Denver Metropolitan Prehospital Protocols

The DMEMSMD protocols are collaboratively written and constantly revised to provide the most ideal and up to date EMS care for our community. We recognize that any new protocol version necessitates training and implementation at the level of the individual agency. Careful training and implementation of these changes are strongly encouraged. It is appropriate to allow up to 6 months for any agency to implement protocol changes with each new revision.

The DMEMSMD group should be credited and asks to be informed of any such edits or alteration to the most current version of the DMEMSMD protocols. The DMEMSMD group may be notified at their website https://dmemsmd.org through the contact tab.

The process that has been initiated in the construction of this revised set of protocols will remain in place. The authors will continue to edit and revise the protocols to reflect the dynamic role of emergency medical services within the medical care community. The authors would like to acknowledge the following for their contribution, talent and time in this revision of the Denver Metro EMS protocols.

July 2022 Denver Metro EMS Medical Directors

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The Denver Metro EMS Medical Directors would also like to recognize the ongoing contributions by our agency EMS representatives and local EMS educators whose continued input into the protocol document and revisions is essential to its success.

Table of Contents

Respiratory Protocols (2000-2999)

- 2000 Obstructed Airway
- 2010 Adult Universal Respiratory Distress
- 2020 Pediatric Universal Respiratory Distress
- 2030 Adult Wheezing
- 2040 Pediatric Wheezing
- 2050 Pediatric Stridor/Croup
- 2060 CHF/Pulmonary Edema
- 2070 COVID-19 Screening
- 2080 COVID-19 Non-Transport
- 2090 Tracheostomy Emergencies

Cardiac Protocols (3000-3999)

- 3000 Medical Pulseless Arrest
- 3010 Medical Pulseless Arrest Considerations
- 3020 Neonatal Resuscitation
- 3030 Post Cardiac Arrest Care
- 3040 Tachyarrhythmia with Poor Perfusion
- 3050 Bradyarrhythmia with Poor Perfusion
- 3060 Chest Pain
- 3070 STEMI Alert
- 3080 Hypertension
- 3090 Ventricular Assist Devices (VAD)

General Medical Protocols (4000-4999)

- 4000 Medical Shock
- 4010 Universal Altered Mental Status
- 4020 Syncope
- 4030 Stroke
- 4040 Seizure
- 4050 Hypoglycemia
- 4060 Pediatric BRUE (Formerly ALTE)
- 4070 Drug/Alcohol Intoxication
- 4080 Overdose and Acute Poisoning
- 4090 Allergy and Anaphylaxis
- 4100 Non-Traumatic Abdominal Pain/Vomiting
- 4110 Suspected Carbon Monoxide Exposure
- 4120 Adrenal Insufficiency
- 4130 Epistaxis Management
- 4140 Sepsis

Environmental Protocols (5000-4999)

- 5000 Drowning
- 5010 Hypothermia
- 5020 Hyperthermia
- 5030 Altitude Illness
- 5040 Insect/Arachnid Stings and Bites
- 5050 Snake Bite

Behavioral Protocols (6000-6999)

- 6000 Psychiatric/Behavioral Patient
- 6010 Agitated/Combative Patient
- 6011 Hyperactive Delirium with Severe Agitation
- 6015 Post Sedation
- 6020 Transport of the Handcuffed Patient

Obstetric Protocols (7000-7999)

- 7000 Childbirth
- 7010 Obstetrical Complications

Trauma Protocols (8000-8999)

- 8000 General Trauma Care
- 8010 Special Trauma Scenarios: Sexual Assault and Abuse/Neglect
- 8020 Trauma in Pregnancy
- 8030 Traumatic Pulseless Arrest
- 8040 Traumatic Shock
- 8050 Amputations
- 8060 Head Trauma
- 8070 Face and Neck Trauma
- 8080 Spinal Trauma
- 8090 Spinal Motion Restrictions (SMR)
- 8100 Suspected Spinal Injury with Protective Athletic Equipment in Place
- 8110 Chest Trauma
- 8120 Abdominal Trauma
- 8130 Burns

Medication Protocols (9000-9999)

- 9000 Medication Administration Guidelines
- 9005 Acetaminophen
- 9010 Adenosine
- 9020 Albuterol Sulfate
- 9030 Amiodarone

- 9040 Antiemetics
- 9050 Aspirin
- 9060 Atropine Sulfate
- 9070 Benzodiazepines
- 9080 Calcium
- 9090 Dextrose
- 9100 Diphenhydramine
- 9110 Droperidol
- 9115 DuoDote™
- 9120 Epinephrine
- 9130 Glucagon
- 9140 Haloperidol
- 9150 Hemostatic Agents
- 9160 Hydroxocobalamin
- 9170 Ipratropium Bromide
- 9180 Lidocaine 2%
- 9190 Magnesium Sulfate
- 9200 Methylprednisolone
- 9210 Naloxone
- 9220 Nitroglycerin
- 9225 NSAID
- 9230 Opioids
- 9240 Oral Glucose
- 9250 Oxygen
- 9260 Phenylephrine
- 9270 Racemic Epinephrine
- 9280 Sodium Bicarbonate
- 9290 Topical Ophthalmic Anesthetics
- 9300 Vasopressor Continuous Infusion – Adult Patients Only

Appendix A

- Foothills and Mile-High Trauma Triage Algorithms

0010 GENERAL GUIDELINES: INTRODUCTION

INTRODUCTION

The following protocols have been developed and approved by the Denver Metro EMS Medical Directors (DMEMSMD) group. These protocols define the standard of care for EMS providers in the Denver Metropolitan area, and delineate the expected practice, actions, and procedures to be followed.

No protocol can account for every clinical scenario encountered, and the DMEMSMD recognize that in rare circumstances deviation from these protocols may be necessary and in a patient's best interest. Variance from protocol should always be done with the patient's best interest in mind and backed by documented clinical reasoning and judgment. Whenever possible, prior approval by direct verbal order from base station physician is preferred. Additionally, all variance from protocol should be documented and submitted for review by the agency's Medical Director in a timely fashion.

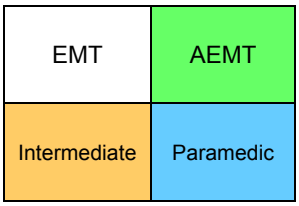
The protocols are presented in an algorithm format. An algorithm is intended to reflect real-life decision points visually. An algorithm has certain limitations, and not every clinical scenario can be represented. Although the algorithm implies a specific sequence of actions, it may often be necessary to provide care out of sequence from that described in the algorithm if dictated by clinical needs. An algorithm provides decision-making support, but need not be rigidly adhered to and is no substitute for sound clinical judgment.

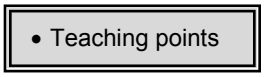
In order to keep protocols as uncluttered as possible, and to limit inconsistencies, individual drug dosing has not been included in the algorithms. It is expected the EMTs will be familiar with standard drug doses. Drug dosages are included with the medications section of the protocols as a reference.

If viewing protocol in an electronic version, it will be possible to link directly to a referenced protocol by clicking on the hyperlink, which is underlined.

PROTOCOL KEY

Boxes without any color fill describe actions applicable to all certification levels. Boxes with orange fill are for actions for intermediate level or higher, and blue-filled boxes are for Paramedic level. When applicable, actions requiring **Base Contact** are identified in the protocol.





Teaching points deemed sufficiently important to be included in the protocol are separated into grey-filled boxes with a double line border.

TRAINING AND EDUCATION

These protocols define the treatments, procedures, and policies approved by the Denver Metro EMS Physician Group. In Colorado, the scope of practice and acts allowed for EMT, EMT-IV, AEMT, EMT-I and Paramedic certifications are defined by the Colorado Department of Public Health and Environment, Chapter Two - Rules Pertaining to EMS Practice and Medical Director Oversight. These protocols do not supersede Chapter Two allowances, but in some instances may vary from Chapter Two depending on medical directors' preference.

The curriculum for initial EMS provider training may not cover some of the treatments, procedures and medications included in these protocols. Therefore, it is the responsibility of the EMS agency and Medical Director to ensure the initial training, verification, and maintenance of these skills falling outside traditional EMS education with all agency providers. This may be of additional importance when training and orienting newly hired providers prior to independent practice.

0015 GENERAL GUIDELINES: AGE DEFINITIONS

INTRODUCTION

For the purposes of these clinical care protocols, the following age guidelines will be used. These are general guidelines, however individual protocols, including medication dosages, may deviate from these age ranges.

ADULT

Adult patients are considered 12 years of age or older.

GERIATRICS

Geriatric patients will be considered 65 years of age or older. Geriatric specific indications will be indicated by a green box.

Geriatric Protocol

PEDIATRICS

Pediatric patients are those less than 12 years of age. Infant is defined as less than 1 year of age. Neonate is defined as less than one month of age. Pediatric specific indications will be noted by a purple box.

Pediatric Protocol

0020 GENERAL GUIDELINES: CONFIDENTIALITY

CONFIDENTIALITY

A. The patient-physician relationship, the patient-registered nurse relationship, and the patient-EMT relationship are recognized as privileged. This means that the physician, nurse, or EMT may not testify as to confidential communications unless:

   1. The patient consents
   2. The disclosure is allowable by law (such as Medical Board or Nursing Board proceedings, or criminal or civil litigation in which the patient's medical condition is in issue)

B. The prehospital provider must keep the patient's medical information confidential. The patient likely has an expectation of privacy, and trusts that personal, medical information will not be disclosed by medical personnel to any person not directly involved in the patient's medical treatment.

   1. Exceptions
      i. The patient is not entitled to confidentiality of information that does not pertain to the medical treatment, medical condition, or is unnecessary for diagnosis or treatment.
      ii. The patient is not entitled to confidentiality for disclosures made publicly.
      iii. The patient is not entitled to confidentiality with regard to evidence of a crime.

C. Additional Considerations:

   1. Any disclosure of medical information should not be made unless necessary for the treatment, evaluation or diagnosis of the patient.
   2. Any disclosures made by any person, medical personnel, the patient, or law enforcement should be treated as limited disclosures and not authorizing further disclosures to any other person.
   3. Any discussions of prehospital care by and between the receiving hospital, the crewmembers in attendance, or at in-services or audits which are done strictly for educational or performance improvement purposes, will fall under the “Carol J. Shanaberger Act” Colorado Revised Statutes §25-3.5-901 et seq., provided that all appropriate criteria have been met for the agencies peer protection program. Further disclosures are not authorized.
   4. Radio communications should not include disclosure of patient names.
   5. This procedure does not preclude or supersede your agency’s HIPAA policy and procedures.
   6. Any communication from the prehospital setting to the receiving hospital or other facility or care provider should be kept in compliance with HIPAA including all smart technology, SMS messaging, wireless communication or otherwise. No personal identifier information should be transmitted over non-HIPAA compliant secure means.

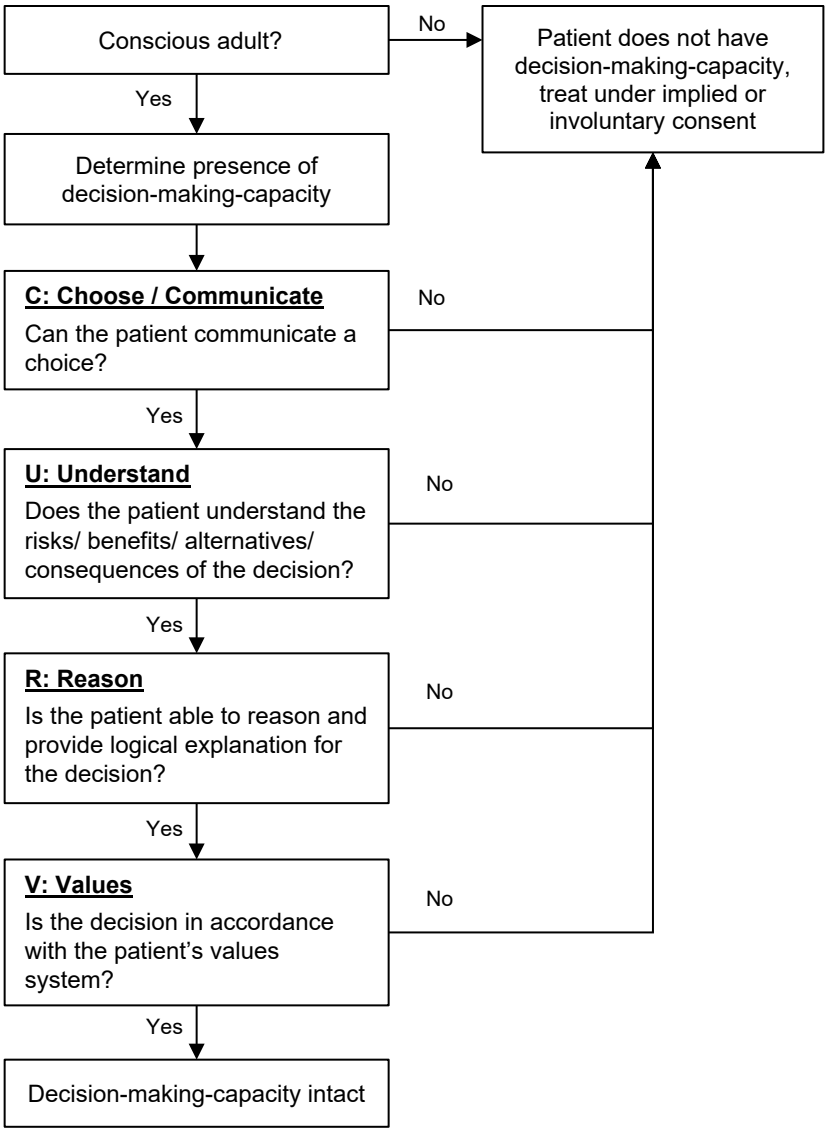
0030 General Guidelines: Consent

General Principles

- An adult in the State of Colorado is 18 years of age or older.
- Every adult is presumed capable of making medical treatment decisions. This includes the right to make "bad" decisions that the prehospital provider believes are not in the best interests of the patient.
- A call to 9-1-1 itself does not prevent a patient from refusing treatment. A patient may refuse medical treatment (IVs, oxygen, medications), but you should try to inform the patient of the need for therapies, offer again, and treat to the extent possible.
- The odor of alcohol on a patient's breath does not, by itself, prevent a patient from refusing treatment.

Values

- Attempt to assess if the patient's decision is in line with how they have approached the other questions they have been asked during assessment
- If possible, obtain collateral from friends or family to determine if the patient's decision is in line with other decisions or conversations
- An example question to assess values: "How did you reach your decision to accept (or reject) care?"



Involuntary Consent

In rare circumstances a person other than the patient may authorize consent. This may include:

- Court order (Guardianship)
- Law enforcement officer may authorize transport of prisoners in custody or detention in order to be evaluated but cannot dictate treatment decisions.
- Persons under a mental health hold or commitment who are a danger to themselves or others or are gravely disabled.
- It is sufficient to assume the patient lacks decision-making-capacity if there is a reasonable concern when any person appears to have a mental illness and, as a result of such mental illness, appears to be an imminent danger to others or to himself or herself or appears to be gravely disabled. Effort should be made to obtain consent for transport from the patient, and to preserve the patient's dignity throughout the process. However, the patient may be transported over his or her objections and treated under involuntary consent if the patient does not comply.

Contact Base if there are any questions or concerns about decision-making-capacity.

0030 General Guidelines: Consent

General Principles: Minors

A. A parent, including a parent who is a minor, may consent to medical or emergency treatment of his/her child. There are exceptions:
    1. Neither the child nor the parent may refuse medical treatment on religious grounds if the child is in imminent danger as a result of not receiving medical treatment, or when the child is in a life-threatening situation, or when the condition will result in serious handicap or disability.
    2. Minors may seek treatment for medical care related to the intended live birth of a child; contraception; abortion; prevention, diagnosis, and treatment for sexually transmitted infections/HIV; evaluation and/or treatment after sexual assault; and treatment for addiction to or use of drugs, emergency treatment for intoxication, and treatment for alcoholism without consent of parents.
    3. Minors 15 years or older may seek treatment for mental health without parents' consent.
    4. The consent of a parent is not necessary to authorize hospital or emergency health care when a first responder in good faith relies on a minor's consent, if the minor is at least 15 years or older, and
        a. Is living separate and apart from his or her parents, and managing his or her own financial affairs; or
        b. They have contracted a lawful marriage
B. When in doubt, your actions should be guided by what is in the minor's best interests and **BASE CONTACT**.

Procedure: Minors

A. A parent or legal guardian may provide consent to or refuse treatment in a non- life-threatening situation.
B. When the parent is not present to consent or refuse:
    1. If a minor has an injury or illness, but not a life-threatening medical emergency, you should attempt to contact the parent(s) or legal guardian. If this cannot be done promptly, transport.
    2. If the child does not need transport, they can be left at the scene in the custody of a responsible adult (e.g., teacher, social worker, grandparent). It should only be in very rare circumstances that a child of any age is left at the scene if the parent is not also present.
    3. If the minor has a life-threatening injury or illness, transport and treat per protocols. If the parent objects to treatment, **CONTACT BASE** immediately and treat to the extent allowable, notify law enforcement to respond and assist.

0040 GENERAL GUIDELINES: PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

Purpose

A. To provide guidelines for prehospital personnel who encounter a physician at the scene of an emergency

General Principles

A. The prehospital provider has a duty to respond to an emergency, initiate treatment, and conduct an assessment of the patient to the extent possible.
B. A physician who voluntarily offers or renders medical assistance at an emergency scene is generally considered a "Good Samaritan." However, once a physician initiates treatment, he/she may feel a physician-patient relationship has been established.
C. Good patient care should be the focus of any interaction between prehospital care providers and the physician.

Procedure

A. See algorithm below and sample note to physician at the scene

Special notes

A. Every situation may be different, based on the physician, the scene, and the condition of the patient.
B. **CONTACT BASE** when any question(s) arise.

0040 GENERAL GUIDELINES: PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

NOTE TO PHYSICIANS ON INVOLVEMENT WITH EMS PROVIDERS

THANK YOU FOR OFFERING YOUR ASSISTANCE.

The prehospital personnel at the scene of this emergency operate under standard policies, procedures, and protocols developed by their Medical Director. The drugs carried and procedures allowed are restricted by law and written protocols.
After identifying yourself by name as a physician licensed in the State of Colorado and providing identification, you may be asked to assist in one of the following ways:

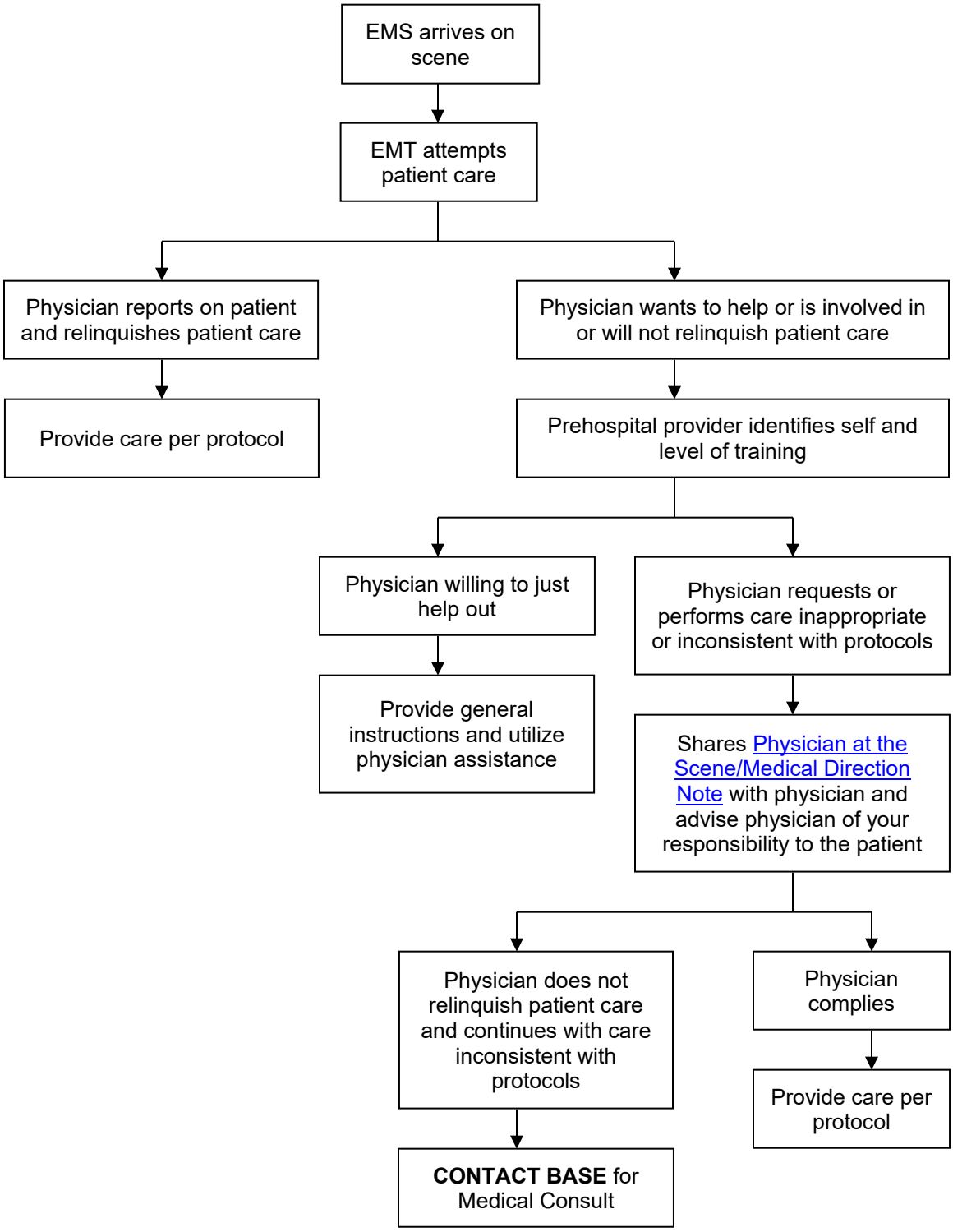
1. Offer your assistance or suggestions, but the prehospital care providers will remain under the medical control of their **base** physician, or
2. With the assistance of the prehospital care providers, talk directly to the **base physician** and offer to direct patient care and accompany the patient to the receiving hospital. Prehospital care providers are required to obtain an order directly from the **base physician** for this to occur.

THANK YOU FOR OFFERING YOUR ASSISTANCE DURING THIS EMERGENCY.

Medical Director _____ Agency _____

0040 GENERAL GUIDELINES: PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

PHYSICIAN AT THE SCENE/MEDICAL DIRECTION ALGORITHM



0050 GENERAL GUIDELINES: FIELD PRONOUNCEMENT

Purpose

A. To provide guidelines for resuscitation and field pronouncement of patients in cardiac arrest in the prehospital setting. EMS may transport any patient perceived to be viable, or if scene dynamics or public perception necessitates transport.

General Principles

A. Agency policy determines base contact requirements for patients for whom resuscitation efforts are being withheld.
B. Medical Arrest:
    1. EMS providers should try their best to determine a patient's end-of-life wishes and honor them. Refer to Advanced Medical Directives protocol for discussion of advanced directives and decision making about appropriateness of performing or withholding resuscitation efforts.
        a. Do not attempt resuscitation for patients with a "No CPR" directive based on the patient's wishes or compelling reasons to withhold resuscitation as covered in Advanced Medical Directives protocol.
        b. Do not attempt resuscitation for patients with definite signs of death, such as dependent lividity, rigor mortis, decomposition.
C. Traumatic Arrest:
    1. Do not attempt resuscitation if there is evidence of a non-survivable injury and no sign of life. Examples of non-survivable injuries include decapitation, evidence of massive head, chest, or abdominal trauma, or massive burn with charring.
    2. Blunt trauma: consider field pronouncement if there are no signs of life. Signs of life include spontaneous movement, breathing, presence of a pulse, or reactive pupils.
    3. Penetrating trauma: consider field pronouncement if there are no signs of life, and the arrest duration is suspected to be > 10 minutes.
    4. Exceptions to the above recommendations to consider field pronouncement include arrests with the following mechanisms/scenarios:
        a. Hypothermic arrest
        b. Drowning w/ hypothermia and submersion < 60 min
        c. Lightning strike and electrocution
        d. Avalanche victim
        e. Pregnant patient with estimated gestational age ≥20 weeks

0051 GENERAL GUIDELINES: TERMINATION OF RESUSCIATION FOR MEDICAL PULSELESS ARREST

Purpose

A. To provide guidelines for termination of resuscitation (TOR) for patients in medical pulseless arrest in the prehospital setting. EMS may transport any patient perceived to be viable, or if scene dynamics or public perception necessitates transport.
B. For termination of efforts of newly born after field delivery, refer to the Neonatal Resuscitation protocol.

General Principles

A. Resuscitate according to Universal Pulseless Arrest Algorithm on scene (unless unsafe) until one of the following endpoints is met:
    1. Return of spontaneous circulation (ROSC).
    2. No ROSC despite 30 minutes of ALS care or BLS care with an AED. If shockable rhythm still present, continue resuscitation and transport to closest emergency department.
    3. Contact base for TOR at any point if the effort is considered futile despite adequate CPR with ventilation and no reversible causes have been identified.
B. For BLS-only providers, contact base for TOR when all of the following criteria met:
    1. No AED shock advised
    2. No ROSC
    3. Arrest unwitnessed by either EMS or bystanders
    4. No bystander CPR before EMS arrival
C. The following patients found pulseless and apneic warrant resuscitation efforts beyond 30 minutes and should be transported:
    1. Hypothermic arrest
    2. Drowning w/ hypothermia and submersion < 60 min
    3. Lightning strike and electrocution
    4. Avalanche victim
    5. Pregnant patient with estimated gestational age ≥20 weeks
D. Once the patient is pronounced, they become a potential coroner's case. From that point on the patient should not be moved and no clothing or medical devices (lines, tubes etc.) should be removed or altered pending coroner evaluation.

