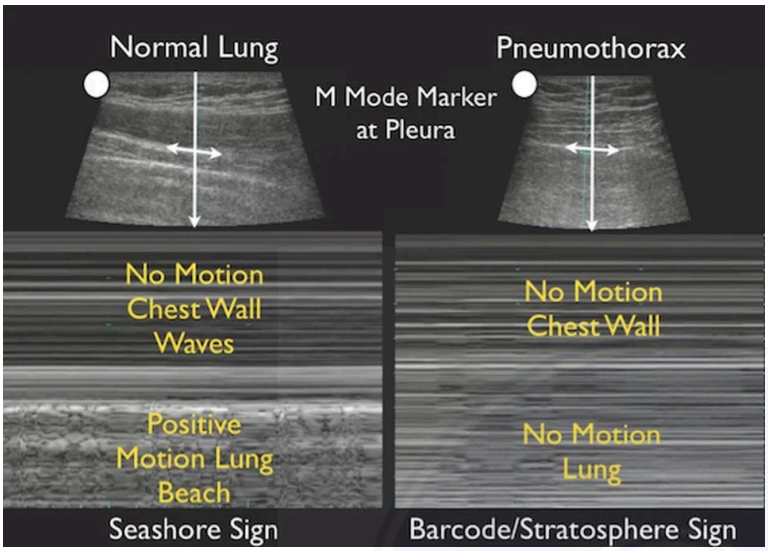
1-P6 ULTRASOUND: E-FAST	Ultrasound use requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

#5 Right and #6 Left Chest



Positive Findings:

- **Pneumothorax**, as demonstrated on the image below with a lack of visualized lung sliding. 'M Mode' can also be used to determine the presence or absence of lung sliding.



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1-P7 ULTRASOUND: PERIPHERAL IV	Ultrasound use requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

For an overview of the specific indications and approach to venous access, please refer to the **IV Protocol [1-03]** Guideline.

INDICATIONS:

- Patients requiring intravenous access in which traditional attempts have failed, or in whom attempts are felt to have a low likelihood of success.

CONTRAINDICATIONS:

- Cardiac arrest or a severely unstable patient (patients in whom delays in access would be detrimental and IO placement would be more appropriate).

Procedure (ULTRASOUND PERIPHERAL IV PLACEMENT):

- Assemble necessary equipment, including ultrasound cover and sterile gel, as well as ultrasound compatible needles.
- Identify anatomy and landmarks, using ultrasound to confirm vein course.
- Disinfect/prep skin using standing antiseptic solution/wipe.
- Utilize standard procedure for IV placement (as per 1-03), utilizing ultrasound to visualize the needle entering the intravenous space.
- Pull back to ensure blood return, and advance the IV catheter into the vessel.
- Secure/cover the IV as per standard practice.
- Document the number of attempts, placement, confirmation and complications in the PCR.

QI Review Parameters:

1. {Pending}

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First Responder
EMT
AEMT
Paramedic

AIRWAY / BREATHING

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Bag-Valve Mask (BVM):

- Successful ventilation with a BVM requires a good seal between the mask and the patient's face and maintaining an open airway.
- If an adequate seal cannot be obtained with the BVM, attempt oxygenation (and ventilation if possible) by other methods.

To properly place a BVM:

- Choose appropriate size for the patient.
- Place the apex of the mask on the bridge of the nose (between the eyebrows).
- Settle the base of the mask between the lower lip and the prominence of the chin.

<u>Procedure</u> - Ventilation technique:

- Hold the mask firmly in position by placing the heel of the hand on top of the mask, extending the fingers and thumb forward forming a “C”, and grasping the lower jaw with the middle two or three fingers.
- Squeeze the bag to ventilate.
- If necessary, a second EMT may be needed to secure seal and assist with bagging.
- Each ventilation should take one second and achieve modest chest rise.





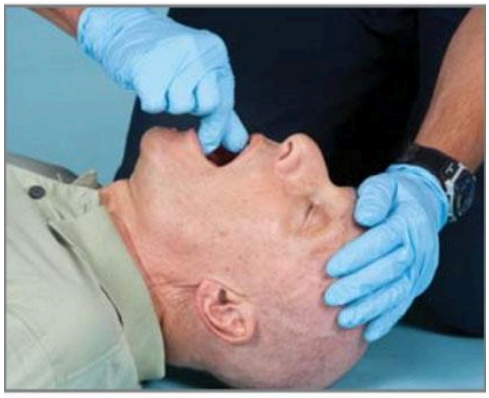


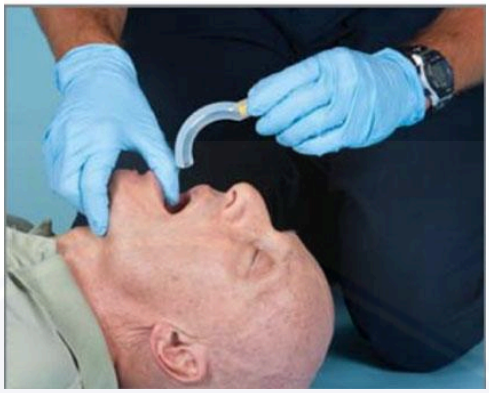
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Oropharyngeal Airway (OPA)

- An OPA is placed in the patient's oropharynx, lifting the tongue away from the back of the throat preventing it from occluding the airway.
- The OP airway is used <u>only on unconscious patients</u>, and generally those without respirations.
    - Do not use an OPA if a patient gags when inserted. A a gag reflex may cause retching, vomiting, or spasm of the vocal cords.
- An OPA is not necessary if ventilation via BVM is easily accomplished.
- *Sizing (top right)*: Choose correct size by measuring from the corner of the mouth to the ear lobe <u>or</u> from the chin to the angle of the jaw.







<u>*Procedure*</u> *- OPA Placement*:

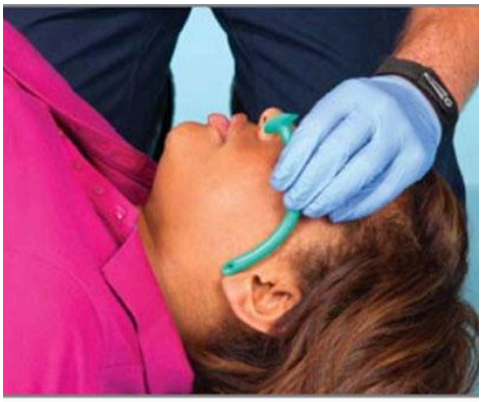
1. Lift/open the lower jaw.
2. Insert the airway along the roof of the mouth (tip sideways).
3. Rotate down when you are halfway in the mouth or approaching the curve on the tongue, and slide the OPA fully into the back of the throat.
    - Infant/child: consider using a tongue depressor if available.

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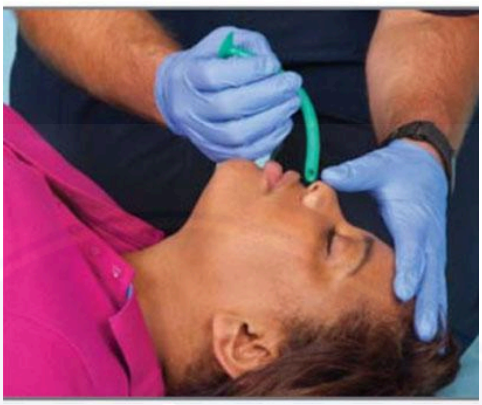
A-PA1 AIRWAY ADJUNCTS		First Responder EMT AEMT Paramedic

Nasopharyngeal Airway (NPA)

- An NPA is placed in the patient's nasopharynx, allowing bypass of airway obstruction by the tongue.
- The NPA <u>can</u> be used on *semi*-conscious patients with an intact gag reflex. They should be avoided in conscious patients as they are very uncomfortable.
- An NPA should be avoiding in patients with suspected basilar skull fracture.
- *Sizing (top right)*: Choose correct size by measuring from tip of the nose to the earlobe. Ensure the diameter is not larger than the nostril.







<u>Procedure</u> - NPA Placement:

1. Lubricate the NPA prior to insertion.
2. Insert with the bevel towards the septum and gently advance the NPA straight in along the floor of the nose (*not upwards*).
3. If resistance is felt, do not force. Try the other nostril if needed.

Suctioning

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A-PA1 AIRWAY ADJUNCTS		First Responder EMT AEMT Paramedic

- Indication: Obstruction of the airway by secretions, blood, or any other substance in a patient who cannot relieve the obstruction themselves, or are currently being assisted by an airway adjunct or advanced airway device (i.e. ETT, tracheostomy tube).

Procedure (Endotracheal Suctioning):

1. Preoxygenate the patient.
2. Setup suction device and ensure it is in proper working order
    - Attach catheter to suction device, keeping sterile plastic covering over catheter.
3. *Size*: Using the proximal opening of the airway (mouth, tube opening, stoma, etc.) and the suprasternal notch as endpoints, measure the depth desired for the catheter.
    - Judgment should be used regarding the depth with crico/tracheostomy tubes.
4. If applicable, remove ventilation devices from the airway.
5. With the thumb port of the catheter uncovered (suction off), insert the catheter through the airway device.
6. Once the desired depth (measured above) has been reached, occlude the thumb port and remove the suction catheter slowly.
7. Small volume (< 10 ml) of normal saline lavage may used as needed.
8. Re-attach ventilation device (e.g., bag-valve mask) and ventilate the patient.
9. Document time and result in the patient care report (PCR).

Notes:

- The Yankauer suction tip is preferred for most oropharyngeal suctioning (i.e. not through ETT or tracheostomy).
- If the catheter gets plugged repeatedly, remove the tip and use larger bore tubing.
- Oxygenate the patient well before and after suctioning.
- Suction for no more than 15 seconds at a time. In rare cases, copious vomiting that threatens the airway may require a longer period of suctioning.

QI Review Parameters:

1.

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1-PA2 AIRWAY SUCTIONING		First Responder EMT AEMT Paramedic

INDICATIONS:

Obstruction of the airway (due to blood, vomitus, secretions, or any other foreign substance) in a patient who cannot maintain/clear their own airway.

- For oropharyngeal obstructions, see '**Basic Suctioning**', below.
- For patients with an Advanced Airway (endotracheal tube, BIAD, etc.) or Tracheostomy, see '**Advanced Suctioning**', below.

Procedure (BASIC SUCTIONING):

1. Ensure suction device is functioning and setup is complete with canister, tubing and suction tip (e.g. Yankauer) in place.
2. Preoxygenate the patient (if able), utilizing passive oxygenation or assisted ventilations as needed.
3. Explain the procedure to the patient.
4. Examine the oropharynx and remove any large material which may occlude the airway–that is avoid pushing anything else further into the airways.
5. Use the suction device to remove any secretions, blood, or other substances.
6. Reattach any ventilation device (e.g., bag-valve mask) that may have been used prior to suctioning and ventilate or assist the patient as needed.
7. Document the time and result of the suctioning in the patient care report (PCR).

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1-PA2 AIRWAY SUCTIONING		First Responder EMT AEMT Paramedic

Procedure (ADVANCED SUCTIONING):

1. Ensure suction the device is functioning and setup is complete with canister and tubing.
2. Preoxygenate the patient (if able), utilizing passive oxygenation or assisted ventilations as needed.
3. Explain the procedure to the patient (if coherent).
4. Attach the suction catheter to the suction device, keeping sterile plastic covering over the catheter.
5. Estimate depth of suction catheter insertion:
    a. For orally inserted airways (standard ET tube or BIAD), measure from the proximal opening of the airway to the supersternal notch.
    b. For tracheostomies or other surgical airways (e.g. cricothyrotomy) the suction catheter should be advanced slightly beyond the (approximate) end of the tube. See **Tracheostomy Management [A-05]** for further troubleshooting of chronic tracheostomy tubes.
6. If applicable, remove any ventilation devices and/or other attachments (e.g. a Passey-Muir valve) from the airway.
7. With the thumb port of the suction catheter uncovered, insert the catheter through the airway device to the appropriate depth (as measured above).
8. Once the desired depth has been reached, occlude the thumb port and slowly remove the catheter.
9. Reattach any ventilation device (e.g., Ambu Bag, ventilator, etc.) that may have been used prior to suctioning or assist the patient as needed.
10. Document the time and result of the suctioning in the patient care report (PCR).

NOTE: A small amount of Normal Saline (10 ml) may be used if needed to loosen secretions for suctioning.

QI Review Parameters:

1. {Pending}

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A-PA3 BLIND INSERTION AIRWAY DEVICE (BIAD)	MFR, EMT & AEMT may perform after Service-Level Training	First Responder EMT AEMT Paramedic

Indications

- In cardiac arrest--a BIAD should be used as the primary airway when available, as attempts at intubation are likely to interrupt CPR.
- Adequate oxygenation/ventilation cannot be accomplished by other less invasive means.
- Use BIAD as a rescue/secondary airway if unable to intubate a patient with an ET tube. (see Failed Airway Guidelines **[A-02]**)
- May use a BIAD as primary if intubation is anticipated to be difficult and rapid airway control is necessary.

Contraindications

- Intact gag reflex
- Caustic ingestion

Procedure

- Assemble equipment, select proper size supraglottic airway based on manufacturer's specifications (*see below*).
- *(If applicable)* Note correct volume for inflation marked on tube itself and test balloon for leaks.
- Lubricate distal tip with water-soluble lubricant.
- Suction airway and maximize oxygenation with BVM ventilation.
- Maintain in-line spinal immobilization if needed.
- Gently advance the supraglottic airway into the oropharyngeal cavity and along the soft palate until it "seats" in the appropriate position.
- Never utilize excessive force. If you meet resistance, the device should be removed, re-lubricated and the head/neck repositioned.
- *(If applicable)* Inflate cuff balloon with correct volume of air (marked on device).
- Confirm tube placement by auscultation, chest movement, ETCO2, etc.
- Continuously monitor $ETCO_2$ (waveform capnography), SpO_2, and vital signs.

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A-PA7 PERCUTANEOUS CRICOTHYROTOMY	**STOP**: Surgical Airways may ONLY be performed by paramedics who have documented training and competency in this skill via written confirmation from the medical director or designated surrogate.	First Responder EMT AEMT Paramedic

Indications

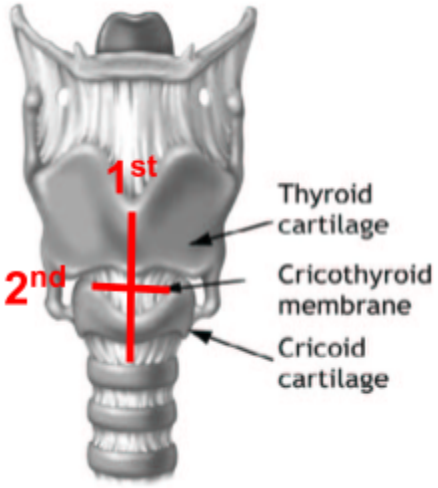
- A life-threatening condition exists AND adequate oxygenation and ventilation cannot be accomplished by other less invasive means. (see Failed Airway Guidelines **[A-02]**)

Contraindications

- Age <12 (i.e. fits on the Broslow tape)
- If patient can be ventilated and oxygenated by less invasive means

Procedure *(use quick kit instructions as applicable)*

- Prepare skin using aseptic solution.
- Identify the cricothyroid membrane.
  - Position the patient supine
  - In-line spinal immobilization as indicated.
  - If possible, neck extension will improve view.
- First, make a **vertical** incision **OVER** the cricoid membrane.
- Then, make a **horizontal** incision **THRU** the cricoid membrane.
- (*If available*) grasp the cricoid cartilage with a trach hook.
- Pass a 6.0 ETT (or size appropriate for patient)
  - Consider using a Bougie as a guide
- Attach and ventilate with ambu-bag.
- Secure the tube with ties or appropriate device.
- Confirm and document tube placement by ETCO2, breath sounds, rising pulse oximetry, etc.
- Observe for subcutaneous air, which may indicate tracheal injury or extra- tracheal tube position
- Continually reassess ventilation and oxygenation.



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A-PA3 BLIND INSERTION AIRWAY DEVICE (BIAD)	MFR, EMT & AEMT may perform after Service-Level Training	First Responder EMT AEMT Paramedic

Broselow Tape Sizes		
	King LT	i-Gel
GREY 3-5 kg	Size 0 (Clear) or 1	Size 1 (Pink)
PINK 6-7 kg	Size 1 (White)	Size 1.5 (Blue)
RED 8-9 kg	Size 1 (White)	Size 1.5 (Blue)
PURPLE 10-11 kg	Size 1 (White)	Size 2 (Grey)
YELLOW 12-14 kg	Size 2 (Green)	Size 2 (Grey)
WHITE 15-18 kg	Size 2 (Green)	Size 2 (Grey)
BLUE 19-23 kg	Size 2 (Green)	Size 2 (Grey)
ORANGE 24-29 kg	Size 2.5 (Orange)	Size 2.5 (White)
GREEN 30-36 kg	Size 2.5 (Orange)	Size 2.5 (White)
Small Adult (<5 ft)	Size 3 (Yellow)	Size 3 (Yellow)
Adult (5-6 ft)	Size 4 (Red)	Size 4 (Green)
Large Adult (>6 ft)	Size 5 (Purple)	Size 5 (Orange)

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A-PA3 BLIND INSERTION AIRWAY DEVICE (BIAD)	MFR, EMT & AEMT may perform after Service-Level Training	First Responder EMT AEMT Paramedic

KEY POINTS:

- Do not remove a properly functioning supraglottic airway in order to attempt intubation.
- Correct sizing of supraglottic airways is critical for correct function.
- Supraglottic airways are safe and effective in pediatric patients, provided the correct size tube is selected. The age-range for supraglottic airway use is dependent on the specific device being used (*see below*).
- Use with caution in patients with broken teeth (may lacerate balloon), or those with known esophageal disease who are at increased risk of esophageal injury.

QI Review Parameters:

1.

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A-PA4 ENDOTRACHEAL INTUBATION		First Responder EMT AEMT Paramedic

***If available*, the use of a *Video Laryngoscope* is MANDATORY on ALL endotracheal intubation attempts, and a BOUGIE is mandatory on the second and all subsequent attempts.**

Indications

- See Airway Maintenance [**A-01A**] for indications/decision-making
- See Drug-Assisted Intubation/RSI [**A-04**], if needed

Equipment (*age appropriate*)

- Manual resuscitator device (BVM) with O_2 delivery system
- Oral & nasal airways (OPA/NPA)
- Endotracheal intubation equipment:
  - Laryngoscope handle and appropriate blade
  - Endotracheal tube, stylet, and 10 cc syringe
  - Lubricant (such as xylocaine jelly)
  - Suction equipment
  - Tape or securing device
  - Secondary device to verify tube placement (e.g. color capnography or $ETCO_2$)
- RSI medications [see **A-04**]
- Rescue equipment:
  - Magill forceps
  - Needle Crich [**A-PA6**] supplies (or similar kit):
    - Cleanser (betadine, chloraprep, etc.)
    - Large-bore angiocath/IV needle (like for chest decompression)
    - 3 mL syringe and an ETT adapter for BVM (usually from a 7.5 ETT)
  - Surgical Crich [**A-PA7**] supplies (or similar kit):
    - Cleanser (betadine, chloraprep, etc.)
    - Scalpel (#11 blade)
    - Curved sharp hemostat (or trach hook)

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A-PA4 ENDOTRACHEAL INTUBATION		First Responder EMT AEMT Paramedic

Prepare the patient:

- Position the patient for optimal visualization, providing c-spine stabilization as needed (consider removing the anterior portion of the collar).
- Preoxygenate with high flow O_2 via NRB for 2 or more minutes if possible. (*This establishes an oxygen reserve which will allow for several minutes of apnea.*)
- Assist with a manual resuscitator only if spontaneous ventilation is inadequate/absent. (*Avoiding positive pressure ventilation will help prevent gastric insufflation*)
- Establish IV access, and if potentially/currently hypotensive provide fluids.
- Attach cardiac monitor and pulse oximetry, and **end-tidal CO_2**..

Procedure (Endotracheal Intubation)

- Consider the need for Sedation/Paralytic Medications per Drug-Assisted Intubation Guideline [**A-04**]
- Have all equipment within reach (*see above*).
- Position the patient and the patient's head in the best position possible.
    - Supine with head extended is optimal.
    - Consider removing the anterior c-collar, and have an assistant hold spinal immobilization if indicated by Spinal Immobilization Guideline [**1-06**].
    - Consider a roll under the patient's shoulders (especially in children).
- Provide 100% O2 and ventilation assistance only if needed.
- Advance the laryngoscope blade and identify the epiglottis.
    - Insert the blade on the right side of the mouth, sweeping the tongue out of the way as the blade is advanced.
    - The epiglottis should be visualized around the base of the tongue.
    - The vocal cords will be just behind (inferior and anterior to) the epiglottis.
    - To help with visualization consider applying cricoid pressure (Sellick Maneuver), or gentle backward/upward/rightward pressure (BURP Technique).
    - If the epiglottis cannot be visualized, slowly remove the blade and it will likely drop into view.
    - If the epiglottis obscures the vocal cords consider repositioning the patient, using a straight (Miller) blade--especially in children--to lift the epiglottis, OR consider using a Bougie introducer [**A-PA5**] as an adjunct to advance the tube.
- Advance the ET tube with introducer or over the Bougie.
- Inflate the cuff, remove stylet, ventilate and confirm ET tube placement (*as below*).
- Always observe for oxygen desaturation (<95%) and begin ventilating back to 100% before reattempting intubation.

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A-PA4 ENDOTRACHEAL INTUBATION		First Responder EMT AEMT Paramedic

Verify Correct ETT placement

- Visualize vocal cords and tube passage during **ETT** placement
- Auscultate bilateral breath sounds and abdomen to determine if air entry is adequate and symmetrical to all lung fields and absent over the epigastrium.
- Observe for symmetric chest wall expansion with ventilation
- Apply an secondary confirmation device (color capnography, $ETCO_2$, etc.)
- Secure and document appropriate depth mark at lips in accordance with **ETT** size

Documentation Requirements

- Indication for intubation
- Pre-oxygenation prior to intubation and oxygen saturation
- Classification and condition of airway: clear, emesis, blood, etc.
- Difficulty with the procedure, including number of attempts
- Tube size, depth of insertion, and how the tube is secured
- Who performed the procedure
- Cricoid pressure, manual c-spine immobilization, or similar maneuvers if used
- Means by which patient was ventilated **after** intubation and oxygen delivered
- Cardiac rhythm
- Status of ETT and vitals/condition after each movement of patient (breath sounds, oxygen saturation, End tidal CO_2, clinical improvement/stability, etc.)

QI Review Parameters:

1.

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A-PA5 ENDOTRACHEAL TUBE INTRODUCER (BOUGIE)		First Responder EMT AEMT Paramedic

Indications

- See airway maintenance guideline [A-01]
- Predictable difficult intubation, but may used for any attempt.

Contraindications

- Introducer larger than ETT internal diameter

PROCEDURE

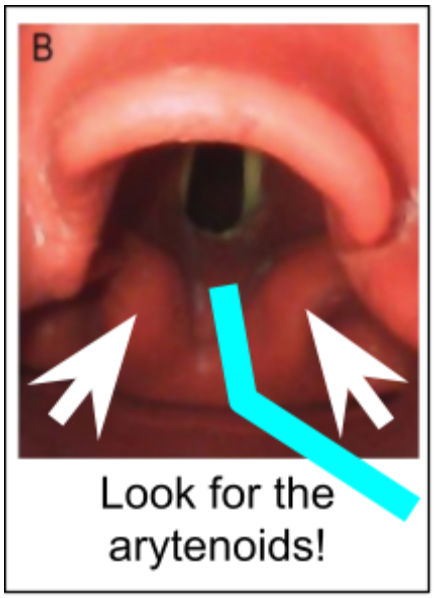
- Prepare, position and oxygenate the patient with 100% Oxygen.
- Select proper ET tube without stylet, test cuff and prepare suction.
- Lubricate the distal end and cuff of the endotracheal tube and the distal ½ of the Bougie.
- Using direct laryngoscopic techniques, visualize the vocal cords.
- Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords (or above the arytenoids if the cords cannot be visualized).
- Once inserted, gently advance the Bougie until you meet resistance or “hold-up” (if you do not meet resistance the introducer is likely in the esophagus and insertion should be reattempted or the failed airway protocol implemented as indicated).
- Load the ET tube onto the introducer, and (while maintaining a firm grasp on the proximal Bougie) gently advance the tube to its appropriate depth.
- If you are unable to advance the ETT into the trachea:
    a. Make sure the Bougie and ETT are adequately lubricated,
    b. Withdraw the ETT slightly and rotate 90° COUNTER CLOCKWISE to turn the bevel of the ETT posteriorly.
    c. If this fails, you may attempt direct laryngoscopy while advancing the ETT (this may require an assistant to maintain the position of the Bougie).
- Once the ETT is correctly placed, hold the ET Tube securely and remove the Bougie.
- Confirm tracheal placement as usual, inflate the cuff with 3-10 cc of air, auscultate for equal breath sounds and reposition accordingly.
- When final position is determined, secure the ET Tube, reassess breath sounds, apply end tidal CO_2 monitor, and record the monitor readings to assure continued tracheal intubation.