0060 General Guidelines: Advanced Medical Directives

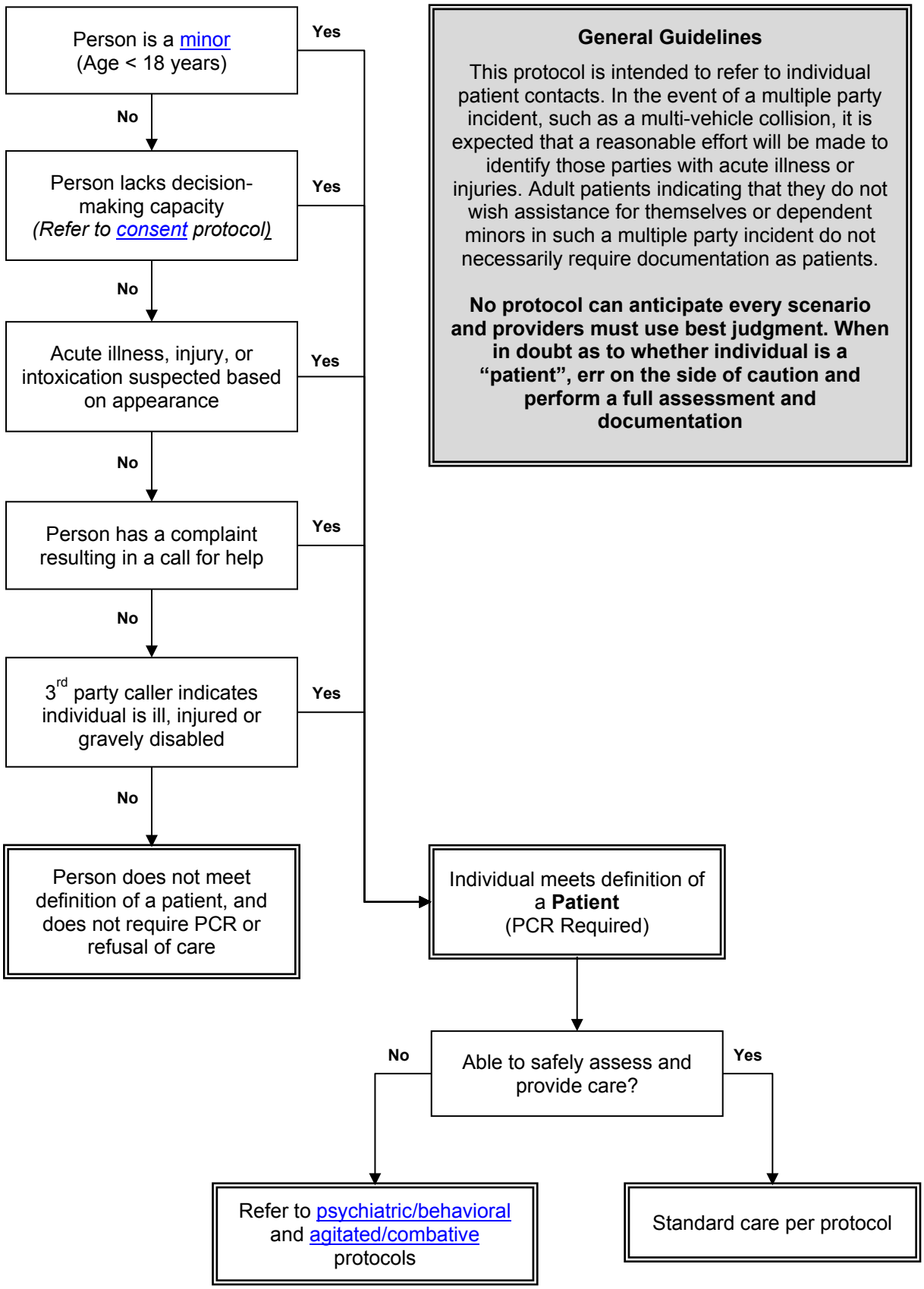
General Principles:

1. These guidelines apply to both adult and pediatric patients.
2. It is the intention of this guideline to protect the welfare of patients and to respect the appropriate exercise of professional judgments made in good faith by EMS personnel. In cases where there is doubt, contact base physician for consult.
3. From Colorado State Statute: *Any EMS personnel who in good faith complies with a CPR directive shall not be subject to civil or criminal liability or regulatory sanction for such compliance pursuant to* (CRS Section 15-18.6-104)
4. EMS providers should try their best to determine a patient's end-of-life wishes and honor them. These wishes may not be written down or documentation may be unavailable. In cases where no documentation exists, consider if compelling reasons to withhold resuscitation exist. Example of compelling reasons to withhold resuscitation may include when written information is not available, yet the situation suggests that the resuscitation effort will be futile, inappropriate, and inhumane and the family, life partner, caregiver, or healthcare agent indicates that the patient would not wish to be resuscitated.
5. Specific examples where resuscitation efforts should be withheld or stopped include:
    a. A readily available "No CPR" directive based on the patient's wishes:
        i. According to CO State Rules this could include: personally written directive, wallet card, "No CPR" bracelet, Healthcare Agent verbal request, MOST form, or other document or item of information that directs that resuscitation not be attempted. Photocopied, scanned, faxed copies are valid.
    b. The resuscitation may be stopped if after a resuscitation effort has been initiated, the EMS practitioner is provided with a Do Not Resuscitate directive *or* compelling reasons that such an effort should have been withheld.
    c. Suspected suicide does not necessarily invalidate an otherwise valid No CPR directive, DNR order, etc. When in doubt, contact base.
6. "Do Not Resuscitate" does not mean "do not care." A dying patient for whom no resuscitation effort is indicated should still be provided with comfort care which may include the following:
    a. Clearing the airway (including stoma) of secretions.
    b. Provide oxygen using nasal cannula or facemask and other non-invasive measures to alleviate respiratory distress.
    c. Pain management.
    d. Transport to the hospital as needed to manage symptoms with the No CPR directive in place

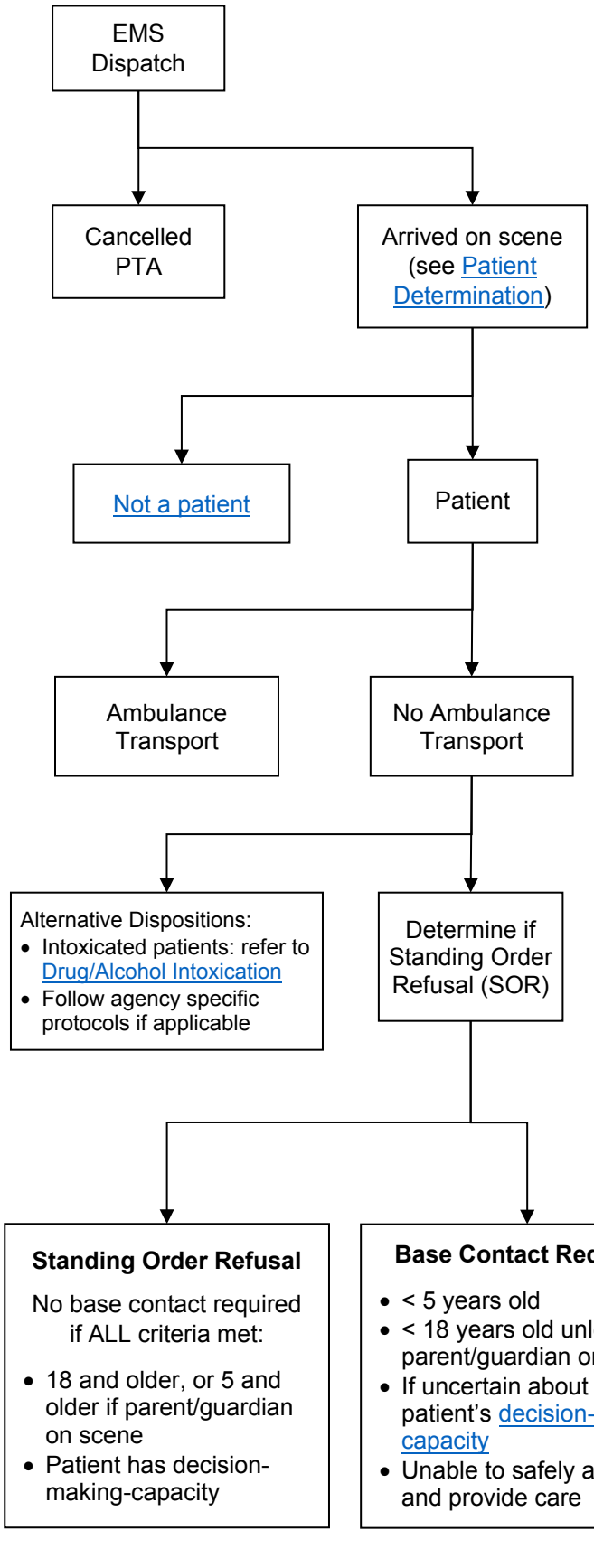
Additional Considerations

1. Document the presence of the CPR Directive on the incident report. Describe the patient's medical history, presence of an advanced directive (if any), or verbal request to withhold resuscitation.
2. Mass casualty incidents are not covered in detail by these guidelines. (See State Trauma Triage Algorithm).
3. If the situation appears to be a potential crime scene, EMS providers should disturb the scene as little as possible and communicate with law enforcement regarding any items that are moved or removed from the scene.
4. Mechanisms for disposition of bodies by means other than EMS providers and vehicles should be prospectively established in each county or locale.
5. In all cases of unattended deaths occurring outside of a medical facility, the coroner should be contacted immediately.

0070 GENERAL GUIDELINES: PATIENT DETERMINATION: "*PATIENT OR NO PATIENT*"



0080 GENERAL GUIDELINES: PATIENT NON-TRANSPORT OR REFUSAL



A person who has decision-making capacity may refuse examination, treatment, and transport

Refer to General Guidelines: Consent for complete decision-making capacity guidelines

If in doubt about patient decision-making capacity, **CONTACT BASE** for physician consult.

Documentation Requirements for Refusal

- Confirm decision-making capacity
- EMS assistance offered and declined
- Risks of refusal explained to patient
- Patient understands risks of refusal
- Name of Base Station physician authorizing refusal of care unless standing order refusal
- Signed refusal of care against medical advice document, if possible
- Any minor with any complaint/injury is a patient and requires a PCR

High Risk Patients

Base Contact is strongly recommended whenever, in the clinical judgement of the EMS provider, the patient is at high risk of deterioration without medical intervention.

0090 GENERAL GUIDELINES: EMERGENCY DEPARTMENT ED DIVERT & CAPACITY NOTIFICATIONS (OPEN, ADVISORY, CRITICAL, ED DIVERT, CLOSED)

Purpose

A. To provide a standard approach to EMS destination decision making that is practical for field use and maintains equity for patients, EMS, and hospitals.
B. To facilitate unobstructed access to hospital emergency departments (ED) for ambulance patients
C. To allow for optimal destination policies in keeping with general EMS principles and Colorado State Trauma System Rules and Regulations.

General EMS Principles

A. EMResource, an internet-based tracking system, is used to manage diversion in the Denver Metro area. The EMResource screen should be routinely monitored for situational awareness of ED capacities to receive patients.
B. The RETAC Prehospital Trauma Triage Algorithm Guidelines should be followed
C. The only time an ambulance can be diverted from a hospital is when that hospital is posted on EMResource as being on official **ED Divert** (**RED**) or **Closed** (**BLACK**) status.
D. The following are appropriate reasons for an EMS provider to **override ED Divert** (**RED**) and, therefore, deliver a patient to an emergency department that is on **ED Divert** status:
    1. All alerts (trauma, cardiac, stroke, sepsis, etc), cardiac arrests, imminent OB or imminent airway emergencies.
    2. Specialty care needs such as pediatric, obstetric, and burn patients
    3. If the patient's condition and/or system constraints do NOT allow transport to a hospital outside of the EMS agency's service area.
    4. EMS providers always have the discretion to override and transport to the closest facility if they determine the patient's condition warrants.
E. There are EMResource notifications that are considered **Advisory** (YELLOW) or **Critical** (ORANGE). These notifications are informational only and are intended to inform field personnel that a hospital on an **Advisory** or **Critical** status may not be able to optimally care for a patient due to a specific resource limitation (such as Psych, ICU) or overall capacity limitation in the availability of staffed ED beds (ED)
F. The following resource limitations may be seen with **Advisory** (YELLOW) or **Critical** (ORANGE) and listed in the Comment section of EMResource:
    1. ICU (Intensive Care Unit)
    2. Psych (Psychiatric)
    3. OB (Obstetrics)
    4. OR (Operating Room)
    5. Trauma, Stroke, STEMI
    6. ED (Emergency Department staffed beds)
G. Prehospital personnel should take into consideration hospital ED capacity notifications, when possible, considering the patient's condition, travel time, weather, and system constraints. Patients with specific problems that fall under a specific resource limitation (such as Psych) should be transported to a hospital not experiencing that resource limitation when feasible.

EMResource Hospital ED Load Leveling Rotation Board Notifications

Open	<80% Staffed ED beds occupied
Advisory	80-100% Staffed ED beds occupied
Critical	>100% of staffed ED beds occupied and >1 ESI2 patient unable to be roomed
Divert	>120% of staffed ED beds occupied and >1 ESI2 patient unable to be roomed and no longer able to safely care for high acuity patients, OR department discretion due to acute incident
Closed	Unable to care for patients due to infrastructure damage, active shooter, etc

0090 GENERAL GUIDELINES: EMERGENCY DEPARTMENT ED DIVERT & CAPACITY NOTIFICATIONS
(OPEN, ADVISORY, CRITICAL, ED DIVERT, CLOSED)

Denver Metro Patient Load Leveling Guideline

A. All hospitals and free-standing emergency departments (FSED) are grouped in EMResource by regions. The Denver Metro area consists of North, East, West, South, Central, and Boulder regions.
    1. **Regional Saturation** exists when all hospitals within a region are either on **Critical** (**ORANGE**) or **ED Divert** (**RED**) status *excluding* FSED.

B. The following guidelines are to be considered when one Denver Metro region experiences **Regional Saturation.**
    1. All Denver Metro dispatch centers track hospital destinations in the EMResource Hospital ED Load Leveling Rotation Board view to establish a real time rolling count of 911 EMS transports to hospitals over a 24-hour period. This would begin at the time of regional saturation to 08:00 the following day, then repeat at 24-hour time intervals until the **Critical** (**ORANGE**) and/or **ED Divert** (**RED**) regional saturation is resolved.
    2. Dispatch centers may restructure facilities on the EMResource Hospital Load Leveling Rotation Board view to accommodate the distribution of patients to hospitals within their geographic area.
    3. FSED are not included in hospital destination tracking or the hospital ED load leveling rotation board. However, to decrease the burden on hospitals, EMS providers are encouraged to transport appropriate patients per FSED protocol.
    4. The closest appropriate hospital destinations will still apply for patients meeting criteria for overriding **ED Divert** (**RED**) as outlined in this protocol.
    5. Hospital distribution of stable patients not meeting **ED Divert** (**RED**) override criteria are considered in the Hospital ED Load Leveling Board procedure as per EMResource Hospital ED Load Leveling Board Instructions
    6. Patients may be transported out of the primary region at the EMS providers discretion, if it is in the patient's best interest and the EMS system constraints allow. Likewise, EMS providers always have the discretion to override the load leveling board and transport to the closest facility if they determine the patient's condition warrants.
    7. A hospital that experiences a significant infrastructure issue such as loss of power, flooding, etc. preventing the facility from receiving patients, it should be listed as **Closed** (**BLACK**) status in EMResource and be exempt from load leveling until functional again.

EMResource
Hospital ED Load Leveling Board
Instructions

Purpose:

The purpose of the EMResource Hospital ED Load Leveling Board is to ensure timely ambulance destination assignments within a region (zone) and avoiding significant travel distance for an EMS service transporting a patient to hospital. This will ONLY be utilized when ALL HOSPITALS are either on **ED Divert (RED)** or **Critical (ORANGE)** within a particular region. Freestanding emergency departments (FSED) will not be used in the rotation nor does this apply to ED advisories and thus will not need to be tracked. Once all hospitals in a region are on **ED Divert** or **Critical**, patient transports by EMS will be distributed in an equitable fashion across facilities as determined through the coordination with local dispatch centers, EMS agencies, and hospitals in a region. When the load leveling procedure is activated, EMS patient transports to hospital emergency departments will be tracked on the EMResource Hospital ED Load Leveling Board.

The following situations (which exist under all circumstances) remain intact and override load leveling:

1. All alerts (trauma, cardiac, stroke, sepsis, etc.), cardiac arrests, imminent OB or imminent airway emergencies.
2. Specialty care needs such as pediatric, obstetric, and burn patients
3. If the patient's condition and/or system constraints do NOT allow transport to a hospital outside of the EMS agency's service area.
4. EMS providers always have the discretion to override and transport to the closest facility if they determine the patient's condition warrants.

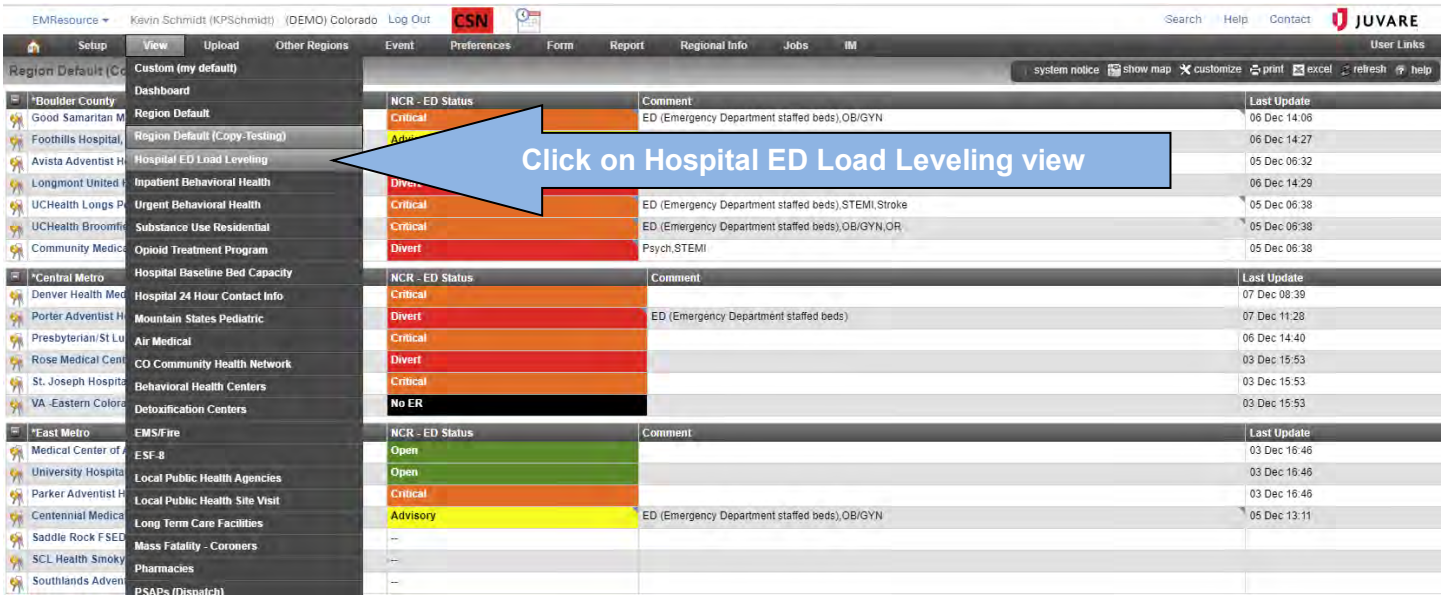
Free-standing emergency departments (FSED) should be utilized for transport of all appropriate patients as delineated by agency protocols and local medical direction.

After the hospital ED load leveling process is begun, all EMS providers, dispatch centers and Emergency departments should have constant monitoring of the EMResource screen. As per local protocol, the EMS provider may continue to use their current local dispatch centers for communication and patient destination decisions if EMResource is not available on scene. Once **Regional Saturation** is triggered, the dispatch center will open the EMResource screen under the "view" tab. The EMResource Hospital ED Load Leveling Board will continually and automatically sort facilities within a region and list the "next up hospital" on the top of the list for that region.

1. Once you log into EMResource, click on "View"

EMResource
Hospital ED Load Leveling Board
Instructions

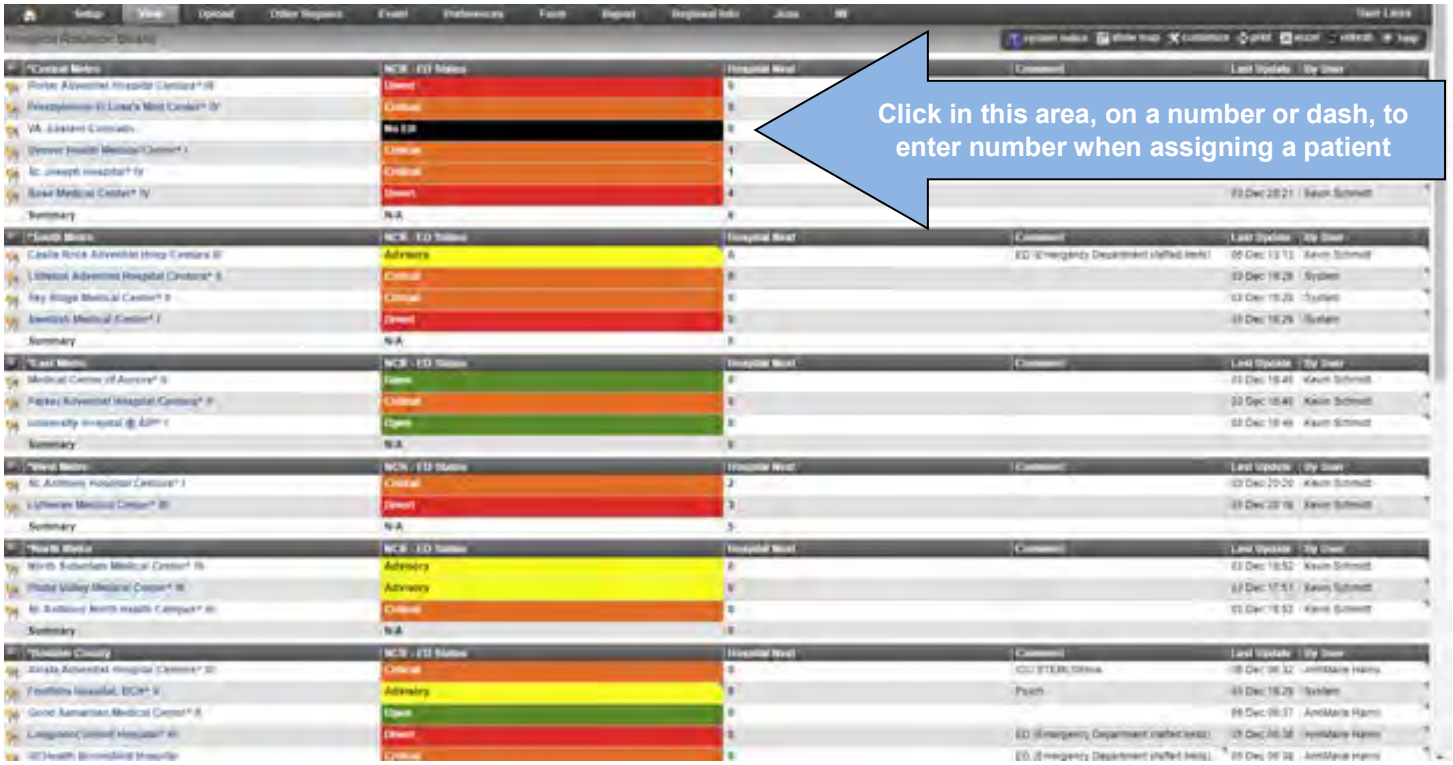
2. Scroll down the list and find the “Hospital ED Load Leveling” and click.



3. Find the region that your ambulance is transporting to. The hospital that is eligible for the next patient will automatically be sorted to the top of the list by the Hospital Rotation Board.

   PSAP/EMS should notify transporting ambulance of “Next Up” status and await ambulance destination decision.

   Click in the area of the “Hospital Next” Column on the dash (--) or number to assign a patient to the next up hospital. This will bring up the popup box for you to enter the number of patients and any comments, which are optional. Click SAVE.



EMResource
Hospital ED Load Leveling Board
Instructions

4. The number you enter should be how many patients that are being transferred by that ambulance. So, if the number was a three and you are transferring one patient enter a four. If the number was a five and you are transferring two patients in the ambulance enter the number 7. Comments are not required. Click SAVE to exit.

5. The facility you just entered a number for will go to the bottom of the list. If it was a higher number than the rest, it will stay out of the rest of the rotation.

*Central Metro	NCR - ED Status	Hospital Next	Comment	Last Update	By User
Porter Adventist Hospital Centura^ III	Divert	0		03 Dec 16:29	System
Presbyterian/St Luke's Med Center^ IV	Critical	0		03 Dec 16:29	System
VA -Eastern Colorado	No ER	0		03 Dec 16:29	System
Denver Health Medical Center^ I	Critical	1		03 Dec 17:11	Kevin Schmidt
St. Joseph Hospital^ IV	Critical	1			
Rose Medical Center^ IV	Divert	4			
Summary	N/A	6			

*South Metro	NCR - ED Status	Hospital Next	Comment	Last Update	By User
Castle Rock Adventist Hosp Centura III	Advisory	0	ED (Emergency Department staffed beds)	05 Dec 13:13	Kevin Schmidt
Littleton Adventist Hospital Centura^ II	Critical	0		03 Dec 16:29	System
Sky Ridge Medical Center^ II	Critical	0		03 Dec 16:29	System
Swedish Medical Center^ I	Divert	0		03 Dec 16:29	System
Summary	N/A	0			

6. Now it's time to move on to the next facility in the rotation and complete steps 1 through 5 again.

MCI Events – In case a MCI Event occurs, hospitals will be requested to input appropriate numbers for **Red**, **Yellow**, and Green patients that they are willing to accept above any Hospital ED Load Leveling in place. Hospitals entering numbers will receive patients. Hospitals may elect to enter zeros (0) depending on their status. After hospitals entering numbers have been exhausted, the ED Load Leveling plan will be utilized for remaining patients

0100 GENERAL GUIDELINES: MANDATORY REPORTING OF ABUSE PATIENTS

Purpose

A. To provide guidelines for the reporting of suspected abuse patients.

Definition of Abuse and Reporting Requirements:

A. Any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation **OR** an act or failure to act which presents an imminent risk of serious harm.
B. An at-risk elder or at-risk adult with intellectual and developmental disability per Colorado Revised Statutes §18-6.5-102, or child who are suspected to be victims of abuse, neglect, or exploitation, as defined in Colorado Revised Statutes §19-3-304, should be reported in a manner consistent with agency guidelines/procedures in a timely manner. Any "suspected" or known incident of abuse, neglect, or exploitation must be reported.

Types of Abuse:

A. Types of maltreatment:
    1. neglect (majority of cases)
    2. physical abuse
    3. sexual abuse
    4. emotional abuse
    5. exploitation (e.g. sex trafficking)

Role of Mandated Reporter:

A. A mandatory reporter has ***reasonable cause*** to know or suspect that someone has been subjected to abuse, neglect, or exploitation. At time of concern, report the information to the department of human services (DHS) where the patient lives and/or if there is concern that the person is at risk in their own home, and to law enforcement where the crime was committed (follow agency specific guidelines).
B. Mandatory reporters that ***do not*** report abuse, neglect, or exploitation can be:
    1. Charged with a class 3 misdemeanor
    2. Liable for damages proximately caused by failing to report

What to report:

A. The name, address, age, sex, and race of the child, at-risk elder, or at-risk adult with intellectual and developmental disability
B. The name(s) and address(es) of the person(s) responsible for the suspected abuse, neglect, or exploitation—if known
C. A description of the concern(s)
D. The nature and extent of any injuries—if known
E. The family composition, including any siblings or others in the household – if known
F. The name, address and/or contact phone number, and occupation of the person making the report
G. Any other information reporting person feels is important.

Additional Information:

A. Protecting patient confidentiality does not legally justify a failure to report.
B. There is established immunity for reporters "acting in good faith".
C. For children, the Colorado Child Abuse and Neglect Hotline is 1-844-CO-4-KIDS (844-264-5437).

0110 GENERAL GUIDELINES: FREE-STANDING EMERGENCY DEPARTMENTS AS EMS DESTINATION

Purpose

A. A freestanding emergency department (FSED) is a facility that is structurally separate and distinct from a hospital and provides emergency care. There are two types of FSEDs:

1. A hospital outpatient department (HOPD), also referred to as an off-site hospital-based or satellite emergency department (ED), these may be either hospital owned or hospital affiliated.
2. The second type of FSED is the independent freestanding emergency centers (IFECs).

B. The number of FSEDs is increasing rapidly with an ever-changing regulatory and health care environment. These facilities have various capability and capacity and the range of accepting ambulance patient is also variable.

C. For this reason, the appropriate utilization of these facilities as an ambulance destination should be at the discretion of the local agency and agency medical director.

Recommendations

A. **Hemodynamically stable patients** may be ***considered*** for transport to a hospital-affiliated FSED with the following exceptions:

1. No OB patients > 20 weeks estimated gestational age
2. No trauma patients meeting RETAC trauma center destination guidelines.
3. No alerts (e.g. STEMI, Stroke, Sepsis).
4. No post-cardiac arrest patients with ROSC unless uncontrolled airway

B. Give consideration to the fact that elderly patients often require hospitalization for conditions such as falls, generalized weakness, dehydration, syncope. These patients should be targeted for full function hospital to avoid secondary transport

C. A psychiatric patient may exceed the capability of the FSED. The facility may not have security available or be able to provide psychiatric evaluation. These patients should be transported to facilities with the capabilities to meet patient's needs.

D. When time and conditions allow, patients whom pre-hospital providers presume to require inpatient management may be transported to a hospital emergency department to avoid subsequent patient transfers.

0120 GENERAL GUIDELINES: BASE CONTACT FOR PHYSICIAN CONSULTATION

Purpose

A. To explain the DMEMS Medical Directors' expectations regarding base physician contact.

General Principles

A. **"BASE CONTACT"** is contact with a physician who is familiar with the protocols.

B. The DMEMSMD protocols function as standing order treatment guidelines designed to reflect CDPHE Chapter 2 Rules pertaining to EMS practice and Medical Director oversight. Protocols are to be used as guidelines and cannot account for every patient scenario. Deviation from protocol may at times be justified and in the patient's best interest. The DMEMSMD place great faith in the training and expertise of our EMS colleagues and therefore wide latitude is granted throughout the protocol.

C. Base contact for physician consultation is not the same as emergency department pre-notification of patient arrival and handoff. Base contact may be used in multiple care scenarios including but not limited to forewarning of unstable or complicated patients, patient refusal, and medical consultation and discussion.

D. Throughout the protocol patient "**BASE CONTACT**" is used to signify the need for call in. These algorithm points are set and agreed upon by the DMEMSMD and reflect critical decision points in care where communication with physician support is expected.

Preferred Base Contact Times.

A. The DMEMSMD group feels strongly that access to medical consultation should be readily available at all times and utilized in the following circumstances:

1. Any time "**BASE CONTACT**" is required or recommended per protocol.
2. Unusual presentations or patient care situations not addressed in the protocols and outside an area of familiar care by the individual prehospital provider.
3. Necessary deviation from protocol deemed to be in the best interest of the patient.
4. For selected patient care refusals as indicated by General Guidelines: Patient Non-Transport or Refusal.
5. During the care of critically ill patient who is not responding to protocol/ algorithmic treatment.