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A-PA5 ENDOTRACHEAL TUBE INTRODUCER (BOUGIE)		First Responder EMT AEMT Paramedic

PEARLS

- The Bougie is a great <u>adjunct</u> for ETT placement when poor visualization of the vocal cords is encountered or expected, allowing for easier visualization/verification of placement.
- It should be used when some anatomy of the laryngeal opening can be identified but the vocal cords cannot be visualized well enough to ensure accurate placement of an ETT (i.e. you can see only a small portion of the cords/arytenoid cartilage).
- Always keep the tip of the Bougie angled anteriorly. This will increase the odds of tracheal placement even when the cords cannot be directly visualized.
- Once passed, you should feel “bumps” as the tip passes over the tracheal rings. The Bougie should also come to a “firm” stop as it encounters the bronchial tree. If the bumps and/or hard stop are not felt (i.e. there is smooth advance of the tube without a firm end point, you are likely in the esophagus.
- There are a few options for the use of a Bougie introducer:
    a. *Stand-alone* -- once in place, an ET tube can be placed on and advanced over the Bougie.
    b. *Preloaded* -- then ETT advanced after placement. This can be done in several different manners (**see right**).
- My personal preference is to place the Bougie (*alone*) using direct laryngoscopy. [NOTE: I find it easiest if it is kept straight--and it really needs to be stored this way if possible]. Once in & advanced (feeling for the tracheal rings and a firm endpoint--i.e. In the bronchial tree), I load and advance an ETT preferably with the help of a bystander while keeping the laryngoscope in place to avoid obstruction or kinking of the ETT.









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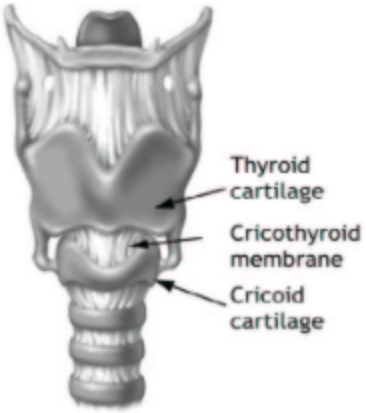
A-PA6 NEEDLE CRICOTHYROTOMY	**STOP**: Surgical Airways may ONLY be performed by paramedics who have documented training and competency in this skill via written confirmation from the medical director or designated surrogate.	First Responder EMT AEMT Paramedic

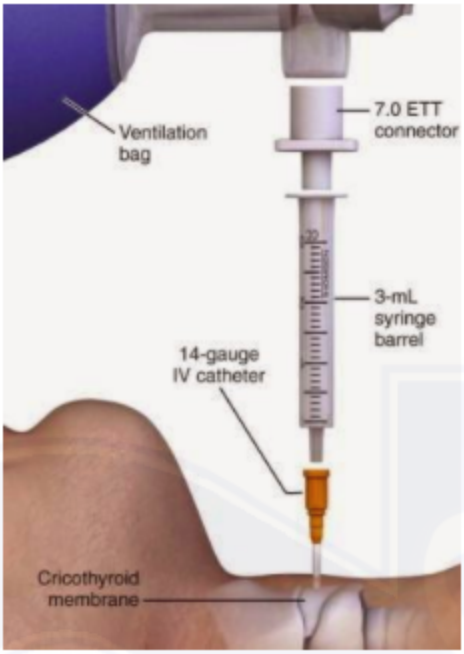
INDICATIONS

- A life-threatening condition exists AND adequate oxygenation and ventilation cannot be accomplished by other less invasive means. (see Failed Airway Guidelines **[A-02]**)

PROCEDURE:

- Assemble equipment (attach angiocath to 3 mL syringe)
- Prep the skin using aseptic solution.
- Locate the cricothyroid membrane just distal ("down the hill") from the tracheal cartilage.
- Insert the catheter through the skin and cricothyroid membrane into the trachea.
    a. Direct the needle 45° caudally (toward the feet)
    b. A "pop" should be felt when the needle penetrates the trachea.
- Aspirate, if air returns easily (or bubbles are seen if saline is used), the cath should be in the trachea.
- Advance the catheter flush to the skin while holding the needle in position, then withdraw the needle.
- Remove the plunger from the 3 mL syringe.
- Attach an ET tube adapter from a 7.5 ETT, this should fit snugly in the 3 mL syringe barrel.
- Attach an ambu-bag to the adapter and provide high-flow oxygen through the bag
    a. May attempt to ventilate through the catheter or my use it as a passive oxygenation device.
- Confirm and document catheter placement by ETCO2 device, rising pulse oximetry, etc.
- NEVER let go of catheter--there is no reliable way to secure it in place.
- Continually reassess oxygenation and catheter position.





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A-PA6 NEEDLE CRICOTHYROTOMY	**STOP**: Surgical Airways may ONLY be performed by paramedics who have documented training and competency in this skill via written confirmation from the medical director or designated surrogate.	First Responder EMT AEMT Paramedic

EQUIPMENT (*sizes may vary depending on manufacturer*):

- 14 - 16 ga catheter over needle
    - i.e. angiocath for needle decompression (adjust size for pediatric patients)
- 3 mL syringe
- Tube adaptor from a 7.5 ETT (piece that attaches to the ambu-bag)
- Ambu-bag

NOTES:

- Needle cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances. The rationale for this procedure must be documented in the PCR, and submitted for review to the EMS Medical Director within 24 hours .
- Every effort should be made to effectively oxygenate and ventilate the patient before attempting needle cricothyrotomy.

QI Review Parameters:

1.

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A-PA7 PERCUTANEOUS CRICOTHYROTOMY	**STOP**: Surgical Airways may ONLY be performed by paramedics who have documented training and competency in this skill via written confirmation from the medical director or designated surrogate.	First Responder EMT AEMT Paramedic

Equipment (*if quick kit not available*):

- 11-blade or similar scalpel
- (*Optional*) trach hook
- 6.0 (or appropriate sized) ET tube

Notes:

- Cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances. The rationale for this procedure must be documented in the PCR, and submitted for review to the EMS Medical Director within 24 hours.
- Every effort should be made to effectively oxygenate and ventilate the patient before attempting a surgical cricothyrotomy.
- Success of the procedure is dependent on correct identification of the cricothyroid membrane.
- Bleeding will occur, even with correct technique. Straying from the midline is dangerous and likely to cause hemorrhage.

QI Review Parameters:

1.

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A-PB1 CAPNOGRAPHY (ETCO2)		First Responder EMT AEMT Paramedic

Indications

Clinical Symptoms	Clinical Interventions
• Every Cardiac Arrest (excluding DOA's) • Any **Altered Mental Status** • Any **Difficulty Breathing** • Any **Signs of Hypoperfusion** (e.g. hypotension, tachycardia, etc.	• **Any Oxygen Administration or Other Respiratory Interventions** (basic or advanced airways, nebulizers, etc.) • **Any Sedating Medications** (narcotics, benzodiazepines, ketamine, etc.)

End-Tidal CO2 Measurements

Physiologic State	High ETCO2 (>45 mmHg)	Low ETCO2 (<35 mmHg)
High (Venous) Blood pCO_2	**Hypoventilation** (Increased CO_2 in the blood & alveoli)	**No ventilation =** Circuit disruption (obstruction, disconnection, etc.) *– or –* **No perfusion=** Shock/Cardiac Arrest (decreased cardiac output)
Low (Venous) Blood pCO_2	N/A	**Hyperventilation** Metabolic Acidosis with a compensating respiratory alkalosis → hyperventilation blowing off CO2; e.g. DKA
ETCO2 Change	**Sudden Rise** Increased delivery of CO2 to the lungs (e.g. **ROSC**, administration of Sodium Bicarb, etc.)	**Sudden Drop** **Circuit Disconnected** (no ventilation occurring) *– or –* **Cardiac Arrest** (sudden decrease in cardiac output)
	Gradual Rise **Hypoventilation** with resultant respiratory acidosis	**Gradual Drop** **Hyperventilation** **Shock** = worsening cardiac output/perfusion

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A-PB1 CAPNOGRAPHY (ETCO2)		First Responder EMT AEMT Paramedic

End-Tidal CO2 Monitoring Procedure

- Zero-out the monitor, and then attach the appropriate capnography adapter to the BIAD/endotracheal tube or EtCO2 cannula on the patient.
- The device should remain in place until patient care is transferred.
- Document $EtCO_2$ value and waveform changes along with each pulse oximetry (SpO2) measurement within the Patient Care Report (PCR/ePCR).
- Any loss of CO_2 detection or waveform indicates a potential airway dislodgement or perfusion problem and should be immediately evaluated and documented.

Overview of Clinical Management based on End-Tidal CO2 Measurements

Refer to individual clinical guidelines for more specific approach

Clinical Scenario	*ETCO2 Reading*
Cardiac Arrest	• Generally 0: due to a lack of blood delivery to the lungs • If <10: improve chest compressions • $ETCO_2$ <10 after 20 minutes of CPR likely indicates low CO_2 production (i.e. no cellular metabolism) and is associated with poor outcomes. • Sudden increase: may indicate reperfusion/ROSC (may also be related to Bicarb administration)
General Approach	**Adjust quality of CPR (rate, depth, etc.) to maintain a goal of 20**
Respiratory Distress	• Absolute number not as important as the trend • >45 may be baseline (chronic CO2 retention with COPD) • <35: likely due to hyperventilation (increased work of breathing); but could also be due in part to decreased perfusion (i.e. shock) • *Asthma*: normal/high EtCO2 is concerning for impending respiratory failure (*should be low due to hyperventilation*) • In asthma/COPD exacerbations: patients may be allowed to have higher ETCO2, as lower ventilation rates allow more time for exhalation and prevents auto- PEEP and/or air trapping. This should be balanced with ventilatory needs to maintain oxygenation.
General Approach	**Increasing EtCO2 = worsening respiratory failure and more aggressive ventilatory assistance should be provided (CPAP/BiPAP, intubation, etc.)**

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Post-Intubation/ Paralysis	• Paralysis removes the respiratory drive and will result in the rapid accumulation of CO2 without appropriate assisted ventilation • If the patient is intubated while in a state of metabolic acidosis (e.g. sepsis), their compensatory hyperventilation will be negated potentially leading to a mixed acidosis (both metabolic and respiratory) which may quickly lead to cardiac arrest.
General Approach	• Assist ventilations as soon as a decreasing respiratory drive is noted, and minimize apnea periods during intubation attempts. • **Most patients should have their EtCO2 maintained between 35-45 with a respiratory rate of 8-12 breaths per minute.** • If the patient was hyperventilating prior to sedation/paralysis, it is reasonable to maintain EtCO2 between 30-35 post intubation with a slightly elevated respiratory rate (avoid frank hyperventilation).
Altered Mental Status	• Elevated pCO2 (CO2 narcosis) is one of the many causes of altered mental status. • >45: may indicate CO2 Narcosis due to direct CNS depression (e.g. overdose) or a respiratory cause of hypoventilation (e.g. pneumonia)
General Approach	• **Ventilatory support titrated to the patient's overall clinical condition should be provided, as per protocol (CPAP/BiPAP, intubation, etc.).**

Shock States (Metabolic Acidosis)	• In states of shock, EtCO2 may be used as a surrogate for cardiac output.
	• A low ETCO2 should prompt appropriate interventions to relieve the shock state:
	  ○ Hemorrhagic Shock → TXA/Blood Products
	  ○ Hypovolemic Shock (e.g. Septic/Distributive) → IV Fluid Bolus(es) & Vasopressors

General Approach	• **Cardiovascular support titrated to the patient's overall clinical condition should be provided, as per protocol (IV fluid resuscitation, blood product administration, vasopressors, etc.).**

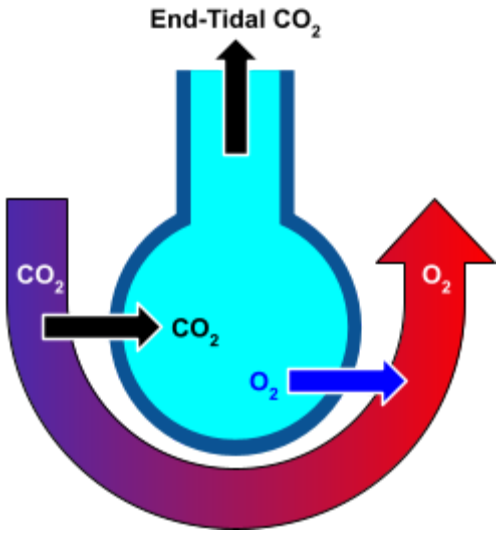
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A-PB1 CAPNOGRAPHY (ETCO2)		First Responder EMT AEMT Paramedic

Notes on ETCO2

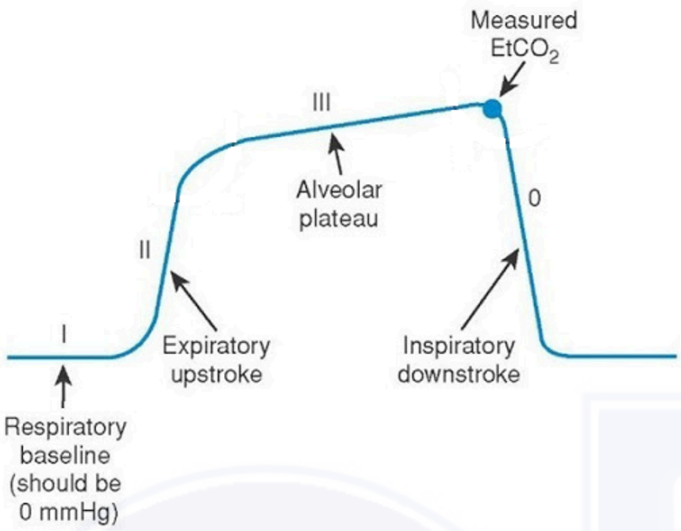
CO2 Physiology

- CO2 rapidly diffuses from blood entering the lungs into the alveolar space.
- End-tidal CO2 is a direct measurement of the pressure (in mmHg) of the CO2 in the alveoli (i.e. the pCO2).
- ETCO2 is thus an INDIRECT measurement of the CO2 in the venous blood entering the lungs (i.e. the paCO2 - as measured in an venous blood gas).
- Therefore, ETCO2 can be affected by either ventilation or perfusion.



Capnogram

- Baseline (I): Dead Space Air = same O_2 and CO_2 concentration of inhaled air
- Expiration (II) & Inspiration (0): rapid change from dead-space air (trachea, bronchioles, etc.) to alveolar air
- Plateau (III): mostly pure expired air
- **End-Tidal CO_2: Maximum CO_2 = approximate venous pCO_2**



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A-PB2 CONT. POSITIVE AIRWAY PRESSURE	EMT may initiate CPAP after the completion of service-level training .	

CONTRAINDICATIONS:

The use of CPAP is NOT appropriate if:

- Patient is in respiratory arrest/apneic.
- Patient is suspected of having a pneumothorax or has suffered trauma to the chest.
- Patient has a tracheostomy or other injury or deformity to the face prohibiting a good mask fit
- Patient is actively vomiting or having upper GI bleeding.
- Patient is hemodynamically unstable (or any signs of poor perfusion).
- The patient **MUST be able to remove the mask themselves** in case of vomiting, or have a provider IMMEDIATELY available to remove it *(see "Precautions" below)*.

PRECAUTIONS:

CPAP may be used with caution in the following situations if closely monitored. If there is any deterioration in the patient's condition, discontinue CPAP and provide appropriate airway support.

- Has impaired mental status and is not able to cooperate with the procedure.
- Has primary complaint of or recent upper GI bleeding or history.
- Has primary complaint of or recent nausea or vomiting.
- Has poor respiratory effort or excessive secretions.
- Has a minor/partial facial deformity that prevents the use of CPAP.
- Has DNR/DNI status with respiratory distress who otherwise would have been intubated.

NOTES:

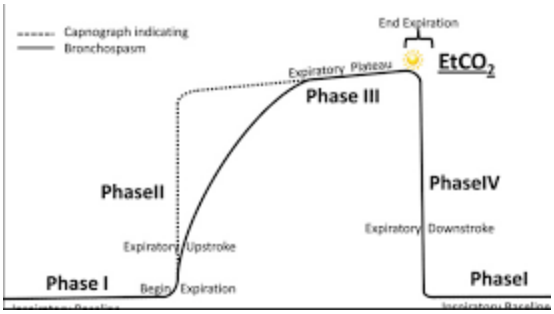
- Use of a non-back pressure flow devices (i.e. Flow-Safe) or nebulizer may affect input gas liter flow/pressure. Always verify delivered CPAP pressure on a manometer.
- Flow meters capable of delivering up to 25 LPM may be required to operate both CPAP and Nebulizer simultaneously.
- Watch for gastric distention that can result in vomiting.
- **Procedure may be performed on patients with a Do Not Resuscitate order.**
- Due to the changes in preload and afterload of the heart during CPAP therapy, a complete set of vital signs must be obtained every 5 minutes.
- Always coach the patient to alleviate fear and to allow maximal effectiveness of the treatment.

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A-PB1 CAPNOGRAPHY (ETCO2)		First Responder EMT AEMT Paramedic

Capnogram: Shark Fin Appearance

- Seen in: Obstructive lung disease (asthma, COPD, etc.)
- Cause: air trapping (due to bronchospasm) in the alveoli cause a delay in expiration, making the Expiratory Upstroke (II) more prolonged (less vertical)



QI Review Parameters:

1. Was ETCO2 used appropriately (based on indications)?
2. Was ETCO2 documented appropriately (i.e. with all SpO2 readings)?
3. Was the ETCO2 level used to guide appropriate clinical management?

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A-PB2 CONT. POSITIVE AIRWAY PRESSURE	EMT may initiate CPAP after the completion of service-level training .	First Responder EMT AEMT Paramedic

Continuous **P**ositive **A**irway **P**ressure (CPAP) has been shown to rapidly improve vital signs, gas exchange, work of breathing, and decrease the need for intubation in patients who suffer asthma, COPD, pulmonary edema, CO poisoning, Near Drowning, CHF, and pneumonia.

INDICATIONS:

Any patient with significant respiratory distress, including one or more of the following:

- A respiratory rate greater than 25 breaths per minute
- Pulse Oximetry of less than 94% at any time
- Use of accessory muscles during respirations

...and ALL of the following (unless discussed with Online Medical Control):

- Is awake and able to follow commands,
- CPAP mask fits appropriately (including appropriate size for age),
- Has a systolic blood pressure above 90 mmHg, and
- Shows signs consistent with an emergent respiratory process.

When available, utilize either Bilevel Positive Airway Pressure (BPAP) [A-PB3] or High-Flow Nasal Cannula (HFNC) [A-PB4] Devices instead of CPAP.

PROCEDURE (Oxygen-Powered/Disposable CPAP Device):

1. Connect CPAP tubing/device to gas source as per manufacturer's recommendations.
2. Activate O_2 source and slowly increase gas flow.
3. Coach the patient on appropriate mask fit/use and slow breathing, and place the face mask securely to the patient's face using head harness.
4. Check face mask fit to patient and device connections for leaks.
5. Slowly **titrate the flow meter per manufacturer's recommendations** until desired pressure is obtained. Not to exceed:
    a. CHF = 10 cmH2O
    b. COPD/Asthma, Pneumonia, or smoke/chemical inhalation = 5 cmH2O
6. Patient SaO_2 should be monitored using a pulse oximeter and EtCO2 should be measured with nasal cannula if available.
7. Nebulized medications may be given through CPAP Nebulizer per appropriate guideline.
8. Do not remove CPAP until hospital therapy is ready to be placed on the patient.

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A-PB2 CONT. POSITIVE AIRWAY PRESSURE	EMT may initiate CPAP after the completion of service-level training .	First Responder EMT AEMT Paramedic

QI Review Parameters:

1. CPAP use indicated (and not contraindicated) as per guideline.
2. CPAP initiated by: EMS, Fire, Pre-Arrival/Home, etc.
3. Time to initiation of CPAP (from patient contact).
4. Response to Treatment?
5. Adverse events: Yes/No?, Type?

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1-PB3 BI-LEVEL POSITIVE AIRWAY PRESSURE	BPAP requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

For an overview of the specific indications and approach to the various non-invasive ventilation modalities, please refer to the **Respiratory Distress [A-01B]** Guideline.

INDICATIONS:

- Patients with significantly increased work of breathing (respiratory distress)
- Patients with suspected hypercarbic respiratory failure/CO2 retention (mild-to-moderated alterations in mental status from sedating medications or underlying lung disease exacerbations).
- Patients who require oxygen supplementation beyond the capabilities of a low-flow nasal cannula.

CONTRAINDICATIONS:

- Patient anatomy is not conducive to the application of the mask (facial trauma, facial hair, etc.).
- Inability to protect the airway (from severe altered mental status or potential airway obstruction (active nausea or vomiting, significant secretions, facial/oropharyngeal bleeding, etc.)
- Impending respiratory failure/severe hypoventilation (decreased respiratory effort and/or rate)
- Known or suspected pneumothorax

Procedure (BI-LEVEL POSITIVE AIRWAY PRESSURE; BPAP):

- Ensure appropriate functioning of and adequate oxygen supply to the device.
- If Prehospital initiation of BPAP:
    a. Explain the procedure to the patient.
    b. Place and secure the face mask (delivery device) as per the manufacturer's instructions.
    c. Initiate air flow/oxygen levels (as per the initial settings, below).
- If Facility-Initiated BPAP:
    a. Continue or match the previous settings.
- Continuously reassess the patient's airway and breathing, and **slowly titrate** device settings to achieve desired oxygen saturations and ventilation needs, as noted below. This includes continuous ECG, pulse oximetry and ETCO2 monitoring.
- Closely monitor the patient and escalate to more aggressive interventions (BVM ventilations, endotracheal intubation, etc.) as needed.

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1-PB3 BI-LEVEL POSITIVE AIRWAY PRESSURE	BPAP requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

BPAP SETTINGS

- Cannula size:
    a. Prongs must not create a seal in the nares (a clear gap must be visible around each prong).
    b. Discomfort is often due to velocity of the gas (smaller diameter cannulas create a higher velocity at the same flow rate), and may be eased by using a larger cannula size (if available).
- **FiO2 - Fractional Inspired Oxygen Level:**
    a. Definition: The percentage of oxygen delivered to the patient.
    b. **Initial: 100%** (may initiate at a lower level, depending on patient condition)
    c. Titration: Titrate down as able to the patients desired oxygen saturation
- **Flow Trigger**
    a. Definition: The percentage of oxygen delivered to the patient.
    b. **Initial: 5 L/min**
    c. Titration: Titrate down if ineffective patient effort. Titrate up if autotriggering.
- **PEEP - Positive End Expiratory Pressure:**
    a. Definition: The pressure maintained at the end of expiration to keep the alveoli and small airways from collapsing and to recruit potential non-ventilated portions of the lung. The singular mechanism employed by CPAP devices.
    b. **Initial: five (5) cmH2O** (or as otherwise directed by manufacturer recommendations).
    c. Titration: Increase in increments of 1-2 cmH20, based on continued hypoxemia.
- **IPAP - Inspiratory Positive Airway Pressure:**
    a. Definition: The additional pressure delivered with inspiration. Depending on the device, this may be set in two (or more) ways:
        - The total inspiratory pressure, where the inspiratory pressure is added on top of the PEEP value → **IPAP or PIP** (positive inspiratory pressure)
        - The isolated inspiratory pressure → **Pinsp** (inspiratory pressure) or **Psupport** (pressure support), *which has to be added to the PEEP value*
    b. Initial: (depending on device settings):
        - **IPAP or PIP: twelve (12) cmH2O**
        - Pinsp or Psupport: seven (7) cm H2O
    c. Titration: Increase (or decrease if able) in increments of 1-2 cmH20, based on continued work of breathing/respiratory distress.
- **Maximum IPAP** (Pinsp/Psupport *plus* PEEP):
    a. **Twenty (20) cmH2O** (without direction from Online Medical Control)
    b. *Critical Care Paramedics:* may titrate within the capabilities of the specific device.

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1-PB3 BI-LEVEL POSITIVE AIRWAY PRESSURE	BPAP requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

NOTES:

- Work of breathing (respiratory distress) is generally reduced by increasing the positive inspiratory pressure (PIP; although refer to device-specific settings).
- Blood oxygenation (hypoxemia) is improved with increased oxygen percentage (FiO2) and positive end expiratory pressure (PEEP).

QI Review Parameters:

1. {Pending}

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1-PB4 HIGH-FLOW NASAL CANNULA	HFNC requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

For an overview of the specific indications and approach to the various non-invasive ventilation modalities, please refer to the **Respiratory Distress [A-01B]** Guideline.

INDICATIONS:

- Patients who require oxygen supplementation beyond the capabilities (generally 6 liters per minute) of a low-flow nasal cannula.

CONTRAINDICATIONS:

- Patient anatomy is not conducive to the application of the cannula, such as facial trauma, nasal obstruction, copious nasal secretions, etc.
- Inability to protect the airway (from severe altered mental status or potential obstruction)
- Impending respiratory failure
- Suspected **Hypoventilation**:
    - Altered mental status from suspected hypercarbic respiratory failure
    - Poor respiratory effort (consider BPAP or assisted ventilations)

NOTES:

HFNC is a method of providing respiratory support to patients requiring higher flows of oxygen than can be provided with a traditional (“low-flow”) oxygen delivery device, and provides the patient with two distinct properties:

- *Oxygen*: the device can deliver/titrate higher levels of oxygen (i.e. the fraction inspired oxygen percentage or FiO2).
- *Air Flow*: While CPAP [A-PB2] and BPAP [A-PB3] are superior in providing non-invasive positive pressure ventilation, HFNC does provide a small amount of positive end expiratory pressure (PEEP), similar to a CPAP device.

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1-PB4 HIGH-FLOW NASAL CANNULA	HFNC requires service/ device-level training and credentialing by the EMS Medical Director.	First Responder EMT AEMT Paramedic

Procedure (HIGH-FLOW NASAL CANNULA):

- Ensure appropriate functioning of and adequate oxygen supply to the device.
- If Prehospital initiation of HFNC:
    a. Explain the procedure to the patient.
    b. Place and secure the nasal cannula (delivery device) as per the manufacturer's instructions.
    c. Initiate air flow/oxygen levels (as per the initial settings, below).
- If Facility-Initiated HFNC:
    a. Continue or match the previous settings.
- Continuously reassess the patient's airway and breathing, and **slowly titrate** flow rate and oxygen to achieve desired oxygen saturations and ventilation needs, as noted below.
- Closely monitor the patient and escalate to more aggressive interventions (BPAP, BVM ventilations, endotracheal intubation, etc.) as needed.

HFNC SETTINGS

- Cannula size:
    a. Prongs must not create a seal in the nares (a clear gap must be visible around each prong).
    b. Discomfort is often due to velocity of the gas (smaller diameter cannulas create a higher velocity at the same flow rate), and may be eased by using a larger cannula size (if available).
- **Flow:**
    a. Initial: 30 liters per minute (or as otherwise directed by manufacturer recommendations.
    b. Titration: Increase flow in increments of 5-10 lpm, based on respiratory distress and patient response.
- **Oxygen:**
    a. Initial: 50% FiO2 (or higher if severe hypoxemia)
    b. Titration: Increase (or decrease if able) FiO2 between 21-100% to maintain SPO2 within target ranges.
- Temperature (if applicable): Set to default setting.. Titrate to patient comfort.
- Titration:
    a. *Escalating*: Titrate flow up prior to oxygen.
    b. *Deescalating*: Titrate oxygen down prior to flow.

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First Responder
EMT
AEMT
Paramedic

CARDIAC

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C-P1 HIGH PERFORMANCE/ PIT-CREW CPR		First Responder EMT AEMT Paramedic

Goals of Pit-Crew Resuscitation

Time	**Goal**	Primary Interventions
0:00 - 1:00	**AED/Monitor**	• Place AED/Monitor by patient's head • Place Pads on patient
1:00 - 2:00	**BIAD/Airway**	• Place BIAD & attach to O2/Ambu Bag
10 Second Pause (or Less) - Pulse Check/Defibrillate		
2:00 - 4:00	**IO/Fluids**	• IV/IO Placement • Start IV Fluids • ALS Epinephrine #1
4:00 - 6:00	**Clean-Up**	• Advanced Monitoring (SpO_2/$ETCO_2$)
Continue Additional Resuscitation & Repeat as Necessary		
Additional 0:00 - 2:00		• ALS Amiodarone/Lidocaine #1 & #2 • ALS Epinephrine #2 & #3 and/or consider Epinephrine Drip • Consider replacing BIAD with an ETT
Additional 2:00 - 4:00		
Repeat Additional 0:00 - 4:00		
After 20-30 minutes of Resuscitation, Consider Termination of Resuscitation per Guideline, or Transport to nearest appropriate facility		

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C-P1 HIGH PERFORMANCE/ PIT-CREW CPR		

Key Points:

The order of these interventions is based on evidence that supports their impact first on **long-term neurologic survival**, then on short-term survival/ROSC and finally on interventions that have limited to no evidence supporting improved clinical outcomes, but are standard or recommended practices.

Order of Importance:

- ❏ 1st = CPR
- ❏ 2nd = Defibrillation
- ❏ 3rd = Oxygenation/Airway
- ❏ 4th = Ventilation
- ❏ 5th = IO/IV Access
- ❏ 6th = Medications & Fluids
- ❏ Other interventions: Lucas (or similar Mechanical CPR Device) & SpO2/EtCO2 Monitor

---

- **High quality CPR includes:**
  - Starting CPR as soon as possible (including bystander and dispatch-directed CPR)
  - Minimizing interruptions during CPR (Continuous Chest Compressions)
  - Compression Rate of 100-120/minute
  - Compression Depth of 2 or more inches in adults (or 1/3rd the depth of the chest in children)
  - Allowing Full Chest Recoil with each compression (no leaning on the chest)
  - Avoid excessive ventilation (using only minimal chest rise)
  - Maintaining EtCO2 >20 if possible (at least >10)

- The only two interventions that have shown a significant benefit to long-term mortality in cardiac arrests are early high-quality CPR and early defibrillation.
- For witnessed cardiac arrests (i.e. not a primary respiratory arrest), blood oxygenation is generally adequate for several minutes after arrest
- Medications have shown minimal if any significant long-term mortality benefit and should be used only after BLS measures have been ensured.

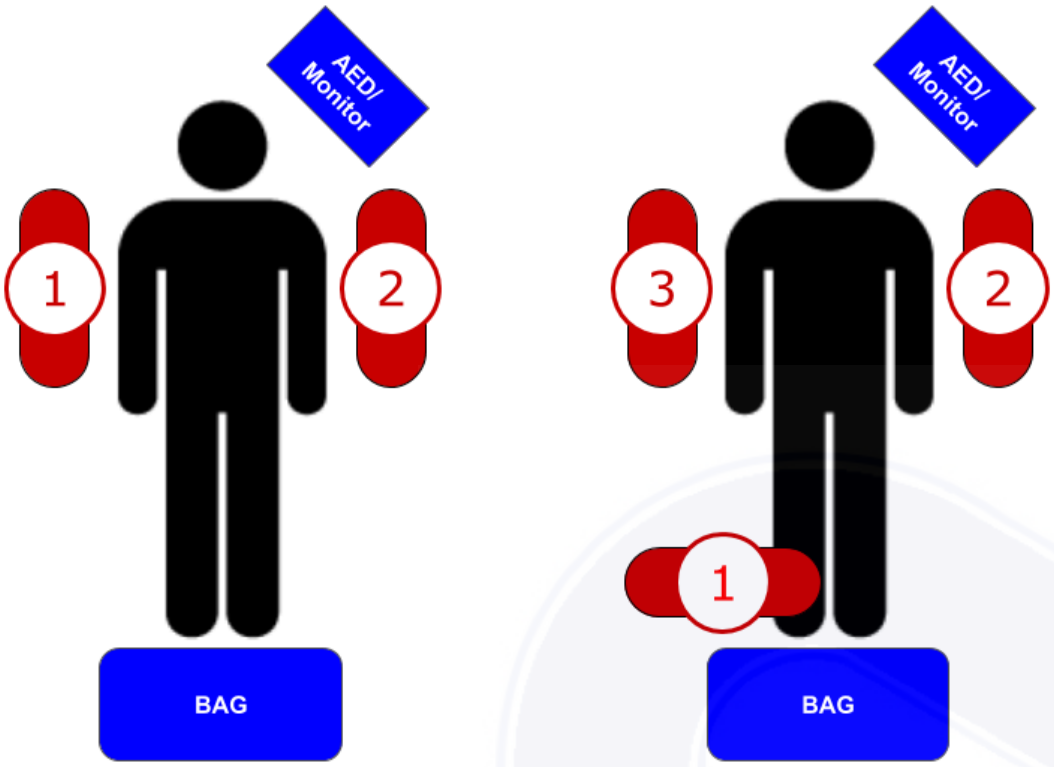
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C-P1 HIGH PERFORMANCE/ PIT-CREW CPR		First Responder EMT AEMT Paramedic

- With a witnessed cardiac arrest by EMS:
  - Focus should be on CPR first and then defibrillation
  - Passive O2 should be initiated ASAP by
    - a non-rebreather with OPA or
    - via an BIAD with high flow O2 attached
- For probable primary respiratory arrests or arrests with downtime prior to initiation of CPR:
  - These patients do NOT have adequate blood oxygenation
  - Early BIAD placement and oxygenation/ventilation should be performed in conjunction with CPR

Two Provider High-Performance CPR Model

Note: The Four Provider adaptation of this model is presented in a following section.



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C-P1 HIGH PERFORMANCE/ PIT-CREW CPR		First Responder EMT AEMT Paramedic

2 Provider Overview

Lead Provider		Provider 2*
AEMT (BLS), or **Paramedic (ALS)**	**Time**	MFR, EMT, or AEMT
Identify "No Pulse" & **Start CPR**	0:00 - 2:00 Goal: AED/Monitor & Airway/O2	**(1) AED/Monitor:** place by head **(2) Defib Pads:** place and attach to AED/Monitor **(3) Place BIAD** and attach Ambu Bag *(4) Ventilate as able* @1:45 Charge Defib
Check Pulse	Pause	**AED/Shock**
(1) Place IO/IV & start **NS Bolus** **(2) Ventilate** **(ALS) Epinephrine** #1 @3:45 Charge Defib	2:00-4:00 Goal: IO/Meds	**CPR**
Check Pulse	Pause	**AED/Shock**
Place Mechanical CPR Device *(if available)*		
CPR**	4:00 - 6:00 Goal: "Clean Up"	**(1) Monitors:** attach SpO2 and EtCO2 **(2) Ventilate** as able @+5:45 Charge Defib
Check Pulse	Pause	**AED/Shock**

Continue as per next page

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C-P1 HIGH PERFORMANCE/ PIT-CREW CPR		First Responder EMT AEMT Paramedic

Continue Additional Resuscitation & Repeat as Necessary		
(1) Ventilate **(ALS) Epi doses (max 3)** **and/or Epi drip** **(ALS) Amio/Lido doses** **(ALS) Replace BIAD with ETT** @+1:45 Charge Defib	Additional 0:00 - 2:00	**CPR**
Check Pulse	Pause	**AED/Shock**
CPR**	Additional 2:00 - 4:00	**(1) Ventilate** @+3:45 Charge Defib
Check Pulse	Pause	**AED/Shock**
Repeat Additional 0:00 - 4:00		
Consider Termination of Resuscitation per Guideline Or Transport to nearest appropriate facility		
*__Note__: If Provider 2 is not trained to perform the designated interventions, the Lead Provider should coordinate the transition of CPR duties (utilizing a **Third Provider**** when available) to ensure interventions are completed within the designated time frame.		

<u>Step 1</u>: Identify, Announce and Acknowledge Arrest

1. In any situation where a patient has a decreased level of consciousness, the highest credentialed provider (Lead Provider/Provider #1) should immediately approach and assess breathing and <u>identify</u> pulse/no-pulse.
2. If no pulse is felt, the Lead Provider should immediately begin CPR (themselves) and <u>announce</u> to the other providers that the patient has no pulse.
3. The other providers should <u>acknowledge</u> #1 and begin preparing the scene, patient and equipment for use per this guideline.

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C-P1 HIGH PERFORMANCE/ PIT-CREW CPR		First Responder EMT AEMT Paramedic

<u>Step 2</u>: Cycle ONE -- Pads/Monitor & BIAD/O_2

2 Person Procedure		
Lead Provider		Provider 2
AEMT (BLS), or Paramedic (ALS)	**Time**	MFR, EMT, or AEMT
Identify "No Pulse" & **Start CPR**	0:00 - 2:00 <u>Goal</u>: AED/Monitor & Airway/O2	**(1) AED/Monitor:** place by head **(2) Defib Pads:** place and attach to AED/Monitor **(3) Place BIAD** and attach Ambu Bag *(4) Ventilate as able* @1:45 Charge Defib
Check Pulse	Pause (10 sec max)	**AED/Shock**

1. Continue CPR, rotating providers every 2 minutes.
    a. **Do not interrupt compressions unless absolutely necessary.**
    b. Pause for a maximum of 10 seconds after each rotation (2 minutes) to check for a pulse, evaluate rhythm and defibrillate the patient if needed.
    c. **Provider #3**: If there is a Third Provider available, they should
        i. Take over CPR responsibility from Provider #1 after the first rotation.
        ii. Assist with preparation of the scene, equipment and medications.
2. While continuous CPR is being performed, the other crew member(s) prepare and perform the following interventions:
    a. <u>1st minute</u>: Place the AED/monitor by the patients head, in arms reach of both providers. **Attach the defibrillation pads to the patient** and hook them to the AED (BLS) or monitor/defibrillator (ALS).
        i. *Critical Thinking*: CPR should not be stopped to place the pads. They should be placed on the Right Anterior and the Left Lateral chest wall.
    b. <u>2nd minute</u>: **Place a BIAD**, attach a BVM and ventilate the patient with high-flow O_2.
        i. *Critical thinking*: In witnessed arrests, the patient's blood should be saturated with enough oxygen to last for several minutes. In unwitnessed arrests (or those with a respiratory/hypoxic arrest OR downtime prior to EMS arrival) the oxygen

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has likely been depleted. In either case, the BIAD should be placed and attached to an ambu-bag with high-flow O2 attached.

ii. *Alternative #1*: attach high flow O_2 directly to the iGel oxygenation port (*if applicable*).

iii. *Alternative #2*: place non-rebreather mask on the patient with high-flow O2. This is not preferred, however as the NRB/O_2 setup likely takes the same amount of time as a BIAD/O_2 setup. Also, if a NRB is placed, a BIAD still must be placed later.

c. **ALS** (with Monitor/Defibrillator): Provider #1 should charge the defibrillator 15 seconds before the planned pause to ensure minimal interruptions of chest compressions.



If Provider 2 is not trained to perform the designated interventions, the Lead Provider (#1) should coordinate available resources to take over CPR duties allowing the Lead Provider to complete the designated interventions within the required time frame.

Step 3: Pause ONE -- 10-second Pause. Minimize time without CPR

1. Provider #2 (the provider managing the monitor) should both charge the defibrillator and place a hand on the carotid or femoral artery to monitor pulse PRIOR TO pausing CPR.
2. The cardiac rhythm and pulse should be assessed simultaneously and Provider #2 should push the “Shock” button as instructed.
3. Provider #1 should restart CPR **immediately** after defibrillation.

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Step 4: Cycle TWO -- IO/IV Placement, Fluids and Meds

2 Person Procedure		
Lead Provider		Provider 2
AEMT (BLS), or **Paramedic (ALS)**	**Time**	MFR, EMT, or AEMT
(1) Place IO & start **NS Bolus** **(2) Ventilate** **(ALS) Epinephrine #1** @3:45 Charge Defib	2:00-4:00 Goal: IO/Meds	**CPR**
Check Pulse	Pause	**AED/Shock**
Place Mechanical CPR Device *(if available)*		

1. 3rd & 4th minutes: Simple...continue CPR, place an IO/IV and start IV fluids.
    a. **ALS**: Give 1st dose of Epinephrine.
    b. *Critical thinking*: A peripheral IV may be attempted if an obvious access point is easily accessible. If the first attempt fails, immediately place an IO. Once access is established and fluids and meds are infusing, additional peripheral access points can be placed.

Step 5: Pause TWO

1. Same as Pause ONE.
2. If Mechanical CPR Device (i.e. Lucas) is available, place it!

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C-P1 HIGH PERFORMANCE/ PIT-CREW CPR		First Responder EMT AEMT Paramedic

Step 6: Cycle 3 -- Clean-Up!

2 Person Procedure		
Lead Provider		Provider 2
AEMT (BLS), or Paramedic (ALS)	**Time**	MFR, EMT, or AEMT
CPR**	4:00 - 6:00 Goal: "Clean Up"	**(1) Monitors:** attach SpO2 and EtCO2 **(2) Ventilate** as able @+5:45 Charge Defib
Check Pulse	Pause	**AED/Shock**

1. At this point, patient should be hooked up to the AED/monitor, an airway (BIAD) should be placed with ongoing oxygenation and ventilation, and IO/IV access should be placed with fluids going.
2. 5th & 6th minutes: Place additional monitoring equipment as needed (i.e. Pulse-Oximetry, End-Tidal CO2 monitor, etc.) and verify all prior interventions have been completed.

Step 7: Continue Additional Resuscitation Measures

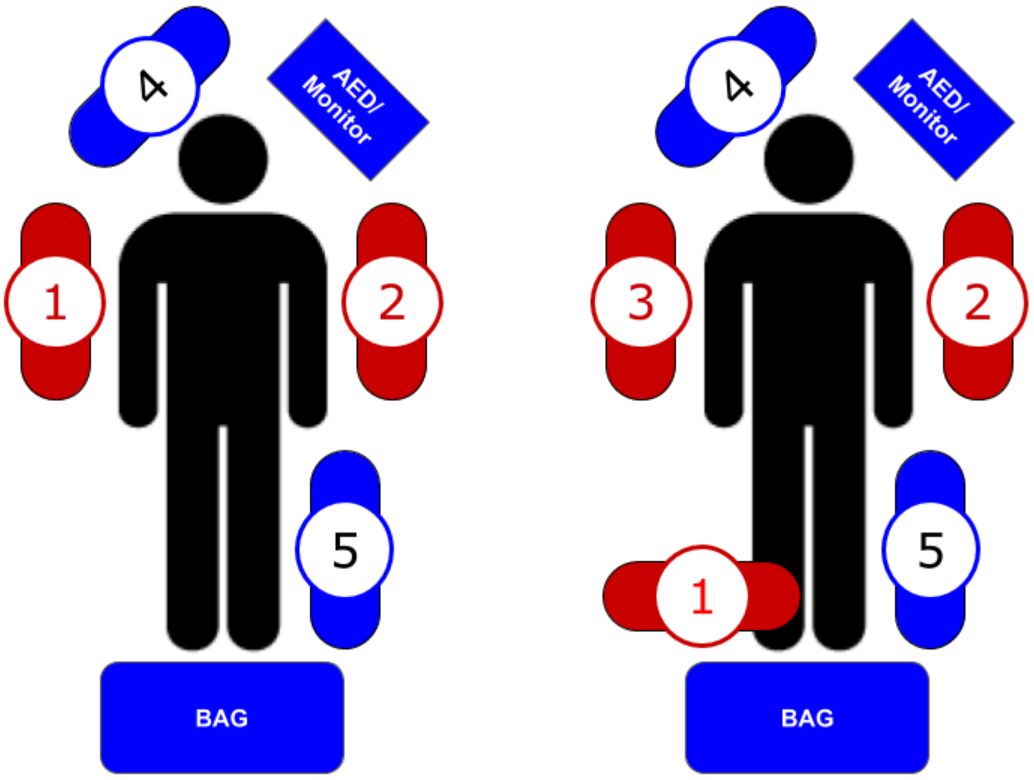
1. Finally, at this point, the scene and resuscitation should be completely setup.
2. 7th minute onwards:
    a. Continue CPR and ventilations.
    b. Provide ACLS drugs per rhythm-specific guideline.
        i. Max: 3 doses of Epinephrine
        ii. Max: 2 doses of Amiodarone/Lidocaine
    c. Consider Replacing BIAD with an ETT
    d. Assess other causes or necessary treatments for arrest.
    e. Contact Online Medical Control with questions or for further direction.
3. Consider termination or transport as appropriate after 20-30 minutes of resuscitation on scene per the Termination of Resuscitation Guideline [X-02].

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C-P1 HIGH PERFORMANCE/ PIT-CREW CPR		First Responder EMT AEMT Paramedic

Four Provider High-Performance CPR Model

*****See Table below for condensed guideline*****



Overview of 4-Person Pit-Crew CPR

- The 4-Person model is essentially the same as the 2-Person Model in function. Provider #4 and Provider #5 simply offload the Airway and Medication responsibilities from Provider #1 and Provider #2.
- This model is based around the expectation of the First Responder/BLS crew arriving first on scene, followed by the transport EMS/ALS crew arriving on average 4 minutes later.
- The First Crew on scene (First Response or EMS) will begin resuscitation based on the 2-Person Model as described.

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- Once the 2nd Crew arrives, the ALS EMS crew will take over the responsibilities as described above.
    - The First Response Crew will default to the Provider 1 & Provider 2 positions (and Provider 3 if applicable).
    - The ALS EMS crew will default to Position 4 & Position 5.
- The BLS interventions may (and often should) be done prior to the ALS EMS Crew's arrival.

Responsibilities of each Provider:

- Provider 1: As with the 2-Person Model, the highest-credentialed provider of the First Crew takes the responsibility of the Lead Provider the resuscitation. This includes:
    - Timing and maintaining the flow of the resuscitation.
    - Ensuring continuous, uninterrupted and effective CPR is being done.
    - Checking for pulse and re-initiating CPR.
    - Making sure the individual roles are assigned and being performed.
    - If a fifth provider (Provider #3) is not present, Provider 1 will alternate with Provider #2 to perform CPR.
    - *Note*: In the event of no ALS crew on scene, Provider 1 maintains the same responsibilities as in the 2-Person Model.
- Provider 2: Similar to the 2-Person Model, Provider #2 is responsible for CPR, including:
    - Retrieving the AED (BLS) or Monitor/Defibrillator (ALS) and placing it by the patients head.
    - Applying the Defibrillation Pads to the patient and hooking them to the AED/Monitor.
    - Providing continuous, high-quality CPR, alternating with Provider #1 (or Provider #3 when available).
    - When time permits, placing the patient on additional monitoring equipment as available, including SpO_2 and $EtCO_2$ monitors.
    - Assisting the other providers in preparing equipment and medications as needed.
    - *Note*: In the event of no ALS crew on scene, Provider 2 maintains the same responsibilities as in the 2-Person Model.
- Provider 3: If there is a third qualified provider on scene (such as a third member of the First Response Crew or an additional qualified provider), they are responsible for CPR, including:
    - Taking the place of Provider #1 (after the First Cycle) and providing continuous, high-quality CPR, alternating with Provider #2.
    - Assisting the other providers in preparing equipment and medications as needed.

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- Provider 4: Once the Transporting ALS EMS Crew is on scene, Provider #4 is the lower-credentialled of the two crew members (generally an EMT or AEMT). They are responsible for Airway Management, including:
    - Placement of a BIAD (iGel, KingLT or Combitube) as soon as possible.
    - Providing continuous airway monitoring, ventilations via a BVM or the BIAD, and suctioning as needed.
- Provider 5: In a joint team resuscitation, Provider #5 is the highest-credentialed EMS provider on the transport crew. They are responsible for:
    - Ensuring appropriate interventions have been done and verifying their effectiveness.
    - Providing IO or additional IV access.
    - Providing medications and other ALS interventions as dictated by appropriate ACLS, PALS or ITLS/PHTLS Guideline, or as published in these Clinical Guidelines.
    - Providing Critical Decision Making and general oversight of the resuscitation, directing or performing additional evaluation and treatment modalities as needed.
    - Determining the need and appropriateness of Transport or Termination of Resuscitation procedures as dictated by the situation.
    - Contacting Online Medical Control as needed.
    - Documenting the resuscitation including times, interventions and the results of those interventions.