0130 GENERAL GUIDELINES: TRANSPORTATION OF THE PEDIATRIC PATIENT

General Principles:

For the purpose of the protocols, pediatric patients are defined as <12 years of age. The unique anatomy, physiology and developmental needs of children in this age range affect prehospital care. Several specific differences include:

A. Airways are smaller, softer and easier to obstruct or collapse. Actions such as neck hyperflexion, hyperextension, or cricoid pressure may create an upper airway obstruction in a child
B. Respiratory reserves are small, resulting in the possibility of rapid desaturation in the setting of increased demand. One of the earliest signs of physiologic stress in a child may be an unexplained increase in respiratory rate
C. Infants and young children utilize their abdominal musculature to assist with respirations. Tight, abdominally-placed straps used to secure children to spine boards may result in onset of or worsening respiratory distress
D. Circulatory reserves are small. The loss of as little as one unit of blood can produce severe shock in an infant.
E. Fluid overload is not a concern in children. 20 mL/kg boluses are always considered safe as the initial fluid resuscitation.
F. The developmental stage of a child impacts his/her ability to cooperate. The perception and memory of pain is escalated by anxiety. Discuss or forewarn what will be done with any child over 2 years of age. Infants, especially those under 6 months of age, tolerate painful procedures better if allowed to suck on a pacifier (especially if dipped in D25W) during the procedure. Utilize the parent or familiar guardian whenever possible to distract/comfort (tell a story, sing a song, etc.) for all pediatric patients during painful procedures.
G. Vital signs on pediatric should include a blood pressure regardless of age. Providers should, if possible, make at least one attempt at obtaining a blood pressure on every pediatric patient.

Specific Consideration: Transportation safety

Children represent a unique challenge for safe transportation in emergency vehicles. The National Highway Traffic Safety Administration has established guidelines to ensure the safe restraint and positioning of children in emergency vehicles. Children should be restrained during transport. Transport of a child in a restrained adult's arms is not recommended but may be considered in special circumstances (i.e. severe croup, newborn). Transportation of children on the side bench seat in the rear compartment is also not recommended. The published goals are to prevent forward motion/ejection of the child, secure the torso, and protect the head, neck and spine in each of the following scenarios:

1. **For a child who is not a patient, but requires transport to a facility**
   All reasonable effort should be made to transport children who are not patients in a vehicle other than the ambulance. If transport in a vehicle other than an ambulance is not possible, transport in a size-appropriate child restraint system in the front passenger seat (with air bags off) or rear-facing EMS provider's seat in the ground ambulance
2. **For a child who is injured/ill and whose condition does not require continuous monitoring or interventions**
   Transport child in a size-appropriate child restraint system secured appropriately on a cot (rear-facing) or in an integrated seat in the EMS provider's seat. Do not use a rear-facing child restraint system in a rear-facing EMS provider's seat. If no child restraint system is available, secure the child on the cot using three horizontal restraints across the child's chest, waist and knees and one vertical restraint across each of the child's shoulders. Remove any bulky clothing on child before restraining. Use blankets to maintain warmth.
3. **For a child whose condition requires continuous or intensive monitoring or interventions**
   Transport child in a size-appropriate child restraint secured appropriately on a cot. If no child restraint system is available, secure the child on the cot using three horizontal restraints across the child's chest, waist and knees and one vertical restraint across each of the child's shoulders.
4. **For a child whose condition requires spinal motion restriction or lying flat**
   Perform spinal motion restriction procedure per protocol. Three points of restraint with shoulder straps is the optimal for the patient. Avoid placing any restraints across the abdomen. Secure the patient, not just the immobilization device to the stretcher. We do not recommend utilizing the child

restraint system if spinal motion restriction is required, as upright positioning places additional axial load on the patient's neck and emergent airway intervention is not possible.

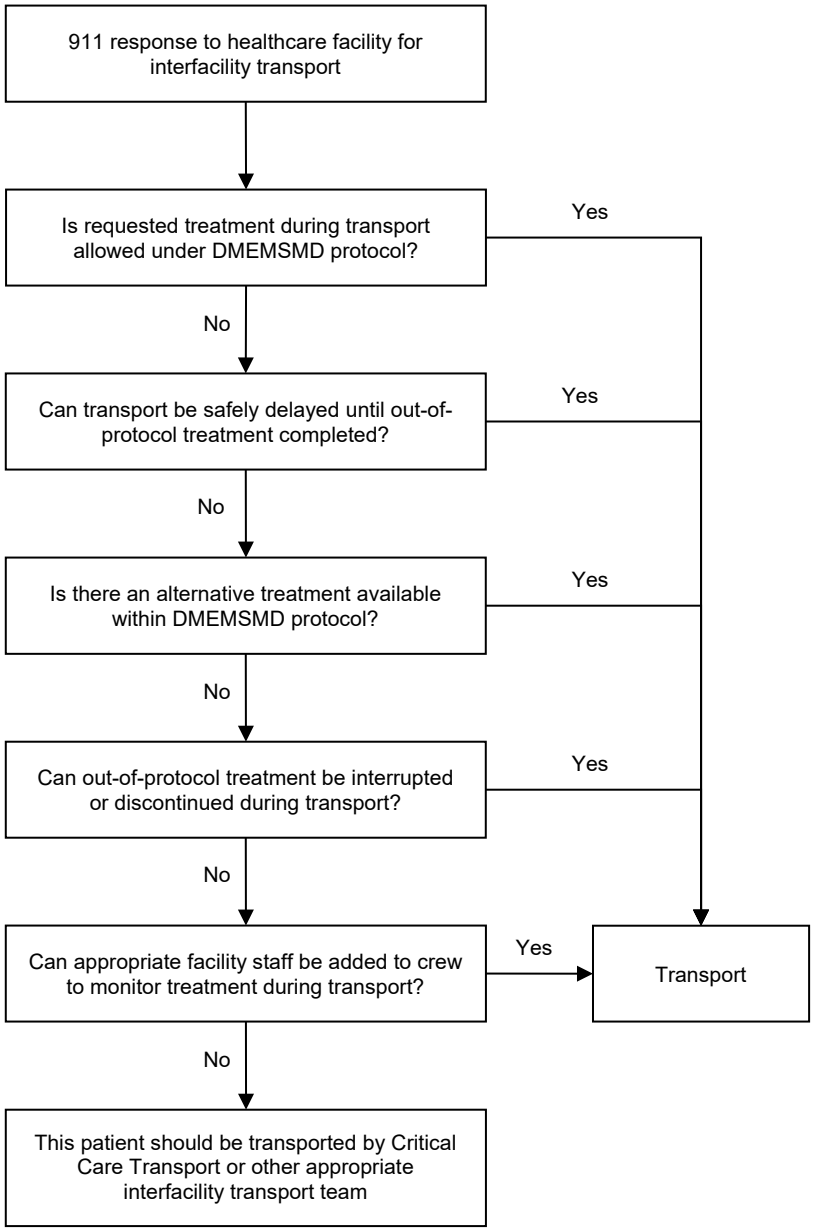
5. **For a child requiring transport as part of a multiple patient transport (newborn with mother, multiple children, etc.)**
   If possible, transport each as a single patient. When available resources prevent single patient transportation, transport patients using safe, designated space available exercising extreme caution and driving at reduced speeds. For mother and newborn, the newborn should be transported in a rear-facing EMS provider seat using a convertible or integrated child restraint system. Do not use a rear-facing child restraint system in a rear-facing EMS provider's seat.

Transportation of the child with special health care needs:

Treat the child, not the equipment. Starting with the ABCs still applies to medically complicated or medical technology-assisted children.

A. The parent/guardian of a special needs child is the expert on that child and knows the details of that illness, typical responses, and baseline interactions better than anyone. Utilize and trust his/her knowledge and concerns. This may include vital signs, medication responses, or physical positioning (i.e. of contracted limbs) that may not be typical.
B. Medically complicated children are often given healthcare notes describing their unique medical history and emergency healthcare needs. Ask the parent/guardian for an emergency information sheet, emergency healthcare form, or QR code.
C. Ask the parent/guardian for the "go bag" for medical technology-assisted children. This will contain the child's spare equipment and supplies that may be needed on scene, during transport or in the hospital
D. Transport the child to their medical "home" hospital whenever possible

0140 GENERAL GUIDELINES: 911 SYSTEM RESPONSE TO REQUEST FOR INTERFACILITY TRANSPORT



Guidelines:

- The purpose of this protocol is to address the scenario where a 911 response is requested for an interfacility transport and is not intended to supersede existing interfacility transport agency protocols for care.
- Follow existing DMEMSMD 911 protocols during transport
- All reasonable efforts should be made to accommodate sending physician's destination choice, as specialized care may have already been arranged at the receiving facility, however, transports must be consistent with individual agency and Denver Metro Protocol as well as RETAC Trauma Triage Algorithm.
- Per Colorado 6 CCR 1015-3, Chapter 2 - Rules Pertaining to EMS Practice and Medical Director Oversight, Section 15 - Interfacility Transport, subsection 15.2 "The transporting EMS provider may decline to transport any patient he or she believes requires a level of care beyond his or her capabilities."

0150 BEHAVIORAL HEALTH WALK-IN CLINIC / WITHDRAWAL MANAGEMENT UNIT ADMIT GUIDELINE

Introduction

A. This is a regional guideline for direct transport of pre-hospital patients to a behavioral health unit (including walk-in clinics inclusive of crisis stabilization units) and withdrawal management units
B. This guideline is considered optional and implementation is dependent upon the specific EMS agency, Medical Director, and appropriate receiving facilities. This is not intended to replace any existing agency specific guidelines.

Medical Criteria for Behavioral Health Unit

A. The following conditions, if currently present, are absolute contraindications to admission until resolved:

1. Uncontrolled bleeding
2. Severe respiratory distress (increased use of accessory muscles/retractions/nasal flaring, pale and/or cyanotic, hypoxia)
3. Open wounds or sores that cannot be covered
4. Communicable disease that can be transmitted through casual contact
5. Parasitic infestation (bed bugs, lice)
6. Symptoms of shock
7. Active tuberculosis
8. Level of consciousness below client's baseline
9. Any condition warranting an inpatient medical hospital admission
10. Any condition that would cause admission to the crisis stabilization unit (versus self-care at home) to negatively impact the client's physical health status

B. The following conditions, if currently present, are absolute contraindications to admission until fully evaluated and treated:

1. Unexplained and/or untreated seizures
2. Chest pain
3. GI bleeding
4. Respiratory distress (shortness of breath, wheezing, current asthma attack, exacerbated emphysema)
5. Severe, unexplained pain
6. Suspected fracture
7. Significant open wounds and/or sores
8. Significant allergic reaction (respiratory difficulty, angioedema, hives)
9. Rash consistent with a communicable viral illness, parasitic infestation, or allergic reaction
10. Diabetic with current s/s of hypoglycemia or ketonuria
11. Positive TB test without treatment
12. Untreated elevated blood pressure causing symptoms.

C. Clients with following conditions will be considered for admission with caution, and admission may be denied based on the individual's presentation:

1. Current cancer treatment with chemo or radiation therapy
2. Feeding tube
3. Urinary catheter (intermittent or indwelling)
4. Colostomy
5. High risk pregnancy
6. Surgery in the past two weeks
7. Unmanaged fecal and/or urinary incontinence, unmanaged enuresis and/or encopresis

8. Difficulty managing activities of daily living

Substance Abuse Criteria for Withdrawal Management Units

A. The following conditions, if currently present, are absolute contraindications to admission until resolved:
   1. The client is on methadone maintenance or buprenorphine for the treatment of an opioid use disorder without the ability to either obtain or administer these medications.
   2. Use of phencyclidine (PCP) within the past 72 hours
   3. Active detoxification from alcohol or opiates.

B. Clients who have positive recent use history and/or urine toxicology screen for the following substances will be evaluated for admission. The presence/use of these substances is not, in and of itself, a contraindication to admission. However, the impact of the substance use on the client's current health and behavior will be considered as part of the admission decision.
   1. Methamphetamine
   2. Amphetamines
   3. Cocaine
   4. Recreational benzodiazepines
   5. Recreational opiates
   6. Recreational barbiturates

C. The following will be assessed when the above substances are present, and, if present, each presents a contraindication to admission:
   1. Client is currently intoxicated/under the influence
   2. Client's use of /withdrawal from the substance potentially complicate a co-occurring medical condition and places the client at significant risk of morbidity or mortality over the next five days
   3. Client has a history of violence when withdrawing from the substance, and this reaction is likely to recur
   4. Client is unable to participate in programming due to withdrawal.

D. Clients who have a positive recent use history and/or urine toxicology screen for the following substances will be evaluated for admission. The presence/use of these substances is not a contraindication to admission unless client is currently under the influence.
   1. THC
   2. Lysergic acid diethylamide (LSD/Acid)
   3. Methylenedioxymethamphetamine (MDMA/Ecstasy/Molly)

Clinical Considerations:

A. The following are a contraindication to admission until resolved:
   1. The client has been in physical restraints within the past 4 hours if a child, 6 hours if an adult
   2. The client has received a benzodiazepine or other medication for behavioral control in the past 6 hours
   3. The client is unable to safely participate in treatment
   4. The client is unable to respond to verbal redirection.

0150 BEHAVIORAL HEALTH WALK-IN CLINIC / WITHDRAWAL MANAGEMENT UNIT ADMIT GUIDELINE

Walk-in Clinic Behavioral Admit Criteria Checklist Form

Indications:

Patient with an expressed or suspected behavioral health condition needing an evaluation at a behavioral health facility.

Inclusions/Exclusions:

If the patient meets all of the following criteria ("yes" to every question), they are appropriate for transport to a behavioral walk-in clinic (WIC). Law enforcement transport of the patient is an acceptable option if available, able to do so, and present on scene.

Medical:				
• Blood Pressure: systolic of 90-180, diastolic of 50-100	YES	☐	NO	☐
• Pulse: 60-120	YES	☐	NO	☐
• Respiratory Rate: 12-25	YES	☐	NO	☐
• Oxygen Saturation: 90% or above on room air or prescribed oxygen	YES	☐	NO	☐
• Blood Glucose: 60-125 if diabetic	YES	☐	NO	☐
• No acute medical conditions warranting emergency medical treatment	YES	☐	NO	☐
• No injuries needing medical attention beyond basic first aid	YES	☐	NO	☐
• No change in LOC, neurologically intact	YES	☐	NO	☐
Substance:				
• Blood alcohol level <0.05 (not mandatory, only if law enforcement performs prior to arrival)	YES	☐	NO	☐
• Not under the influence of/impaired by recreational substance use	YES	☐	NO	☐
Psychiatric:				
• Agrees to WIC level of care and understands that transfer to an emergency department may be necessary prior to placement in a higher level of care (if applicable).	YES	☐	NO	☐
• No physically aggressive behavior	YES	☐	NO	☐
• No verbally aggressive behavior not responsive to redirection	YES	☐	NO	☐
• Able to engage in a coherent exchange of information	YES	☐	NO	☐
• Can maintain safety without active intervention	YES	☐	NO	☐

Personnel Conducting Patient Assessment

Assessment Date: _____ Assessment Time: _____

Patient Name: _____ Date of Birth: _____

EMS Provider (if involved): _____ Signature: _____

Law Enforcement Officer (if involved): _____ Signature: _____

Other Licensed Provider (if involved): _____ Signature: _____

0150 BEHAVIORAL HEALTH WALK-IN CLINIC / WITHDRAWAL MANAGEMENT UNIT ADMIT GUIDELINE

Withdrawal Management Unit Admit Criteria Checklist Form

Indications:

A patient with a substance abuse condition that would benefit from an evaluation at a withdrawal management unit.

Inclusions/Exclusions:

- If the patient meets all the following criteria ("yes" to every question), they are appropriate for transport to a withdrawal management unit.
- These are general guidelines to help assess the initial placement of a person (18 years of age and older) under the influence of alcohol and/or other drugs, or in any stage of withdrawal from alcohol or drugs. **Each organization/withdrawal management program will complete a secondary screening on site which may result in a denied admission.**

Vitals (if known):				
• Blood Pressure: systolic of 90-180, diastolic of 50-100	YES	☐	NO	☐
• Pulse: 60-100	YES	☐	NO	☐
• Respiratory Rate: 10-26	YES	☐	NO	☐
• Oxygen Saturation: 88% or above on room air	YES	☐	NO	☐
• Blood Glucose: 60-250	YES	☐	NO	☐
• Blood alcohol level ≤ 0.400 (not mandatory, only if law enforcement performs prior to arrival)	YES	☐	NO	☐
Other Medical:				
• No history of withdrawal seizure or seizure disorder	YES	☐	NO	☐
• Ability or willingness to perform self-care (includes medical devices)	YES	☐	NO	☐
• No respiratory difficulties	YES	☐	NO	☐
• No injuries needing medical attention	YES	☐	NO	☐
• No change in level of consciousness	YES	☐	NO	☐
Other:				
• No aggressive or combative behavior	YES	☐	NO	☐
• No bizarre behavior not explained by intoxication	YES	☐	NO	☐
• Not on a mental health hold	YES	☐	NO	☐
• Patient in a pregnant woman with atypical symptoms	YES	☐	NO	☐

Personnel Conducting Patient Assessment

Assessment Date: _____ Assessment Time: _____

Patient Name: _____ Date of Birth: _____

EMS Provider (if involved): _____ Signature: _____

Law Enforcement Officer (if involved): _____ Signature: _____

Other Licensed Provider (if involved): _____ Signature: _____

0990 QUICK REFERENCE FOR PROCEDURES AND MEDICATIONS ALLOWED BY PROTOCOL

This list does not include Medical Director specific waivers or base contact requirements. It is assumed that not all agencies will necessarily stock all medications.

Abbreviations	S = Standing order	B = Base contact

Airway Procedures	B	BIV	AEMT	I	P
Capnography	S	S	S	S	S
Public health related oral/nasal swab sample collection	S	S	S	S	S
Supraglottic airway	S	S	S	S	S
Continuous positive airway pressure (CPAP)	S	S	S	S	S
Orotracheal intubation				S	S
Nasotracheal intubation					S
Percutaneous cricothyrotomy					S
Bougie assisted surgical cricothyrotomy					S
Pediatric needle cricothyrotomy					S
Needle thoracostomy for tension pneumothorax decompression				S	S
Orogastric tube insertion with advanced airway					S
Tracheobronchial suctioning			S	S	S
Tracheostomy maintenance – Airway management only	S	S	S	S	S
Tracheostomy maintenance – Including replacement					S

Cardiovascular Procedures	B	BIV	AEMT	I	P
Tourniquet	S	S	S	S	S
ECG - Acquire (including 12-lead)	S	S	S	S	S
ECG - Interpretation (including 12-lead)				S	S
Blood glucose monitoring	S	S	S	S	S
IV – Peripheral		S	S	S	S
IV – External jugular			S	S	S
IO					
• Rescue or primary vascular access device when peripheral IV access not obtainable in a patient with critical illness		S	S	S	S
• Utilization of IO access for all other patients			B	B	B
Use of established central line (including PICC) for fluid and medication administration (must have appropriate equipment, e.g., Huber needle, and training to access subcutaneous ports)				S	S
Automated / Semi-automated external defibrillator (AED)	S	S	S	S	S
Defibrillation – Manual				S	S
Valsalva maneuver					S
Synchronized cardioversion					S
Transcutaneous cardiac pacing					
• Adult				S	S
• Pediatric				B	B

Medications	B	BIV	AEMT	I	P
Specialized prescription medications to address an acute crisis given the route of administration is within the scope of the provider	B	B	B	B	B
Acetaminophen (Tylenol)					
• PO	S	S	S	S	S
• Adult – IV			S	S	S
Adenosine (Adenocard)					
• Adult				B	S
• Pediatric				B	B
Albuterol sulfate - MDI and nebulizer	S	S	S	S	S
Amiodarone					
• Pulseless arrest				B	S
• Tachyarrhythmia with poor perfusion					B
Antiemetic					
• Ondansetron (Zofran) ODT	S	S	S	S	S
• Ondansetron (Zofran) IV/IO		S	S	S	S
• Promethazine (Phenergan)				B	S
• Metoclopramide (Reglan)				B	S
• Droperidol – Adult only				B	S
Aspirin	S	S	S	S	S
Atropine sulfate					
• Hemodynamically unstable bradycardia				B	S
• Organophosphate poisoning				B	S

0990 QUICK REFERENCE FOR PROCEDURES AND MEDICATIONS ALLOWED BY PROTOCOL

Medications	B	BIV	AEMT	I	P
Benzodiazepines (midazolam, diazepam, lorazepam)					
• Seizure – Midazolam IN			S	S	S
• Seizure – All medications and routes in protocol				S	S
• Sedation for transcutaneous pacing or cardioversion				S	S
• Sedation for severely agitated or combative patient – Adult				S	S
• Sedation for severely agitated or combative patient – Pediatric				B	B
• Adjunctive agent for treatment of severe pain / muscle spasms				B	B
Calcium					
• Pulseless arrest assumed due to hyperkalemia					S
• Calcium channel blocker overdose					B
Crystalloids (D_5W, LR, NS) – Initiation/Maintenance		S	S	S	S
Dextrose IV		S	S	S	S
Diphenhydramine (Benadryl)			S	S	S
Dopamine					S
Droperidol – Behavioral Management (For nausea/vomiting refer to Antiemetics)					
• Adult				S	S
• Pediatric				B	B
DuoDote™ / Mark I Kits	S	S	S	S	S
Epinephrine					
• Pulseless arrest – IV/IO				S	S
• Pediatric bradycardia – IV/IO				B	B
• Asthma – IM					S
• Anaphylaxis– IM	S	S	S	S	S
• Pediatric severe systemic allergic reaction refractory to IM epinephrine - IV/IO				B	S
• Stridor at rest (alternative to racemic epinephrine)				B	S
• Epinephrine Auto-injector	S	S	S	S	S
• Adult hypotension refractory to fluid resuscitation – IV drip					S
• Adult bradycardia with signs of poor perfusion – IV drip					S
• Adult severe systemic allergic reaction – IV drip					S
Glucagon					
• Hypoglycemia			S	S	S
• Calcium channel blocker and β-blocker overdose			B	B	S
Haloperidol (Haldol)					
• Adult				S	S
• Pediatric				B	B
Hemostatic agents	S	S	S	S	S
Hydroxocobalamin (Cyanokit)				S	S
Ipratropium Bromide (Atrovent) – MDI or nebulizer	S	S	S	S	S
Lidocaine 2% Solution – Anesthetic for IO needle insertion in adults			S	S	S
Magnesium sulfate					
• Torsades de pointes associated with prolonged QT interval					S
• Refractory severe bronchospasm					S
• Eclampsia				S	S
Methylprednisolone (Solu-Medrol)				S	S
Naloxone (Narcan)	S	S	S	S	S
Nitroglycerin (Nitrostat, Nitroquick)					
• Sublingual, patient assisted	B	B	S	S	S
• Sublingual, agency supplied			S	S	S
• Nitroglycerin paste			B	B	S
NSAIDS					
• Ibuprofen	S	S	S	S	S
• Ketorolac (Toradol)					S
Opioids – Administration for cardiac chest pain				S	S
Opioids – Moderate to severe pain due to traumatic and medical conditions (excluding cardiac chest pain)					
• Fentanyl – Adult and pediatric 1 year and older			B	S	S
• Fentanyl – <1 year old			B	B	B
• Morphine – Adult and pediatric 1 year and older			B	S	S
• Morphine – <1 year old			B	B	B
• Hydromorphone – Adult only					S
Oral glucose (Glutose, Insta-glucose)	S	S	S	S	S
Oxygen	S	S	S	S	S

0990 QUICK REFERENCE FOR PROCEDURES AND MEDICATIONS ALLOWED BY PROTOCOL

Medications	B	BIV	AEMT	I	P
Phenylephrine (Intranasal)					
• Epistaxis	S	S	S	S	S
• Prior to nasotracheal intubation					S
Racemic epinephrine (Vaponephrine)				S	S
Sodium bicarbonate					
• Pulseless arrest assumed due to hyperkalemia				B	S
• Tricyclic antidepressant overdose					S
Topical ophthalmic anesthetics				S	S

1000 PROCEDURE PROTOCOL: OROTRACHEAL INTUBATION

EMT-I	Paramedic

Indications:

- Respiratory failure
- Absence of protective airway reflexes
- Present or impending complete airway obstruction

Contraindications:

- There are no absolute contraindications. However, in general the primary goals of airway management are adequate oxygenation and ventilation, and these should be achieved in the least invasive manner possible
  - Orotracheal intubation is associated with worse outcomes among pediatric patients and head injured patients when compared to BLS airway maneuvers. Therefore, it is relatively contraindicated in these populations, and BLS airway is preferred unless patient cannot be oxygenated or ventilated by other means.
  - Intubation is associated with interruptions in chest compressions during CPR, which is associated with worse patient outcomes. Additionally, intubation itself has not been shown to improve outcomes in cardiac arrest. Intubation should only be performed during pulseless arrest if it does not cause interruptions in chest compressions.
  - With traumatic brain injury, secondary insult from hypoxia or hypotension have been associated with worse outcomes. Caution should be taken to minimize these potential side effects with intubation.

Technique:

1. Initiate BLS airway sequence and confirm $ETCO_2$ production at this time.
2. Suction airway and pre-oxygenate with BVM ventilations, if possible
3. Check equipment and position patient:
   a. If trauma: have assistant hold in-line spinal motion restriction in neutral position
   b. If no trauma, sniffing position or slight cervical hyperextension is preferred
4. Perform laryngoscopy
   a. To improve laryngeal view, use right hand to manipulate larynx, or have assistant apply backwards, upwards, rightward pressure (BURP)
5. Place ETT. Confirm tracheal location and appropriate depth and secure tube
   a. Correct tube depth may be estimated as 3 times the internal diameter of tube at teeth or gums (e.g., 7.0 ETT is positioned at 21 cm at teeth)
6. Confirm and document tracheal location by:
   a. Continuous waveform capnography
   b. Presence and symmetry of breath sounds
   c. Rising SpO_2
7. Ventilate with BVM. Assess adequacy of ventilations
8. During transport, continually reassess ventilation, oxygenation and tube position with continuous waveform capnography and SpO_2

Precautions:

- Ventilate at age-appropriate rates. Do not hyperventilate
- If the intubated patient deteriorates, think “DOPE”
  - **D**islodgement
  - **O**bstruction
  - **P**neumothorax
  - **E**quipment failure (no oxygen)
- Reconfirm and document correct tube position, preferably with waveform capnography, after moving patient and before disconnecting from monitor in ED
- Unsuccessful intubation does not equal failed airway management. Many patients cannot be intubated without paralytics. Abandon further attempts at intubation and use supraglottic airway or BVM ventilations if 2 attempts at intubation unsuccessful.

1010 PROCEDURE PROTOCOL: NASOTRACHEAL INTUBATION

Paramedic

Indications:

- Age 12 years and older spontaneously breathing patient with indication for intubation who cannot tolerate either supine position or laryngoscopy
- Present or impending airway obstruction
- Lack of protective airway reflexes

Contraindications:

- Apnea
- Severe mid-face trauma

Technique:

1. Initiate BLS airway sequence and confirm $ETCO_2$ production at this time.
2. Suction airway and pre-oxygenate with BVM ventilations, if possible
3. Check equipment, choose correct ETT size (usually 7.0 in adult, limit is size of naris)
4. Position patient with head in midline, neutral position
5. If trauma, cervical collar may be in place, or assistant may hold in-line stabilization in neutral position
6. If no trauma, patient may be sitting upright
7. Administer phenylephrine nasal drops in each nostril
8. Lubricate ETT with lidocaine jelly or other water-soluble lubricant
9. With gentle steady pressure, advance the tube through the nose to the posterior pharynx. Use the largest nostril. Abandon procedure if significant resistance is felt
10. Keeping the curve of the tube exactly in midline, continue advancing slowly
11. There will be slight resistance just before entering trachea. Wait for an inspiratory effort before final passage through cords. Listen for loss of breath sounds
12. Continue advancing tube until air is definitely exchanging through tube, then advance 2 cm more and inflate cuff
13. Note tube depth and tape securely
14. Confirm and document endotracheal location by:
    a. Continuous waveform capnography
    b. Presence and symmetry of breath sounds
    c. Rising SpO_2
15. Ventilate with BVM. Assess adequacy of ventilations
16. During transport, continually reassess ventilation, oxygenation and tube position with continuous waveform capnography and pulse oximetry

Precautions:

- Before performing BNTI, consider if patient can be safely ventilated with non-invasive means such as CPAP or BVM
- Use caution in anticoagulated or bleeding disorders given risk of epistaxis.
- Ventilate at age-appropriate rates. Do not hyperventilate
- If the intubated patient deteriorates, think “DOPE”
    - **D**islodgement
    - **O**bstruction
    - **P**neumothorax
    - **E**quipment failure (no oxygen)
- Reconfirm and document correct tube position with, preferably with waveform capnography after moving patient and before disconnecting from monitor in ED
- Blind nasotracheal intubation is a very gentle technique. The secret to success is perfect positioning and patience.