Note: Provider #1 and Provider #5 should work in unison to direct and monitor the resuscitation.

- Provider #1 (Fire) is the Lead “Technician” of the resuscitation. They are responsible for the logistics and flow of the resuscitation. This means making sure who and what is needed is appropriately available and utilized. They are also responsible for appropriate timing of the cycles and pauses of the resuscitation.
- Provider #5 (EMS) is the Lead “Clinician”. They are responsible for the overall clinical evaluation of the patient. They are responsible for using critical thinking skills to make clinical decisions (assessments and interventions) that are different or additional to those in the guideline (e.g. alternative airways, alternative transport, additional procedures, etc.).

The Crews on scene may delegate individual providers to a position different than is stipulated in this guideline if the situation warrants it, AND

- The interventions provided by that position are in the provider’s scope of practice.
- There is no interruption or delay of an intervention or any other compromise of the resuscitation.

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C-P1
HIGH PERFORMANCE/ PIT-CREW CPR

First Responder
EMT
AEMT
Paramedic

4+ Person Procedure					
Provider 4	**Provider 1**	**Time**	**Provider 2**	**Provider 3**	**Provider 5**
IV/Med/Doc	Lead/Timer		CPR/Monitor	CPR/Lucas	Airway/BVM
EMS Paramedic	AEMT or Paramedic (Lead)		MFR, EMT, or AEMT	MFR #2 (if available)	EMS EMT or AEMT
	Identify "No Pulse" & **Start CPR**	0:00 - 2:00 Goal: AED/Monitor & Airway/O2	**(1) AED/Monitor** **(2) Defib Pads:** place and attach to AED/Monitor **(3) BIAD**/Ambu Bag *(4) Ventilate as able* @1:45 Charge Defib		**(1) Place BIAD** (2) Attach to 100% O2 and Ambu Bag *(3) Ventilate as able*
	Check Pulse	Pause (10 sec max)	**AED/Shock**		
(1) Place IO **(2) NS Bolus** **(3) Epinephrine #1**	(1) IO (2) NS Bolus (3) Ventilate (ALS) Epinephrine #1 @3:45 Charge Defib	2:00-4:00 Goal: IO/Meds	**CPR**		**(1) Ventilate**
	Check Pulse	Pause	**AED/Shock**		
Place Mechanical CPR Device *(if available)*					
Prep Meds	**CPR**	4:00 - 6:00 Goal: "Clean Up"	**(1) Monitors:** SpO2 & EtCO2 **(2) Ventilate** as able @+5:45 Charge Defib	**CPR**	**(1) Ventilate**
	Check Pulse	Pause	**AED/Shock**		
Continue Additional Resuscitation and Repeat as Necessary					
(ALS) Epinephrine **(ALS) Amio/Lido**	(1) Ventilate (ALS) Epinephrine (ALS) Amio/Lido **(ALS) Exchange BIAD** @+1:45 Charge Defib	Additional 0:00 - 2:00	**CPR**		**(1) Ventilate**
	Check Pulse	Pause	**AED/Shock**		
	CPR	Additional 2:00 - 4:00	(1) Ventilate @+3:45 Charge Defib	**CPR**	**(1) Ventilate**
	Check Pulse	Pause	**AED/Shock**		
Repeat Additional 0:00 - 4:00					
After 20-30 minutes of Resuscitation, Consider Termination of Resuscitation per Guideline, or Transport to nearest appropriate facility					

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C-P2 AUTOMATIC EXTERNAL DEFIBRILLATOR (AED)		First Responder EMT AEMT Paramedic

Indications for AED Use:

- All pulseless patients, except those who meet obviously dead criteria [X-01].
- Patients who appear to have the possibility of impending cardiac arrest.

Exclusion Criteria:

- Patient has a pulse.

Procedure: Automated External Defibrillator (AED)

1. Press On/Off.
2. Bare the patient's chest. Shave any excessive chest hair if needed.
3. Place the pads in accordance with the pictures on the AED pad packaging.
    a. Adolescents/Adults: use the standard adult AED pads.
        i. Anterior: upper right torso, lateral to the sternum and below the clavicle.
        ii. Lateral: lateral to the left nipple, centered in the midaxillary line.
    b. Children (< 8 years old): use the 'Infant/Child' AED pads.
        i. Place the pads in an anterior and posterior fashion.
    c. If the AED pads contain a CPR sensor, ensure it is placed over the sternum consistent with package labeling.
4. Connect the electrodes to the AED.
5. Await analysis: there are three possible messages
    a. If the AED detects a shockable rhythm: "Stand Clear. Push Shock Button."
        i. Immediately clear from the patient and depress the shock button.
        ii. Resume compressions immediately after the defibrillation.
    b. If the AED detects a non-shockable rhythm: "No Shock Advised. Start CPR."
    c. After three minutes, the AED will prompt: "Stand Clear. Analyzing Now."
        i. If motion interferes with the analysis, the AED will state "Motion Detected. Stop Motion." Make certain no one is touching the patient, wires or device.

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C-P2 AUTOMATIC EXTERNAL DEFIBRILLATOR (AED)		First Responder EMT AEMT Paramedic

Procedure: Manual Defibrillation

1. Attach the pads to the patient in accordance with the pictures on the electrode packaging, and plug pads into the monitor/defibrillator.
2. Select the defibrillation/cardioversion setting on the monitor/defibrillator.
3. Select the appropriate energy setting
   a. Adults: 200 J (for cardiac arrest)
   b. Pediatrics: 2-4 J/kg (for cardiac arrest)
4. Clear the area around the patient by loudly stating, “Clear! I’m clear, you’re clear, everybody’s clear” while visually verifying that you and all other persons are clear of the patient.
5. Push the “shock” button on the defibrillator unit.
6. Resume CPR until the next pulse/rhythm check.

NOTES:

- If the patient loses pulses at any time (an EMS witnessed arrest), immediately initiate an AED analysis by pressing the right soft-key.
- Documentation: record comments about the incident regarding AED use, bystander CPR and other therapies in the patient care record.
- AED information shall be downloaded as soon as possible

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C-P3 MECHANICAL CPR DEVICE		First Responder EMT AEMT Paramedic

Criteria for Use of Mechanical CPR Device:

- Patient >12 years old, and >42 kg (90 lbs)
- **Use of the Mechanical CPR Device is not required.** If there are adequate properly trained personnel on scene, routine chest compressions may continue.

Exclusion Criteria:

- Body habitus too large for the device
- Any individual which the suction cup or band does not make firm contact with the chest
- Down time suspected to be ≥ 15 min (or confirmed >10 min) without CPR

Procedure - Mechanical CPR Device

1. CPR will be performed manually for at least one cycle (2 minutes), and the patient will be ventilated with a BVM/oral airway during this time.
2. After 2 minutes, the defibrillation pads will be applied to the patient. At this time the Mechanical CPR device will also be applied to the patient [***see below***].
3. Defibrillation performed if indicated.
4. CPR then resumed using the Mechanical CPR Device.
5. Obtain airway control (OPA/NPA/BVM, King Airway/ETT, etc.), IV/IO access, and initiate ACLS interventions per appropriate resuscitation guideline.
6. If pulse confirmed (ROSC), prepare for immediate transport. The Mechanical CPR device may be turned off, but must be left on the patient during transport.
7. If the patient goes back into cardiac arrest, immediately resume of Mechanical CPR.
8. Detailed documentation with times of all initiation and termination of use of the Mechanical CPR device must be kept for statistical and feedback purposes

If the Mechanical CPR device does not appear to be working correctly, or if there are problem with the device that cannot be immediately rectified, remove the device and RESUME MANUAL CPR.

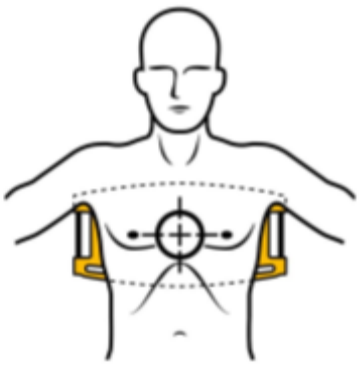
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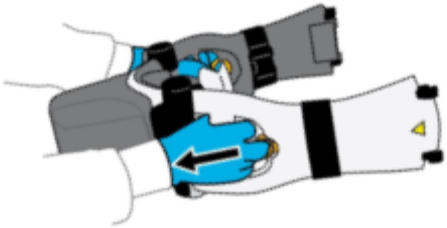
C-P3 MECHANICAL CPR DEVICE		First Responder EMT AEMT Paramedic

Lucas® 3 Setup & Use

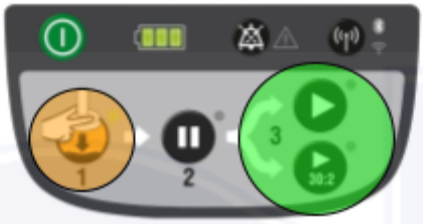
(see product manual for full instructions and troubleshooting)

1. Power on Lucas
   a. Press **ON/OFF** to start self-test/power up.
2. Place the Backplate (*right top*):
   a. The backplate should be centered on the nipple line and the top of the backplate should be located just below the patient's armpits.
3. Position the Upper Part
   a. Pull the release rings to open the claw locks.
   b. Attach to the back plate, listening for a "click".
   c. Pull up slightly to ensure attachment.
4. Adjust the Height of the Compression Arm
   a. Press **ADJUST MODE** (*orange button*)
   b. Verify that the lower edge of the suction cup is immediately above the end of the sternum.
   c. Push down the suction cup with two fingers onto the chest (do not compress the chest).
   d. Press **PAUSE** to lock the cup in position.
5. Start Compressions
   a. If not intubated, press the **ACTIVE 30:2** (*green/lower button*) to start compressions.
   b. If the patient has an advanced airway (i.e. ETT or KingLT), press **ACTIVE (CONTINUOUS)** (*green/upper button*).
6. Pause/Rhythm Analysis
   a. Press **PAUSE**.
   b. If pulseless and once rhythm is determined, press the appropriate **ACTIVE** button to resume compressions.









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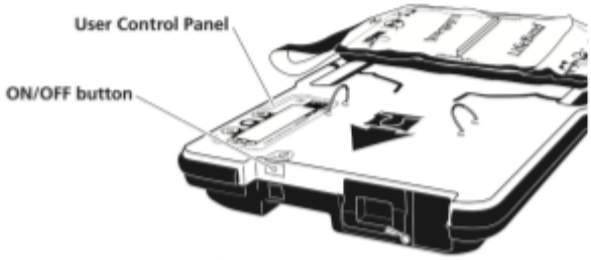
C-P3 MECHANICAL CPR DEVICE		First Responder EMT AEMT Paramedic

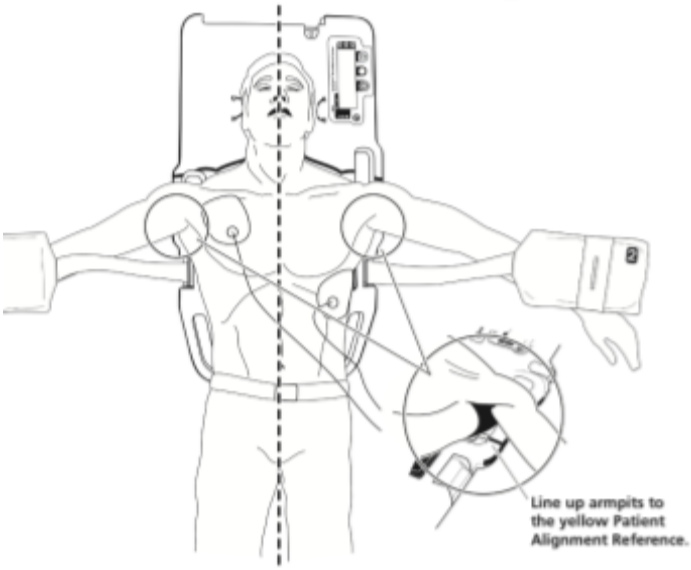
AutoPulse® Setup & Use

(see product manual for full instructions and troubleshooting)

To begin:

1. Remove all clothing from the torso to ensure skin-to-platform contact, and place defibrillation pads if needed.
2. Press ON/OFF (on top edge of platform, *top right*) to turn device on.
3. Lift the patient, place the device beneath the torso, and align armpits onto yellow line on the platform (*middle right*).
4. Close the LifeBand around the patient's chest and secure the velcro fastener.
5. Press CONTINUE (green button, *bottom right*). The device should automatically adjust the bands to the patient's chest.
6. Press START (green button) to begin compressions, or the device should automatically begin compressions after a 3 second pause.







To pause/stop:

1. Press STOP (orange button).
2. Press RESTART (green button) to continue compressions.

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C-P4 SYNCHRONIZED CARDIOVERSION		First Responder EMT AEMT Paramedic

Indications

- Unstable patient with a tachydysrhythmia

Contraindications

- Pulseless patient

Procedure - Synchronized Cardioversion

1. Provide appropriate sedation per protocol [**RX-03**].
2. Apply limb leads and defibrillation pads to the patient and monitor.
3. Push the ‘SYNC’ button.
    a. Confirm that the triangle sense marker appears near the middle of each QRS complex.
    b. If the sense markers do not appear or they are displayed in the wrong location adjust the EKG size or select another lead.
    c. The location of the sense marker may vary slightly with each QRS complex.
4. Rotate the ‘ENERGY SELECT’ dial and select the proper setting as required by protocol.
5. Push the ‘CHARGE’ button.
6. Make sure that everyone is clear of the patient.
7. After confirming that the monitor is still in SYNC mode, push and hold the SHOCK button until it discharges.
8. Reassess the patient and the cardiac rhythm. Repeat steps 2 - 6 as indicated by the protocol.

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C-P5 TRANSCUTANEOUS CARDIAC PACING		First Responder EMT AEMT Paramedic

Indications

- See Bradycardia Guideline [***C-05***]
- Bradycardia with signs or symptoms of inadequate perfusion, not responding to vasopressors.
- Pediatric patients with profound symptomatic bradycardia unresponsive to optimal airway management, oxygenation, epinephrine, and atropine.

Contraindications

- Cardiac rhythms other than bradycardia.
- Patients with no or minimal symptoms attributable to a low heart rate/cardiac output.
- Hypothermia: do NOT pace until rewarmed to >85 ºF (30 ºC).

Procedure - Transcutaneous Pacing

1. Provide appropriate sedation per protocol [**RX-03**].
2. Apply defibrillation/pacing pads.
3. Turn monitor/defibrillator to appropriate pacing mode.
4. Set heart rate to 70-80 beats per minute.
5. Start the milliamperes (m.a.) as low as possible, and gradually increase up to 200 milliamps until both electrical capture confirms AND pulse reflects mechanical capture.
    a. Most patients will be captured between 60 and 100 milliamps.
    b. If exceeding 100 ma, consider moving/replacing pads and re-attempting capture.

NOTES:

- Pacing should generally only be used if vasopressors do not improve heart rate.
- **ALWAYS provide sedation to the patient if using electrical pacing.**
- When properly applied, chest compressions can be performed directly over the insulated electrodes **while** the pacer is operating.

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PSYCHOLOGICAL/ BEHAVIORAL

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P-P1 TASER PROBE REMOVAL		First Responder EMT AEMT Paramedic

Indications

- Patient with TASER® probe(s) embedded in skin.

Contraindications

- TASER® probe embedded in the eye or genitals. In such cases, transport patient to an emergency department for removal.

Procedure

1. Confirm the TASER® has been shut off and the barb cartridge has been disconnected. .
2. Using a pair of shears cut the TASER® wires at the base of the probe.
3. Place one hand on the patient in the area where the probe is embedded and stabilize the skin surrounding the puncture site. Using the other hand (or pliers) firmly grasp the probe.
4. In one uninterrupted motion, pull the probe out of the puncture site maintaining a 90° angle to the skin. *Avoid twisting or bending the probe.*
5. Repeat the process for any additional probes.
6. Once the probes are removed, inspect and assure they have been removed intact. In the event the probe is not removed intact or there is suspicion of a retained probe, the patient must be transported to the emergency department for evaluation.
7. Cleanse the probe site and surrounding skin with betadine and apply sterile dressing.
8. Advise patients to watch for signs of infection including increased pain at the site, redness swelling or fever.

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P-P2 LEGAL BLOOD DRAW (CONSENSUAL)	This guideline may or may not be adopted by at the discretion of the Agency's EMS Director	First Responder EMT AEMT Paramedic

INDICATIONS

- An informal (without warrant) or formal (with warrant) request is made by an appropriate/affiliated Law Enforcement Officer (LEO) to collect a patient's blood sample.
  - The procedure must be performed with an Officer present for the entire procedure.
  - The patient must willingly allow the EMS provider to draw the blood sample.

CONTRAINDICATIONS

- **Any patient that is unwilling to allow a blood draw**:
  - Verbally refuses (even without decision-making capacity)
  - Shows signs of agitation/combativeness
  - Any other signs where the EMS provider is concerned about their safety
- Any patient that requires any physical or chemical restraint → This includes anyone (EMS personal, law enforcement, etc.) even having to hold the wrist/arm in extension.
- Any patient less than 18 years of age

STOP!

- Any patient who refuses a blood draw (even with an appropriate warrant) should/may be transported by a law enforcement officer to the closest emergency department (or other location at the officer's discretion) for a forced blood draw.
- **EMS providers will NOT transport a patient to the ED or other locale if the only need is for the legal blood draw.**
- If a patient must be transported for other medical concerns, the destination will be based on the patient's perceived clinical needs and is at the discretion only of the attending EMS provider.

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P-P2 LEGAL BLOOD DRAW (CONSENSUAL)	This guideline may or may not be adopted by at the discretion of the Agency's EMS Director	First Responder EMT AEMT Paramedic

SPECIAL INSTRUCTIONS

1. Only two (2) attempts will be made to collect samples.
2. Iodine prep pads shall not be used if allergic to Iodine or Shellfish, use an alternate pad.
3. **No Alcohol prep pads may be used.**
4. The requesting officer will label all specimens.
5. If the person appears to be injured, perform a thorough assessment, treat conditions as required and recommend transport to the hospital.

PROCEDURE: **Legal Blood Draw**

1. Receive and complete request form (if applicable). Print and sign name.
2. Utilize proper PPE.
3. Prepare equipment – Gloves, tourniquet, 4X4 Gauze, Cohesive wrap, Iodine prep pad (if no allergies) Blood collection set, and Vacutainer. Confirm the officer has the appropriate blood tubes.
4. Position the patient appropriately with the arm extended in a downward position.
5. Apply tourniquet.
6. Cleanse site with Iodine prep pad (ensure no Iodine or shellfish allergies)
   a. Use an alternate pad if the patient is allergic.
   b. Do NOT use an Alcohol prep pad.
7. Insert the needle, bevel up at appropriate angle to match depth of Vein.
8. Obtain first blood tube from Officer. Place the tube inside the vacutainer and fill the tube to just below the rubber stopper on the vial. Give the first sample to the Officer.
9. Obtain a second blood tube from the Officer and repeat collection. Give the second sample to the Officer.
10. Release tourniquet.
11. Remove the blood collection set. Place in a sharps container.
12. Place 4x4 (or other appropriate dressing) on access, hold or instruct the patient to hold direct pressure at the access site.
13. Wrap with Cohesive wrap.
14. Advise the patient no alcohol prep pads were used in the cleansing site.
15. Doff PPE and dispose of properly.

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First Responder
EMT
AEMT
Paramedic

MEDICATIONS

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RX-P1 AEROSOL/INHALER TREATMENTS		

Indications

- Patients experiencing bronchospasm

Contraindications

- Allergy to medication
- (Active/New) Arrhythmias
- For home MDI use: Medication is not prescribed to patient, or medication has expired

Procedure - Nebulizer/Aerosol

1. Assemble the nebulizer kit.
2. Instill the premixed medication into the reservoir well of the nebulizer.
3. Connect the nebulizer device to oxygen at 6 - 8 liters per minute for a steady, visible mist.
4. Instruct the patient to inhale normally through the mouthpiece of the ne needs to have a good lip seal around the mouthpiece if no mask.
5. The treatment should last until the solution is depleted. Tapping the reservoir of the treatment will assist in utilizing all of the solution.
6. Monitor the patient for medication effects. This should include the patie her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
7. Document the treatment, dose, and route on the patient care report (PCR).

Procedure - Personal Inhaler (MDI)

1. Make sure that personal inhaler is at room temperature.
2. Follow the instructions for either gentle or vigorous shaking.
3. Instruct patient to seal lips around opening of inhaler, using spacer if present.
4. Instruct patient to inhale deeply while depressing the inhaler.
5. Instruct patient to hold breathe as long as possible.

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RX-P2 INTRANASAL MEDICATION		First Responder EMT AEMT Paramedic

Indications

- Emergent need for medication administration and IV access unobtainable/presents a high risk of needlestick injury due to patient condition

Contraindications

- Bleeding from the nose or excessive nasal discharge
- Mucosal destruction

Procedure

1. Draw proper dosage (*see below*)
    a. Medications administered via the IN route require a higher concentration of drug in a smaller volume of fluid than typically used.
    b. In general, no more than 1 milliliter of volume can be administered per nostril.
2. Expel air from syringe
3. Attach the MAD device via LuerLock
4. *Briskly* compress the syringe plunger
5. Divide the total dose between each nostril (½ in each)

NOTES:

- *Gently* pushing the plunger will not result in proper atomization
- IntraNasal Dosing is less effective than IV dosing (slower onset, incomplete absorption)
- Home use of nasal vasoconstrictors (i.e. Afrin) will significantly reduce the effectiveness of IN medications.

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RX-P2 INTRANASAL MEDICATION		First Responder EMT AEMT Paramedic

Approved IN Medications

Ativan (lorazepam) 2 mg IN	**Versed** (midazolam) 5-10 mg IN	**Ketamine** Nebulized
Repeat: every 5 min Max: 2 doses IN	Repeat: every 5 min Max: 2 doses IN	See Ketamine for Pain **RX-03**
Peds: 0.1 mg/kg	Peds: 0.2 mg/kg	Peds: per Medical Control
Narcan [naloxone] 0.4-2 mg IN	**Fentanyl** 50-100 mcg IN	**Glucagon** 1-2 mg IN
Repeat: as needed	Repeat: 10 min Max: 2 does IN	Repeat: every 10 min
Peds: 0.1 mg/kg	Peds: 1 mcg/kg	Peds: 0.1 mg/kg

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RX-P3 MEDICATION ADMINISTRATION		First Responder EMT AEMT Paramedic

Indications

- When medication administration is necessary and the medication must be given via the SQ or IM route or as an alternative route in selected medications

Contraindications

- Allergy to medication per protocol
- Aspiration of blood

Procedure - Intramuscular (IM)

1. Receive and confirm medication order, or perform according to standing orders.
2. Prepare equipment and medication, expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. Identify injection site(s) and cleanse with alcohol:
   a. Adults: No more than 1 mL for the arm or 2 mL in the thigh or buttock.
   b. Peds: The thigh should be used for all injections, and should not exceed 1 mL.
5. Hold the syringe at 90 degree angle, with skin pinched and flattened.
6. Insert the needle into the skin with a smooth, steady motion.
7. Aspirate for blood, then inject the medication.
8. Withdraw the needle quickly, dispose without recapping, and apply pressure to the site.
9. Monitor for the desired therapeutic effects as well as any possible side effects.
10. Document the medication, dose, route, and time on the patient care report (PCR).

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RX-P3 MEDICATION ADMINISTRATION		First Responder EMT AEMT Paramedic

Procedure - Subcutaneous (SC)

1. Prep as per IM instructions #1 - #3.
2. Identify injection site(s) and cleanse with alcohol:
   a. Adults: No more than 1 mL for the arm.
   b. Peds: The thigh should be used for all injections, and should not exceed 1 mL.
3. Hold subcutaneous syringe at 45 degree angle.
4. Insert the needle into the skin with a smooth, steady motion.
5. Aspirate for blood, then inject the medication.
6. Withdraw the needle quickly, dispose without recapping, and apply pressure to the site.
7. Monitor for the desired therapeutic effects as well as any possible side effects.
8. Document the medication, dose, route, and time on the patient care report (PCR).