1030 PROCEDURE PROTOCOL: CRICOTHYROTOMY

Paramedic

Introduction:

- Surgical cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances as defined below. The reason for performing this procedure must be documented and submitted for review to the EMS Medical Director within 24 hours. Surgical cricothyrotomy is to be performed only by paramedics trained in this procedure.
- An endotracheal tube introducer ("bougie") facilitates this procedure and has the advantage of additional confirmation of tube position and ease of endotracheal tube placement. If no bougie is available, the procedure may be performed without a bougie by introducing endotracheal tube or tracheostomy tube directly into cricothyroid membrane.
- Given the rarity and relative unfamiliarity of this procedure it may be helpful to have a medical consult on the phone during the procedure. Consider contacting base for all cricothyroidotomy procedures. Individual Medical Directors may mandate base contact before initiating the procedure. Individual agency policy and procedures apply and providers are responsible for knowing and following these policies.
- If using a commercially available cricothyrotomy kit, perform cricothyrotomy according to manufacturer's instructions.

Indications:

- A life-threatening condition exists AND advanced airway management is indicated ***AND*** you are unable to establish an airway or ventilate the patient by any other means. ("Cannot intubate/cannot ventilate")

Contraindications:

- Surgical cricothyrotomy is contraindicated in patients less than 12 years of age for anatomic reasons.

Technique:

1. Position the patient supine, with in-line spinal motion restriction if indicated. If cervical spine injury not suspected, neck extension will improve anatomic view.
2. Clean skin per agency approved aseptic technique.
3. Stabilize the larynx with the thumb and middle finger of your non dominant hand, and identify the cricothyroid membrane with your index finger, typically 4 fingerbreadths below mandible
4. Using a scalpel, make a 3 cm centimeter vertical incision 0.5 cm deep through the skin and fascia, over the cricothyroid membrane. With finger, dissect the tissue and locate the cricothyroid membrane.
5. Make a horizontal incision through the cricothyroid membrane with the scalpel blade oriented caudal and away from the cords. Remove scalpel blade and insert finger.
6. Insert the bougie curved-tip first through the incision and angled towards the patient's feet guided by the finger.

a. If no bougie available, use tracheal hook instrument to lift caudal edge of incision to facilitate visualization and introduction of ETT directly into trachea and skip to # 9.

7. Advance the bougie into the trachea feeling for "clicks" of tracheal rings and until "hang-up" when it cannot be advanced any further. This confirms tracheal position.
8. Advance a 6-0 endotracheal tube over the bougie and into the trachea. It is very easy to place tube in right mainstem bronchus, so carefully assess for symmetry of breath sounds. Remove bougie while stabilizing ETT ensuring it does not become dislodged
9. Ventilate with BVM and 100% oxygen
10. Confirm and document tracheal tube placement as with all advanced airways: Waveform capnography as well as clinical indicators e.g.: symmetry of breath sounds, rising pulse oximetry, etc.
11. Secure tube with ties.
12. Observe for subcutaneous air, which may indicate tracheal injury or extra- tracheal tube position
13. Continually reassess ventilation, oxygenation and tube placement.

Precautions:

- Success of procedure is dependent on correct identification of cricothyroid membrane
- Bleeding will occur, even with correct technique. Straying from the midline is dangerous and likely to cause hemorrhage.

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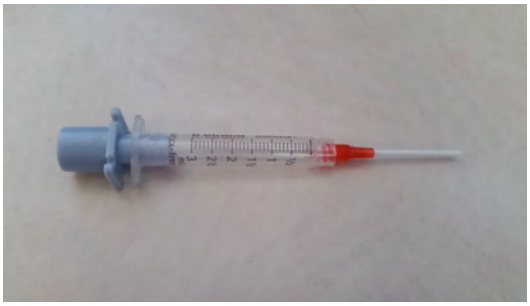
1040 PROCEDURE PROTOCOL: PEDIATRIC NEEDLE CRICOTHYROTOMY

Paramedic

Introduction:

- Needle cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances as defined below. The rationale for this procedure must be documented in the patient care report and submitted for review to the EMS Medical Director within 24 hours.
- Due to the funnel-shaped, rostral, highly compliant larynx of a pediatric patient, cricothyrotomy is an extremely difficult procedure to successfully perform. As such, every effort should be made to effectively oxygenate the patient before attempting needle cricothyrotomy.
- This protocol is considered optional and may not be adopted by all EMS Medical Directors or by all EMS agencies.
- A standardized, pre-prepared kit is recommended, and can be assembled using common airway equipment. An example is given below. Kit selection may vary and should be approved by the individual agency Medical Director.
- Example of kit:
  - 14 ga. and 16 ga. catheter over needle
  - 3 mL syringe
  - 15 mm endotracheal tube adaptor that fits the 3 mL syringe used by agency (syringe barrel sizes vary)



Indications:

- A life-threatening condition exists ***AND*** adequate oxygenation and ventilation cannot be accomplished by other less invasive means for patients < 12 years old.

Contraindications:

- If patient can be ventilated and oxygenated by less invasive means

Technique:

1. Ensure patent upper airway with placement of an oral airway and nasal airway, unless contraindicated.
2. Open pre-prepared kit, attach angiocath to syringe, and aspirate 1-2 mL of saline into syringe
3. Prepare skin using aseptic solution
4. Insert the IV catheter through the skin and cricothyroid membrane into the trachea. Direct the needle at a 45° angle caudally (toward the feet). When the needle penetrates the trachea a “pop” will be felt.
5. Aspirate with the syringe. If air is retuned easily or bubbles are seen (with saline), the needle is in the trachea.
6. Advance the catheter over the needle while holding the needle in position, then withdraw needle after catheter is advanced flush to skin.
7. Remove the plunger and attach the 3 mL syringe to the catheter hub
8. Attach the 15 mm adaptor to the syringe chamber
9. Oxygenate the patient with bag-valve-mask device using the 15 mm adaptor provide high flow oxygen.
10. Confirm and document catheter placement by:
    a. Waveform capnography
    b. Rising pulse oximetry
11. **Do not let go of catheter and be careful not to kink the catheter**. There is no reliable way to secure it in place, and it is only a temporizing measure until a definitive airway can be established at the hospital
12. Observe for subcutaneous air, which may indicate tracheal injury or extra- tracheal catheter position
13. Continually reassess oxygenation and catheter position.

1050 PROCEDURE PROTOCOL: SUPRAGLOTTIC AIRWAY

EMT	AEMT
EMT-I	Paramedic

Indications:

- Rescue airway if unable to intubate a patient in need of airway protection
- Primary airway if intubation anticipated to be difficult and rapid airway control is necessary
- Primary airway in pulseless arrest, when attempts at intubation are likely to interrupt CPR
- Designated advanced airway for EMTs
- Preferred advanced airway in the pediatric patient

Contraindications:

- Intact gag reflex
- Caustic ingestion

Technique:

1. Initiate BLS airway sequence
2. Select proper size supraglottic airway based on manufacturer's specifications
3. Assemble equipment, note correct volume for inflation marked on tube itself, test balloon for leaks, lubricate posterior aspect distal tip with water-soluble lubricant
4. Suction airway and maximize oxygenation with BVM ventilations
5. If trauma: have assistant hold in-line spinal immobilization in neutral position
6. If no trauma, sniffing position or slight cervical hyperextension is preferred
7. Place supraglottic airway utilizing device-specific technique
8. Inflate cuff balloon with correct volume of air (marked on device)
9. Confirm tube placement by auscultation, chest movement, and waveform capnography
10. Continuously monitor waveform capnography, SpO_2, vital signs

Precautions:

1. Do not remove a properly functioning supraglottic airway in order to attempt intubation
2. Correct sizing of supraglottic airways is critical for correct function
3. 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. Providers should be trained on and familiar with correct size selection for their device.
4. Use with caution in patients with broken teeth, which may lacerate balloon.
5. Use with caution in patients with known esophageal disease who are at increased risk of esophageal injury.

1060 PROCEDURE PROTOCOL: CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

EMT	AEMT
EMT-I	Paramedic

Indications:

- Symptomatic patients with moderate-to-severe respiratory distress as evidenced by at least two (2) of the following:
  - Rales (crackles), rhonchi, or wheezes
  - Dyspnea with hypoxia (SpO_2 less than 90% despite O_2)
  - Dyspnea with inability to speak full sentences
  - Accessory muscle use
  - Respiratory rate greater than 24/minute despite O_2
  - Diminished tidal volume

Contraindications:

- Respiratory or cardiac arrest
- Systolic BP less than 90mmHg
- Lack of airway protective reflexes
- Significant altered level of consciousness such that unable to follow verbal instructions or signal distress
- Vomiting or active upper GI bleed
- Suspected pneumothorax
- Trauma
- Patient size or anatomy prevents adequate mask seal

Technique:

1. Place patient in a seated position and explain the procedure to him or her
2. Assess vital signs (BP, HR, RR, SpO_2, and $ETCO_2$)
3. Apply the CPAP mask and secure with provided straps, progressively tightening as tolerated to minimize air leak
4. Operate CPAP device according to manufacturer specifications
5. Start with the lowest continuous pressure that appears to be effective. Adjust pressure following manufacturer instructions to achieve the most stable respiratory status utilizing the signs described below as a guide
6. Monitor patient continuously, record vital signs every 5 minutes.
7. Assess patient for improvement as evidenced by the following:
   a. Reduced dyspnea
   b. Reduced verbal impairment, respiratory rate and heart rate
   c. Increased SpO_2
   d. Stabilized blood pressure
   e. Appropriate $ETCO_2$ values and waveforms
   f. Increased tidal volume
8. Observe for signs of deterioration or failure of response to CPAP:
   a. Decrease in level of consciousness
   b. Sustained or increased heart rate, respiratory rate or decreased blood pressure
   c. Sustained low or decreasing SpO_2 readings
   d. Rising $ETCO_2$ levels or other $ETCO_2$ evidence of ventilatory failure
   e. Diminished or no improvement in tidal volume

Precautions:

- Should patient deteriorate on CPAP:
  - Troubleshoot equipment
  - Consider endotracheal intubation
  - Assess need for possible chest decompression due to pneumothorax
  - Assess for possibility of hypotension due to significantly reduced preload from positive pressure ventilation
- In-line nebulized medications may be given during CPAP as indicated and in accordance with manufacturer guidelines
- Some fixed pressure CPAP devices do not have FiO2 adjustment and will only administer up to 30% oxygen. If no improvement in oxygenation with a fixed pressure CPAP device, consider adding supplemental oxygen.

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1070 PROCEDURE PROTOCOL: CAPNOGRAPHY

EMT	AEMT	EMT-I	Paramedic

Indications:

A. MANDATORY: to rule out esophageal intubation and confirm endotracheal tube position in all intubated patients.
B. To identify late endotracheal tube dislodgement
C. To monitor ventilation and perfusion in any ill or injured patient

Contraindications:

A. None

Technique:

A. In patient with ETT or advanced airway: place $ETCO_2$ detector in-line between airway adaptor and BVM after airway positioned and secured
B. Patients without ETT or advanced airway in place: place $ETCO_2$ cannula on patient. May be placed under CPAP or NRB facemask
C. Assess and document both capnography waveform and $ETCO_2$ value

Precautions:

A. To understand and interpret capnography, remember the 3 determinants of $ETCO_2$:
    1. Alveolar ventilation
    2. Pulmonary perfusion
    3. Metabolism
B. Sudden loss of $ETCO_2$:
    1. Tube dislodged
    2. Circuit disconnected
    3. Cardiac arrest
C. High $ETCO_2$ (> 45)
    1. Hypoventilation/CO_2 retention
D. Low $ETCO_2$ (< 25)
    1. Hyperventilation
    2. Low perfusion: shock, PE, sepsis
E. Cardiac Arrest:
    1. In low-pulmonary blood flow states, such as cardiac arrest, the primary determinant of $ETCO_2$ is blood flow, so $ETCO_2$ is a good indicator of quality of CPR
    2. If $ETCO_2$ is dropping, change out person doing chest compressions
    3. In cardiac arrest, if $ETCO_2$ not > 10 mmHg after 20 minutes of good CPR, this likely reflects very low CO_2 production and is associated with poor outcome
    4. Sudden rise in $EtCO_2$ may be an indicator of ROSC

1080 PROCEDURE PROTOCOL: NEEDLE THORACOSTOMY FOR TENSION PNEUMOTHORAX DECOMPRESSION

EMT-I	Paramedic

Indications:

A. **All** of the following clinical indicators **must** be present:
    1. Severe respiratory distress
    2. Hypotension and signs of shock
    3. Unilateral absent or decreased breath sounds
B. Consider bilateral needle chest decompression in traumatic pulseless arrest if patient is being resuscitated and any trauma to trunk

Technique:

A. Expose entire chest
B. Clean skin overlying site with available skin prep
C. Insert angiocath either at 2nd intercostal space at midclavicular line, or 5th intercostal space at midaxillary line
    1. Either approach is acceptable, generally the site with the least soft tissue overlying ribs is preferred
    2. For adult, use largest, longest available angiocath. For children, a shorter angiocath is appropriate.
D. Notify receiving hospital of needle decompression attempt

Precautions:

A. Angiocath may become occluded with blood or by soft tissue
B. A simple pneumothorax is NOT an indication for needle decompression
C. Extra care is needed when performing on a pediatric patient.

1090 PROCEDURE PROTOCOL: SYNCHRONIZED CARDIOVERSION

Paramedic

Unstable tachyarrhythmia with a pulse

↓

Check:
- O_2 via NRB facemask
- Functioning IV line
- Suction
- Advanced airway equipment ready

↓

Sedate with benzodiazepine if not contraindicated

↓

Perform Synchronized Cardioversion

Adult	Pediatric
200 Joules biphasic	0.5-1 Joules/kg biphasic

↓

Continue treatment according to Tachycardia with Poor Perfusion

Precautions:
- If rhythm is AV nodal reentrant tachycardia (AVNRT, historically referred to as “PSVT”) it is preferred to attempt a trial of adenosine prior to electrical cardioversion, even if signs of poor perfusion are present, due to rapid action of adenosine
- If defibrillator does not discharge in “synch” mode, then deactivate “synch” and reattempt
- If sinus rhythm achieved, however briefly, then dysrhythmia resumes immediately, repeated attempts at cardioversion at higher energies are unlikely to be helpful. First correct hypoxia, hypovolemia, etc. prior to further attempts at cardioversion
- If pulseless, treat according to Medical Pulseless Arrest Algorithm
- Chronic atrial fibrillation is rarely a cause of hemodynamic instability, especially if rate is < 150 bpm. First correct hypoxia, hypovolemia, before considering cardioversion of chronic atrial fibrillation, which may be difficult, or impossible and poses risk of stroke
- Sinus tachycardia rarely exceeds 150 bpm in adults or 180 bpm in children and does not require or respond to cardioversion. Treat underlying causes.
- Transient dysrhythmias or ectopy are common immediately following cardioversion and rarely require specific treatment other than supportive care

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1100 PROCEDURE PROTOCOL: TRANSCUTANEOUS CARDIAC PACING

EMT-I	Paramedic

Indications

1. Symptomatic bradyarrhythmias (includes A-V block) not responsive to medical therapy
2. Pacing is rarely indicated in patients under the age of 12 years.
   CONTACT BASE

Precautions

1. Conscious patient will experience discomfort; consider sedation with benzodiazepine if blood pressure allows.

Contraindications

1. Pacing is contraindicated in pulseless arrest.

Technique

1. Apply electrodes as per manufacturer specifications: (-) left anterior, (+) left posterior.
2. Turn pacer unit on.
3. Set initial current to 80 mAmps.
4. Select pacing rate at 80 beats per minute (BPM)
5. Start pacing unit.
6. Confirm that pacer senses intrinsic cardiac activity by adjusting ECG size.
7. If no initial capture, increase current 10 mAmps every 10-15 seconds until capture or 200 mAmps (usually captures around 100 mAmps).
8. Check for femoral pulse once there is electrical capture.
9. If no capture occurs with maximum output, discontinue pacing and resume ACLS.

Complications

1. Ventricular fibrillation and ventricular tachycardia are rare complications, but follow appropriate protocols if either occur.
2. Muscle tremors may complicate evaluation of pulses; femoral pulse may be more accurate.
3. Pacing may cause diaphragmatic stimulation and apparent hiccups.

1110 PROCEDURE PROTOCOL: INTRAOSSEUS CATHETER PLACEMENT

EMT -IV ONLY	AEMT	EMT-I	Paramedic

Indications:

1. Rescue or primary vascular access device when peripheral IV access not obtainable in a patient with critical illness defined as any of the following:
    A. Cardiopulmonary arrest or impending arrest
    B. Profound shock with severe hypotension and poor perfusion
    C. Hypoglycemia with severe symptoms (e.g. unresponsive) and no venous access
2. Utilization of IO access for all other patients requires base station contact (**NOT** indicated for EMT-IV)

Technique:

1. Site of choice – typically proximal tibia. Other sites such as distal femur or humeral head may be considered based on clinical presentation if authorized by agency Medical Director after completion of appropriate training.
2. Clean skin per agency approved aseptic technique.
3. Place intraosseous needle perpendicular to the bone.
    A. For infants less than 6 months consider manual insertion of needle rather than powered device to avoid puncturing through both sides of the bone.
4. Follow manufacturer's guidelines specific to the device being used for insertion.
5. Entrance into the bone marrow is indicated by a sudden loss of resistance.
6. Flush line with 10 mL saline. Do not attempt to aspirate marrow
    A. IO infusion is very painful. If the patient is conscious, administer lidocaine for pain control **before** infusing fluids or medications.
7. Secure line
    A. Even if properly placed, the needle will not be secure. The needle must be secured and the IV tubing taped. The IO needle should be stabilized at all times.
8. Observe for signs of limb swelling, decreased perfusion to distal extremity that would indicate a malpositioned IO catheter or other complication. If limb becomes tense or malperfused, disconnect IO tubing immediately and leave IO in place.
9. A person should be assigned to monitor the IO at the scene and en route to the hospital.
10. Do not make more than one IO placement attempt per bone.
11. Do not remove IO needles in the field.
12. Notify hospital staff of all insertion sites/attempts.

Complications:

1. Fracture
2. Compartment syndrome
3. Infection

Contraindications:

1. Fracture of target bone
2. Cellulitis (skin infection overlying insertion site)
3. Osteogenesis imperfecta (rare condition predisposing to fractures with minimal trauma)
4. Total knee replacement (hardware will prevent placement)

Side Effects and Special Notes:

1. IO placement may be considered prior to peripheral IV attempts in critical patients without identifiable peripheral veins
2. Some authorities recommend aspiration of marrow fluid or tissue to confirm needle location. This is not recommended for field procedures, as it increases the risk of plugging the needle.
3. Expect flow rates to be slower than peripheral IVs. Pressure bags may be needed. Any drug or IV fluid may be infused.
4. Some manufacturers recommend the use of lidocaine for the treatment of pain associated with fluid administration. Check with your manufacturer and Medical Director for further guidance

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1120 PROCEDURE PROTOCOL: TOURNIQUET PROTOCOL

EMT	AEMT
EMT-I	Paramedic

Indications

A. A tourniquet should be used for initial control of life threatening hemorrhage.

Precautions

A. In cases of life-threatening bleeding, benefit of tourniquet use outweighs any theoretical risk of limb ischemia.
B. A commercially made tourniquet is the preferred tourniquet. If none is available, a blood pressure cuff inflated to a pressure sufficient to stop bleeding is an acceptable alternative.

Technique

A. First, attempt to control hemorrhage by using direct pressure over bleeding area.
B. If a discrete bleeding vessel can be identified, point pressure over bleeding vessel is more effective than a large bandage and diffuse pressure.
C. If unable to control hemorrhage using direct pressure, apply tourniquet according to manufacturer specifications and using the steps below:
    1. Cut away any clothing so that the tourniquet will be clearly visible. NEVER obscure a tourniquet with clothing or bandages.
    2. Apply tourniquet proximal to the wound and not across any joints.
    3. Tighten tourniquet until bleeding stops. Applying tourniquet too loosely will only increase blood loss by inhibiting venous return.
    4. If bleeding is not controlled with the application of a single tourniquet, a 2nd can be applied adjacent to the 1st.
    5. Mark the time and date of application on the patient's skin next to the tourniquet.
    6. Keep tourniquet on throughout hospital transport – a correctly applied tourniquet should only be removed by the receiving hospital.
    7. Pain management as needed.

1130 PROCEDURE PROTOCOL: RESTRAINT PROTOCOL

EMT	AEMT
EMT-I	Paramedic

Indications:

A. Physical restraint of patients is permissible and encouraged if the patient poses a danger to him/herself or to others. Only reasonable force is allowable, i.e., the minimum amount of force necessary to control the patient and prevent harm to the patient or others. Try alternative methods first. Verbal de-escalation should be used first if the situation allows.
B. Consider pharmacological sedation for agitated patients that require transport and are behaving in a manner that poses a threat to him/herself or others. See Agitated/Combative Patient Protocol
C. Restraints may be indicated for patients who meet the following criteria:
    1. A patient who is significantly impaired (e.g., intoxication, medical illness, injury, psychiatric condition, etc.) and lacks decision-making capacity regarding his or her own care.
    2. A patient who exhibits violent, combative, or uncooperative behavior who does not respond to verbal de-escalation.
    3. A patient who is suicidal and considered to be a risk for behavior dangerous to his or herself or to healthcare providers.
    4. A patient who is on a mental health hold if there is a concern for elopement.

Precautions:

A. When appropriate involve law enforcement, however, law enforcement never serves as medical control for EMS and cannot tell EMS to restrain a patient for their own purposes.
B. Restraints shall be used only when necessary to prevent a patient from seriously injuring him/herself or others (including the EMS providers), and only if safe transportation and treatment of the patient cannot be accomplished without restraints. They may not be used as punishment, or for the convenience of the crew.
C. Any attempt to restrain a patient involves risk to the patient and the prehospital provider. Efforts to restrain a patient should only be done with adequate assistance present.
D. Be sure to evaluate the patient adequately to determine his or her medical condition, mental status, and decision-making capacity.
E. Do not use hobble restraints and do not restrain the patient in the prone position or any position that impairs the airway or breathing.
F. Search the patient for weapons.
G. Handcuffs are not appropriate medical restraints and should only be placed by law enforcement personnel. See Transport of Handcuffed Patient Protocol.

Technique:

A. Be alert for any medical conditions which may ensue following physical struggle. Refer to Agitated/Combative protocol for appropriate assessment and treatment.
B. Treat the patient with respect. Attempts to verbally reassure or calm the patient should be done prior to the use of restraints. To the extent possible, explain what is being done and why.
C. Have all equipment and personnel ready (restraints, suction, a means to promptly remove restraints).
D. Use assistance such that, if possible, 1 rescuer handles each limb and 1 manages the head or supervises the application of restraints.
E. Apply restraints to the extent necessary to allow treatment of, and prevent injury to, the patient. **Under-restraint may place patient and provider at greater risk**.
F. After application of restraints, check all limbs for circulation. During the time that a patient is in restraints, continuous attention to the patient's airway, circulation and vital signs is mandatory. A restrained patient may never be left unattended.

Documentation

A. Document the following in all cases of restraint:
    1. Description of the facts justifying restraint
    2. Efforts to de-escalate prior to restraint
    3. Type of restraints used
    4. Condition of the patient while restrained, including reevaluations during transport
    5. Condition of the patient at the time of transfer of care to emergency department staff
    6. Any injury to patient or to EMS personnel

Approved by Denver Metro EMS Medical Directors July 1, 2022. Next review January 2023

1130 PROCEDURE PROTOCOL: RESTRAINT PROTOCOL

Complications:

A. Aspiration: continually monitor patient's airway
B. Nerve injury: assess neurovascular status of patient's limbs during transport
C. Complications of medical conditions associated with need for restraint
    1. Patients may have underlying trauma, hypoxia, hypoglycemia, hyperthermia, hypothermia, drug ingestion, intoxication, or other medical conditions
    2. Hyperactive delirium with severe agitation

1140 PROCEDURE PROTOCOL: OROGASTRIC TUBE INSERTION WITH ADVANCED AIRWAY

Paramedic

Indications:

- Gastric decompression in the intubated patient
- Gastric decompression with placement of supraglottic airway
- Intended for agencies with prolonged transport times in situations where time and conditions allow gastric decompression without interruption of routine care

Contraindications:

- Known esophageal varices

Technique:

1. Determine length of tube for insertion. Measure from tip of nose, to earlobe, then down to xiphoid process
2. Liberally lubricate the distal end of the orogastric tube
3. Suction airway and pre-oxygenate with BVM ventilations, if possible
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 supraglottic airway, 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. Aspirate gastric contents to confirm proper placement.
6. Secure with tape to inserted airway and attach to low continuous suction if indicated

1150 PROCEDURE PROTOCOL: TASER® PROBE REMOVAL

EMT	AEMT
EMT-I	Paramedic

Indications

- Patient with TASER® probe(s) embedded in skin.

Contraindications

- TASER® probe embedded in the eye, genitals, or close to major neurovascular structures. In such cases, transport patient to an emergency department for removal.

Technique

1. Be alert for any medical conditions which may ensue following physical struggle. Refer to agitate/combative protocol for appropriate assessment and treatment.
2. Confirm the TASER® has been shut off and the barb cartridge has been disconnected.
3. Using a pair of shears cut the TASER® wires at the base of the probe.
4. Place one hand on the patient in area where the probe is embedded and stabilize the skin surrounding the puncture site. Using the other hand (or use pliers) firmly grasp the probe.
5. 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.
6. Repeat the process for any additional probes.
7. 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.
8. Cleanse the probe site and surrounding skin and apply sterile dressing.
9. Advise patient to watch for signs of infection including increased pain at the site, redness swelling or fever.

1160 PROCEDURE PROTOCOL: PAIN MANAGEMENT

Goal of Pain Management

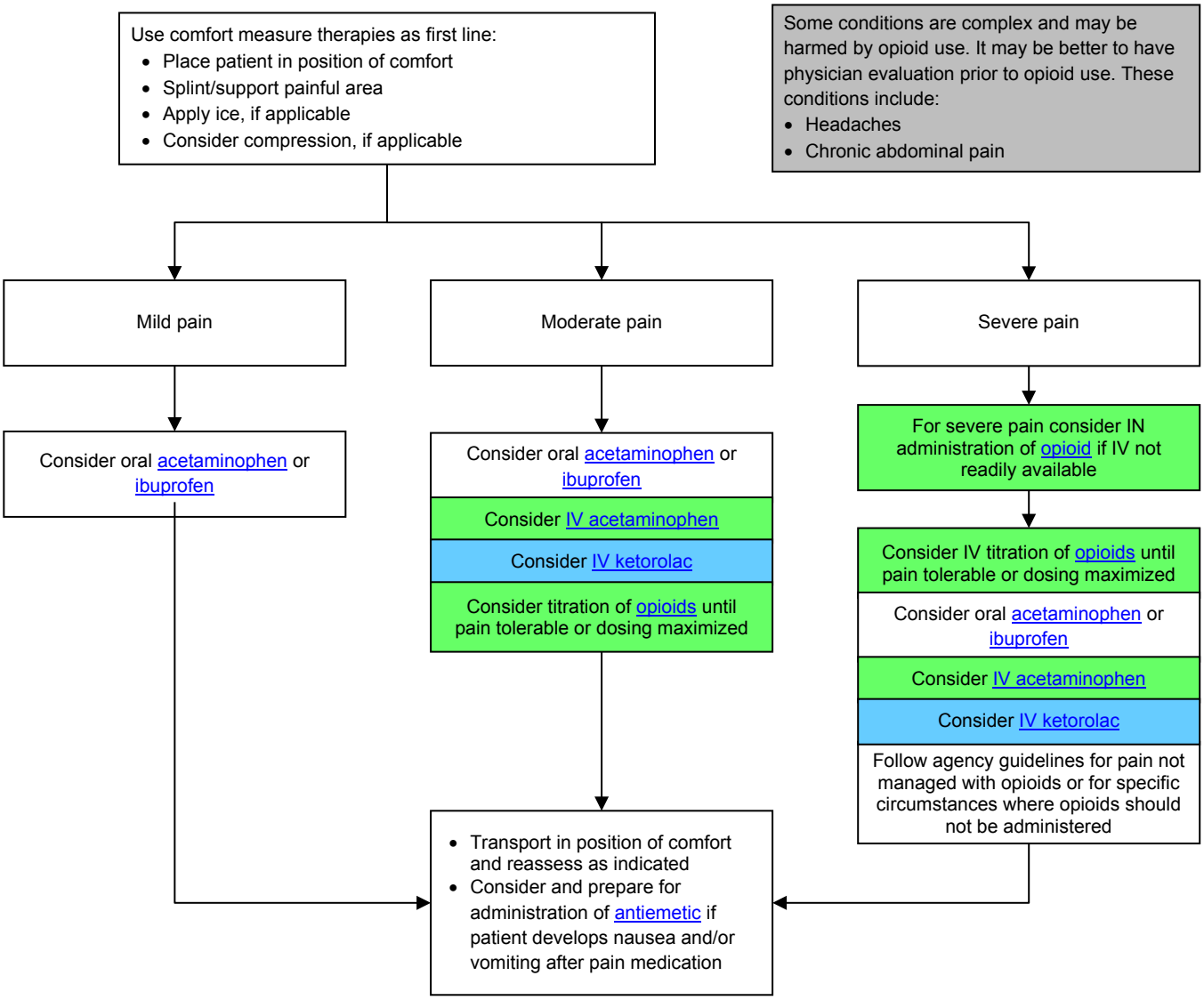
EMT	AEMT
EMT-I	Paramedic

A. Use comfort measure therapies as first line.
B. If used, medications should be administered to a point where pain is tolerable. This point is not necessarily pain free.

Assessment

A. Determine patient's pain assessment and consider using a pain scale:
   1. Pediatric use observational scale (see Pediatric Pain Scales)
   2. Adult Self-report scale (Numeric Rating Scale [NRS])
B. Categorize the assessment of pain to mild, moderate, or severe.
   1. Overreliance on pain scores may lead to either inadequate pain control in stoic patients, or over sedation in patients reporting high levels of pain. Use subjective and objective findings to evaluate need for and efficacy of pain management.
   2. For pediatric patients, pain scale use is recommended. A pain score of 0-3 is mild pain, scores from 4-6 moderate pain, and 7-10 severe pain.

General Pain Management Technique



General Information

A. Document assessment or pain scale before and after administration of pain medications. Reassess pain 5 minutes after IV administration.
B. Multi-modal analgesia is reasonable with goal of avoiding combinations of sedating agents reducing the overall need for opiates. It is safe to combine acetaminophen or NSAIDS with opioids or other sedating agents.
C. Strongly consider ½ typical dosing in the elderly or frail patient

Pediatric Pain Scales

Faces, Legs, Activity, Cry, Consolability (FLACC) Behavioral Scale

Appropriate age for use (per guideline): less than 4 years

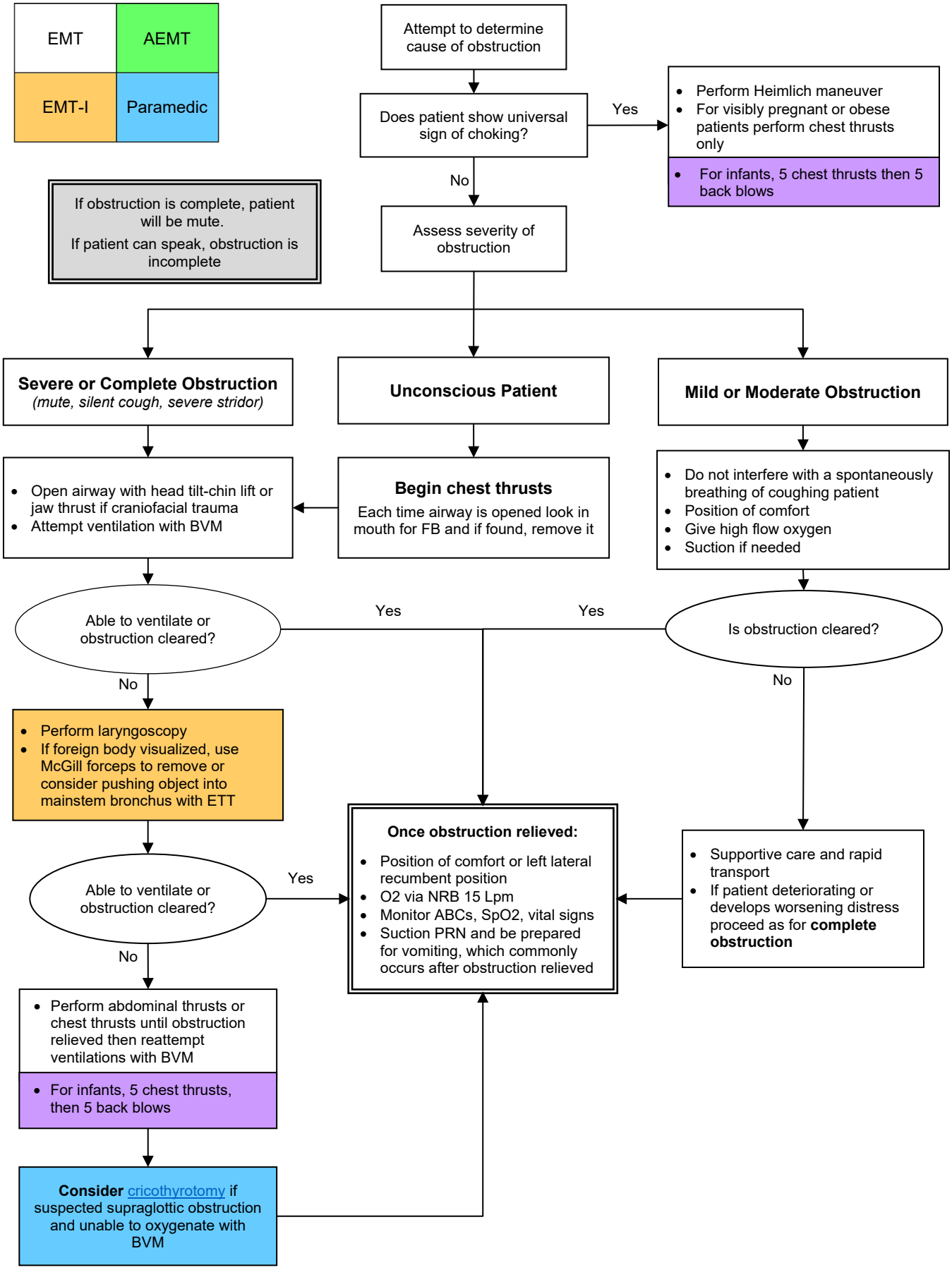
Categories	Scoring		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to, distractible	Difficult to console or comfort
Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0-2, which results in a total score between zero and ten.			

Recommended Pain Scale for Ages 4-12 Years

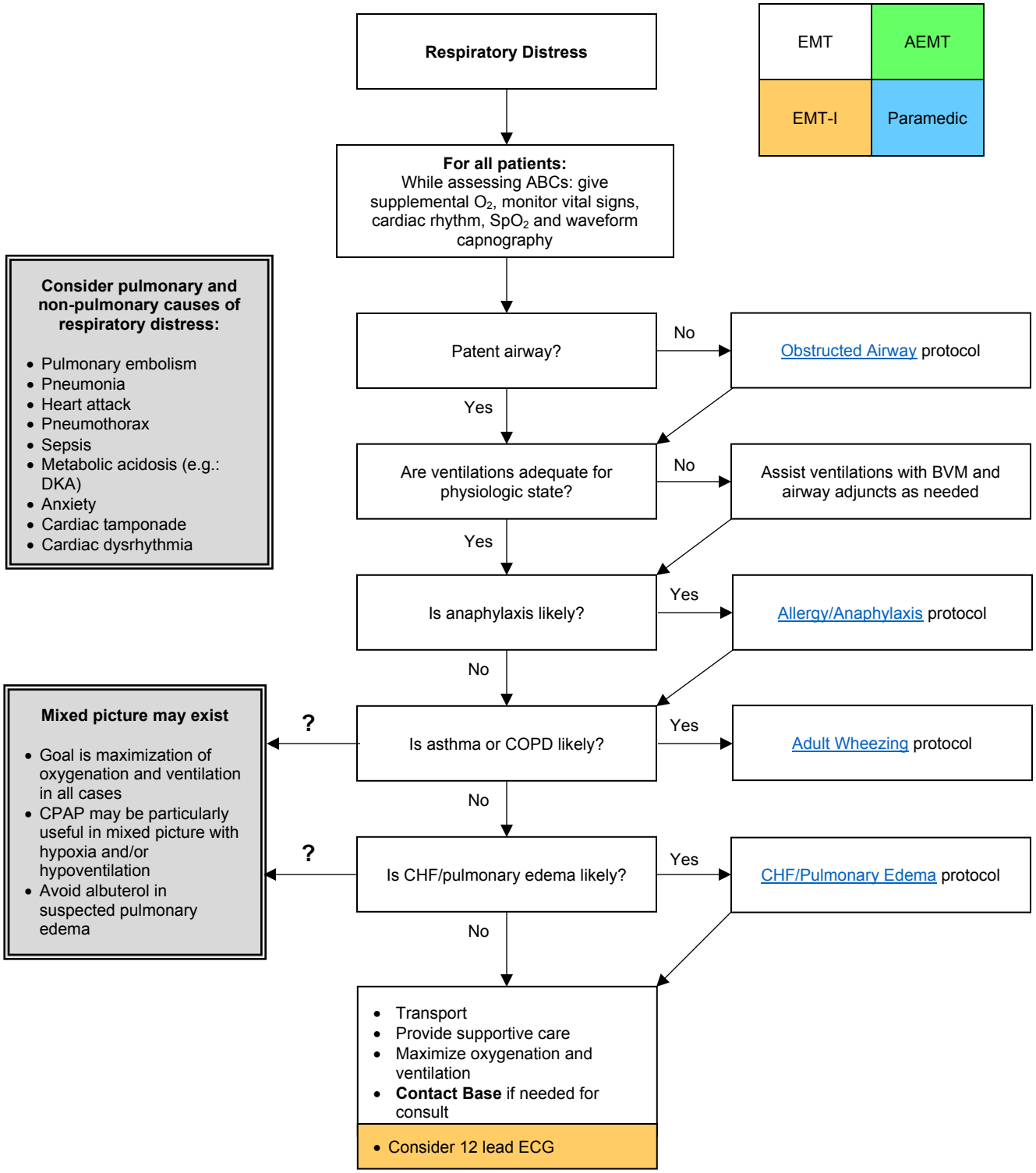
Faces Pain Scale – Revised (FPS-R)

0 2 4 6 8 10

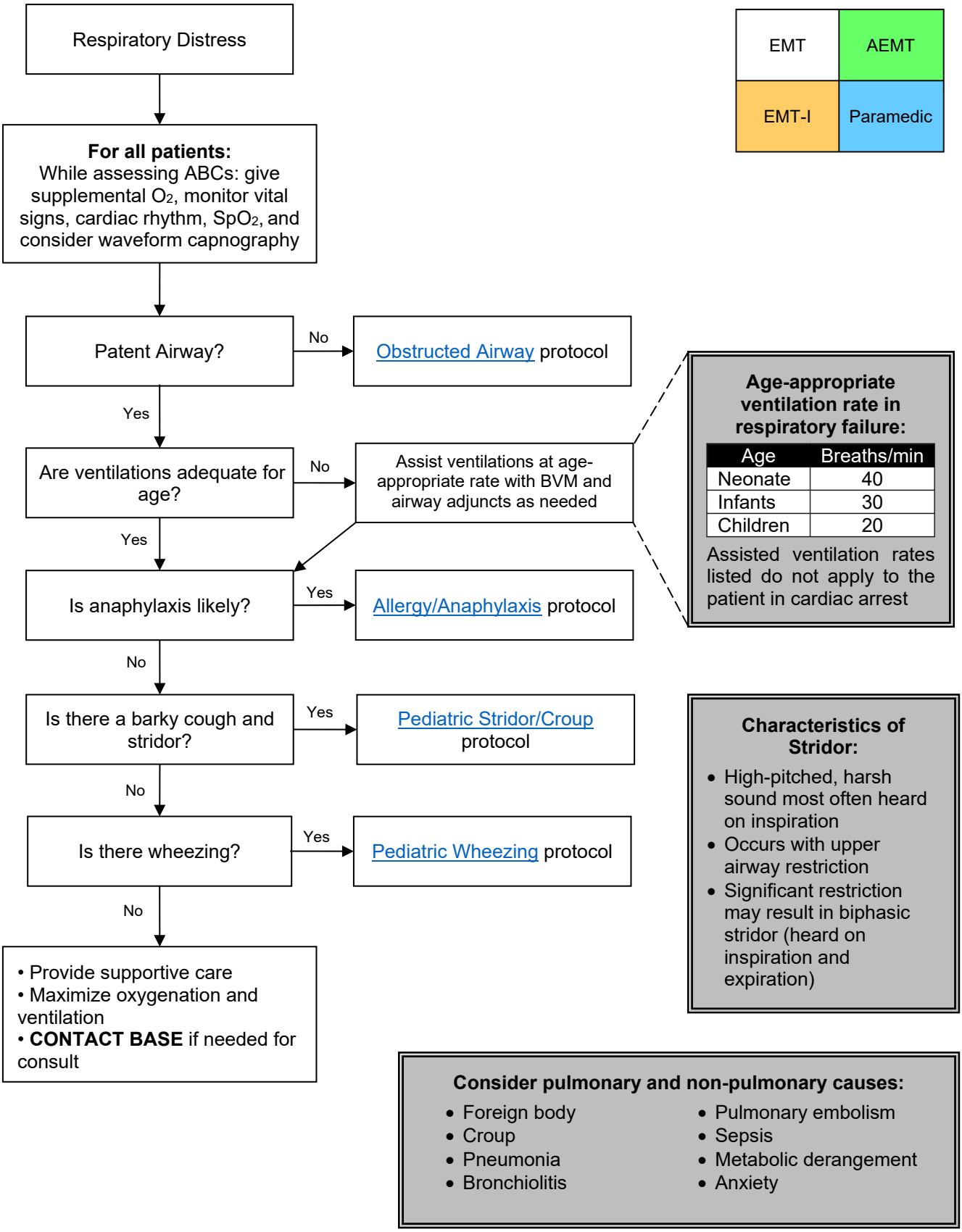
2000 OBSTRUCTED AIRWAY



2010 ADULT UNIVERSAL RESPIRATORY DISTRESS



2020 PEDIATRIC UNIVERSAL RESPIRATORY DISTRESS



2030 ADULT WHEEZING

Presentation suggests Bronchospasm: *wheezing, prolonged expiratory phase, decreased breath sounds, accessory muscle use, known hx of asthma/COPD*

→ Adult Respiratory Distress Protocol and prepare for immediate transport

EMT	AEMT
EMT-I	Paramedic

Therapeutic Goals:

- Maximize oxygenation
- Decrease work of breathing
- Identify cardiac ischemia (Obtain 12 lead EKG)
- Identify complications, e.g., pneumothorax

Give oxygen, check SpO_2, waveform capnography, & consider IV for severe respiratory distress

Give nebulized albuterol + ipratropium

May give continuous neb for severe respiratory distress

Consider pulmonary and non-pulmonary causes of respiratory distress:

Examples: pulmonary embolism, pneumonia, pulmonary edema, anaphylaxis, heart attack, pneumothorax, sepsis, metabolic acidosis (e.g.: DKA), Anxiety

Yes ← Is response to treatment adequate?

No ↓

- Reassess for pneumothorax
- Consider CPAP early, especially in COPD
- If CPAP contraindicated, ventilate with BVM, and consider advanced airway

- IV methylprednisolone
- Obtain ECG: rule out unstable rhythm, ACS

IV **methylprednisolone** will help resolve acute asthma exacerbation over hours, without immediate effect. In severe exacerbations, it may be given prehospital but should not be given for mild attacks responding well to bronchodilators

COPD

- **Correct hypoxia**: do not withhold maximum oxygen for fear of CO_2 retention
- Patients with COPD are older and have comorbidities, including heart disease.
- Wheezing may be a presentation of pulmonary edema, "cardiac asthma"
- Common triggers for COPD exacerbations include Infection, dysrhythmia (e.g., atrial fibrillation), myocardial ischemia
- **COPD exacerbations are particularly responsive to CPAP, which may help avoid the need for intubation and should be considered early in treatment**

Yes ← Is response to treatment adequate?

No ↓

- Consider IM epinephrine. Indicated **only** if no response to neb, CPAP and for patient in severe distress. Use with caution if any concern for myocardial ischemia or known coronary artery disease.

- Consider IV magnesium

IM **epinephrine** is only indicated for most severe attacks deemed life-threatening and not responding to inhaled bronchodilators. Use extreme caution when administering. Cardiopulmonary monitoring is mandatory

IV **magnesium** may be beneficial in some patients with severe attacks. It should not be given routinely, rather should be reserved for life-threatening asthma attacks not responding to conventional therapy

- Continue monitoring and assessment en-route
- Be prepared to assist ventilations as needed
- Contact base for medical consult as needed

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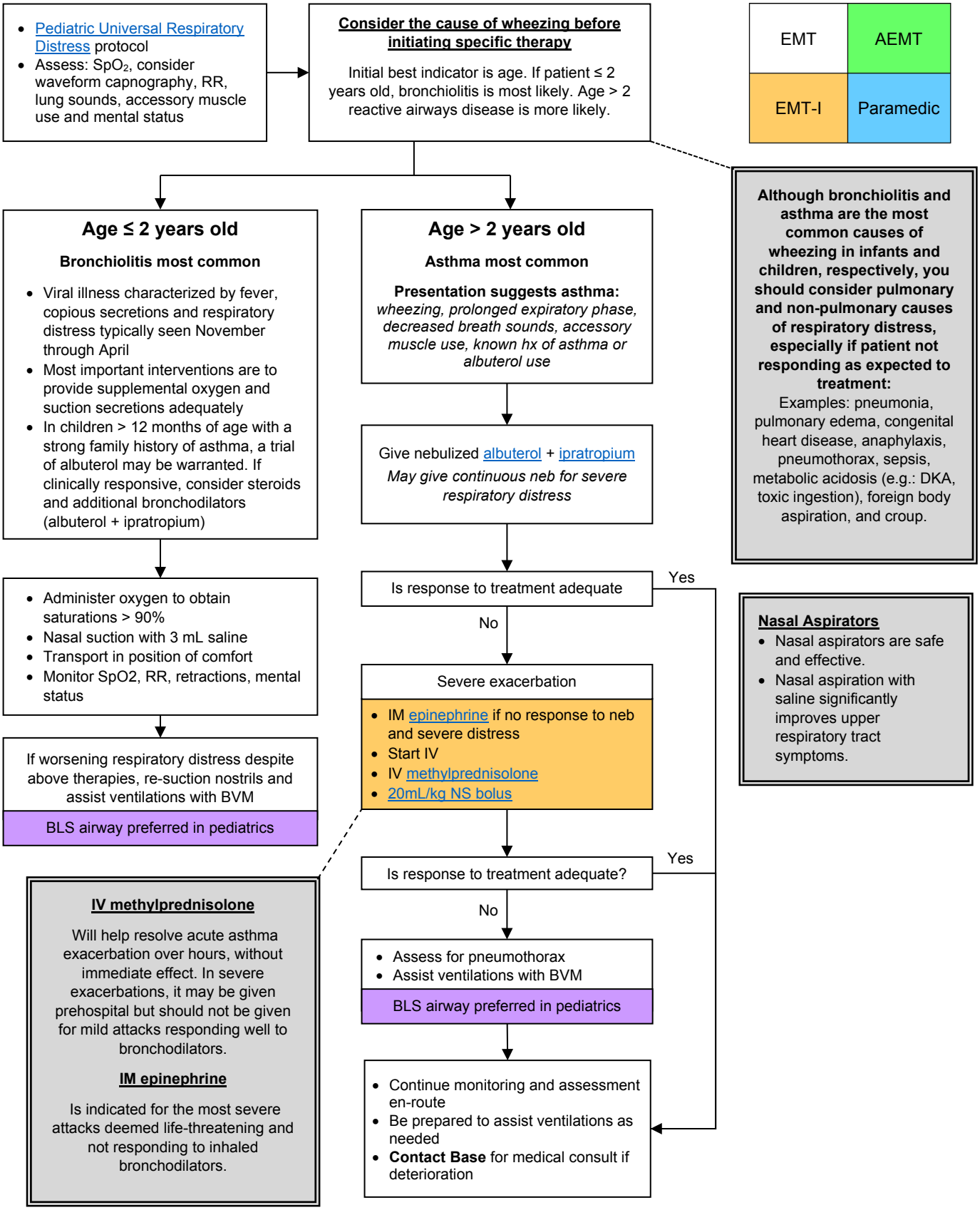
2040 PEDIATRIC WHEEZING



Approved by Denver Metro EMS Medical Directors July 1, 2022. Next review January 2023

2050 PEDIATRIC STRIDOR/CROUP

Characteristics of Croup:

- Most common cause of stridor in children
- Child will have stridor, barky cough, and URI symptoms of sudden, often nocturnal onset
- Most often seen in children < 9 years old
- Agitation worsens the stridor and respiratory distress

Pediatric Universal Respiratory Distress protocol and prepare for immediate transport

Minimize agitation:
Transport in position of comfort, interventions only as necessary

Check SpO_2, give oxygen as needed

Are symptoms severe and croup most likely?

- Stridor at rest or biphasic stridor
- Severe retractions
- SpO_2 < 90% despite O_2
- Altered LOC
- Cyanosis

No

Yes

Give nebulized epinephrine

If signs of poor perfusion AND/OR hypotension for age, see Medical Shock protocol and begin fluid resuscitation

- Continue monitoring and assessment en route
- **Contact Base** for repeat dose of nebulized epinephrine and medical consult as needed

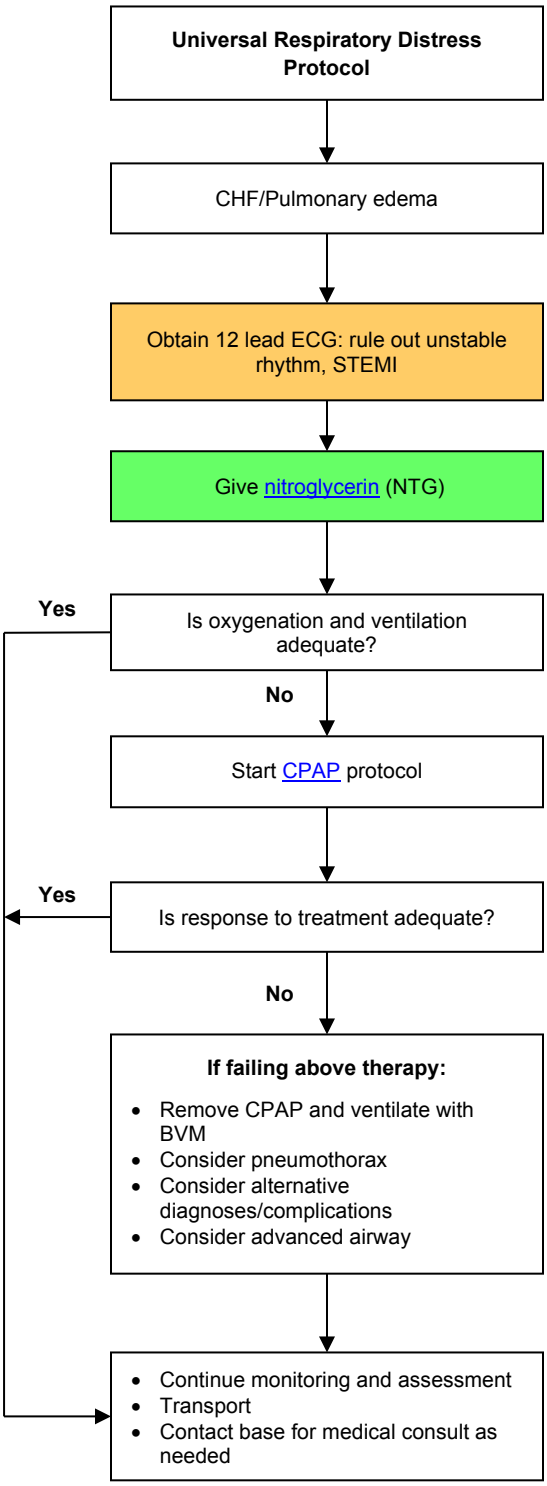
EMT	AEMT
EMT-I	Paramedic

Considerations with Stridor:

- Stridor is a harsh, usually inspiratory sound caused by narrowing or obstruction of the upper airway
- Causes include croup, foreign body aspiration, allergic reactions, trauma, infection, mass
- Epiglottitis is exceedingly rare. May consider in the unimmunized child. Treatment is minimization of agitation. Airway manipulation is best done in the hospital.

2060 CHF/PULMONARY EDEMA

EMT	AEMT
EMT-I	Paramedic



Therapeutic Goals:

- Maximize oxygenation
- Decrease work of breathing
- Identify cardiac ischemia (Obtain 12 lead ECG)

Special Notes:

- In general diuretics have little role in initial treatment of acute pulmonary edema and are no longer considered first line therapy.
- Morphine has been associated with worse outcomes in patients with CHF and is no longer indicated

COVID-19 SCREENING, TREATMENT, and TRANSPORT

COLORADO
Health Facilities & Emergency Medical Services Division
Department of Public Health & Environment

Dispatch should utilize screening methods to identify patients at risk of COVID-19 which may include but not limited to screening criteria questions, the EMD Emerging Infectious Disease (EID) Surveillance tool, telehealth, or other mechanisms and notify responding services. With widespread community COVID-19 transmission, epidemic/pandemic EMD protocols may be developed for determination of triage and response.

Negative Screen

Do not rely solely on EMD personnel to identify a potential exposure patient:

- EMD may be constrained by time and caller information
- From a distance of at least 6 feet, obtain your own history and assess for clinical signs and symptoms
- Limit the number of providers to only those necessary for care
- High risk patients include history of close contact with a known or suspected COVID 19 infected person or recent travel to an affected geographic region within the last 14 days. However, this **CAN NOT** be used to exclude the possibility of COVID 19 illness given outbreak of cases in Colorado

Screening criteria - Does the patient have?

Fever (subjective or measured)
AND/OR
Symptoms of a Respiratory Illness or Diarrhea
(Cough, sore throat,difficulty breathing)

NO → Exit to Appropriate Protocol(s)

YES

Positive Screen

- One provider enters in full PPE and assesses the need for additional resources
- If the patient can self-apply a mask, give him/her one from a distance. Otherwise, place a mask on the patient once provider has full PPE in place

PERSONAL PROTECTIVE EQUIPMENT

Utilize standard, contact, droplet, and airborne precautions:

- Eye protection (goggles or face shield)
- N95 respirator mask or higher alternatives (N100, PAPR, half-mask, etc.)
- Gloves
- Isolation gown
- Maintain at least 6 ft of distance from the patient until above PPE is donned
- Place surgical mask on the patient
- Avoid Aerosol Generating Procedures (AGPs) such as suctioning, CPAP, BVM, advanced airway management, and nebulized medications unless patient presents with respiratory failure. If AGPs are utilized, a face shield or PAPR is recommended
- If supply of N95 or alternative is critically low, agency policy may dictate use of surgical mask unless performing AGPs

TREATMENT AND TRANSPORT DECISION

- Treatment as per standard respiratory protocols with consideration to avoid AGPs as above. Consider IM epinephrine and IV magnesium instead of nebs for treatment of severe asthma exacerbation from COVID19
- Transport decisions will need to be made on a case-by-case basis.
- Agencies may need to consider treatment in place, transport to alternative destinations, or non-transport. These decisions will be at the discretion of the transporting agency's medical director.

RECEIVING FACILITY NOTIFICATION

Notify the receiving facility as soon as possible to allow for room and equipment preparation. Remain in the ambulance bay until escorted to a room by facility staff.

Links for COVID-19 Information

- CDC: https://www.cdc.gov/coronavirus/2019-ncov/index.html
- State of Colorado: https://covid19.colorado.gov
- Colorado EMS Google Drive: https://drive.google.com/drive/folders/1k6ut0mw4rlGf3xr3f433xolmDwtkeqww

Individual agency policy and procedures apply, and providers are responsible for knowing and following those policies. This protocol is not intended to replace any existing agency specific guidelines provided by the EMS agency, Medical Director, or receiving facilities.

Updated 3/23/2020

COLORADO
Health Facilities & Emergency Medical Services Division
Department of Public Health & Environment

COVID-19 NON-TRANSPORT PROTOCOL

Purpose

A. Identify patients that are safe to not transport to a hospital during widespread cases of confirmed COVID-19 patients in order to accomplish the following:
   a. Minimize disease transmission to the community
   b. Protect first responders and healthcare personnel
   c. Preserve healthcare system functioning when the system is overwhelmed.

Individual agency policy and procedures apply, and providers are responsible for knowing and following those policies. This protocol is not intended to replace any existing agency specific guidelines provided by the EMS agency, Medical Director, or receiving facilities.

Indications for Non-Transport

A. EMS agency Medical Direction has decided to enact non-transport guidelines based on local indications that the healthcare system infrastructure is overwhelmed. This may include, but is not limited to, one of the following circumstances:
   a. Hospitals are exceeding maximum census
   b. Hospitals and facilities are experiencing significant overcrowding
   c. Hospitals and first response agencies have enacted surge plans
   d. Healthcare providers are unable to obtain required personal protective equipment (PPE) to prevent transmission of disease.