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RX-P4 NITROUS OXIDE ADMINISTRATION		First Responder EMT AEMT Paramedic

Inclusion Criteria

Intractable Pain (≥7/10)
Normal (i.e. baseline) Mental Status

Contraindications

Age <16 Years
Suspected Pneumothorax
Severe Head Injury
Severe Facial Deformities or Burns
Respiratory Distress
Hypoxemia

When administering Nitrous Oxide:

Only administer in a well-ventilated area. If in the back of the ambulance, **the ambulance exhaust fans must be in operation and at the maximum setting for the duration of transport.**

Procedure: **ADMINISTRATION OF NITROUS OXIDE (NO)**

DEVICE SETUP:

1. Connect the Nitrous Oxide cylinder (BLUE, see right) to the regulator/mixer (RED Top) and turn on the valve.
2. Connect the oxygen tubing (GREEN, see right) to the oxygen tank or ambulance supply line.
3. Open the cylinder/wall valves and ensure there is sufficient gas pressure to the device.
4. Place the patient on **all required monitoring devices** prior to starting nitrous oxide administration.



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RX-P4 NITROUS OXIDE ADMINISTRATION		First Responder EMT AEMT Paramedic

NITROUS OXIDE ADMINISTRATION

1. Explain the procedure to the patient:
    a. This is a self-administered inhaled pain medication
    b. Instruct the patient to place the mask over their face and take several deep breaths
    c. Repeat as needed to achieve maximum pain relief
2. Monitor the patient's self-administration of Nitrous Oxide
3. Provide a **continuous reassessment** during administration
    a. Document any changes in mental or respiratory status
    b. All patients require:
        i. Continuous ECG monitoring;
        ii. Continuous pulse-oximetry; and
        iii. Continuous end-tidal CO2 (ETCO2) monitoring
    c. Document vital signs every 5 minutes (including SpO2 and ETCO2)
    d. Document at least two (2) pain scores
4. **IMMEDIATELY discontinue the Nitrous Oxide Administration and place the patient on a Nonrebreather Mask with 100% oxygen if:**
    a. Oxygen saturations go below 90%
    b. End-tidal CO2 values go above 45 mmHg (or increase 10 mmHg from baseline)
    c. Significant increases in heart rate are noted
    d. Systolic blood pressure drops below 90 mmHg
    e. The patient becomes responsive only to pain (‘P’ on AVPU scale)
5. Once discontinued, Nitrous Oxide may not be reapplied unless approved by Online Medical Control.
6. Document in patient care report (ePCR):
    a. The Nitrous Oxide pressure (in the BLUE cylinder) both before and after administration
    b. The patient’s pain both before and after Nitrous Oxide administration.
    c. All required vital signs and changes in patient assessment

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RX-P4 NITROUS OXIDE ADMINISTRATION		

NOTES:

- The administered concentration of gasses must be a 50% Oxygen & 50% Nitrous Oxide (NO) mixture. No other ratio or gas use is permitted.
- The negative pressure created by the patient's inhalation effort triggers gas flow. A tight mask-face seal is necessary.
- If pain does not improve, consider other medications to treat the patient's pain

QI Review Parameters:

1. TBD

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TOC/NOTES: TRAUMA		First Responder EMT AEMT Paramedic

TRAUMA

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T-P1 BLOOD PRODUCT ADMINISTRATION		First Responder EMT AEMT Paramedic

Indications	Contraindications
Traumatic or Non-Traumatic Hemorrhagic Shock *(as defined in T-04)*	Personal or religious/cultural objection to receiving blood products (e.g. Jehovah's Witness)

Determine the most appropriate **Blood Products** *(as available)*:

Blood Product Selection

1st Choice	2nd Choice	3rd Choice
1 unit Whole Blood	1 unit PRBC and 1 unit FFP	1 unit PRBC only

Pediatrics: "1 unit" = 10 mL/kg of Blood Product

Administer a 2nd unit (with a 2nd unit of FFP if PRBC) if clinical signs have not significantly improved. Administration of more than 2 units requires discussion with Online Medical Control for approval.

PROCEDURE: **Blood Product Administration** — *below*

Administer Calcium

P

Calcium (Chloride or Gluconate) **1 gram** slow push IV/IO

Peds: 20 mg/kg

- Utilize a separate IV/IO from the blood product.

– AND –

Administer **Tranexamic Acid (TXA)** — T-P5

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T-P1 BLOOD PRODUCT ADMINISTRATION		First Responder EMT AEMT Paramedic

Procedure (Blood Administration):

1. Patient Prep

a. Ensure the patient has at least two (2) large-bore IVs (and/or IO) access dedicated for blood product administration.
b. Place the patient on all appropriate monitoring devices, including:
    i. Continuous pulse oximetry (SpO2)
    ii. Continuous end-tidal CO2 (ETCO2) monitoring
    iii. Continuous ECG monitoring
c. Obtain pre-transfusion vital signs, including blood pressure, respiratory rate, and temperature, as well as SpO2, ETCO2 and heart rate.

2. Blood Product Preparation

a. Remove the blood products from the cooler *only* immediately prior to use.
b. Ensure the temperature indicator on the blood product bag is indicating appropriate temperature storage. If the product has reached an unacceptable storage temperature, then *do not transfuse* the product.
c. Warm the blood product to 37° C (95° F)

3. Blood Administration (Transfusion)

a. Gently agitate (massage) the blood product bag
b. Set up specific blood tubing (filtered) and prime the tubing as required.
c. Perform medication safety checks and then begin infusing the **Blood Product** through the dedicated IV or IO line.
    i. For adults, administer: One (1) unit whole blood; One (1) unit each of PRBC (packed red blood cells) and FFP (fresh frozen plasma); or One (1) unit of PRBC alone.
    ii. For pediatrics, administer 10 mL/kg of the appropriate blood product.
d. Administer **Calcium** (dosing above) through a separate IV or IO.
e. Administer **Tranexamic Acid (TXA)** as per T-P5, if no contraindications

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4. Monitor for & Manage Transfusion Reaction

Note: Transfusion reactions may present with common signs and symptoms of anaphylaxis or medication reaction, fever (usually low-grade), as well as other vague symptoms including unexplained abdominal or back pain during or after administration.

a. Continuously reassess the patient during transfusion, watching for any concerning signs of allergic reaction or other unexplained signs or symptoms.
b. Obtain and document **vital signs every five (5) minutes**, including: blood pressure, heart rate, respiratory rate, SpO2, and ETCO2.
    i. If any question of fever, obtain and document the temperature.
c. If the patient experiences a possible reaction:
    i. Immediately stop the transfusion
        1. If only a mild reaction (fever, mild rash, etc.) treatment will likely be symptomatic. Consider continuing the transfusion and monitoring closely only if the risk outweighs the benefit.
        2. Do not continue or restart transfusion if there is evidence of a significant reaction (angioedema or concerns for partial/complete airway obstruction, dramatic and unexpected hemodynamic changes, etc.)
    ii. Contact **Online Medical Control** to discuss further management

5. Documentation

a. Within the electronic Patient Care Report (ePCR), document:
    i. All assessments and vital signs as per agency policy and/or as outlined in this guideline.
    ii. The type and total volume of blood products transfused, as well as other medications administered.
    iii. Any signs or symptoms of a transfusion reaction, as well as any interventions taken to remedy the reaction.
    iv. All clinical decision-making supporting the need for blood product administration and other interventions.
b. Complete the agency/product-specific Prehospital Blood Product Transfusion Record–generally a multi-layered, carbon-copied paper included directly with the blood products–as per agency policy.

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T-P1 BLOOD PRODUCT ADMINISTRATION		

Notes:

- TBD

QI Review Parameters:

1. Did the patient meet the indications for blood product administration?
2. Was the appropriate product and volume administered through an appropriate line?
3. Was calcium co-administered? (or contraindication documented)
4. Was TXA co-administered? (or contraindication documented)
5. Was the patient monitored appropriately, and were assessments and vital signs documented as per policy/guideline?
6. Was there evidence of a transfusion reaction, and were appropriate steps taken to manage the reaction?

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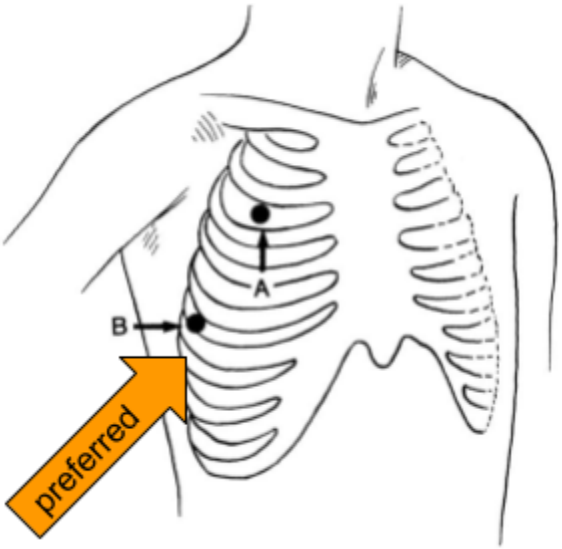
T-P2 NEEDLE/FINGER THORACOSTOMY	**Finger Thoracostomy can ONLY be performed after training and written approval of the Medical Director**	First Responder EMT AEMT Paramedic

Indications

- Tension Pneumothorax
- Refer to Chest Trauma Guideline [T-09] *(see Tension Pneumothorax)* for specific indications

Procedure **(Needle Decompression)**

1. Cleanse skin on affected side using aseptic technique
2. Using a large-bore (e.g. 14 or 16 gauge) 3 ½" angiocath (*see figure*), insert between the
   a. [**A**] 2nd-3rd mid-clavicular, or
   b. [**B, preferred**] 4th-5th mid-axillary spaces.
3. Advance needle until "pop" is felt while the needle is entering the pleural space
4. Advance catheter until hub contacts skin
5. Cover catheter hub with Asherman Chest Seal (ensure one way valve effect)
6. Reassess patient for breath sound changes
7. If signs of tension recur,
   a. Check chest seal
   b. Consider repeating chest decompression per above steps
8. Contact Medical Control
9. Transport ASAP



Pediatrics **(Needle Thoracostomy <u>ONLY</u>)**:

- Use the same procedure for pediatric patients
- Substitute an 18 or 20-gauge angiocath

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T-P2 NEEDLE/FINGER THORACOSTOMY	**Finger Thoracostomy can ONLY be performed after training and written approval of the Medical Director**	First Responder EMT AEMT Paramedic

Procedure **(Finger Thoracostomy)**

Preparation

1. Don appropriate PPE, including a gown if available.
2. Position Patient: place **supine**, and abduct the patient's arm away from the chest → place the **patient's hand behind their head** (if possible).
3. Cleanse the skin with chlorhexidine (preferred) or alcohol swab.

Identify Appropriate Location

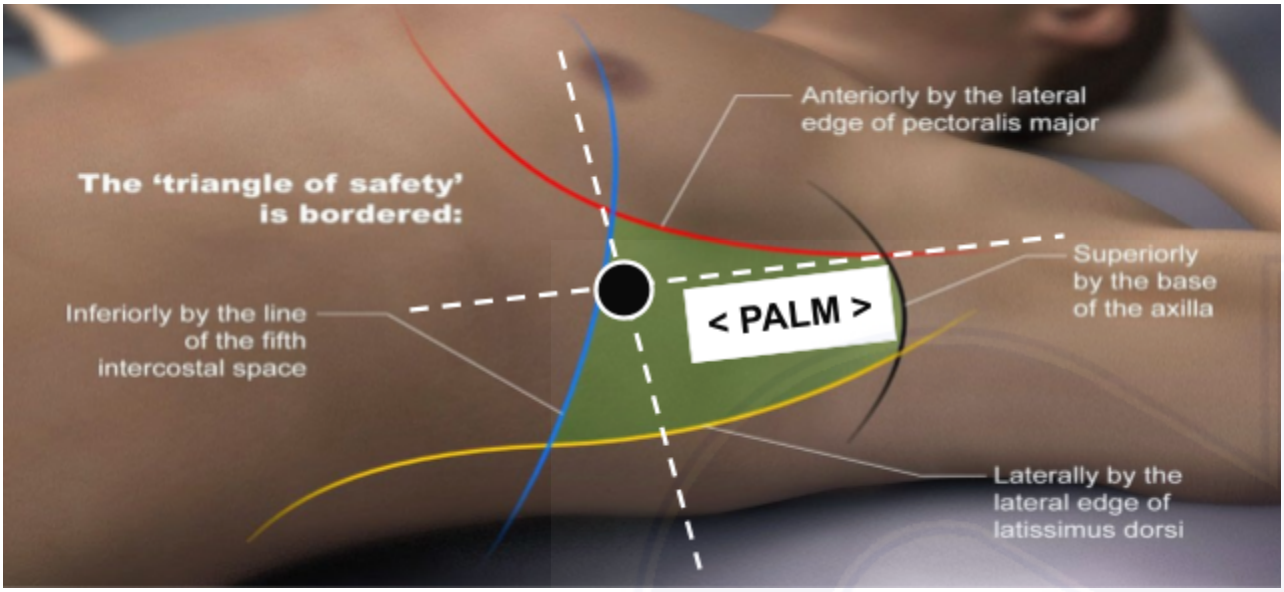
Insertion Box:

- **Lower (caudal) border** = Nipple Line (men) or the Inframammary Crease (women)
- Upper (cranial) border = anywhere near the axilla
- **Posterior border** = mid-axillary line (or Latissimus Dorsi)
- **Anterior Border** = anywhere anterior to the anterior axillary line (or Pectoralis major)

Ideal location =

- **Anterior Axillary Line**, and the
- **Nipple Line (men) or Inframammary Crease (women)**

Note: the incision should in general be at least the Width of the Palm below the axilla



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T-P2 NEEDLE/FINGER THORACOSTOMY	**Finger Thoracostomy can ONLY be performed after training and written approval of the Medical Director**	First Responder EMT AEMT Paramedic

Decompression Technique

1. Using a scalpel, make a 1-2 inch incision through the skin directly over the 5th rib between the anterior axillary line and midaxillary line (*Figure 1*).
2. Utilizing curved forceps (or similar blunt instrument), penetrate into the thoracic cavity over the rib (*Figure 2*)
3. Following penetration into the thoracic cavity, open the forceps to create an adequate opening sufficient to place your finger in the chest.
4. Insert finger into pleural space, ensuring that the lung is palpated.
5. Place a 3-sided dressing over the incision

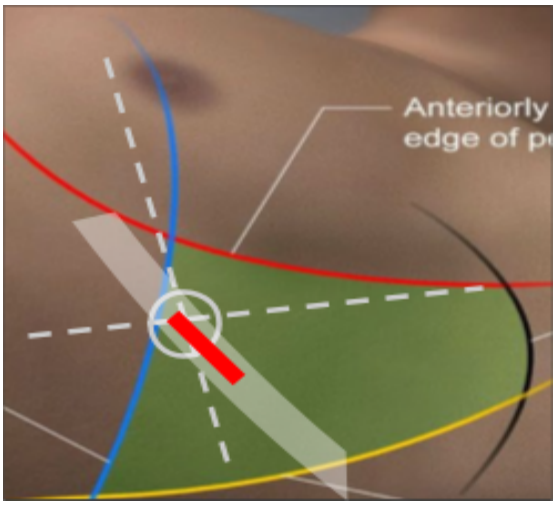


Figure 1: Incision over the 5th Rib

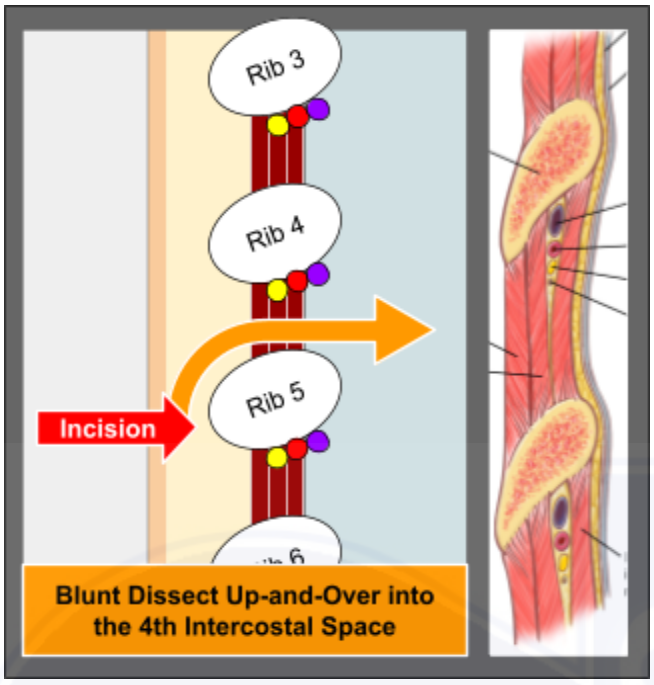


Figure 2: Appropriate Intercostal Location

Notes:

- Avoid making an incision through an existing penetrating wound if at all possible.
- Use scalpel for skin only. Use blunt dissection to pass through the intercostal muscles.
- Control the depth of insertion by grasping the forceps near the curved portion while inserting.

Video Tutorial: https://youtu.be/hCXnovUOpr0?si=JXQkLoS2e5voDlD-

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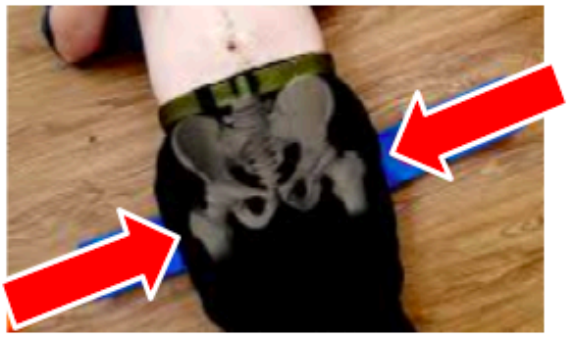
T-P3 PELVIC BINDER		First Responder EMT AEMT Paramedic

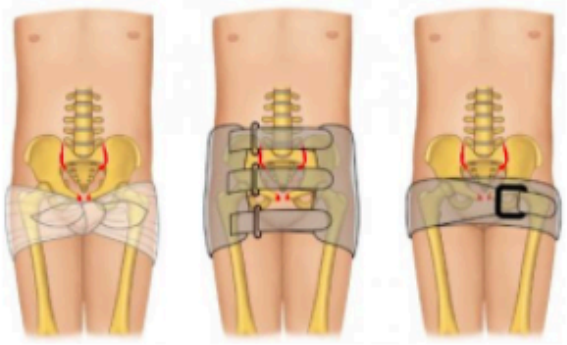
Indications

- Pelvic Fracture (Unstable)

Procedure

1. Identify unstable pelvis or concern for significant pelvic fractures.
2. Identify greater trochanters (*widest area of hips, see right*)
3. Place appropriate device (i.e. SAM Sling®, KED devices, etc.) around hips and secure as appropriate (*see below for specifics*).
4. Once placed, a pelvic binder should only be removed by a physician in the ED.





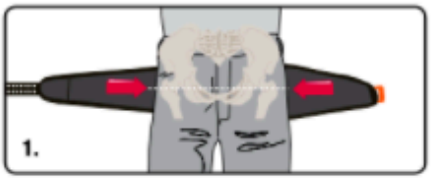
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T-P3 PELVIC BINDER		First Responder EMT AEMT Paramedic

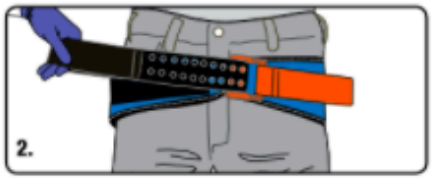
SAM Sling®:

Applies in 3 Easy Steps

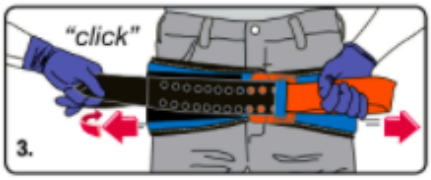
no trimming, no cutting, no guessing



Remove objects from patient's pocket or pelvic area. Place SAM Pelvic Sling II black side up beneath patient at level of trochanters (hips).



Place **BLACK STRAP** through buckle and pull completely through.



Hold **ORANGE STRAP** and pull **BLACK STRAP** in opposite direction until you hear and feel the buckle click. Maintain tension and immediately press **BLACK STRAP** onto surface of SAM Pelvic Sling II to secure. You may hear a second click as the sling secures.

KED®:

1. Invert the KED from typical use (head straps towards feet (*see right*).
2. Place "bottom" of the KED (wide portion with colored straps around hips (*greater trochanters*), and tighten firmly.
3. "Head" wrap/straps may be placed around one or both legs to assist with stabilization if needed--i.e. for femur fracture(s).
4. Padded board may be used to stabilize fractures if available/needed (*see right for examples*).



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T-P4 TOURNIQUET PLACEMENT		First Responder EMT AEMT Paramedic

Indications

- **Serious or life threatening** extremity hemorrhage, *AND*
- Standard hemorrhage control techniques are inadequate, or tactical considerations prevent their use.

Contraindications

- Non–extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical

Technique

1. Place tourniquet proximal to wound
2. Tighten (*per manufacturer instructions*) until hemorrhage stops and/or distal pulses in affected extremity disappear
3. Secure tourniquet (*per manufacturer instructions*)
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds per standard wound care guidelines
6. Contact Medical Control ASAP, and always include tourniquet use in your report
7. If delayed or prolonged transport and tourniquet application time anticipated greater than 2 hours, consider air transport
8. Document times, location and clinical bleeding/exam changes in the PCR

If bleeding persists apply a second tourniquet.

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T-P5 TXA ADMINISTRATION		First Responder EMT AEMT Paramedic

INDICATIONS (Inclusion Criteria)

1. Traumatic Injury or Uncontrolled Non-Traumatic Hemorrhage

Penetrating Injury or Significant Blunt Trauma with a likelihood of internal/non-compressible hemorrhage.

GI Bleeding (hematemesis or bloody/melanotic stools); Vaginal/postpartum bleeding; etc.

With any of the following:

- **SBP <90 mmHg**
- **Shock Index >1.0 (Heart Rate > SBP)**
- Pediatric (<10 years): SBP < 70 mmHg + (2 x age in years)

- **Deteriorating vital signs** (even if above thresholds) **or other clinical findings consistent with hypoperfusion** (**ETCO2 <25-30 mmHg,** altered mental status, cool extremities, weak pulses, etc.)
- **Severe Altered Mental Status (AMS; *see below)***

2. Isolated Head Injury

With **Severe Altered Mental Status (AMS)**:

- **Responsive only to Pain** (AVPU Scale)
- **Motor GCS <6 (i.e. unable to follow commands)**
- **Rapidly deteriorating mental status**

3. High Suspicion of Hemorrhagic Stroke

Including **BOTH**:

Known bleeding disorder
(hemophilia, von Willebrand's disease, etc.)