Assessment Algorithm for Non-Transport

Initial Assessment:
- Refer to COVID-19 screening protocol for initial encounter guidance
- Initial assessment should begin from a distance of at least 6 feet from the patient and be limited to one EMS provider if possible.

↓

Inclusion Criteria for Non-Transport:
- Age < 60 years old
- History of fever with symptoms of viral syndrome illness (cough, nasal/chest congestion, sore throat, body aches)
- **Vital signs:** (or normal for age for pediatric patients)
  - Respiratory Rate > 8 or < 20
  - O2 Saturation > 90%
  - Heart Rate < 100 bpm
  - Systolic BP at least 100
  - GCS 15
- **Absence of** shortness of breath with activity, respiratory distress, syncope, cyanosis, diaphoresis, and chest pain other than mild pain with coughing
- Patient has intact decision-making capacity

No → Proceed with standard medical treatment protocols

Yes to all ↓

Non-Transport Disposition:
- The patient has a support system
- EMS provides notice to local public health authorities in a timely manner
- Patient should be followed up by local public health authorities, pre-hospital/out-of hospital services, or other health care services
- Contact medical control if patient refuses non-transport

Patient guidance for EMS return precautions depending on system's ability to respond:

Severe shortness of breath, confusion or alteration of mental status, syncope, moderate to severe chest pain, inability to tolerate food or liquids, skin cyanosis

Updated 3/16/2020

2090 TRACHEOSTOMY EMERGENCIES

Adult or Pediatric Universal Respiratory Distress Protocol

EMT	AEMT	EMT-I	Paramedic

Tracheostomy in Place

Attempt repositioning and supplemental oxygen

If gurgling, rhonchi, or mucous present:

- Preoxygenate with 3-5 BVM breaths
- If inner cannula present, remove while stabilizing tracheostomy flange
- Measure suction catheter to length of inner cannula (generally 3-6 cm)
- Instill 1-2 mL saline and suction for ≤10 seconds
- Replace inner cannula if removed
- Begin ventilations with supplemental oxygen through tracheostomy

If patient still has signs of inadequate oxygenation and ventilation:

- Remove tracheostomy, deflating cuff if needed
- If patient has additional tracheostomy tubes readily available, gently insert the same size tracheostomy tube with the obturator in place. Do not force the tube.
- If the tracheostomy tube cannot be inserted easily, withdraw the tube, and attempt to pass a smaller size tracheostomy tube, if available.
- If smaller tracheostomy tube is not available, or cannot be inserted easily, place ETT in stoma if trach is mature (at least 6 weeks old) and advance until balloon is within trachea
- Confirm placement by continuous waveform capnography, presence, and symmetry of breath sounds, and rising SpO_2

Tracheostomy Removed

- Attempt to replace the tracheostomy tube if trach is mature (at least 6 weeks old)
- If the tracheostomy tube cannot be inserted easily, withdraw the tube, and attempt to pass a smaller size tracheostomy tube, if available.
- If smaller tracheostomy tube is not available, or cannot be inserted easily, place ETT in stoma if trach is mature (at least 6 weeks old) and advance until balloon is within trachea
- Confirm placement by continuous waveform capnography, presence, and symmetry of breath sounds, and rising SpO_2

If unable to place tube and patient hypoxic or in respiratory distress, begin BVM over nose and mouth and occlude the stoma with a gloved finger.

If unable to oxygenate or ventilate, attempt to place advanced airway through mouth and occlude stoma with gloved finger.

If oral ETI is performed, advance ETT balloon below level of stoma

- Transport in position of comfort and monitor
- Reassess for signs of deterioration
- Provide oxygen and ventilator support as needed
- Contact Base if patient is not improving with treatment

ETT Recommended Sizes – Length Based

- Color Pink to Blue (Newborn to <7 years): 3.5 cuffed
- Color Orange to Adult (7 years and up): 6.0 cuffed

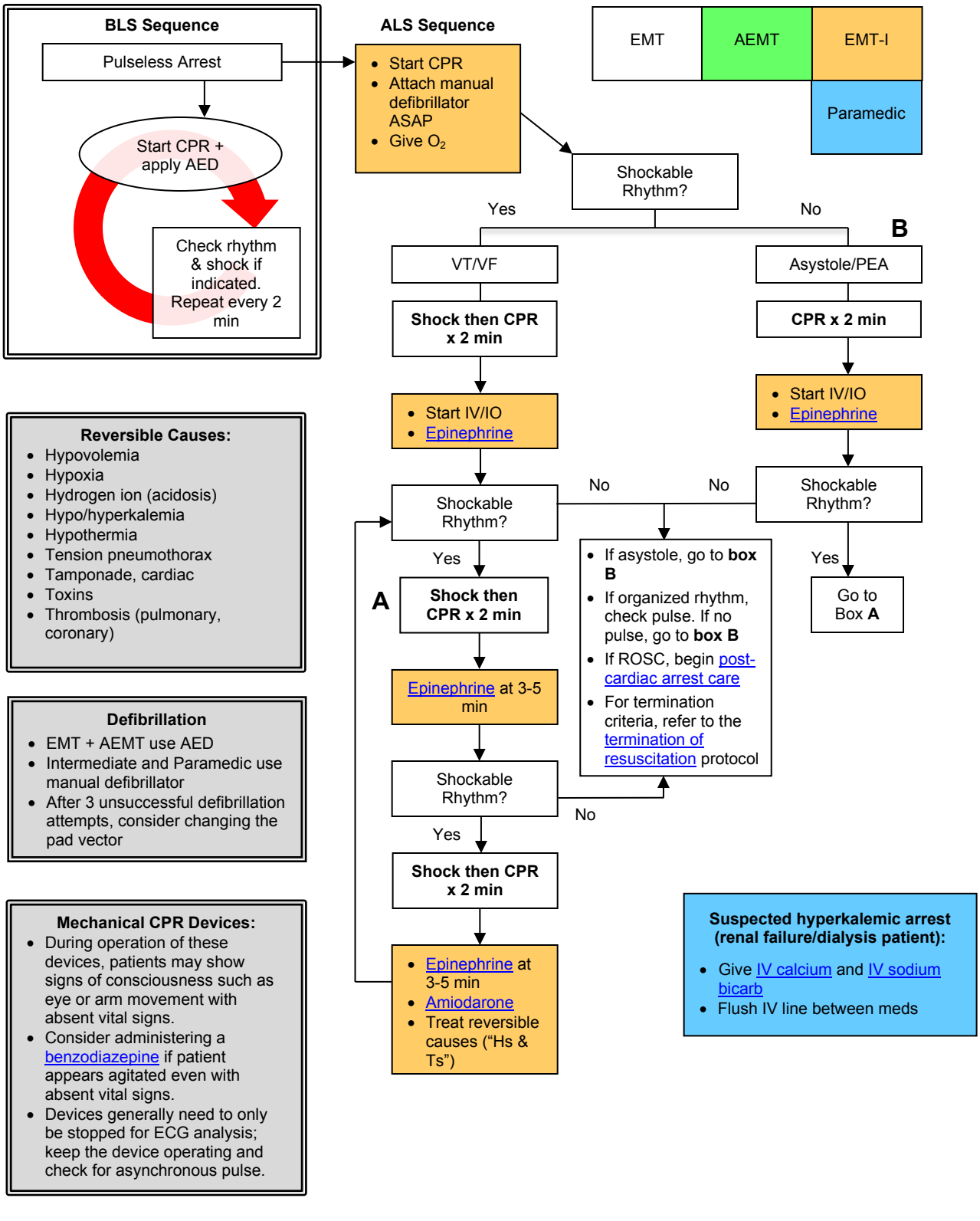
Stomas <6 weeks old

- An established tracheostomy is a tracheostomy that was surgically placed longer than 6 weeks ago. Never replace anything into a stoma that is less than 6 weeks of age.
- For stomas <6 weeks old, if patient has an upper airway, occlude stoma and BVM via traditional method. If patient does not have an upper airway, use neonate mask over stoma site.

- Always utilize family members, both for information and for assistance
- Types of tracheostomies include cuffed, uncuffed, fenestrated (allowing for speech), and unfenestrated
- Ask if family has a suction catheter and use theirs if available to ensure appropriate size. If none available, inquire as to size. If size unknown, estimate by doubling the inner diameter of the tracheostomy tube and rounding down to the available size catheter
- Never force suction catheter. When inserting, allow catheter to gently follow the curvature of the tracheostomy
- If tracheostomy tube is a double lumen tube, the inner cannula must be in place to attach the bag-valve-mask. Remove the inner cannula to suction and then re-insert. If outer flange becomes removed, it requires a Paramedic to replace.
- Apply suction only while withdrawing catheter from the tracheostomy tube, never during insertion and always <100mmHg of suction

Approved by Denver Metro EMS Medical Directors July 1, 2022. Next review January 2023

3000 MEDICAL PULSELESS ARREST ALGORITHM



3010 MEDICAL PULSELESS ARREST CONSIDERATIONS

ADULT PATIENT

Compressions

- Follow current ACLS guidelines for chest compressions.
- Minimize interruptions, resume compressions immediately after shocks, rhythm checks. Check pulses only if organized rhythm.
- Push hard and fast and allow complete chest recoil.
- Assess quality of CPR with continuous waveform capnography.
- If $ETCO_2$ < 10, improve quality of compressions.
- If using automated CPR devices, use manufacturer's specifications.

Defibrillation

- Biphasic: manufacturer recommendation. If unknown, use maximum energy.
- Monophasic: 360 J
- After 3 unsuccessful defibrillation attempts, consider changing the pad vector.

Ventilations

- Open the airway, place NPA/OPA, place NRB facemask with O_2 at 15 L/min for first 4 minutes of chest compressions, unless hypoxic arrest suspected (e.g.: asphyxiation, overdose, status asthmaticus), In which case begin ventilations immediately.
- Do not over ventilate.
- If no advanced airway, 30:2 compressions to ventilation ratio.
- If advanced airway in place ventilate at rate of 10 breaths/min.

Airway

- An advanced airway (supraglottic airway, ETT) may be placed at any time after initial 4 minutes of passive oxygenation, if applicable, or as soon as possible if asphyxial arrest suspected, provided placement does not interrupt compressions.

ROSC

- Pulse and blood pressure.
- Sustained abrupt rise in $ETCO_2$, typically > 40 mmHg.
- Obtain 12-lead ECG after ROSC and before transport to identify STEMI alert.

PEDIATRIC PATIENT

Compressions

- Follow current PALS guidelines for chest compressions.
- Minimize interruptions, resume compressions immediately after shocks, rhythm checks. Check pulses only if organized rhythm.
- Push hard (≥ 1/3 of anteroposterior chest diameter and fast (100-120/min) and allow complete chest recoil.
- Assess quality of CPR with continuous waveform capnography.

Defibrillation:

- 1st shock 2 J/kg, subsequent shocks 4 J/kg
- EMT + AEMT use AED.
- Intermediate and Paramedic use manual defibrillator.

Ventilations

- If no advanced airway, alternate ventilations and compressions in 15:2 ratio.
- If advanced airway in place, ventilate continuously at 10 breaths/minute.
- Do not over ventilate.

Airway

- No intubation for cardiac arrest <12 years old.
- BVM preferred for all pediatric patients.
- An appropriately sized supraglottic airway may be placed as an alternative if BVM ventilations are inadequate.

Medications

- Attempt to administer the initial dose of epinephrine within 5 minutes from the start of chest compressions or after arrival of ALS provider.

ROSC

- Pulse and blood pressure.
- Sustained abrupt rise in $ETCO_2$, typically > 40 mmHg.

Regarding where to work arrest and presence of family members:

- Manual CPR in a moving ambulance or pram is suboptimal.
- In general, work cardiac arrest on scene either to return of spontaneous circulation (ROSC), or to field pronouncement, unless scene unsafe.
- Family presence during resuscitation is preferred by most families, is rarely disruptive, and may help with grieving process for family members. Family presence during resuscitation is recommended, unless disruptive to resuscitation efforts.
- Contact base for consideration of termination of resuscitation.

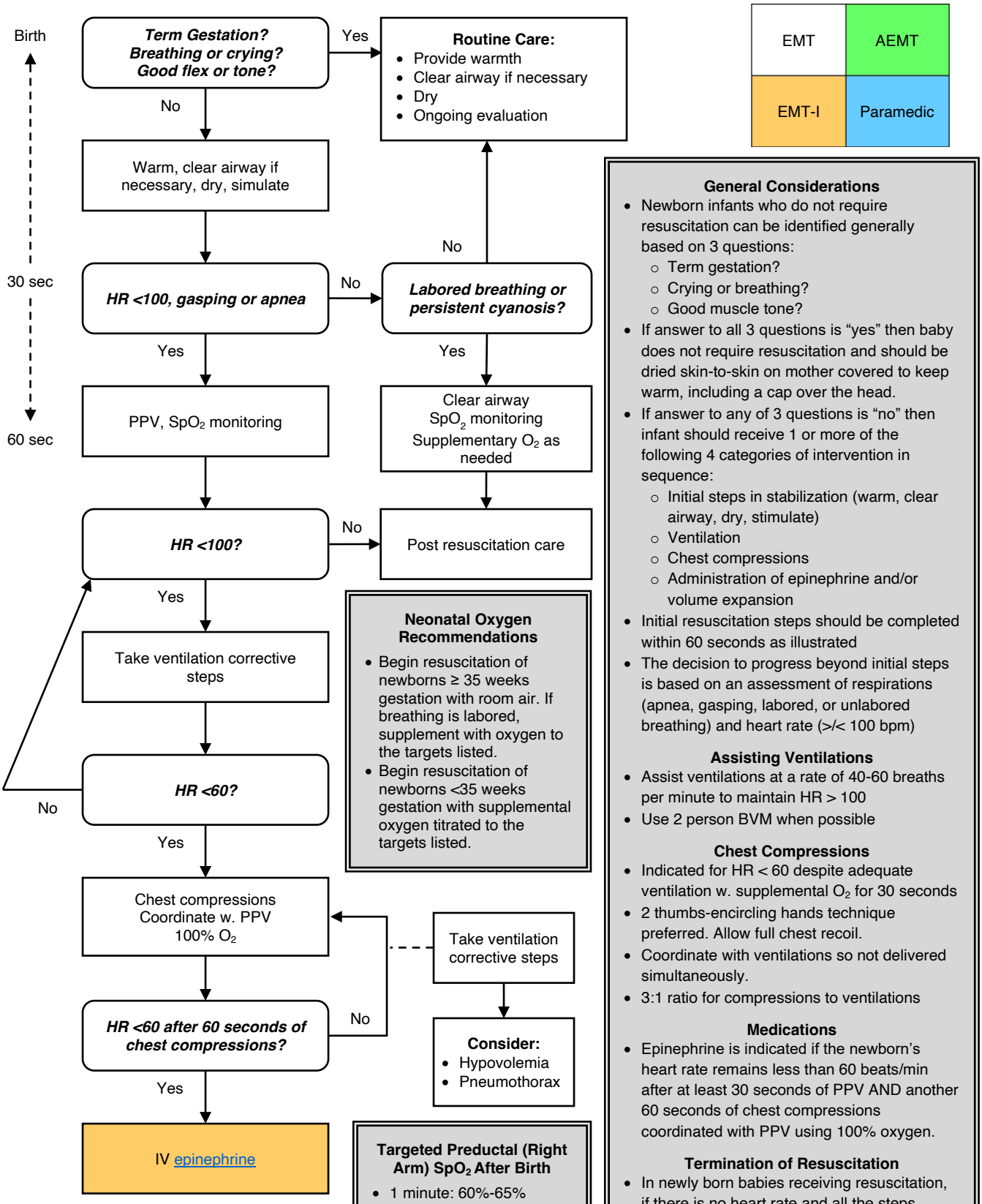
Pacing

- Pacing is not recommended in cardiac arrest.

ICD/Pacemaker patients

- If cardiac arrest patient has an implantable cardioverter defibrillator (ICD) or pacemaker: place pacer/defib pads at least 1 inch from device. Biaxillary or anterior posterior pad placement may be used.

3020 NEONATAL RESUSCITATION



Neonatal Oxygen Recommendations

- Begin resuscitation of newborns ≥ 35 weeks gestation with room air. If breathing is labored, supplement with oxygen to the targets listed.
- Begin resuscitation of newborns <35 weeks gestation with supplemental oxygen titrated to the targets listed.

Targeted Preductal (Right Arm) SpO_2 After Birth

- 1 minute: 60%-65%
- 3 minutes: 60%-75%
- 5 minutes: 80%-85%
- 10 minutes: 85%-95%

General Considerations

- Newborn infants who do not require resuscitation can be identified generally based on 3 questions:
  - Term gestation?
  - Crying or breathing?
  - Good muscle tone?
- If answer to all 3 questions is "yes" then baby does not require resuscitation and should be dried skin-to-skin on mother covered to keep warm, including a cap over the head.
- If answer to any of 3 questions is "no" then infant should receive 1 or more of the following 4 categories of intervention in sequence:
  - Initial steps in stabilization (warm, clear airway, dry, stimulate)
  - Ventilation
  - Chest compressions
  - Administration of epinephrine and/or volume expansion
- Initial resuscitation steps should be completed within 60 seconds as illustrated
- The decision to progress beyond initial steps is based on an assessment of respirations (apnea, gasping, labored, or unlabored breathing) and heart rate (>/< 100 bpm)

Assisting Ventilations

- Assist ventilations at a rate of 40-60 breaths per minute to maintain HR > 100
- Use 2 person BVM when possible

Chest Compressions

- Indicated for HR < 60 despite adequate ventilation w. supplemental O_2 for 30 seconds
- 2 thumbs-encircling hands technique preferred. Allow full chest recoil.
- Coordinate with ventilations so not delivered simultaneously.
- 3:1 ratio for compressions to ventilations

Medications

- Epinephrine is indicated if the newborn's heart rate remains less than 60 beats/min after at least 30 seconds of PPV AND another 60 seconds of chest compressions coordinated with PPV using 100% oxygen.

Termination of Resuscitation

- In newly born babies receiving resuscitation, if there is no heart rate and all the steps of resuscitation have been performed, cessation of resuscitation efforts may be discussed with the team and the family. A reasonable time frame for this change in goals of care are around 30 min after birth.

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3030 POST-CARDIAC ARREST CARE

Post-Cardiac Arrest Care

- Following ROSC, several simultaneous and stepwise interventions must be performed to optimize care and maximize patient outcome
- Survival and neurologic outcome worsen with fever, hypoxia, hypo/hypercapnia, and hypotension. Post-ROSC care should focus on prevention of these elements

Return of spontaneous circulation (ROSC) criteria:

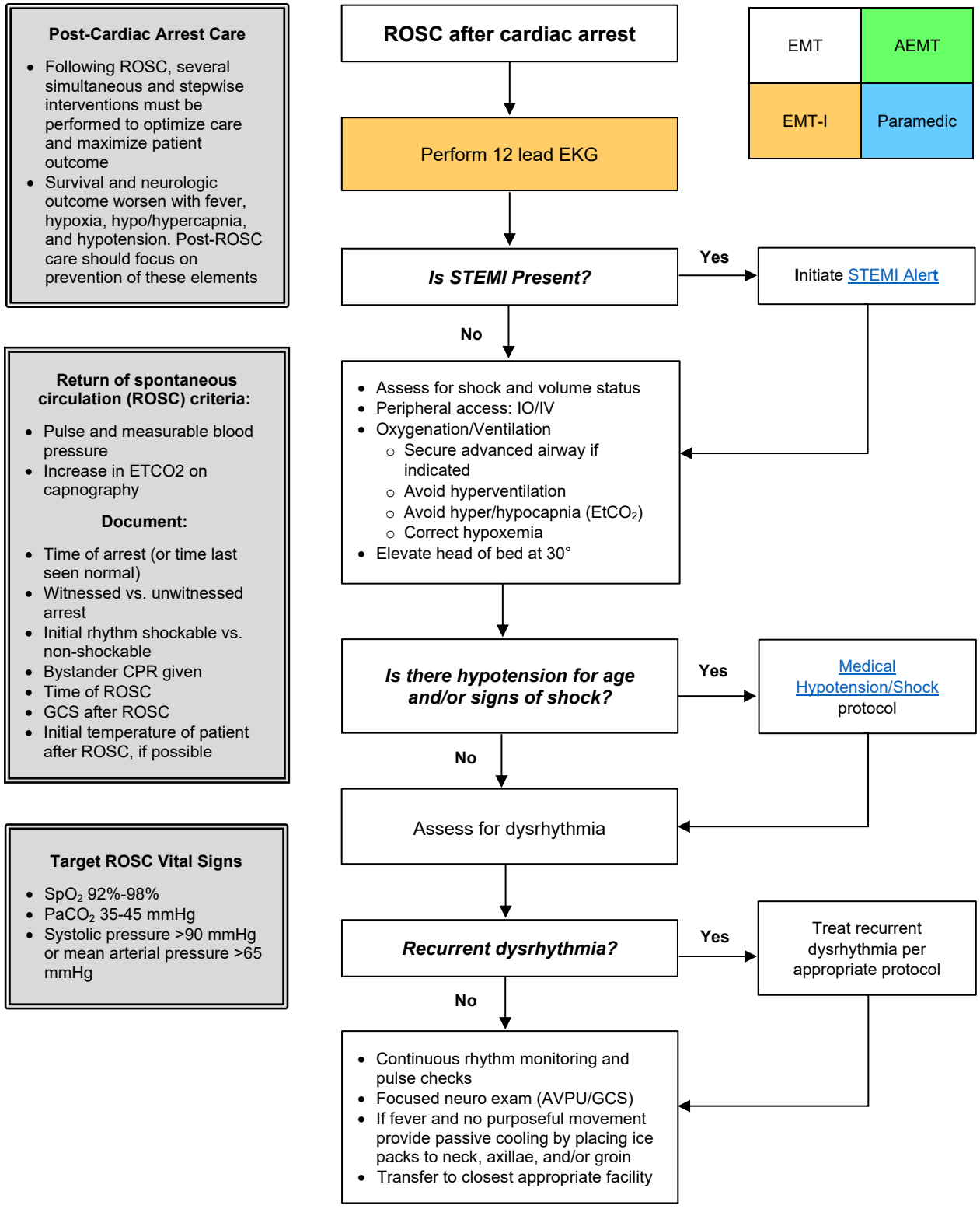
- Pulse and measurable blood pressure
- Increase in ETCO2 on capnography

Document:

- Time of arrest (or time last seen normal)
- Witnessed vs. unwitnessed arrest
- Initial rhythm shockable vs. non-shockable
- Bystander CPR given
- Time of ROSC
- GCS after ROSC
- Initial temperature of patient after ROSC, if possible

Target ROSC Vital Signs

- SpO_2 92%-98%
- $PaCO_2$ 35-45 mmHg
- Systolic pressure >90 mmHg or mean arterial pressure >65 mmHg



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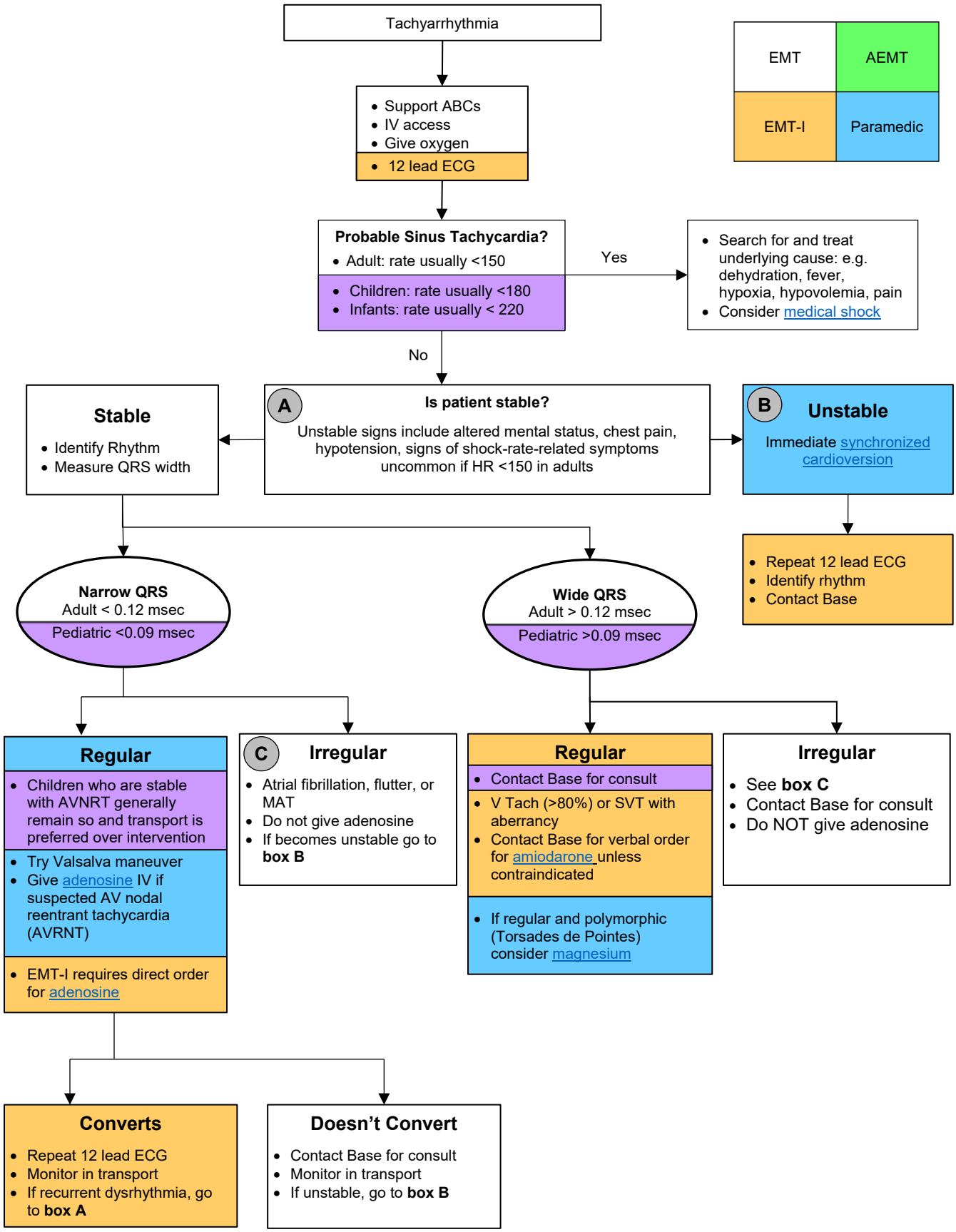
3040 TACHYARRHYTHMIA WITH POOR PERFUSION



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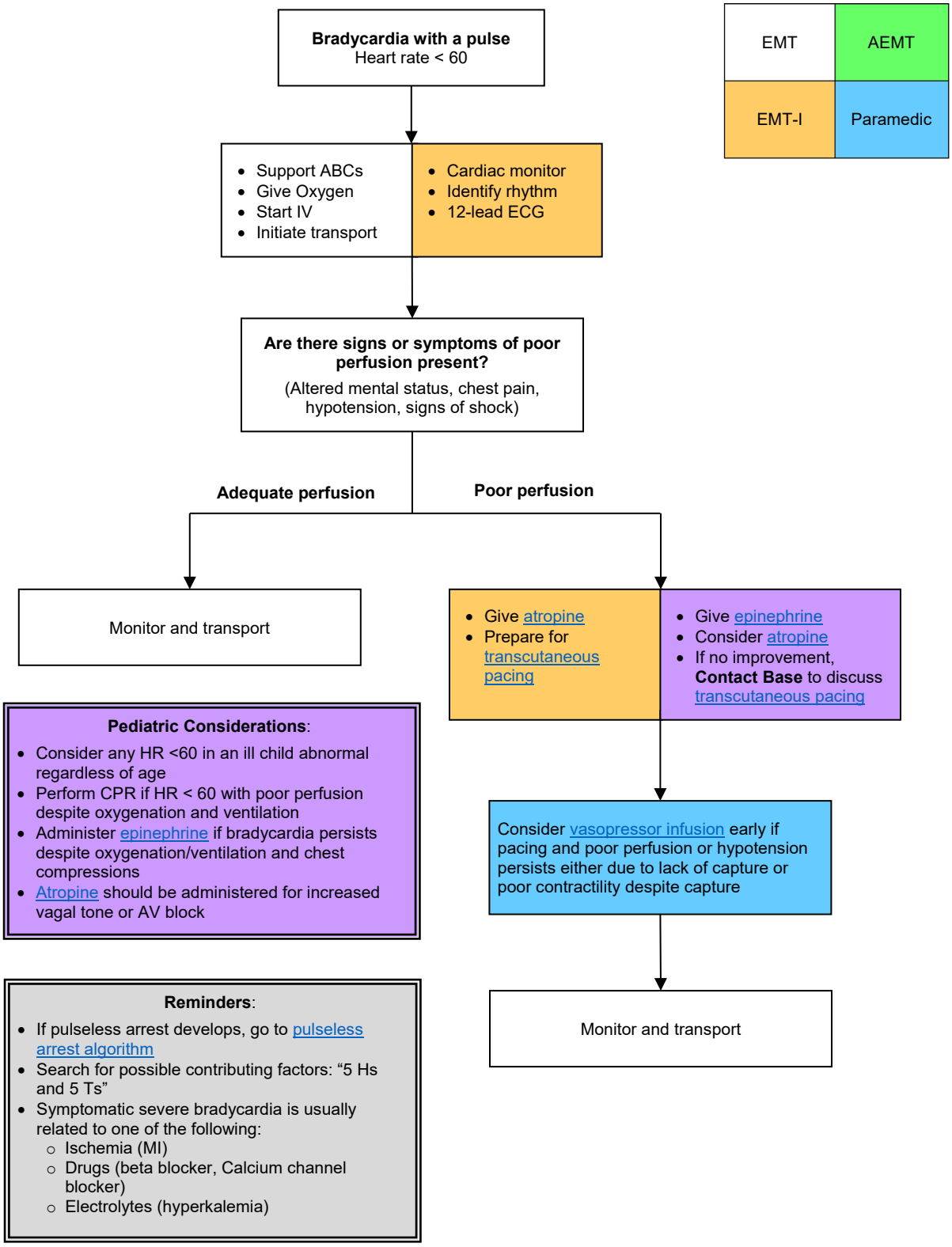
3050 BRADYARRHYTHMIA WITH POOR PERFUSION



3060 CHEST PAIN

Consider life threatening causes of chest pain in all patients

- While assessing ABCs titrate oxygen, monitor vital signs, cardiac rhythm, start IV
- Obtain 12-lead ECG
- Administer aspirin if history suggests possible cardiac chest pain

STEMI?

No

Yes

- Notify receiving facility immediately if STEMI Alert criteria met
- Place combination defibrillation/ pacing pads on patient

Give SL nitroglycerin if suspected cardiac chest pain and no contraindication

An **EMT** may administer patient's prescribed nitroglycerin, **Contact Base** for verbal order

For hypotension following nitroglycerin give 250 ml NS bolus, reassess, and repeat bolus as needed. Do not give additional nitroglycerin.

Consider opioid for chest pain refractory to nitroglycerin, if no contraindication

- Consider repeat 12-lead if initial 12-lead non-diagnostic and/or patient's condition changes
- Consider additional 12-lead views such as R sided leads for R ventricular infarct if inferior MI present

EMT	AEMT
EMT-I	Paramedic

Life threatening causes of chest pain:

- Acute coronary syndrome (ACS)
  - Unstable angina
  - NSTEMI
  - STEMI
- Pulmonary embolism
- Thoracic aortic dissection
- Tension pneumothorax

Nitroglycerin Contraindications:

- Suspected right ventricular ST-segment elevation MI (inferior STEMI pattern plus ST elevation in right-sided precordial leads e.g., V4R)
- Hypotension SBP < 100
- Recent use of erectile dysfunction (ED) medication (e.g., Viagra, Cialis)

Causes of Chest Pain in Children:

- Costochondritis
- Pulmonary causes
- Ischemia Is rare but can be seen with a history of Kawasaki's disease with coronary aneurysms
- Cyanotic or congenital heart disease
- Myocarditis
- Pericarditis
- Arrhythmia
- Anxiety
- Abdominal causes

3070 STEMI ALERT

EMT-I	Paramedic

Goal:

- To identify patients with ST-segment elevation myocardial infarction (STEMI) in the prehospital setting and provide advanced receiving hospital notification in order to minimize door-to-balloon times for percutaneous coronary intervention (PCI)

STEMI Alert Criteria: *note all 4 criteria must be met for field activation*

1. Chest discomfort consistent with ACS
2. 12-lead ECG showing ST-segment elevation (STE) at least 1 mm in two or more anatomically contiguous leads other than leads V2-V3 where at least 2 mm is required
3. Age 35-85 years old
4. No wide complex QRS (paced rhythm, BBB, other)

If patient does not meet all four STEMI alert criteria yet clinical scenario suggestive of STEMI consult the receiving hospital **Emergency Physician** for override

Actions:

- Treat according to chest pain protocol enroute (cardiac monitor, oxygen, aspirin, nitroglycerin, and opioid as needed for pain control).
- Notify receiving hospital ASAP with ETA and request STEMI ALERT. Do not delay hospital notification. If possible, notify ED before leaving scene.
- Start 2 large bore peripheral IVs – avoid the right wrist or hand, if possible, in the field to avoid interfering with cath lab radial access
- Place combination defibrillation/pacing pads on patient
- Rapid transport

Additional Documentation Requirements:

- Time of first patient contact
- Time of first ECG

3080 HYPERTENSION

AEMT	EMT-I	Paramedic

Intent:

A. Even with extremes of blood pressure, treat the medical emergency **associated** with hypertension ("treat the patient, not the number")
    1. Treat chest pain, pulmonary edema, or stroke according to standard protocols (pain control will usually improve BP significantly)
B. Do not use medication to treat asymptomatic hypertension
C. Do not treat hypertension in acute stroke
D. Obtain a 12 lead ECG if patient's chief complaint is hypertension

3090 VENTRICULAR ASSIST DEVICES

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. LVAD patients can be identified by an electric driveline cable that comes directly out of their abdomen and connects to an external control pack powered by two external batteries they will be wearing with a bag, harness or vest. The patient still has underlying heart function and rhythm that can be assessed and treated as appropriate per protocols.

EMT	AEMT
EMT-I	Paramedic

Assess the patient

Typically, LVAD patients have no discernible pulse. Blood pressure measurement requires manual BP cuff and Doppler which the patient may have. Utilize other parameters for patient assessment:

- Level of consciousness
- Respiratory rate and work of breathing
- Signs of perfusion: skin color/temperature, capillary refill (HR >100 is hemodynamically unstable)
- Cardiac monitor, SpO_2, blood glucose level

Is the patient stable?

STABLE

- Address any medical problems according to protocol
- Transport to University of Colorado Hospital for further treatment, if practical
- Contact VAD Coordinator

UNSTABLE

- Determine if VAD is running and functioning properly
- Auscultate chest for whirling sounds
- Examine VAD control unit for alarms

Common VAD Complications

- CVA
- TIA
- Arrhythmias
- Infections
- Sepsis
- Obstructions
- Pump Failure

VAD RUNNING

- 250 mL bolus
- Notify destination of VAD patient inbound
- Consider chest compressions if apneic with no clinical evidence of perfusion
- Initiate ACLS (PALS if patient pre-pubescent) and address underlying dysrhythmia or other problems per protocol

VAD NOT RUNNING

- Consider chest compressions if required
- Address VAD alarms/faults
- Consider defibrillation if required
- Notify destination of VAD patient inbound
- Initiate ACLS (PALS if patient pre-pubescent)

Key Points

- Unstable VAD patients should be transported to the nearest appropriate facility. University of Colorado Hospital is the only facility in the region that definitively treats VAD patients—and is therefore the preferred destination when patient condition is stable and conditions/operational factors allow transport.
- **Contact VAD Coordinator as soon as possible at 24/7 pager # (303) 266-4522**. **For pediatric patients contact the Children's Hospital Colorado transplant coordinator pager at (303) 890-3503.** Provide patient name, DOB, condition & ETA at destination for consultation and/or if transporting to University of Colorado Hospital. VAD coordinator will call back.
- 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.**
- Device specific information for EMS can be found at: https://www.mylvad.com/medical-professionals/resource-library/ems-field-guides

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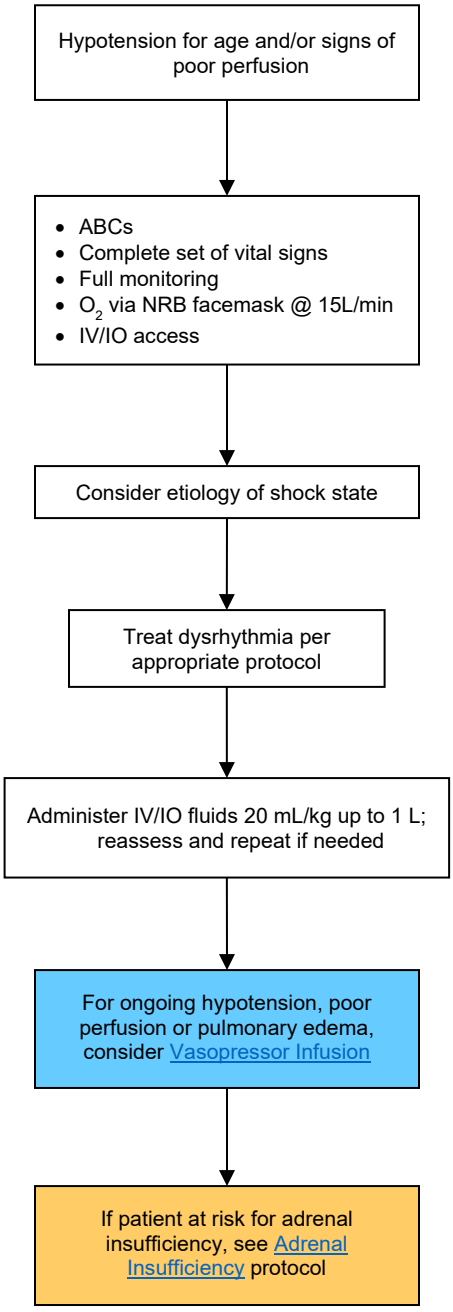
4000 MEDICAL SHOCK PROTOCOL



EMT	AEMT	EMT-I	Paramedic

Hypotension for Age

Age	Blood Pressure
<1 year	<70 mmHg
1-10 years	<70 + (2 x age in years)
>10 years	<90 mmHg

Tachycardia for Age

Age	Heart Rate
<1 year	>160 bpm
1-2 years	>150 bpm
2-5 years	>140 bpm
5-12 years	>120 bpm
>12 years	>100 bpm

Etiologies of Shock

- Dysrhythmia, myocardial ischemia
- Sepsis
- Hemorrhage
- Anaphylaxis
- Overdose
- Cyanide or carbon monoxide poisoning
- Other: PE, MI, tension pneumothorax

Pediatric Fluid Administration

- For children <40 kg or not longer than length based tape, hand pull/push fluid with a 60 mL syringe utilizing a 3 way stop cock.
- The treatment of compensated shock requires aggressive fluid replacement of 20 mL/kg up to 3 boluses.
- Goal of therapy is normalization of vital signs within the first hour.
- Hypotension is a late sign in pediatric shock patients.

Pediatric Shock

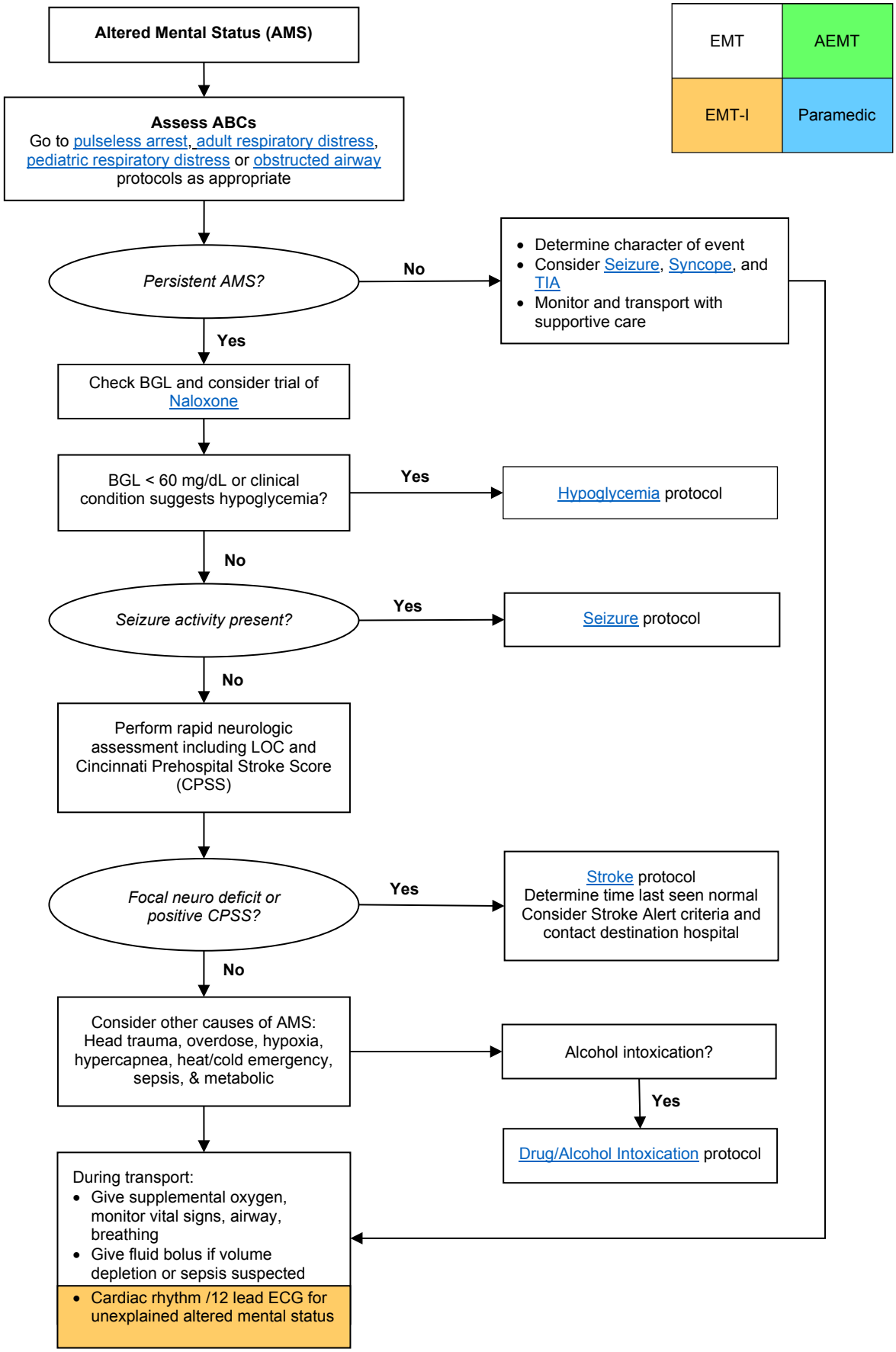
Signs of Compensated Shock

- Normal mental status
- Normal systolic blood pressure
- Tachycardia
- Prolonged (>2 seconds) capillary refill
- Tachypnea
- Cool and pale distal extremities
- Weak peripheral pulse

Signs of Decompensated Shock

- Decrease mental status
- Weak central pulses
- Poor color
- Hypotension for age

4010 UNIVERSAL ALTERED MENTAL STATUS



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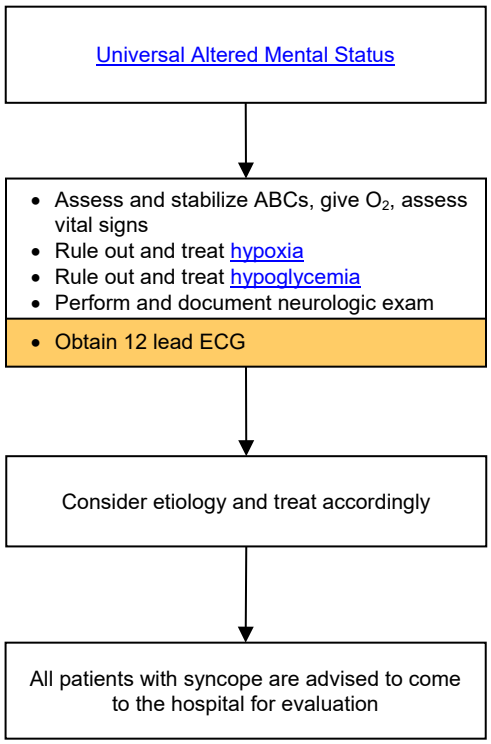
4020 SYNCOPE



EMT	AEMT
EMT-I	Paramedic

Causes of Syncope:

- Cardiac
  - Structural heart disease
  - Arrhythmia (Prolonged QT, Brugada, WPW, heart block, etc.)
- Seizure
- Hypovolemia
  - Dehydration
  - Blood loss
  - Pregnancy/ectopic
- Pulmonary Embolism
- Vasovagal

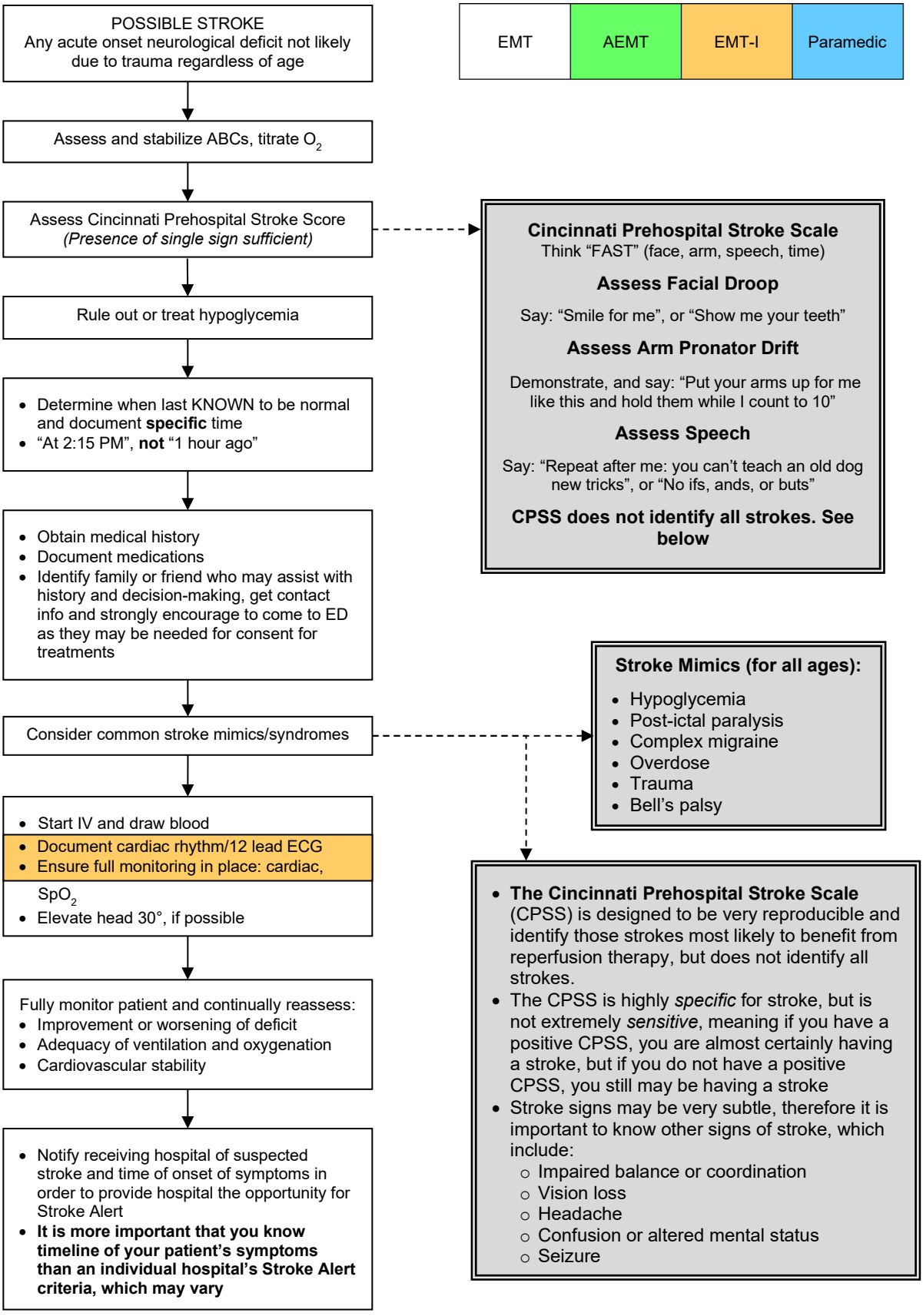
General Information:

- Syncope is defined as transient loss of consciousness accompanied by loss of postural tone.
- A syncopal episode will generally be very brief and have a rapid recovery with no postictal confusion.
- Convulsive movements called myoclonic jerks may occur 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

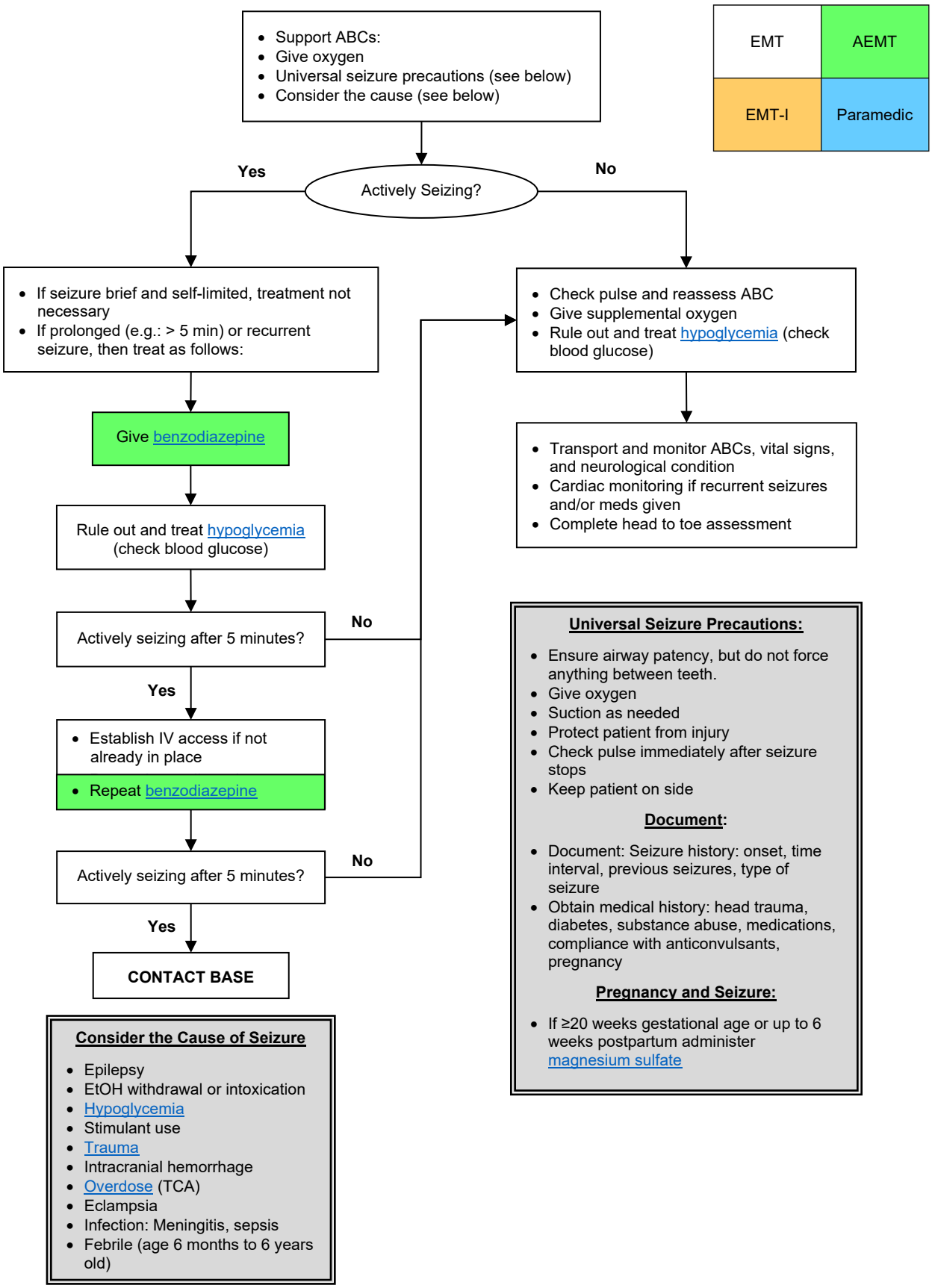
Pediatric Considerations:

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

4030 STROKE


EMT
AEMT
EMT-I
Paramedic
POSSIBLE STROKE
Any acute onset neurological deficit not likely due to trauma regardless of age
Assess and stabilize ABCs, titrate O_2
Assess Cincinnati Prehospital Stroke Score
(Presence of single sign sufficient)
Cincinnati Prehospital Stroke Scale
Think "FAST" (face, arm, speech, time)
Assess Facial Droop
Say: "Smile for me", or "Show me your teeth"
Assess Arm Pronator Drift
Demonstrate, and say: "Put your arms up for me like this and hold them while I count to 10"
Assess Speech
Say: "Repeat after me: you can't teach an old dog new tricks", or "No ifs, ands, or buts"
CPSS does not identify all strokes. See below
Rule out or treat hypoglycemia
Determine when last KNOWN to be normal and document specific time
"At 2:15 PM", not "1 hour ago"
Obtain medical history
Document medications
Identify family or friend who may assist with history and decision-making, get contact info and strongly encourage to come to ED as they may be needed for consent for treatments
Consider common stroke mimics/syndromes
Stroke Mimics (for all ages):
Hypoglycemia
Post-ictal paralysis
Complex migraine
Overdose
Trauma
Bell's palsy
Start IV and draw blood
Document cardiac rhythm/12 lead ECG
Ensure full monitoring in place: cardiac, SpO_2
Elevate head 30°, if possible
The Cincinnati Prehospital Stroke Scale (CPSS) is designed to be very reproducible and identify those strokes most likely to benefit from reperfusion therapy, but does not identify all strokes.
The CPSS is highly specific for stroke, but is not extremely sensitive, meaning if you have a positive CPSS, you are almost certainly having a stroke, but if you do not have a positive CPSS, you still may be having a stroke
Stroke signs may be very subtle, therefore it is important to know other signs of stroke, which include:
Impaired balance or coordination
Vision loss
Headache
Confusion or altered mental status
Seizure
Fully monitor patient and continually reassess:
Improvement or worsening of deficit
Adequacy of ventilation and oxygenation
Cardiovascular stability
Notify receiving hospital of suspected stroke and time of onset of symptoms in order to provide hospital the opportunity for Stroke Alert
It is more important that you know timeline of your patient's symptoms than an individual hospital's Stroke Alert criteria, which may vary

4040 SEIZURE



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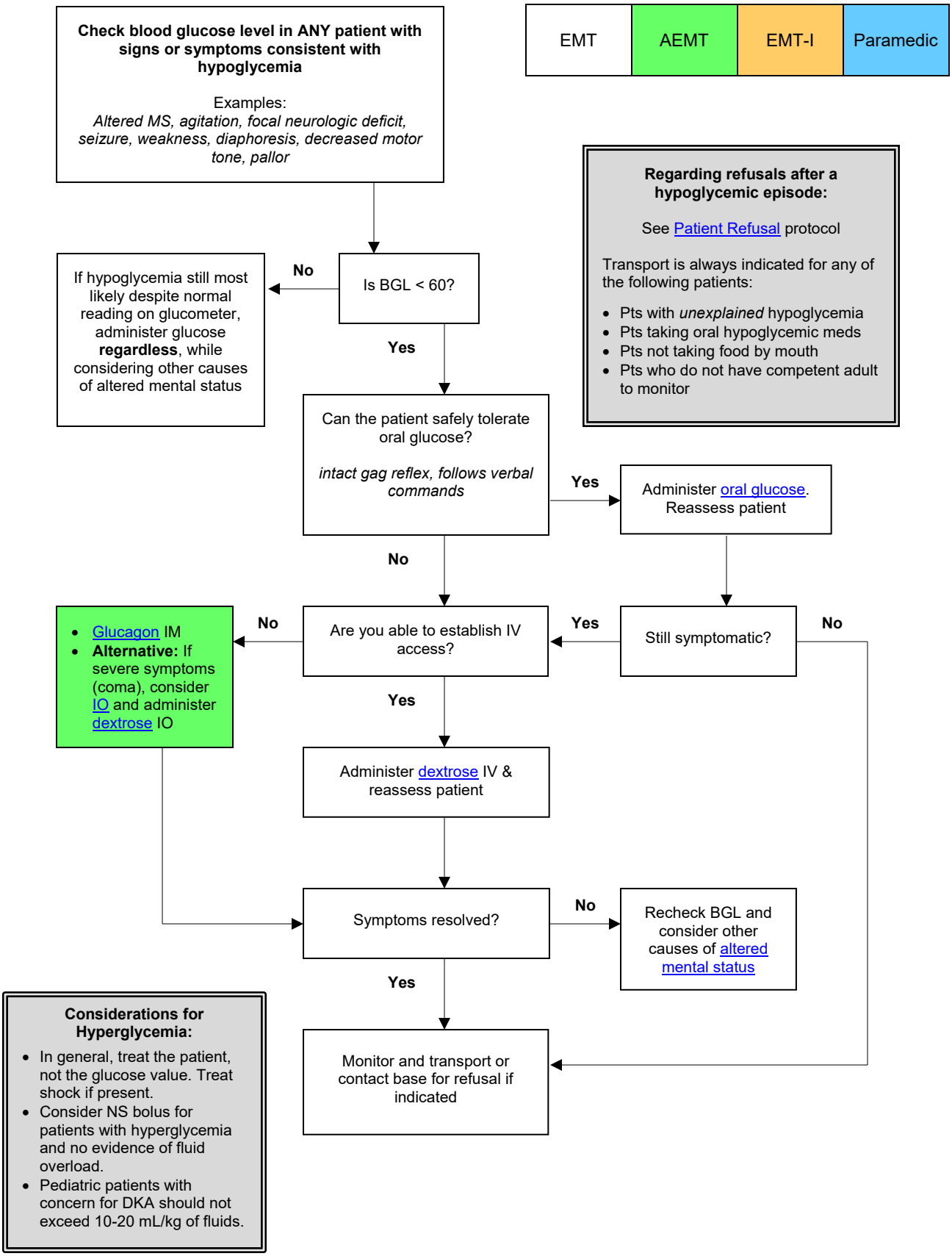
4050 HYPOGLYCEMIA



4060 PEDIATRIC BRIEF RESOLVED UNEXPLAINED EVENTS (BRUE) (FORMERLY ALTE)

EMT	AEMT
EMT-I	Paramedic

DEFINITION:
An infant < 1 year of age with episode frightening to the observer characterized by apnea, choking/gagging, color change or change in muscle tone

↓

Support ABCs as necessary

↓

Obtain detailed history of event and medical history

↓

Complete head-to-toe assessment

↓

- Any child with an BRUE should be transported to ED for evaluation
- Monitor vital signs en route

Clinical history to obtain from observer of event:

- Document **observer's** impression of the infant's color, respirations and muscle tone
- For example, was the child apneic, or cyanotic or limp during event?
- Was there seizure-like activity noted?
- Was any resuscitation attempted or required, or did event resolve spontaneously?
- How long did the event last?