– – OR – –

Confirmed to take a blood thinner
Does NOT include antiplatelet medications such as aspirin or clopidogrel [Plavix]

AND

Severe lateralizing neurologic deficits (e.g. hemiparesis), OR **Severe Altered Mental Status *(AMS, see left)***

EXCLUSION CRITERIA

- Injuries or the onset of acute neurologic symptoms > 3 hours prior to administration
- Known hypersensitivity to TXA
- Suspected concurrent STEMI, Pulmonary Embolism or Ischemic Stroke (CVA)
- Ventricular Assist Device (VAD)

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T-P5 TXA ADMINISTRATION		First Responder EMT AEMT Paramedic

Tranexamic Acid (TXA) 2 grams (2000 mg) IV/IO
MIX: ***2 grams of TXA in 50-100 mL NS*** • Can also add to a 500 mL fluid bolus • Infuse over 10 minutes

Pediatric Dosing of Tranexamic Acid (TXA)		
MIX: ***15 mg/kg of TXA in 50-100 mL NS*** *or in a 10 mL/kg fluid bolus (below)*		
Broselow Color/ Weight (kg)	**TXA Dose** (mg)	**IV Fluid Bolus** Normal Saline (mL)
Gray (3-5)	**75**	50
Pink (6-7)	**105**	70
Red (8-9)	**135**	90
Purple (10-11)	**165**	110
Yellow (12-14)	**210**	140
White (15-18)	**270**	180
Blue (19-23)	350	230
Orange (24-29)	435	290
Green (30-36)	540	360
Adult	2000 (2 grams)	500

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T-P5 TXA ADMINISTRATION		First Responder EMT AEMT Paramedic

NOTES:

- TXA is a synthetic amino acid (lysine) that blocks plasminogen from being converted to the enzyme plasmin.
    - Plasmin normally destroys clots by breaking down fibrin (fibrinolysis).
    - TXA decreases bleeding by inhibiting this natural process.
- TXA should <u>never</u> be bolused in, it should be **dripped in over 10 minutes.**
- Recent evidence does not support a significant rate of DVT or Pulmonary Embolism with appropriate use of TXA, but it can theoretically cause a hypercoagulable state where [*unwanted*] blood clots may formed.
    - Caution should be used in patients who are at risk of forming blood clots (history of multiple clots, using estrogens or progesterones, etc.), or
    - Who have concurrent active disease caused by blood clots (i.e. patients who are actively showing signs or symptoms of stroke/CVA, STEMI, etc. in addition to the traumatic event.

QI Review Parameters:

1.

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First Responder
EMT
AEMT
Paramedic

TRANSPORT / GENERAL CARE

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Z-P1 DELAYED PATIENT OFF-LOADING IN ED		First Responder EMT AEMT Paramedic

INDICATIONS:

- Actual or likely “wall time” exceeds 30 or more minutes.

CONTRAINDICATIONS! should NEVER BE OFFLOADED to an Unsupervised Area:

- Patient is requiring ***active*** **treatment of an emergent condition**, such as:
  - Airway management
  - Ventilatory support such as CPAP, BVM or *actively receiving* a nebulizer treatment.
  - CPR or Defibrillation/Electrical Cardioversion
  - Drips or repetitive doses of cardioactive medications (epi, diltiazem, etc.).
- Patient meets criteria for a **time-sensitive condition**:
  - STEMI
  - Stroke
  - Penetrating Trauma to the Head/Trunk
  - OB with Imminent Delivery

Caution should be used with the following patients. These cases should generally be discussed with a Supervisor and involve attempted collaboration with the Facility Staff.

- Any **unstable or potentially unstable patient.**
  - The following complaints should be considered *potentially unstable*.
    - Acute chest pain, dyspnea or other anginal-equivalent symptoms that are consistent with a likely acute cardiac cause.
    - Unexplained syncope with ECG changes in patients >35 years old.
    - Acute neurologic symptoms that are concerning for stroke.
    - Severe sudden-onset headache with alteration in LOC (i.e. aneurysm).
    - Overdose of any medication that has cardiac effects (slowing heart rate or lowering blood pressure) or potential sedative effects, regardless of quantity or timing of ingestion.
- Any patient with significantly **abnormal vital signs**:
  - Hypotension (SBP <90 mmHg in adults) at *any time* during evaluation.
  - Any of the following that do not improve with basic comfort/calming measures:
    - Heart Rate >120 or

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- Respiratory Rate >20 or
- Systolic Blood Pressure >220 (with no symptoms of stroke, chest pain or SOB).

- Any patient with *new/increased oxygen demand* (oxygen saturation <94% on room air/home O_2).
- Any patient not at their baseline mental status (e.g postictal seizure patients).



- **IV's should only be started if IV fluids and/or medications are necessary.**
- **IV's should be avoided in patients who are expected to be offloaded, and should always be removed prior to offloading to the ED lobby.**

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Z-P1 DELAYED PATIENT OFF-LOADING IN ED		

OFFLOADING DISPOSITION

#1: IMMEDIATE PLACEMENT in the Lobby:

Must meet **ALL** of the following criteria:

- Greater than 17 years old.
- Patient can walk or sit in a wheelchair unassisted.
- Stable vital signs and no signs of immediate distress or emergent condition.
- Patient has had no significant, emergent/life-saving clinical interventions by EMS.

#2: Eligible for Offloading AFTER DISCUSSION WITH SUPERVISOR

- All patients who do not meet criteria for “Immediate Placement” or for “Never be Offloaded” (*above*), and
- The patient can sit or be placed in a chair/wheelchair and not fall to the floor. This may include patients who cannot ambulate.

#3: ALTERNATIVE Offloading -- i.e. patients who cannot be placed in a chair/wheelchair

- Alternative Offloading situations (e.g. onto a vacant stretcher or military litter) may be utilized in extreme situations, and should always be discussed with a Supervisor prior to any action being taken.
- **Patients may also be given the option to be transported to an alternative ED.**

NOTES:

- **Make EVERY attempt to communicate and collaborate with the ED Staff on disposition of patients before attempting any offload or transfer.**
- Staff have the discretion to place patients in whichever location they wish if done in a timely manner, however, they do not have the right to prevent offloading of EMS patients.
- Staff cannot prevent the EMS crew from taking the patient to another facility if that is the patient’s wish.
- **If there is ANY question, contact your supervisor.**

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Z-P1 DELAYED PATIENT OFF-LOADING IN ED		

OFFLOAD PROCEDURE

- Appropriately notify the Emergency Department Staff of patient arrival as quickly as possible.
- If the Nursing Staff can not immediately assign a location for the patient to be offloaded, *AND* there is evidence that the wait for placement will likely be **longer than 30 minutes**, then see "Offloading Disposition" (*above*).
    - If the patient(s) meet criteria for "Immediate Placement", **escort them to the ED lobby.**
        - Attempt to give a report to ED Triage staff or other appropriate hospital personnel.
        - If this is not possible, direct the patient to the appropriate triage/registration area.
        - Notify your EMS Supervisor of lobby placement and return to service.
    - If the patient(s) does <u>not</u> meet these "Immediate Placement" criteria, **contact your EMS Supervisor.** Together the decision will be made to:
        - Place the patient in the lobby, as above. *This should be the primary option for any patient able to sit in a chair unassisted.*
        - Place the patient in an "EMS surge unit" *organized and staffed by hospital personnel.*
        - Offload the patient onto any ED stretcher, a designated auxiliary ambulance stretcher, or utilize a military litter or similar temporary bedding as appropriate and available.
        - Offer the patient the opportunity to be taken back to the ambulance to be transferred to another Emergency Department. *<u>Note</u>: patients may not be taken back home.*
        - Hold the patient on the EMS cot while the Supervisor contacts appropriate ED Nursing Staff/Administration for assistance. *This should never exceed 60 minutes.*
- Once the patient meets all the criteria above, perform the following:
    - Escort/place the patient in the appropriate area.
    - Ensure the patient's condition is unchanged.
    - **<u>Document</u> all contacts with ED personnel, hospital administrators and all discussion with EMS Supervisors.**
    - Complete an abbreviated, handwritten EMS Offload report *(sample report below)* to

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include patient demographics, complaint, vital signs and pertinent history. Take a photo of this report, attach it to the ePCR and leave the original copy with the patient.

- Make reasonable attempts to ensure the hospital staff is aware of the patient's location, complaint and condition.
- Complete standard ePCR run report, denoting method and location of patient care transfer.
- **Return to service within 60 minutes of arrival at destination.**

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Z-P1 DELAYED PATIENT OFF-LOADING IN ED		First Responder EMT AEMT Paramedic

ED OFFLOADING REPORT - EXAMPLE

Form Z-RXX

EMS Patient Care Summary

Date of Service:		EMS Unit	County ###
Facility:		Time of Arrival (to Facility)	00:00
Patient Name:		Time of Patient Offloading	00:00
DOB:		Location of Offloading	e.g. Lobby

	Chief Complaint	Brief History of Event/Illness
M Mechnism or Medical Complaint		

	Brief Assessment (pertinant findings or injuries)
I Injuries or Illness	

S — Signs and Symptoms

Vitals *(must be taken at destination prior to offloading)*

Time	Blood Pressure	Heart Rate	Respirations	LOC	Glucose *(PTA)*
00:00	/	bpm	Rate @ O2 Sat.	❒ Alert ❒ Verbal ❒ Pain ❒ Unresponsive	

	EMS Interventions
T Treatments	

Contacts

Position	Last Name	Time	Comments
EMS Supervisor			
Hospital Staff			
other			
other			

Signature (EMS Provider):

If there are any questions or concerns please call the EMS Supervisor or EMS Dispatch.

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Emergency Medical Services



2026 Clinical Guidelines

Release: 7/1/2026

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Version 2.16.20

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Section 4: REFERENCE

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M - [OTHER] MEDICAL COMPLAINTS

M-R1 C-STAT Stroke Scale
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RX-R1 Medication Information

Z - GENERAL OPERATIONS done

Z-R1 Common Abbreviations
Z-R2 Definitions

Legend:

SLT: Service-Level Training Required (EMT, AEMT, Paramedic)
NEW: New Protocol
2026: Significant 2026 Updates

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TOC: HAZARDOUS MAT./ TOXICOLOGY		First Responder EMT AEMT Paramedic

Hazardous Mat. & Toxicology

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H-R1 CARDIOVASCULAR DRUGS		First Responder EMT AEMT Paramedic

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received through online Medical Control.

Cardiovascular Drugs		
Substance	Notes	Treatment (beyond typical supportive care)

Digitalis/Cardiac Glycosides
Digoxin
 	
Plants
Foxglove
Lily of the Valley
Oleander
Red Squill
 	
Skin of Toads (Bufonidae)
	• Acute toxicity:
	  ○ GI sxs (nausea/vomiting)
	  ○ Cardiac (**bradyarrhythmias, AV block,** etc.) with dizziness, syncope, etc.
	• Chronic toxicity/accumulation
	  ○ Typically the result of drug–drug interactions or changes in kidney function.
	  ○ Usually vague/nonspecific complaints including **weakness,** fatigue, **confusion/delirium**, etc.
	• The classic description includes viewing **yellow-green halos around objects**, termed *xanthopsia*.
		ED Treatment:
		Digibind (digoxin-specific antibody [Fab] fragments)

β-Adrenergic receptor antagonists (β-blockers)
Atenolol
Carvedilol
Labetalol
Metoprolol
Propranolol
…and others
	• Symptoms:
	  ○ Cardiovascular: **bradycardia**, cardiac dysrhythmias and **cardiogenic shock**
	  ○ Pulmonary: bronchospasm
	  ○ Neurologic/CNS: altered mental status, coma, and seizures
	  ○ **HYPOglycemia**
	• Notes:
	  ○ Propranolol can block sodium channels → wide QRS = treat with Sodium Bicarbonate
	  ○ Sotalol → QT prolongation/torsades = treat with Magnesium
		Fluid resuscitation and vasopressors, as per Medical Shock [M-06]
		
		ED Treatments:
		• **Glucagon** - requires <u>very</u> high doses
		• **High-dose Insulin**, with dextrose (D50, D10, etc.)
		• **Lipid emulsion therapy** (acts as a sink lessening the effect of the drug)

Calcium channel	• All CCBs relax vascular smooth muscle,	**Same as β-blockers**

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blockers (CCBs) <u>Nondihydropyridines</u> *Diltiazem* *Verapamil* <u>Dihydropyridines</u> *Amlodipine* *Felodipine* *Isradipine* *Nicardipine* *Nifedipine* *Nimodipine* *Nisoldipine*	reduce pacemaker activity, and decrease cardiac contractility that ultimately may result in cardiovascular collapse. ● **Nondihydropyridines** ○ **Slow heart rate** (more rate control, i.e. “cardioselective”) ○ Used to manage hypertension, control atrial flutter/fibrillation and other supraventricular tachycardias ● **Dihydropyridines** ○ **Lower blood pressure** (more vasodilation) ○ May have **reflex tachycardia** ○ Used to treat hypertension, angina, and vasospasm after SAH ● Symptoms ○ **Profound, resistant hypotension** from decreased cardiac output and peripheral vasodilation ○ **HYPERglycemia** (compared to hypoglycemia from β-blockers	(above), also may consider more aggressive calcium administration: **Calcium Chloride** **1 gram (20 mg/kg) IV/IO** *or* **Calcium Gluconate** **1 gram (20-50 mg/kg) IV/IO** ● Give over 10 minutes ● Repeat every 20 minutes as needed
Diuretics *Amiloride* *Bumetanide* *Chlorothiazide* *Chlorthalidone* *Eplerenone* *Furosemide* *Hydrochlorothiazide* *Indapamide* *Metolazone* *Spironolactone* *Triamterene*	● Cause increased urine production leading to hypovolemia/dehydration and various possible electrolyte disturbances	Fluid Resuscitation
Alpha-Adrenergic Blockers α1-Blockers *Doxazosin* *Prazosin*	● Mechanism: inhibit peripheral sympathetic tone in order to decrease blood pressure. ● **Doxazosin**, **prazosin**, and **terazosin** primarily reduce peripheral vascular resistance (treatment of hypertension)	

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Tamsulosin
Terazosin
 	
α2-Agonist
Clonidine
	• T**amsulosin** is used exclusively for management of benign prostatic hyperplasia (BPH)
	• **Clonidine**
	  ○ **ONE PILL may cause severe symptoms in a child**
	  ○ Stimulates α2-adrenergic receptors in the CNS, inhibiting release of catecholamines, resulting in decreased heart rate, contractility, and peripheral vascular resistance.
	  ○ Severe symptoms → **bradycardia, CNS depression, and hypotension**	

ACE Inhibitors [-PRIL's]
(Angiotensin Converting Enzyme)
Benazepril
Captopril
Enalapril
Fosinopril
Moexipril
Perindopril
Quinapril
Trandolapril
 	
ARBs [-SARTAN's]
(Angiotensin Receptor Blockers)
Candesartan
Eprosartan
Irbesartan
Losartan
Telmisartan
Valsartan
	• Not been associated with significant morbidity in overdose.
	• Mechanism: inhibition of ACE causes decreased production of angiotensin II, resulting in vasodilation. ARB's block the receptor directly.
	• **Angioedema**
	  ○ Most dangerous adverse effect
	  ○ Not dose dependant
	  ○ **Can occur any time** during treatment (i.e. years of being on the drug)
		Aggressive airway management with angioedema, including the need for potential surgical airway (cricothyrotomy)

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H-R1 CARDIOVASCULAR DRUGS		First Responder EMT AEMT Paramedic

Vasodilators *Hydralazine* *Minoxidil*	• Isolated vasodilation (no direct cardiac effects) decreases blood pressure. • May be associated with reflex tachycardia.	

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H-R2 METALS		First Responder EMT AEMT Paramedic

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received through online Medical Control.

Metals

- In order of ascending atomic weight, the following metals are toxic to humans: beryllium, vanadium, cadmium, barium, osmium, **mercury**, thallium, and **lead**.
    - Acute poisoning generally causes direct irritation to the superficial tissues:
        - GI - nausea, vomiting, abdominal pain, GI bleeding/hemorrhagic gastritis, etc.
        - Inhalation - mucous membrane irritation/burning, pneumonitis with wheezing/bronchoconstriction (Metal Fume Fever), pulmonary edema, etc.
        - Skin exposure - inflammation (i.e. dermatitis), ulceration, etc.
    - Chronic poisoning/exposure commonly leads to vague and progressive cellular dysfunction:
        - Neurologic - e.g. peripheral neuropathies, ataxia, weakness
        - Psychological and cognitive symptoms
        - Hematologic disturbance - aplastic anemia or hemolytic anemia, neutropenia, etc.
- *Metalloids*
    - Chemical elements with properties intermediate to those of metals and nonmetals, that tend to have these two general properties: (1) they are semiconductors of electricity, and (2) they form amphoteric oxides.
    - In order of ascending atomic weight, the following metalloids are considered toxic: boron, silicon, germanium, **arsenic**, antimony, tellurium, and polonium.
- **Metal Fume Fever** is the clinical syndrome of fever and other “flu-like” symptoms resulting from inhalation of dust or fumes containing zinc, aluminum, or magnesium oxide.

Specific Metals

Substance	Notes	Treatment (beyond typical supportive care)

Arsenic
 	
Weed killers, pesticides, taxidermy, wood preservatives, etc.
	• Acute exposure
	  ○ GI: **severe, prolonged gastroenteritis** with nausea, vomiting, and cholera-like diarrhea; possible hemorrhage
	  ○ CNS: Altered mental status, seizures and possibly coma
	• Subacute/chronic exposure
	  ○ CNS: peripheral neuropathy
	  ○ Hematologic: anemia
		ED Treatment:
		Dimercaprol or succimer

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H-R2 METALS		First Responder EMT AEMT Paramedic

Bismuth *Antidiarrheals (bismuth subsalicylate*	• Acute: GI; nephrotoxicity • Chronic: Neurologic	ED Treatment: **Dimercaprol** (limited evidence)
Cadmium *Contaminated soil; welding, soldering, jewelry, and batteries*	• Acute ingestion: GI/hemorrhagic gastritis • Acute inhalation: pneumonitis/pulmonary edema • Chronic: nephrotoxicity	ED Treatment: **Succimer** (limited evidence)
Chromium Corrosion inhibitors (e.g., heating systems), pigment production, leather tanning, metal finishing, dietary supplements, prosthetic joints	• Acute: Skin irritation/dermatitis; GI sxs irritation, renal and pulmonary failure • Chronic: chronic skin irritation, chronic mucus membrane/pulmonary irritation	ED Treatment: **Acetylcysteine** (animal studies suggest efficacy)
Cobalt “Hard metal dust” (tungsten–cobalt mixture), flexible magnets, drying agents, prosthetic joints	• Acute: Contact dermatitis, asthma • Chronic: Metal lung disease (spectrum ranging from alveolitis to fibrosis), cardiomyopathy	ED Treatment: **Acetylcysteine** (animal studies suggest efficacy)

Copper
Copper pipes/containers; fungicide (copper sulfate); welding (copper oxide)
	• Acute:
	  ○ *Ingestion*: resembles iron poisoning (i.e. GI sxs); **blue vomitus** (copper salts), hemolysis, methemoglobinemia
	  ○ *Inhalation*: metal fume fever
	• Chronic: Hepatotoxicity (cirrhosis)
		ED Treatment:
		Dimercaprol or succimer

Iron
Iron pills/supplements
	• **Stage 1 (<6 hours) - Acute GI symptoms:**
	  ○ Directly corrosive to the GI tract
	  ○ The absence of GI symptoms within 6 hours essentially excludes a significant ingestion
	• **Stage 2 (6-24 hours) - Latent Stage:**
	  ○ GI symptoms improve
	  ○ Systemic deterioration begins
	• **Stage 3 (24-48 hours) - Systemic Toxicity:**
	  ○ Iron-induced disruption of cellular
		ED Treatment:
		Deferoxamine

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	metabolism with resultant shock and lactic acidosis ○ Coagulopathy/bleeding, cardiomyopathy and multisystem organ failure may also occur ● **Stage 4 (2-5 days) - Hepatotoxicity** ● **Stage 5 (4-6 weeks) - Delayed Sequelae**	
Lead Ingestion (children): *lead paint (banned in the 1970's), ammunition, fishing weights, imported toys, etc.* Inhalation (adults): *battery manufacturing, stained glass, lead smelting, radiator repair, etc.*	● Acute = GI symptoms ● Chronic = Neurologic & cognitive disorders, anemia, renal failure	ED Treatment: **Dimercaprol** (previously known as *British anti-Lewisite or BAL*), *or* **Edetate calcium disodium** (EDTA), *or* **Succimer** (also known as *dimercapto-succinic acid or DMSA*)
Mercury *<u>Elemental</u>: jewelry, battery, and thermometer manufacturing; dentistry* *<u>Inorganic</u>: taxidermy, cosmetics, manufacturing* *<u>Organic</u>: contaminated* ***seafood***	● GI (N/V/D) & Neuro (HA, weakness, etc.) symptoms predominate. ● Ingestion of inorganic form = caustic injury ● **Ingestion of elemental mercury (i.e. liquid in thermometers) generally causes little, if any, toxicity.** ● Inhalation = pneumonitis/pulmonary edema	ED Treatment: **Dimercaprol or succimer**
Silver Colloidal (metallic) silver, cauterizing and antiseptic agent (silver nitrate); jewelry, wire	● Acute: Skin & mucosal irritation (silver oxide or nitrate) ● Chronic: Argyria (permanent skin discoloration)	ED Treatment: **Selenium** (possible role)
Thallium Rodenticides (banned in the US); contaminated herbal products; medical	● Acute: ○ Early: GI symptoms ○ Intermediate (>24 h): painful ascending neuropathy, cardiac	ED Treatment: **Prussian Blue**

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radioisotope; homicide (majority)	dysrhythmias, altered mental status ○ Delayed (2 wk): alopecia ● Chronic: Sensorimotor neuropathy, psychosis, hepatotoxicity	
Zinc *Smelting, electroplating, zinc lozenges, welding/ galvanizing (zinc oxide)*	● Acute: ○ Ingestion: GI symptoms ○ Inhalation: mucosal irritation, metal fume fever (zinc oxide) ● Chronic: copper deficiency, anemia, neutropenia	ED Treatment: **Edetate calcium disodium** (EDTA)

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NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received through online Medical Control.

Antidepressants/Antipsychotics		
Substance [Tradename]	Notes	Treatment (beyond typical supportive care)

Antidepressants
 	
Atypical
Bupropion [Wellbutrin]
Mirtazapine [Remeron]
Nefazodone [Serzone]
Trazodone [Oleptro]
Vilazodone [Viibryd]
Vortioxetine [Trinellix]
 	
Selective Serotonin Reuptake Inhibitors (SSRIs)
Citalopram [Celexa]
Escitalopram [Lexapro]
Fluoxetine [Prozac]
Fluvoxamine [Luvox]
Paroxetine [Paxil]
Sertraline [Zoloft]
 	
Serotonin/Norepinephrine Reuptake Inhibitors (SNRIs)
Desvenlafaxine [Pristiq]
Duloxetine [Cymbalta]
Levomilnacipran [Fetzima]
Venlafaxine [Effexor]
	• Mechanism:
	  ○ Most inhibit serotonin reuptake (increase serotonin)
	  ○ Some also inhibit norepinephrine and interact with other various neurotransmitters/receptors
	• Symptoms:
	  ○ Most cause CNS depression but are not life threatening
	  ○ Other non-specific neuro symptoms are likely, e.g dizziness, weakness/fatigue, tremor, and nervousness
	• The combination of multiple serotonin increasing medications can lead to Serotonin Syndrome
	• SNRIs cause moderate sympathetic stimulation via increased norepinephrine → tachycardia, hypertension, diaphoresis, and mydriasis	

Antipsychotics **First-Generation (Typical)**	• Mechanism: primary effects are mediated through **dopamine (D2) receptor blockage** • Secondary effects → many drugs also	**Sodium Bicarbonate 1-2 mEq/kg** Indication:

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Chlorpromazine [Thorazine] *Droperidol [Inapsine]* *Fluphenazine [Prolixin]* *Haloperidol [Haldol]* *Loxapine [Loxitane]* *Perphenazine [Trilafon]* *Pimozide [Orap]* *Prochlorperazine [Compazine]* *Promethazine [Phenergan]* *Thioridazine [Mellaril]* *Thiothixene [Navene]* *Trifluoperazine [Stelazine]* **Second-Generation (Atypical)** *Amisulpride [Solian]* *Asenapine [Saphris]* *Brexpiprazole [Rexulti]* *Cariprazine [Vraylar]* *Clozapine [Clozaril]* *Iloperidone [Fanapt]* *Lurasidone [Latuda]* *Olanzapine [Zyprexa]* *Paliperidone [Invega]* *Pimavanserin [Nuplazid]* *Quetiapine [Seroquel]* *Risperidone [Risperdal]* *Sulpiride [Dogmatil]* *Ziprasidone [Geodon]* **Third-Generation** *Aripiprazole [Abilify]* *Brexpiprazole [Rexulti]* *Cariprazine [Vraylar]*	inhibit other receptors, including: ○ α1-adrenergic → orthostatic hypotension and reflex tachycardia ○ Muscarinic → hyperthermia, tachycardia, mydriasis, dry mouth/skin, and urinary retention ○ Histamine → sedation ○ Serotonin → similar to other antidepressants *(above)*	● Wide QRS >100 ms ● Ventricular Dysrhythmia
Cyclic Antidepressants *Amitriptyline [Elavil]* *Clomipramine [Anafranil]* *Cyclobenzaprine [Flexeril]* *(muscle relaxant related to*	● Mild sxs: antimuscarinic symptoms ○ e.g. confusion/altered mental status, dry mouth/skin, tachycardia ● Severe = **cardiotoxicity** secondary to	**Sodium Bicarbonate 1-2 mEq/kg** Indication: ● Wide QRS >100 ms

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amitriptyline) *Desipramine [Norpramin]* *Doxepin [Silenor]* *Imipramine [Tofranil]* *Nortriptyline [Pamelor]*	sodium channel blockade ○ **Wide QRS & dysrhythmias** ○ Seizures possible	● Ventricular Dysrhythmia Avoid typical dysrhythmics (e.g. amiodarone)
Lithium	● Complex mechanism of action that is not fully understood. ● **GI symptoms (acute ingestions)** ○ Similar to other metal salts ○ May result in volume depletion ● **Neurologic sxs (chronic CNS accumulation)** ○ May be overdosing or decreased excretion (i.e. renal dysfunction) ○ Common: tremor, ataxia, weakness, dysarthria, altered mental status ○ Coma & seizures are possible ● Cardiac abnormalities (uncommon): hypotension, bradycardia, AV blocks, and ventricular dysrhythmias	
Monoamine Oxidase Inhibitors (MAOIs) *Isocarboxazid* *Moclobemide* *Phenelzine [Nardil]* *Rasagiline* *Selegiline [Emsam]* *Tranylcypromine [Parnate]*	● **ONE PILL can kill a toddler** ● Mild/initial symptoms = headache, nausea, agitation/hyperactivity, tachycardia/palpitations, and tremor ● Moderate = **marked hyperthermia**, **muscle rigidity**, hallucinations ● Severe = coma, seizures, worsening hyperthermia with possible cardiovascular collapse.	
Anticonvulsants/Antiepileptics		
Substance	Notes	
First Generation *Carbamazepine [Tegretol]* *Ethosuximide [Zarontin]* *Fosphenytoin [Cerebyx]* *Methsuximide [Celontin]* *Phenobarbital*	● Mechanism: ○ Most **inhibit sodium-channels** thereby blocking/decreasing nerve conduction. ○ Some also ■ Increase **γ-aminobutyric**	**Sodium Bicarbonate 1-2 mEq/kg** Indication: ● Wide QRS >100 ms ● Ventricular

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Phenytoin [Dilantin] *Primidone [Mysoline]* *Valproic Acid [Depakote or Depakene]* **Second- and Third-Generation** *Brivaracetam [Briviact]* *Eslicarbazepine acetate* *Ezogabine or retigabine** *Felbamate [Felbatol]* *Gabapentin [Neurontin]* *Lacosamide [Vimpat]* *Lamotrigine [Lamictal]* *Levetiracetam [Keppra]* *Oxcarbazepine [Trileptal]* *Perampanel* *Pregabalin [Lyrica]* *Rufinamide [Banzel]* *Stiripentol* *Tiagabine [Gabitril]* *Topiramate [Topamax]* *Vigabatrin [Sabril]* *Zonisamide [Zonegran]*	**acid (GABA) stimulation** (CNS depression) ■ Inhibit *N*-methyl-D-aspartate (NMDA, excitatory receptors) ■ Interfere with muscarinic and/or nicotinic acetylcholine receptors (see anticholinergic toxicity) ● Symptoms: ○ CNS depression with lethargy, confusion, weakness/fatigue, ataxia, and dysarthria are common ○ Severe ingestions can lead to seizures, coma and respiratory depression/apnea ○ Cardiovascular effects are rare, but may include QRS prolongation (from sodium channel blockage) and cardiac dysrhythmias. ● Second/third-generation anticonvulsants are generally less toxic in acute overdose than the first-generation agents ● Propylene glycol (diluent used with IV phenytoin) is a potent myocardial depressant and vasodilator → can cause hypotension, dysrhythmias, and circulatory collapse.	Dysrhythmia

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First Responder
EMT
AEMT
Paramedic

SEROTONIN SYNDROME & Serotonergic Medications

- Many medications/substances increase serotonin release, decrease reuptake of serotonin (increase availability) or directly stimulate serotonergic receptors.
- **Serotonin Syndrome** is a manifestation of overstimulation
  - Most common from the **combined use** of two or more serotonergic medications (*below*). Less common from an acute overdose.
  - *Symptoms*: the triad of cognitive, autonomic, and neuromuscular effects
    - Mild symptoms are often misinterpreted as other psychiatric and medical disorders
    - **Severe cases** are often misdiagnosed as **neuroleptic malignant syndrome** because the two disorders share some features such as hypertension, tachycardia, tachypnea, fever, hypersalivation, and diaphoresis
    - **Myoclonus is a common finding in serotonin syndrome and is an important distinguishing feature, because myoclonus is rarely seen in other conditions that mimic serotonin syndrome**
  - *Treatment*: Generally supportive, but may require benzodiazepines (e.g. midazolam/Versed) or other sedatives.

Common Serotonergic Medications:

- Monoamine oxidase inhibitors (MAOIs)
- Selective serotonin reuptake inhibitors (SSRI's)
- Serotonin/norepinephrine reuptake inhibitors (SNRI's)
- Cyclic antidepressants
- Other: trazodone (moderate potency), bupropion (low), and vilazodone (moderate)

Other substances with serotonergic activity (associated potency):

Amantadine (low) Amphetamines (moderate) Bromocriptine (low) Buspirone (moderate) Carbamazepine (low) Cocaine (moderate) Codeine (low) Dextromethorphan (high) Fentanyl (moderate)	Levodopa (moderate potency) Linezolid (high potency) Lithium (high potency) L-Tryptophan and 5-hydroxytryptophan (high) Lysergic acid diethylamide (moderate) Meperidine (high) Mescaline (moderate) Metoclopramide (low)	Pentazocine (low) Pergolide (low) Reserpine (low) St. John's wort (moderate) Sumatriptan and related triptans (high) Tramadol (high)

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H-R4 OTHER COMMON SUBSTANCES		First Responder EMT AEMT Paramedic

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received through online Medical Control.

Other Common Substances		
Substance	Notes	Treatment (beyond typical supportive care)
Acetaminophen (Tylenol) *N*-acetyl-*p*-aminophenol Paracetamol	• Acute overdose = asymptomatic to minimal GI effects • Days 2 to 3 (stage 2) = may have clinical signs of hepatotoxicity (RUQ pain and worsening GI sxs) • May progress over several days to fulminant hepatic failure	ED Treatment: **N-Acetylcysteine (NAC)**

Alcohols
Ethanol
Ethylene Glycol
Isopropyl Alcohol
Methanol
	• Symptoms: all alcohols primarily cause CNS Depression (inebriation)
	• **Isopropyl Alcohol** (rubbing alcohol)
	  ○ Twice as potent & duration of action is 2-4 times that of ethanol
	  ○ Gastric irritation/GI bleeding more common (**hemorrhagic gastritis**)
	  ○ No significant metabolic acidosis
	• **Methanol** & **Ethylene Glycol**
	  ○ Liver metabolizes to substances (formic acid & glycolic acid/oxalic acid, respectively) that **cause serious metabolic acidosis and end-organ damage**
	• *Methanol*: windshield wiper fluid, solid fuel for stoves/chafing dishes, model airplane fuel, carburetor cleaner, solvents, etc.
	• *Ethylene glycol*: many uses as a glycerin substitute, antifreeze, brake fluid, etc.
		ED treatment:
		Fomepizole
		• Used to inhibit the metabolism of ethylene glycol and methanol to their toxic metabolites

Anticholinergics Antihistamines *Cetirizine (Zyrtec)*	• Present in over 600 compounds, including prescription drugs, over-the-counter medications, and plants • **Antihistamine (particularly**	

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Chlorpheniramine (Chlor-Trimeton) *Cyproheptadine (Periactin)* *Desloratadine (Clarinex)* *Diphenhydramine (Benadryl)* *Dimenhydrinate (Dramamine)* *Disodium Cromoglycate (Intal)* *Fexofenadine (Allegra)* *Hydroxyzine (Atarax)* *Levocetirizine (Xyzal)* *Loratadine (Claritin)* *Promethazine (Phenergan)* *Tripelennamine* <u>Other Medications</u> *Atropine* *Benztropine (Cogentin)* *Cyclobenzaprine (Flexeril)* *Glycopyrrolate* *Hyoscyamine (Levsin)* *Ipratropium (Atrovent)* *Scopolamine* *…and <u>many</u> other Antidepressants, Antipsychotics, Anti-Parkinsonian or similar neurologic medications* *Also see "Poisonous Plants" [H-RXXXX] for more*	**diphenhydramine/Benadryl) overdose is the most common overdose that produces anticholinergic toxicity** ● Symptoms (<u>Anticholinergic toxidrome</u>): ○ "Dry as a bone" (anhidrosis/no sweating and dry mouth/mucous membranes) ○ "Red as a beet" (flushed) ○ "Hot as a hare" (hyperthermia) ○ "Blind as a bat" (myadrysis/blurry vision) ○ "Mad as a hatter" (delirium/hallucinations) ○ "Stuffed as a pipe" (urinary/fecal retention) ○ "Tacky as an ugly sweater" (tachycardia)	
Antimicrobials *Various Antibiotics* *Various Antifungals* *Various Antivirals*	● Symptoms: ○ Generally mild to moderate GI upset ○ Seizures/CNS effects possible in high doses	
Methylxanthines	● Mechanism = induces the release of	**Switch to Decaf**

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Caffeine *Doxofylline* *Pentoxifylline* *Theobromine (chocolate)* *Theophylline*	endogenous catecholamines → CNS stimulation ● **Sympathomimetic toxidrome:** seizures, tachycardia, vasodilation, diaphoresis, etc. ○ Mild sxs = GI (nausea and vomiting) ○ Severe sxs = CNS excitation (seizures) ● Theophylline and its water-soluble salt, aminophylline, were used in the past for asthma and COPD	
Nicotine & Nicotine-like toxins *Tobacco* *See "Poisonous Plants" [H-RXXXX] for more*	● **Children who ingest ≥1 intact cigarettes, or ≥3 cigarette butts** will generally become symptomatic within 30 minutes ● Mechanism: overstimulation of nicotinic cholinergic receptors ○ Mild = nervousness and tremor ○ Severe = paralysis/respiratory failure ● Mild sxs = GI (most common), tremor, dizziness, tachycardia, and bronchorrhea ● Severe ingestions can result in **seizures**, respiratory failure, hypotension, dysrhythmias, and death ○ Generally seen with ingestion of nicotine-containing pesticides, **nicotine-containing E-cigarette liquid,** or abuse of dermal patches/gum	
Nonsteroidal anti-inflammatory drugs (NSAIDs) *Celecoxib (Celebrex)* *Diclofenac (Voltaren)* *Etodolac* *Fenoprofen* *Flurbiprofen* *Ibuprofen (Indocin)* *Indomethacin (Motrin)*	● Rarely produces serious complications ● Symptoms = gastric irritation (nausea, vomiting, potential GI bleeding, etc.) ● In *massive* NSAID ingestions, metabolic acidosis with altered mental status and cardiovascular dysfunction (shock) may occur	

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Ketoprofen *Ketorolac (Toradol)* *Meclofenamate* *Meloxicam (Mobic)* *Mefenamic acid* *Nabumetone* *Naproxen (Aleve)* *Oxaprozin* *Piroxicam* *Sulindac* *Tolmetin*		
Salicylates *Aspirin (acetylsalicylic acid)* *Wintergreen Oil (methyl salicylate)*	• Numerous forms of salicylate are available as karyolytic agents, liniments, and combination products. All are rapidly converted to salicylate once ingested. • Causes a **metabolic acidosis with a respiratory alkalosis** • Mild symptoms = GI irritation (nausea/vomiting) • Serious toxicity → worsening acidosis & CNS dysfunction (altered mental status, seizures, coma, etc.) • **Hearing loss or tinnitus** are relatively pathognomonic	**Sodium Bicarbonate** **1-2 mEq/kg** • Systemic and urinary alkalinization are beneficial, although the precise mechanism is debated

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H-R5 POISONOUS PLANTS		First Responder EMT AEMT Paramedic

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received through online Medical Control.

Poisonous Plants

Notes:
- Localized dermatitis is the most common finding after plant exposure.
- For ingestions, gastric irritation similar to mushroom ingestion is the most common complaint.
- Treatment for all plant ingestions/exposure is generally supportive (few exceptions as noted below).

Substance/Toxin	Notes
Antimitotic Alkaloids *Autumn Crocus (Colchicum autumnale)* *Glory Lily (Gloriosa superba)* *Mayapple (Podophyllum peltatum)* *Wild mandrake (Podophyllum emodi)* *Madagascar periwinkle (Catharanthus roseus)*	• Colchicine (autumn crocus & glory lily - all parts of the plant) and podophyllin (roots of the mayapple) halt cellular mitosis by inhibiting microtubule formation. • Symptoms: **gastroenteritis**, which may be delayed (2 to 24 hours), with potential multisystem organ failure/death.
Belladonna Alkaloids *Deadly Nightshade (Atropa belladonna)* *Jimsonweed (Datura spp.)* *Henbane (Hyoscyamus niger)* *Mandrake (Mandragora officinarum)*	• Contain **atropine/atropine-like alkaloids**, such as hyoscyamine and scopolamine. • **Anticholinergic**: results in antimuscarinic effects: tachycardia, hyperthermia, mydriasis, urinary retention, altered mental status, **hallucinations**, and dry/flushed skin. • Severe = seizures, coma, and death
Cardioactive Steroids (Cardiac Glycosides) *Foxglove (Digitalis spp.)* *Oleander (Nerium spp.)* *Christmas rose (Helleborus niger)* *Dogbane (Apocynum cannabinum)* *Lily of the Valley (Convallaria majalis)* *Milkweed (Asclepias spp.)* *Squill (Urginea spp.)* *Yellow oleander (Thevetia peruviana)*	• Mechanism: inhibit the sodium/potassium–adenosine triphosphatase pump. • **Toxicity closely resembles digoxin** (see above), and includes early GI effects followed by cardiac dysrhythmias (e.g. bradycardia and AV blocks) • ED Treatment = **Digibind** (digoxin immune Fab fragments) after an acute overdose or any cardiac dysrhythmia
Convulsants *Water hemlock (Cicuta maculata)*	• Often mistaken for wild parsnip, turnip, or parsley. • All parts of the plant are poisonous, with the highest

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Western water hemlock (Cicuta douglasii) *Hemlock water dropwort (Oenanthe crocata)*	concentration of cicutoxin in the tuber (root). ● Mild (most common) effects = GI ● More severe = bradycardia, hypotension, respiratory distress, seizures
Cyanogenic (Cyanide-Like) *Prunus species (including Pears, Apples, Plums, Peaches, & Apricots)* *Cassava/Tapioca (Manihot esculenta)* *Hydrangea (Hydrangea macrophylla)*	● Ingestion can result in the liberation of **hydrogen cyanide** from amygdalin (found in the leaves, bark and seeds/pits) in the GI tract. ● Linamarin and lotaustralin are present in cassava, and similarly liberate hydrogen cyanide if not prepared correctly. ● Rapid progression of toxicity from tissue hypoxia can occur.
Dermatitis (Direct Irritation of Skin/Mucous Membranes)	● Specialized plant structures can directly injure the dermis: ○ Needleshaped crystals (e.g calcium oxalate) are found in a number of common plants, including: ■ *Dumbcane (Dieffenbachia spp.)* ■ *Philodendron (Philodendron spp.)* ■ *Caladium (Caladium spp.)* ■ *Jack in the pulpit (Arisaema triphyllum)* ■ *Elephant's ear (Colocasia spp.)* ■ *Rhubarb (Rheum raponticum)* ○ Needles of *pineapples (Bromeliaceae spp.)* ○ Hairs of *stinging nettles (Urtica dioica)* ● Chemicals within the plant may directly irritate the skin, mucous membranes, eyes or GI tract: ○ *Spurge (Euphorbiaceae spp.)* ○ *Poinsettia (Euphorbia pulcherrima)* ● Chemicals/resins from the plant may act as an antigen eliciting an allergic contact dermatitis (T-cell mediated response): ○ *Poison ivy, poison oak, and poison sumac (Toxicodendron spp.)* ○ *Ginkgo (Ginkgoaceae)* ○ *Mango (Mangifera indica)* ○ *Pistachio (Pistacia vera)* ○ *Cashew (Anacardium occidentale)* ○ *Tulips (Tulipa spp.)* ○ *Daffodils (Narcissus spp.)* ● Ingestion results in *immediate* oropharyngeal pain and swelling–usually limits the amount of plant ingested.

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	• Severe = upper airway swelling/obstruction and respiratory compromise.
Demyelinating Anthracenones *Buckthorn/Coyotillo (Karwinskia humboldtiana)*	• Found in the southwestern US, Mexico, Central America and the Caribbean • Leads to progressive muscle weakness–**resembles Guillain-Barré** syndrome

Gastrointestinal (GI) Toxins	• **Unripe Eggplant, green Potatoes, and their sprouts** (Solanum spp.)
	  ○ Contain a small amount of glycoalkaloids.
	  ○ Ingestion may cause GI effects, which can be delayed as long as 24 hours, as well as CNS symptoms such as hallucinations, delirium, and obtundation.
	• **Pokeweed** (Phytolacca americana)
	  ○ Contains phytotoxins in the leaves and roots. The mature berries are less toxic.
	  ○ May be mistaken for other non-toxics such as parsnips or horseradish.
	  ○ Often prepared in poke salad or pokeroot tea where toxicity is avoided by parboiling young greens.
	  ○ Sxs = GI upset and hemorrhagic gastritis from direct mucosal irritation. May last for 48 hours
	• **Ackee Fruit**
	  ○ Common ingredient in West African and Jamaican cuisine. Unripe fruit contains the heat-stable toxins
	  ○ *"Jamaican Vomiting Sickness"* = characterized by severe vomiting and **hypoglycemia**.
	• **Litchi or Lychee Fruit (Sapindaceae species)**
	  ○ Similar toxin to Ackee Fruit, causing life-threatening hypoglycemia
	• **Holly (Ilex spp.)**
	  ○ Berries contain a mixture of toxins (leaves are nontoxic)

Mushrooms
No accurate way to differentiate poisonous versus non-poisonous mushrooms.
	• Most common = direct GI irritation → nausea, vomiting and diarrhea that can be associated with GI bleeding
	• Some can cause:
	  ○ CNS excitation and/or psychogenic effects
	  ○ **Delayed hepatic (liver) injury** *(e.g. Aminta*

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	spp.) ○ Muscarinic effects, such as salivation, vomiting & diarrhea, etc.
Nicotinic (Nicotine-like) Toxins *Tobacco (Nicotiana spp.)* *Poison hemlock (Conium maculatum)* *Golden chain (Laburnum anagyroides)* *Blue cohosh (Caulophyllum thalictroides)* *Lupin (Lupinus spp.)*	● Mechanism: overstimulation of nicotinic cholinergic receptors ● Mild = nervousness and tremor ● Severe = paralysis/respiratory failure
Sodium Channel Toxins *Azalea and Rhododendron (Rhododoendron spp.)* *Mountain Laurel (Kalmia latifolia)* *Yew (Taxus spp.)* *False or green hellebore (Veratrum spp.)* *Larkspur (Delphinium spp.)* *Monkshood (Aconitum spp.)*	● Findings after ingestion/inhalation are variable from vague neurological symptoms to muscle weakness, seizures, respiratory failure and death. ● Cardiac dysrhythmias, hypotension and cardiovascular collapse are possible.
Toxalbumins *Castor Bean (Ricinus communis)* *Rosary Pea (Abrus precatorius)* *American Mistletoe (Phoradendron flavescens)* *European Mistletoe (Viscum album)* *Pokeweed (Phytolacca americana)* *Black locust (Robinia pseudoacacia)* *Black vomit nut (Jatropha curcas)*	● Mechanism: inhibits protein synthesis ● **<u>Ricin</u>** ○ Extracted from the castor bean, and is a **potential biologic weapon** and has been implicated in a number of attempted assassinations. ○ Inhalation = rapidly progressive, life-threatening respiratory failure, circulatory collapse, and death within 36 hours. ● **Mistletoe** ○ The leaves, stems and **berries** contain phoratoxin and viscumin– less potent than ricin. ○ Most commonly result in gastroenteritis following large doses. Significant morbidity is rare.

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H-R6 VITAMINS/HERBAL SUPPLEMENTS		First Responder EMT AEMT Paramedic

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received through online Medical Control.

Vitamins

- No specific treatments
- Water-soluble vitamins (B's, C and folate) are generally very safe in overdose and usually cause minimal, if any, symptoms. Any unneeded (extra) water-soluble vitamins are excreted in the urine.
- Fat-soluble vitamins (A, D, E and K) accumulate in the body and typically cause subacute/chronic symptoms from continued overuse.

Substance	Notes
Vitamin A	• Acute: red peeling rash (desquamation), headache, vomiting. • Chronic: blurred vision, dry skin/pruritus/abnormal pigmentation, hair loss, bone pain, liver toxicity, pseudotumor cerebri (increased ICP)
VitaminB1 (thiamine)	• No toxicity observed
Vitamin B2 (riboflavin)	• No toxicity observed
Vitamin B3 (niacin)	• Acute: "niacin flush" (redness, burning, and itching of the skin) • Chronic: liver dysfunction
Vitamin B6 (pyridoxine)	• Subacute/chronic: peripheral neuropathy with unstable gait (ataxia), and loss of position and vibration sense
Vitamin B12 (cyanocobalamin)	• Ingestion: no toxicity observed • Large IV doses: erythema of skin; rare anaphylactoid reactions
Vitamin C (ascorbate)	• Chronic: kidney stones (controversial)
Vitamin D	• Subacute/chronic: **hypercalcemia** (weakness, bone pain, abdominal pain/nausea/constipation/anorexia, confusion)
Vitamin E	• Chronic: easy bruising/bleeding, nausea, headache, weakness/fatigue
Folate	• No toxicity observed
Vitamin K	• Acute: anaphylactoid reactions if given rapidly in the IV form • Interferes with warfarin resulting in subtherapeutic coagulation (i.e. treatment for warfarin overdose/hypercoagulable state)

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H-R6 VITAMINS/HERBAL SUPPLEMENTS		First Responder EMT AEMT Paramedic

Herbal Supplements

- Symptoms:
  - All may cause some degree of GI irritation, especially in acute overdose
  - Many cause neurologic (weakness/fatigue, headache, dizziness, etc.) or psychogenic symptoms (often abused for this purpose)
  - Some agents have specific liver, kidney, and cardiovascular toxicities
- No specific treatments

- Generally safe: **Chamomile, Chondroitin, Echinacea, Feverfew, Garlic, Ginkgo, Ginseng, Glucosamine, Kava, St. John's wort and Valerian**
- Some herbal preparations cause direct toxicity, but illness is **much more common from the contamination, misuse, overuse, or misidentification of the herbal preparation**.

(Some) Potential Toxic Herbals

Substance	Notes
Black Cohosh *Actaea racemosa; Cimicifuga racemosa; b*aneberry, black snakeroot, bugwort, rattleweed, squawroot	• CNS disturbances; bradycardia
Chaparral (Creosote bush) *Larrea divaricata*	• Hepatotoxic and nephrotoxic
Clove Oil	• Hepatotoxic
Comfrey *Symphytum officinale;* black root, blackwort, bruisewort, knitbone, salsify, slippery root, wallwort	• Hepatotoxic • Veno-occlusive disease
Ephedra Desert herb, herbal ecstasy, ma huang, popotillo, sea grape, yellow horse	• Sympathomimetic → hypertension, tachycardia, hyperthermia (especially with exertion)
Juniper Juniperus communis	• Hallucinogenic • May cause GI symptoms or renal toxicity
Nutmeg	• Hallucinations; tachycardia
Wormwood Absinthe	• CNS: delirium (similar to alcohol intoxication), **hallucinations**, seizures, etc.

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First Responder
EMT
AEMT
Paramedic

MEDICAL

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M-R1 C-STAT STROKE SCALE		First Responder EMT AEMT Paramedic

Indication - as per CVA/Stroke [M-08]

- Any Complaint of Neurologic Signs/Symptoms

ANY abnormal finding localized to one side is a stroke until proven otherwise.

Cincinnati Stroke Triage Assessment Tool (C-STAT)

Injury	Positive if...	Value
Conjugate Gaze Deviation	**Gaze is acutely impaired in one direction**	**2 Points**
Level of Consciousness	**Fails 1 or more of each of the following:** • **Ask age & current month** • **Ask to follow 2 commands: close eyes, open & close hands**	**1 Point**
Arm Weakness	**When held up, one or both arms drift down to bed within 10 seconds**	**1 Point**
Positive C-STAT = 2 or More		

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M-R2 CINCINNATI STROKE SCALE	This scale is for reference: **Utilize C-STAT [M-R1] for all patients with new neuro signs/symptoms**	First Responder EMT AEMT Paramedic

For evaluation of acute, non-comatose, non-traumatic neurologic complaint.

Facial/Smile or Grimace:

Have the patient show teeth or smile.	**Normal:** Both sides of the face move equally 	**Abnormal:** Left or right side of face does not move as well 

Arm Drift:

Have the patient close both eyes & hold both arms straight out for 10 seconds.	**Normal:** Arms move equally or do not move 	**Abnormal:** Left or right arm does not move or drifts down 

Speech:

Have the patient repeat a simple phrase, such as "It is sunny outside today"	**Normal:** Words stated correctly without slurring	**Abnormal:** Patient slurs words or uses the wrong words, or is unable to speak.

ANY abnormal finding localized to one side is a stroke until proven otherwise.

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M-R3 COMFORT-CARE/ HOSPICE PATIENTS		First Responder EMT AEMT Paramedic

STANDING ORDERS:

1. Maintain a calm environment, and avoid performing measures beyond basic life support.
2. Elicit as much information from persons present who are familiar with the patient's condition as possible.
3. Obtain and document the name and telephone number of the patient's physician if possible.
4. Maintain BLS procedures and contact Medical Control as soon as possible. Provide full information on the patient's present condition, history, and name of the patient's physician and telephone number.
5. Medical Control will direct the management of the call.
6. Accept DNR/POST forms (original or copy):
   - **a.** State approved forms
   - **b.** Signed order in patient's medical records: nursing home, hospice, or home care

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- If DNR/POST for is used to withhold or terminate resuscitation efforts, a copy must be attached to the PCR.

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First Responder
EMT
AEMT
Paramedic

MEDICATIONS

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Please refer to the individual Clinical Guidelines for more information of medication use in specific situations

First Responder
EMT
AEMT
Paramedic

Generic Drug [Trade Name]	**Indication** [Guideline]	**Typical Adult Dosage****	***Pediatric Dosage**** *(WB = Adult weight-based dosing)*
		***unless otherwise noted in guidelines*	
Acetaminophen [Tylenol]	**Pain [RX-02]** **Fever [M-06]**	650-1000 mg PO 1 gram IV/IO	*15 mg/kg*
Adenosine [Adenocard]	**Narrow-Tach [C-07]** **Wide-Tach [C-08]**	6-12 mg rapid IVP	*0.2 mg/kg*
Albuterol [Proventil, Ventolin, Proair, etc.]	**Asthma/COPD [A-06]** **Allergic Reaction [M-02]**	*Aerosol Nebulization*: 2.5 mg in 3 mL NS *MDI*: 2 puffs Inhaled	*[SAME]*
Amiodarone [Cardarone]	**Vfib/VTach [C-03]** **Narrow-Tach (with CHF) [C-07]** **Wide-Tach [C-08]** **Torsades (short QT) [C-09]**	**Pulseless**: 300 mg initial then 150 mg IV/IO **Pulsed:** 150 mg IV/IO	*5 mg/kg*
	{DRIP}	1 mg/min	*per Medical Control*
Aspirin	**Chest Pain [C-06]**	324 mg chewed	*N/A*
Atropine	**Bradycardia [C-05]**	1 mg IV/IO	*0.02 mg/kg*
	Organophosphate [H-10]	1-2 mg** IV/IO **Escalate dose as needed	*0.02 mg/kg***
Calcium (Chloride or Gluconate)	**Cardiac Arrest [C-02 & C-03]** **Blood Admin. [T-P1]**	1 gram IV/IO	*20 mg/kg*
Dexamethasone [Decadron]	**Allergic Reaction [M-02]** **Asthma/COPD [A-06]** **Croup/Stridor [A-07]**	10 mg IV/IO or IM	*0.6 mg/kg*
Dexmedetomadine **[Precedex]**	**Advanced Sedation/Pain [RX-06]**	0.2-1.5 mcg/kg/hour	*[SAME]*

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Please refer to the individual Clinical Guidelines for more information of medication use in specific situations

First Responder
EMT
AEMT
Paramedic

Generic Drug	Indication	Typical Adult Dosage**	*Pediatric Dosage***
Dextrose D_{50}/50% D_{25}/25% D_{10}/10%	**Hypoglycemia** **[1-04]**	25 grams IV/IO (1 amp D50, or 250 mL D10)	*1 gram/kg* *(2 mL/kg D25, or* *5 mL/kg D10)*
Diazepam [**Valium**]	**Anxiolysis/** **Chemical Rest.** **[RX-04]**	**SAT=2**: 2-5 mg IV/IO; or 5 mg IM/IN **SAT=1**: 1-2 mg IV/IO; or 2 mg IM/IN	*per Medical Control*
	Seizures [M-08]	5 mg IV/IO or 10 mg IM	*0.2 mg/kg IV/IO* *0.5 mg/kg IM/PR*
Diltiazem [Cardizem]	**Narrow-Tach** **[C-07]**	Bolus: 10-20 mg IV/IO Drip: 5-10 mg/hr	*per Medical Control*
Diphenhydramine [**Benadryl**]	**Abd Pain/Vomiting** **[M-01]** **Allergic Reaction** **[M-02]**	25-50 mg IV/IO or IM	*1 mg/kg*
Dopamine	**Bradycardia** **[C-05]** **Medical Shock** **[M-06]**	Drip: 2-20 mcg/**kg**/min	*[SAME]*
Epinephrine [Adrenaline]	**Allergic Reaction** **[M-02]**	0.3 mg (1:1000) IM *or* EpiPen	*0.01 mg/kg*
	Asthma [A-06]	0.3-0.5 mg 1:10,000 IV/IO *or* 1:1000 IM	*0.01 mg/kg*
	Bradycardia **[C-05]**	*Primary:* 0.1-0.2 mg IV/IO (100-200 mcg) *Low dose:* 0.01-0.02 mg IV/IO (10-20 mcg)	*0.01 mg/kg*
		Drip: 0.1-1 mcg/**kg**/min	*[SAME]*
	Croup/Stridor **[A-08]**	**Nebulized**: 1 mg (1:1000) diluted in 3 mL saline **Parental**: 0.3 mg 1:10,000 IV/IO *or* 1:1000 IM	***Nebulized**: [SAME]* ***Parental**: 0.01 mg/kg*
	Cardiac Arrest **[C-02 & C-03]**	1 mg (1:10,000) IV/IO	*0.01 mg/kg*
	Medical Shock **[M-06]**	Bolus: 10-20 mcg IV/IO Drip: 0.1-1 mcg/**kg**/min	*0.1-1 mcg/**kg**/min* *[No bolus]*
	Nasal/Oral Bleed **[M-07]**	1 mg (1:1000) Topically	*[SAME]*

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Please refer to the individual Clinical Guidelines for more information of medication use in specific situations

First Responder
EMT
AEMT
Paramedic

Generic Drug	Indication	Typical Adult Dosage**	*Pediatric Dosage***
Etomidate [Amidate]	**DAI/RSI [A-04]**	20-30 mg IV/IO	*0.3 mg/kg*
	Procedures [RX-05]	5-10 mg IV/IO	*WB Adults: 0.1-0.2 mg/kg Pediatrics: per Medical Control*
Fentanyl [Sublimaze]	**Pain [RX-02]**	25-100 mcg IV/IO 50-100 mcg IM/IN	*1 mcg/kg*
	Procedures [RX-05]	25-50 mg IV/IO 50-100 mg IM/IN	*WB Adults: 0.5-1 mg/kg Pediatrics: per Medical Control*
	Advanced Sedation/Pain [RX-06]	0.5-2 mcg/kg/hour	*Same as Adults*
Glucagon	**Hypoglycemia [1-04]**	1-2 mg IV/IO or IM	*>20 kg: 1 mg <20 kg: 0.5 mg*
Hydromorphone [**Dilaudid**]	**Pain [RX-02]**	0.5-1 mg IV/IO or IM	*0.01 mg/kg*
Ibuprofen [Motrin, etc.]	**Pain [RX-02] Fever [M-06]**	400 mg PO	*10 mg/kg*
Ipratropium [Atrovent]	**Asthma/COPD [A-06]**	0.5 mg Mixed with albuterol neb	*[SAME]*
Ketamine	**DAI/RSI [A-04]**	200 mg IV/IO	*WB: 2 mg/kg*
	Anxiolysis/ Chemical Rest. [RX-04]	**SAT=3**: 100-200 mg IV/IO; or 400-500 mg IM or IN **SAT=2**: 50-100 mg IV/IO	*WB Adults: 0.5-2 mg/kg IV/IO 4-5 mg/kg IM Pediatrics: per Medical Control*
	Seizures [M-08]	100 mg IV/IO	*1-2 mg/kg*
	Ketamine for Pain [RX-03]	25-50 mg SLOW IV/IO or IM 0.75 mg/kg Nebulized	*per Medical Control*
	Procedures [RX-05]	50-100 mg IV/IO 100-200 mg IM	*WB Adults: 0.5-1 mg/kg Pediatrics: per Medical Control*
	Advanced Sedation/Pain [RX-06]	0.2-2 mg/kg/hour	*Same as Adults*

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RX-R1
MEDICATION
DOSAGE/REFERENCE

Please refer to the individual Clinical Guidelines for more information of medication use in specific situations

First Responder
EMT
AEMT
Paramedic

Generic Drug	Indication	Typical Adult Dosage**	*Pediatric Dosage***
Ketorolac [**Toradol**]	**Pain [RX-02]** **Fever [M-06]**	7.5-15 mg IV/IO 30 mg IM	*N/A*
Labetalol	**Hypertension [M-04]**	10 mg IV/IO	*N/A*
Lidocaine [Xylocaine]	**VFib/VTach [C-03]** **Wide-Tachycardia [C-08]** **Torsades (short QT) [C-09]**	100 mg IV/IO initial Repeat at ½ of initial dose	*1 mg/kg*
	{DRIP}	2-4 mg/min	*per Medical Control*
		MIX: 2 grams in 500 mL D5W	
		Concentration: **4 mg/mL** (use 60 gtt. set)	
		Adult	*Peds (for reference)*
	2 mg/min	30 gtt/min	*0.3 gtt/kg/min*
	4 mg/min	60 gtt/min	*0.6 gtt/kg/min*
Lorazepam [**Ativan**]	**Anxiolysis/ Chemical Rest. [RX-04]**	**SAT=2**: 1-2 mg IV/IO; or 2 mg IM/IN **SAT=1**: 0.5-1 mg IV/IO; or 1 mg IM/IN	*per Medical Control*
	Seizures [M-08]	2 mg IV/IO *or* 2 mg IM/IN	*0.1 mg/kg*
Magnesium Sulfate	**Asthma/COPD [A-06]**	2 grams slow IV/IO	*25-50 mg/kg*
	Eclampsia [OB-08]	4 grams IV/IO	*N/A*
	Torsades (long QT) [C-09]	4 grams slow IV/IO	*50 mg/kg*
	{DRIP}	4 g in 250ccD_5W (16 mg/ml) run at 30-60 gtts/min	*per Medical Control*
Methylprednisolone [**Solu-Medrol**]	**Allergic Reaction [M-02]** **Asthma/COPD [A-06]**	125 mg IV/IO or IM	*per Medical Control*
Metoprolol [Lopressor]	**Narrow-Tach [C-07]**	2.5-5 mg IV/IO	*per Medical Control*

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RX-R1
MEDICATION
DOSAGE/REFERENCE

Please refer to the individual Clinical Guidelines for more information of medication use in specific situations

First Responder
EMT
AEMT
Paramedic

Generic Drug	Indication	Typical Adult Dosage**	*Pediatric Dosage***
Midazolam [**Versed**]	**DAI/RSI [A-04]**	10 mg IV/IO	*WB: 0.1 mg/kg*
	Anxiolysis/ Chemical Rest. [RX-04]	**SAT=2**: 1-2 mg IV/IO; or 2-5 mg IM/IN **SAT=1**: 0.5-1 mg IV/IO; or 1-2 mg IM/IN	*per Medical Control*
	Seizures [M-08]	5 mg IV/IO or 5 mg IM/IN	*0.1 mg/kg IV/IO* *0.2 mg/kg IM/IN*
	Procedures [RX-05]	1-2 mg IV/IO 2-5 mg IM/IN	*WB Adults:* *0.5-1 mg/kg* *Pediatrics:* *per Medical Control*
	Advanced Sedation/Pain [RX-06]	0.5-2 mcg/kg/hour	*[SAME]*
Morphine	**Pain [RX-02]**	5-10 mg IV/IO or IM	*0.1 mg/kg*
Nitroglycerine	**Chest Pain [C-06]** **CHF [A-05]** **Hypertension [M-04]**	0.4 mg SL or spray q 5 min *(Maximum 3 doses, unless otherwise directed)*	N/A
Naloxone [**Narcan**]	**Opiates/Sedatives [H-09]**	0.1-0.2 mg IV/IO, IM 2 mg IN	0.01 mg/kg
Norepinephrine [**Levophed**]	**Bradycardia [C-05]** **Medical Shock [M-06]**	Drip: 0.1-2 mcg/**kg**/min	*[SAME]*
Ondansetron [**Zofran**]	**Abd Pain/Vomiting [M-01]**	4 mg IV/IO, IM or PO (ODT)	*<1 yr: contact Medical Control* *1-4 yr: 2 mg* *>4 yr: 4 mg*
Piperacillin/ Tazobactam [**Zosyn**]	**Fever/Sepsis [M-05]**	3.375 grams IV/IO	*Contact Medical Control*
Promethazine [**Phenergan**]	**Abd Pain/Vomiting [M-01]**	25 mg IM	*Contact Medical Control*
Propofol [Diprivan]	**Advanced Sedation/Pain [RX-06]**	5-50 mcg/kg/minute	*Same as Adults*
Rocuronium [Zemuron]	**DAI/RSI [A-04]**	100 mg IV/IO	*WB: 1 mg/kg*

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RX-R1
MEDICATION
DOSAGE/REFERENCE

Please refer to the individual Clinical Guidelines for more information of medication use in specific situations

First Responder
EMT
AEMT
Paramedic

Generic Drug	Indication	Typical Adult Dosage**	*Pediatric Dosage***
Sodium Bicarbonate	**Cardiac Arrest [C-02 & C-03]** **Overdose [H-02]**	1 mEq/kg IV/IO [1 ampule]	*1 mEq/kg*
Succinylcholine [Anectine]	**DAI/RSI [A-04]**	100-150 mg IV/IO	*WB: 1-2 mg/kg*
Tranexamic Acid [TXA]	**Angioedema [M-02]**	1 gram IV/IO	*Contact Medical Control*
	Hemorrhagic Shock [T-04] **Head Trauma [T-07]**	2 grams IV/IO	*15 mg/kg*
	Nasal/Oral Bleed [M-07]	1 gram Topically	*Same as adults*
	Stroke [M-09]	2 grams IV/IO **Only after approval of Online Medical Control*	*Contact Medical Control*
Vecuronium [Norcuron]	**DAI/RSI [A-04]**	10 mg IV/IO	WB: 0.1 mg/kg

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First Responder
EMT
AEMT
Paramedic

TRANSPORT / GENERAL CARE

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Z-R1 COMMON MEDICAL ABBREVIATIONS		First Responder EMT AEMT Paramedic

Abbreviation.....Definition

@..... at

AAA..... abdominal aortic aneurysm
ABD..... abdomen
ABC..... airway, breathing, circulation
AC..... antecubital
ACLS..... advanced cardiac life support
AED..... automatic external defibrillator
A-fib..... atrial fibrillation
AIDS..... acquired immune deficiency syndrome
ALS..... advanced life support
AKA..... also known as/ above the knee amputation
A.M.A., AMA..... against medical advice
APAP..... acetaminophen
APGAR..... infant assessment scale
APPROX..... approximately
ARDS……. Acute/Adult Respiratory Distress Syndrome
ASA..... aspirin
AV…….. atrioventricular

BBB..... bundle branch block
bilat..... bilateral
BKA ..... below knee amputation
BLS..... basic life support
BM..... bowel movement
BP..... blood pressure
BS/BG..... blood sugar/glucose
BSA…….Body Surface Area
BVM..... bag valve mask

CABG..... coronary artery bypass graft
CAD..... coronary artery disease
CA..... cancer

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Z-R1 COMMON MEDICAL ABBREVIATIONS		First Responder EMT AEMT Paramedic

Cath..... catheterization
CC..... chief complain
CCU..... coronary care unit/critical care unit
CHF..... congestive heart failure
CNS..... central nervous system
C/O..... complains of
CO……..carbon monoxide
CO2..... carbon dioxide
COPD..... chronic obstructive pulmonary disease
CP..... chest pain
CPR..... cardiopulmonary resuscitation
CSF..... cerebral spinal fluid
CT scan..... computerized axial tomography
CVA..... cerebral vascular accident

D/C..... discontinue or discharge
DM……...diabetes mellitus
DNR ..... do not resuscitate
DOA..... dead on arrival
DT's..... delirium tremens
DVT..... deep vein thrombosis
D5W..... dextrose 5% in water
DX..... diagnosis

ECG/EKG..... electrocardiogram
EEG..... electroencephalogram
EJ..... external jugular
EMS..... Emergency Medical Services
EMT..... Emergency Medical Technician
ETA..... estimated time of arrival
ETOH..... ethyl alcohol
ET..... endotracheal tube
EXT..... external (extension)

F..... female

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Z-R1 COMMON MEDICAL ABBREVIATIONS		First Responder EMT AEMT Paramedic

FB..... foreign body
FX..... fracture

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g..... gram(s)
GCS..... Glasgow Coma Scale
GI..... gastrointestinal
GSW..... gunshot wound
gtts..... drops
GU..... genitourinary
GYN..... gynecology

HA..... headache
HEENT..... head, ears, eyes, nose, throat
HR..... heart rate/hour
HTN..... hypertension
Hx..... history
hyper..... above or high
hypo..... below or low

ICP..... intracranial pressure
ICU..... intensive care unit
IM..... intramuscular
IO..... intraosseous
IV..... intravenous
IVP..... intravenous push
IVPB..... intravenous piggy back

J..... joules
JVD..... jugular vein distension

Kg..... kilogram
KVO..... keep vein open

LAC……laceration
L&D..... labor and delivery

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Z-R1 COMMON MEDICAL ABBREVIATIONS		First Responder EMT AEMT Paramedic

LAT..... lateral
LBBB..... left bundle branch block
lb..... pound
LLQ.....left lower quadrant
LMP.....last menstrual period
LOC..... loss of consciousness/level of consciousness
LR..... lactated ringers
L-Spine..... lumbar spine
LSB..... long spine board
LUQ..... left upper quadrant

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mcg..... microgram
MCI..... mass casualty incident
MDI ..... metered dose inhaler
ME..... medical examiner
mEq..... millequilvalent
MED..... medication/ medium
mg..... milligram
MICU..... medical intensive care unit
MI..... myocardial infarction
MOI..... mechanism of injury
MRI..... magnetic resonance imaging
MVA..... motor vehicle accident

NaCl..... sodium chloride
NAD..... no acute distress
NC..... nasal cannula
NEB..... nebulizer
NKA, NKDA..... no known allergies, no known drug allergies
NPO……..Nothing by mouth
NRM, NRB..... non-rebreather mask
NS..... normal saline
NSR ..... normal sinus rhythm
NTG..... nitro- nitroglycerine
N/V..... nausea and vomiting

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Z-R1 COMMON MEDICAL ABBREVIATIONS		First Responder EMT AEMT Paramedic

N/V/D..... nausea, vomiting and diarrhea

O2..... oxygen
O2Sat..... oxygen saturation by pulse oximeter
OB..... obstetrics
OD..... overdose
OPA..... oralpharyngeal airway
OPQRST.....onset, provoking factors, quality, radiation, severity, time.
OTC..... over the counter

PAC..... premature atrial contraction
PALP..... palpation
PALS..... pediatric advanced life support
PCN..... penicillin
PE..... physical examination/ pulmonary embolism/pulmonary edema
PEA..... pulseless electrical activity
PEEP..... positive end expiratory pressure
PERRL..... pupils equal round and reactive to light
PJC..... premature junctional contraction
PMHx..... past medical history
PO..... orally
POV..... privately owned vehicle
PRN, prn..... as needed
PSVT..... paroxysmal supraventricular tachycardia
PT..... patient
PTA ..... prior to arrival
PVC..... premature ventricular contraction

R/O..... rule out
ROM..... range of motion/movement
(R)..... right
RLQ..... right lower quadrant
RUQ..... right upper quadrant

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Z-R1 COMMON MEDICAL ABBREVIATIONS		First Responder EMT AEMT Paramedic

Rx..... prescription therapy

SL..... sublingual
SOB..... short of breath
SpO2..... oxygen saturation by pulse oximeter
STAT..... at once
STD.....sexually transmitted disease
SQ..... subcutaneous
START..... simple triage & rapid treatment
SVT..... supraventricular tachycardia
SZ..... seizure
SX..... symptom

Temp..... temperature
TIA..... transient ischemic attack
TKO..... to keep open
Tx..... treatment

URI..... upper respiratory infection
UTI..... urinary tract infection

V-fib.....ventricular fibrillation
V/S.....vital signs
VT.....ventricular tachycardia

W/……With
W/C..... Wheel Chair
W/O……..Without
WNL..... within normal limits
WPW..... Parkinson-White Syndrome

YO.....…..years old

<u>Symbols</u>
M or ♂ ..... male

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Z-R1 COMMON MEDICAL ABBREVIATIONS		First Responder EMT AEMT Paramedic

F or ♀ ..... female
+ ..... positive
- ..... negative
? ..... questionable
Ψ ..... psychiatric
~ ..... approximately
> ..... greater than
= ..... equal
Δ ..... change
L ..... left
R ..... right

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Standing Order – This skill or treatment **may** be initiated prior to contact with Medical Control.

Medical Director – the physician that has the ultimate responsibility for the patient care aspects of the EMS System

Unstable (symptomatic) – indicates that one or more of the following are present:

a. Chest pain
b. Dyspnea
c. Hypotension (SBP less than 90 mmHg in an adult)
d. Signs and symptoms of congestive heart failure or pulmonary edema
e. Signs and symptoms of a myocardial infarction
f. Signs and symptoms of inadequate perfusion
g. Altered level of consciousness

Stable (asymptomatic) – Indicates that the patient has no or very mild signs and symptoms associated with the current history of illness or trauma.

Emergency Medical Responder – Personnel licensed by the Tennessee Department of Health, Office of EMS and authorized by the service Medical Director to perform lifesaving interventions while awaiting additional EMS response. May also assist higher level personnel at scene and during transport under medical direction and within their scope of practice.

EMT – Personnel licensed by the Tennessee Department of Health, Office of EMS and authorized by the Medical Director to provide basic emergency care according to the Standard of Care and these Guidelines.

AEMT – Personnel licensed by the Tennessee Department of Health, Office of EMS and authorized by the Medical Director to provide limited advanced emergency care according to the Standard of Care and Standing Orders and Protocols.

Paramedic – Personnel licensed by the Tennessee Department of Health, Office of EMS and authorized by the Medical Director to provide basic and advanced emergency

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patient care according to the standard of care and these guidelines Orders and Protocols

Transfer of Care – Properly maintaining the continuity of care through appropriate verbal and/or written communication of patient care aspects to an equal or higher appropriate medical authority.

Higher Medical Authority – Any medical personnel that possesses a current medical license or certificate recognized by the State of Tennessee with a higher level of medical training than the one possessed by EMS Personnel. (MD)

Medical Control (transport) – The instructions and advice provided by a physician, and the orders by a physician that define the treatment of the patient. To access Medical Control, contact the Emergency Department physician on duty of the patient's first choice. If the patient does not have a preference, the patient's condition and/or chief complaint may influence the choice of medical treatment facilities.

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