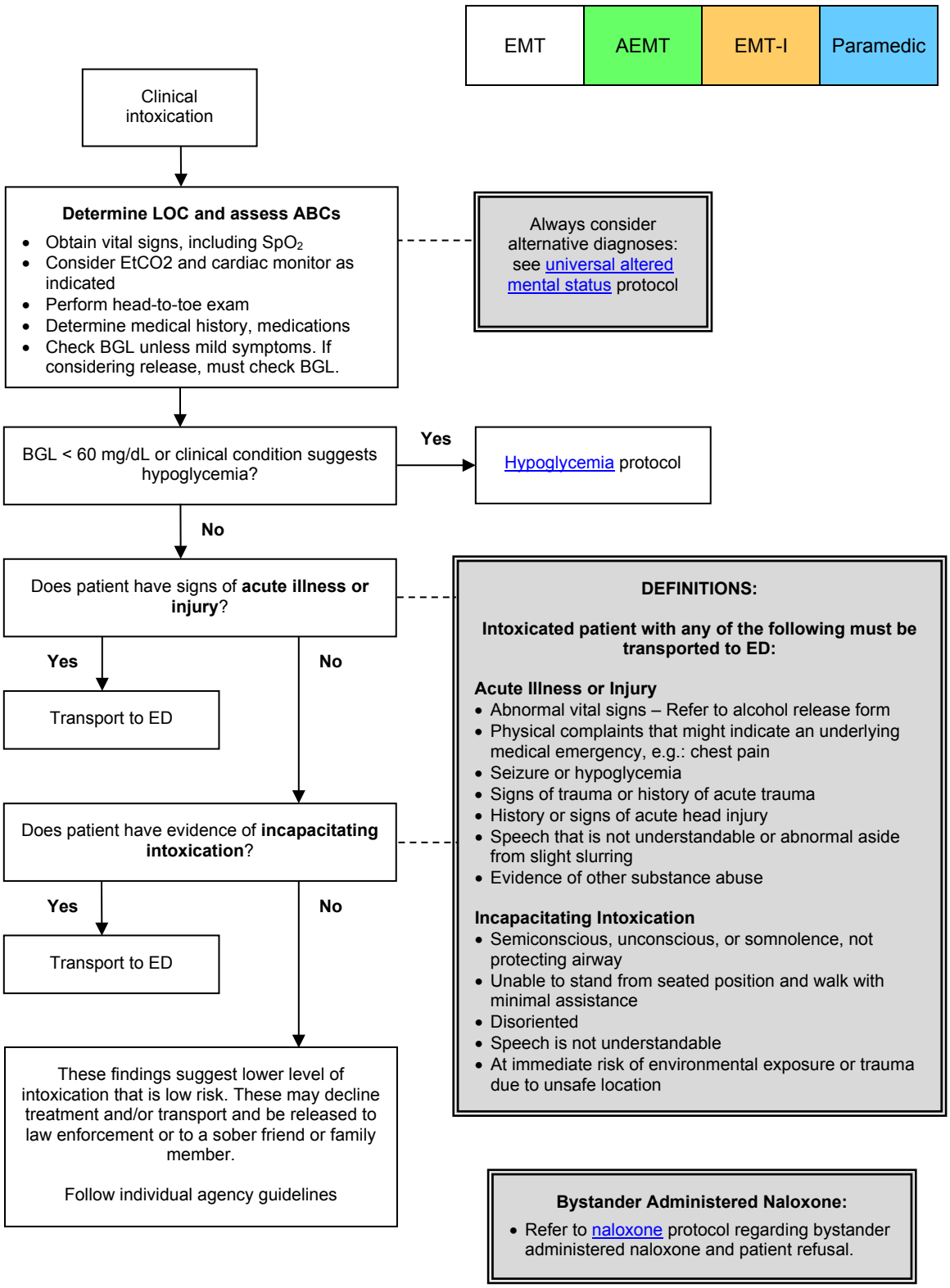
Past Medical History:

- Recent trauma, infection (e.g. fever, cough)
- History of GERD
- History of Congenital Heart Disease
- History of Seizures
- Medication history

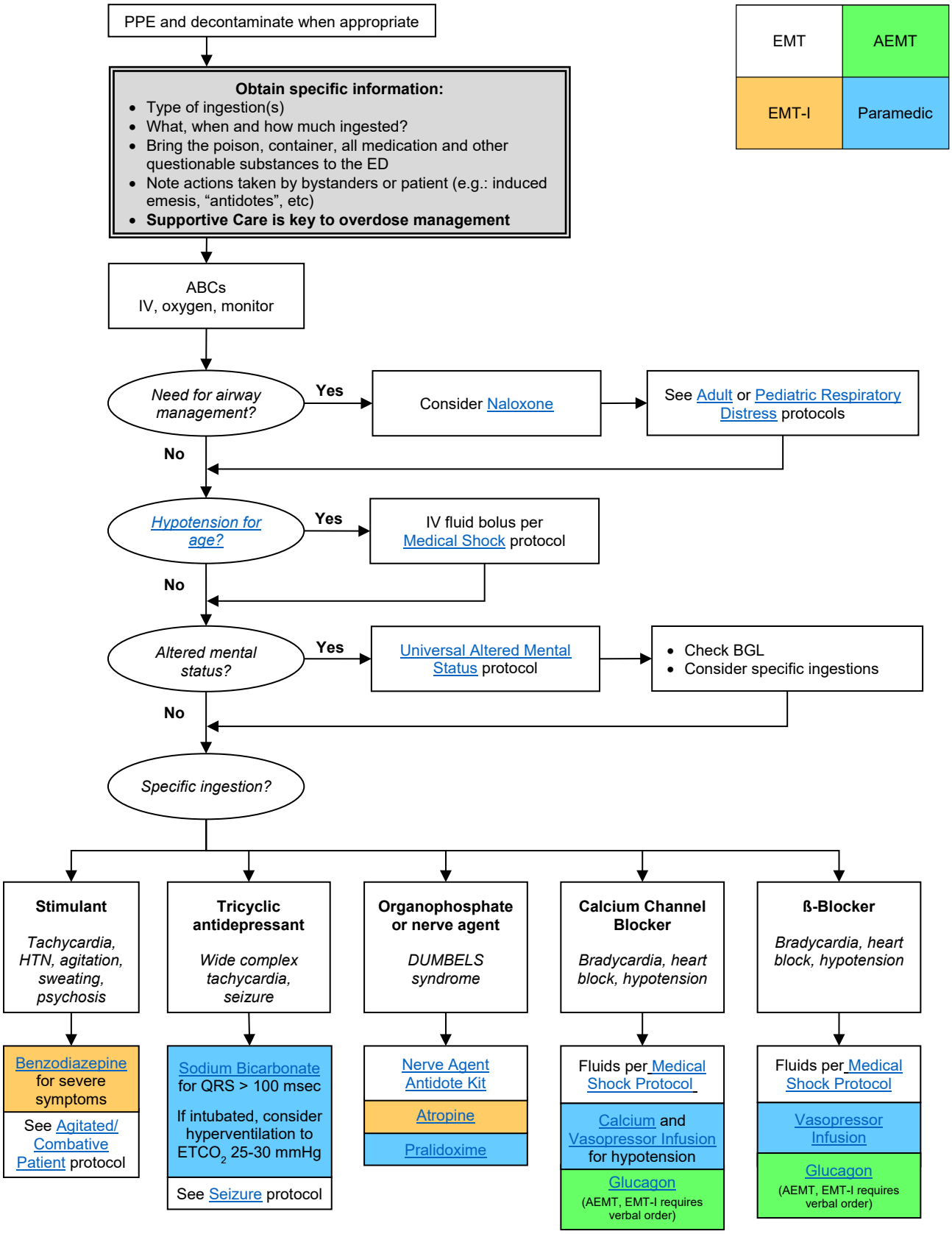
Examination/Assessment

- Head to toe exam for trauma, bruising, or skin lesions
- Check anterior fontanelle: is it bulging, flat or sunken?
- Pupillary exam
- Respiratory exam for rate, pattern, work of breathing and lung sounds
- Cardiovascular exam for murmurs and symmetry of brachial and femoral pulses
- Neuro exam for level of consciousness, responsiveness and any focal weakness

4070 DRUG/ALCOHOL INTOXICATION



4080 OVERDOSE AND ACUTE POISONING



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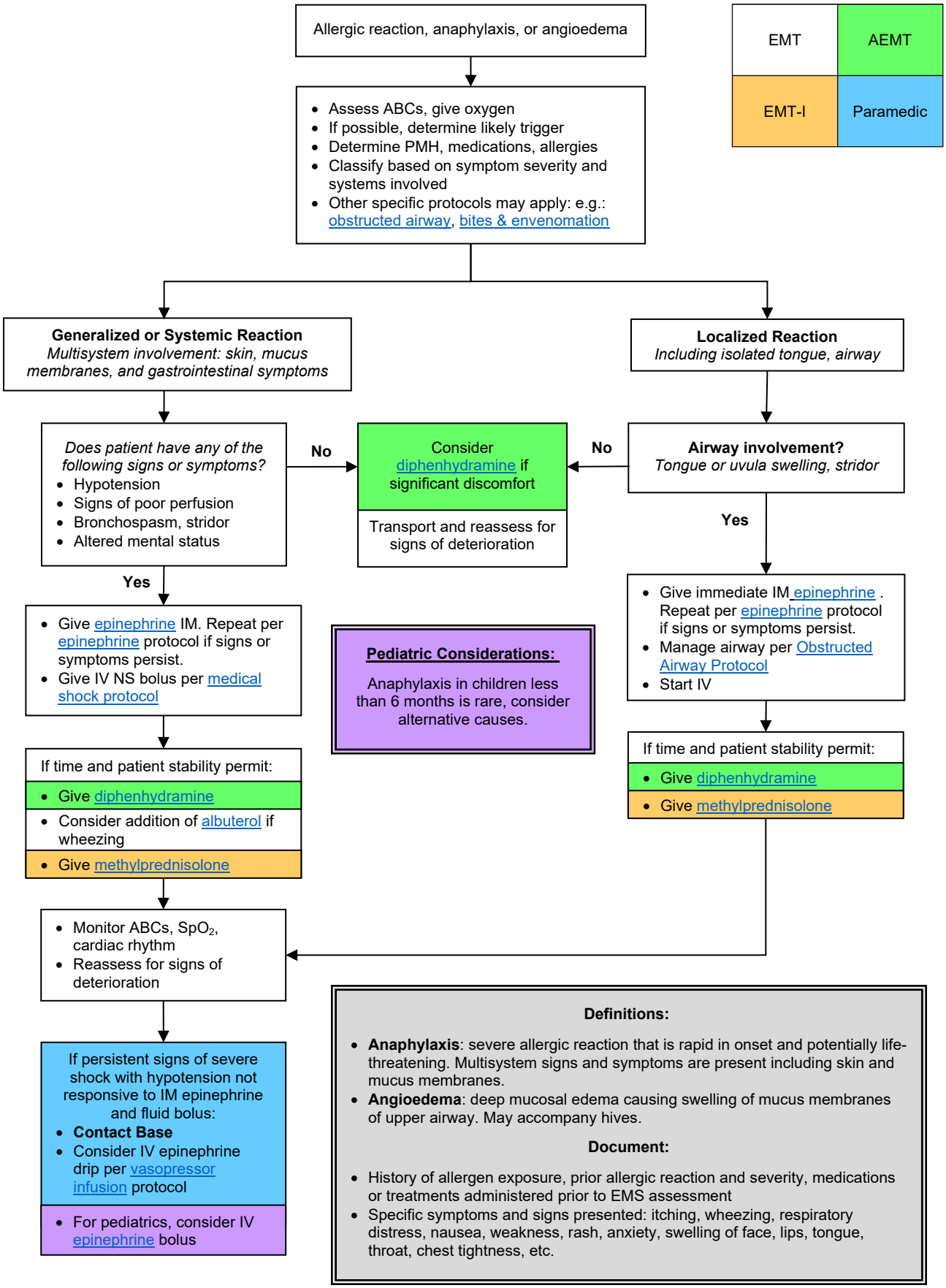
4090 ALLERGY AND ANAPHYLAXIS



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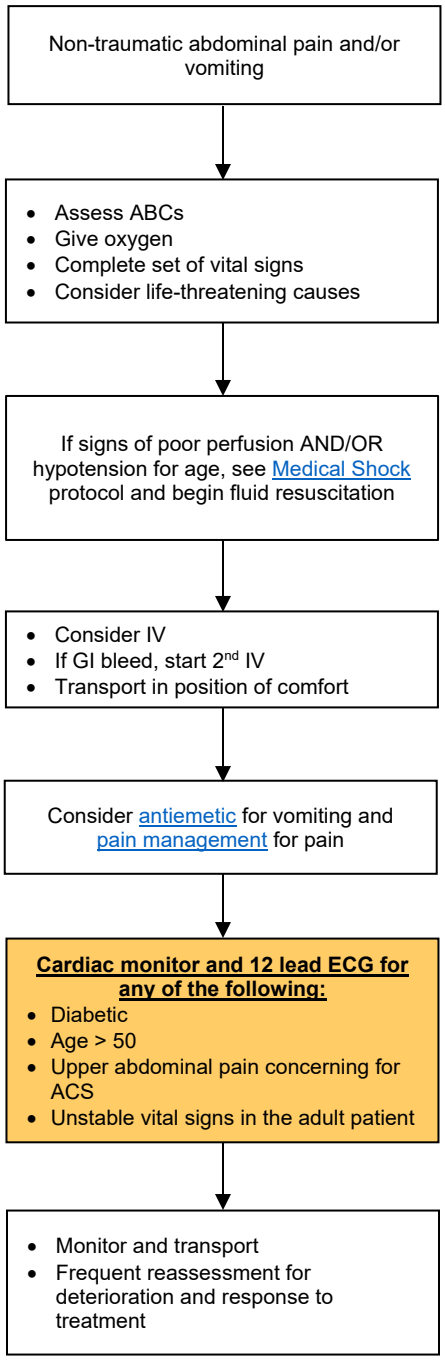
4100 NON-TRAUMATIC ABDOMINAL PAIN/VOMITING



EMT	AEMT	EMT-I	Paramedic

Life-threatening causes:

- Cardiac etiology: MI, ischemia
- Vascular etiology: AAA, dissection
- GI bleed
- Gynecologic etiology: ectopic pregnancy

History:

- Onset, location, duration, radiation of pain
- Associated sx: vomiting, bilious emesis, GU sx, hematemesis, coffee ground emesis, melena, rectal bleeding, vaginal bleeding, known or suspected pregnancy, recent trauma

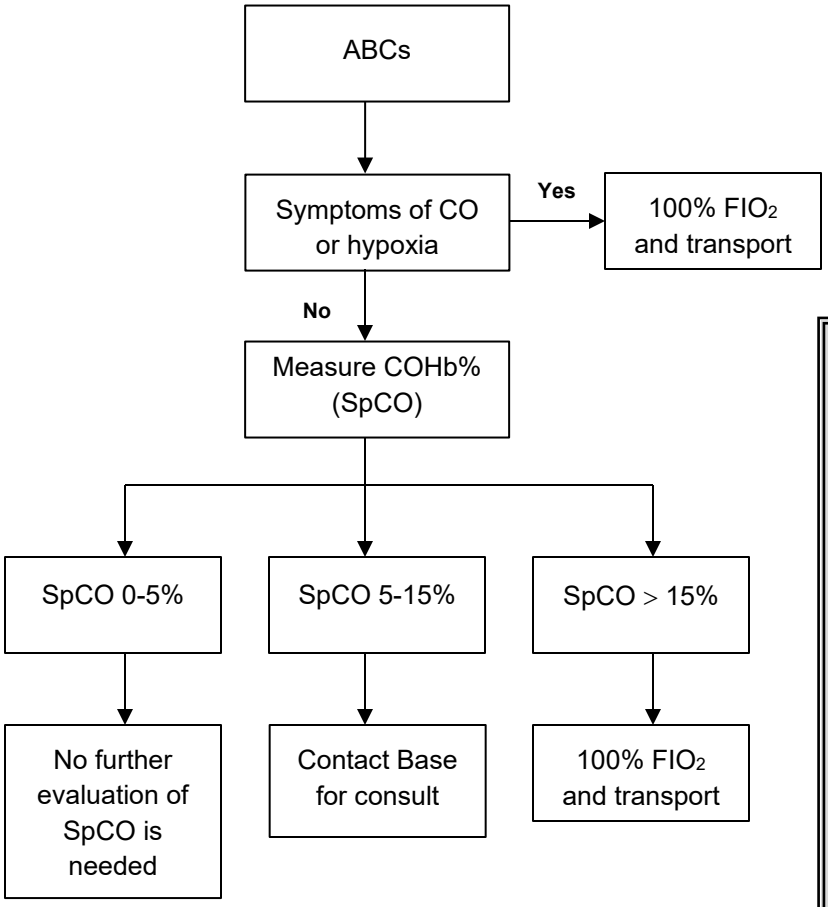
Pediatric Patients:

- Life-threatening causes vary by age. Consider occult or non-accidental trauma, toxic ingestion, button battery ingestion, GI bleed, peritonitis
- For most pediatric patients without signs of shock, no IV is required and pharmacologic pain management should be limited

Elderly Patients:

- Much more likely to have life-threatening cause of symptoms
- Shock may be occult, with absent tachycardia in setting of severe hypovolemia

4110 SUSPECTED CARBON MONOXIDE EXPOSURE



EMT	AEMT
EMT-I	Paramedic

General Guidelines:

- *Signs and Symptoms of CO exposure include*:
  Headache, dizziness, coma, altered mentation, seizures, visual changes, chest pain, tachycardia, arrhythmias, dyspnea, N/V, "flu-like illness"
- The absence or low readings of COHb is not a reliable predictor of toxicity of other fire byproducts
- In smoke inhalation victims, consider cyanide treatment with Hydroxocobalamin as per indications
- The fetus of a pregnant woman is at higher risk due to the greater affinity of fetal hemoglobin to CO. With CO exposure, the pregnant woman may be asymptomatic while the fetus may be in distress. In general, pregnant patients exposed to CO should be transported.

COHb	Severity	Signs and Symptoms
<15-20%	Mild	Headache, nausea, vomiting, dizziness, blurred vision
21-40%	Moderate	Confusion, syncope, chest pain, dyspnea, tachycardia, tachypnea, weakness
41-59%	Severe	Dysrhythmias, hypotension, cardiac ischemia, palpitations, respiratory arrest, pulmonary edema, seizures, coma, cardiac arrest
>60%	Fatal	Death

4120 ADRENAL INSUFFICIENCY PROTOCOL

Patient at risk for adrenal insufficiency (Addisonian crisis):

- Identified by family or medical alert bracelet
- Chronic steroid use
- Congenital Adrenal Hyperplasia
- Addison's disease

Assess for signs of acute adrenal crisis:

- Pallor, weakness, lethargy
- Vomiting, abdominal pain
- Hypotension, shock
- Congestive heart failure

All symptomatic patients:

- Check blood glucose and treat hypoglycemia, if present
- Start IV and give oxygen
- If signs of poor perfusion AND/OR hypotension for age, see Medical Shock protocol and begin fluid resuscitation

Give corticosteroid

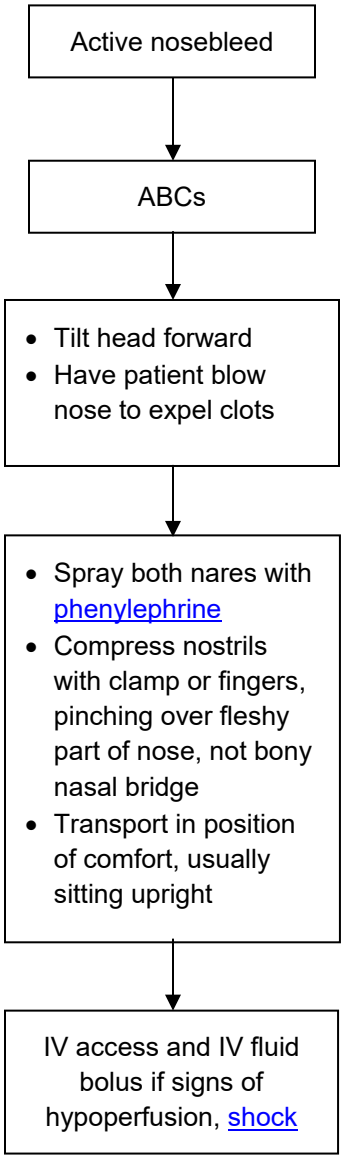
- Continue to monitor for development of hypoglycemia
- **Contact base** for consult if patient not responding to treatment

- Monitor 12 lead ECG for signs of hyperkalemia

EMT	AEMT
EMT-I	Paramedic

- Chronic corticosteroid use is a common cause for adrenal crisis, carefully assess for steroid use in patients with unexplained shock.
- Administration of steroids are life-saving and necessary for reversing shock or preventing cardiovascular collapse
- Patients at risk for adrenal insufficiency may show signs of shock when under physiologic stress which would not lead to cardiovascular collapse in normal patients. Such triggers may include trauma, dehydration, infection, myocardial ischemia, etc.
- If no corticosteroid is available during transport, notify receiving hospital of need for immediate corticosteroid upon arrival
- Under Chapter 2 Rule: specialized prescription medications to address an acute crisis may be given by all levels with a direct VO, given the route of administration is within the scope of the provider. This applies to giving hydrocortisone for adrenal crisis, for instance, if a patient or family member has this medication available on scene. Contact base for direct verbal order

4130 EPISTAXIS MANAGEMENT

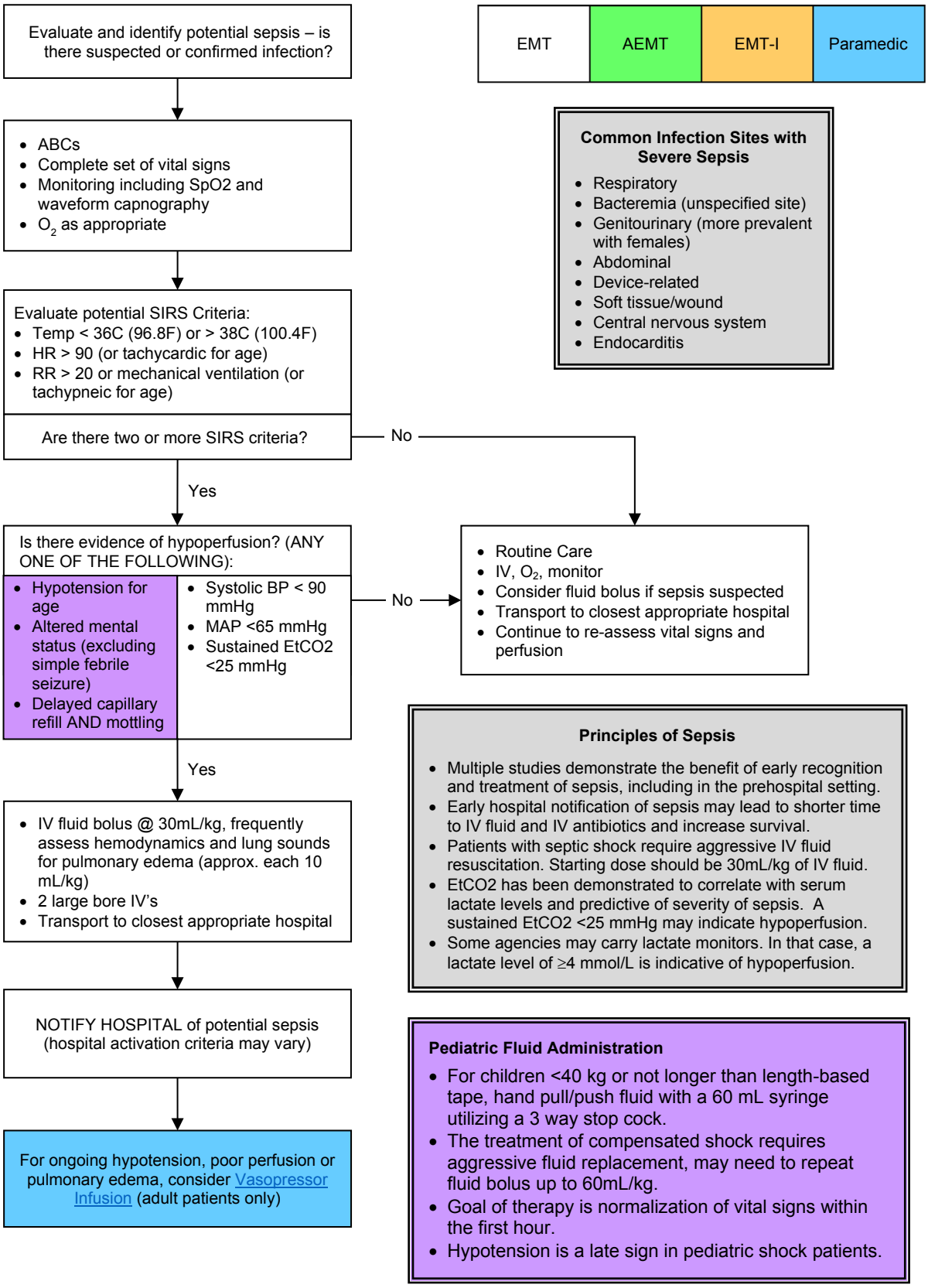


EMT	AEMT
EMT-I	Paramedic

General Guidelines:

- Most nose bleeding is from an anterior source and may be easily controlled.
- Avoid phenylephrine in pts with known CAD.
- Anticoagulation with aspirin, clopidogrel (Plavix), warfarin (Coumadin) will make epistaxis much harder to control. Note if your patient is taking these, or other, anticoagulant medications.
- Posterior epistaxis is a true emergency and may require advanced ED techniques such as balloon tamponade or interventional radiology. Do not delay transport. Be prepared for potential airway issues.
- For patients on home oxygen via nasal cannula, place the cannula in the patient's mouth while nares are clamped or compressed for nosebleed.

4140 SEPSIS PROTOCOL



Approved by Denver Metro EMS Medical Directors July 1, 2022. Next review January 2023

5000 DROWNING

ABCs

Spinal motion restriction *before* moving patient if trauma suspected

Assess mental status

Specific Information Needed:

- Length of submersion
- Degree of contamination of water
- Water temperature
- Diving accident and/or suspected trauma

EMT	AEMT
EMT-I	Paramedic

Awake and alert

- Remove wet garments, dry and insulate patient
- Transport, even if initial assessment normal
- Monitor ABC, VS, mental status
- If respiratory distress develops, consider CPAP as delayed pulmonary edema may occur after drowning.

Awake but altered LOC

- Remove wet garments, dry and insulate patient
- Suction as needed
- Start IV, obtain BGL, give oxygen
- Transport
- Monitor ABC, VS, mental status
- Monitor cardiac rhythm

Comatose or unresponsive

Pulse Present?

No

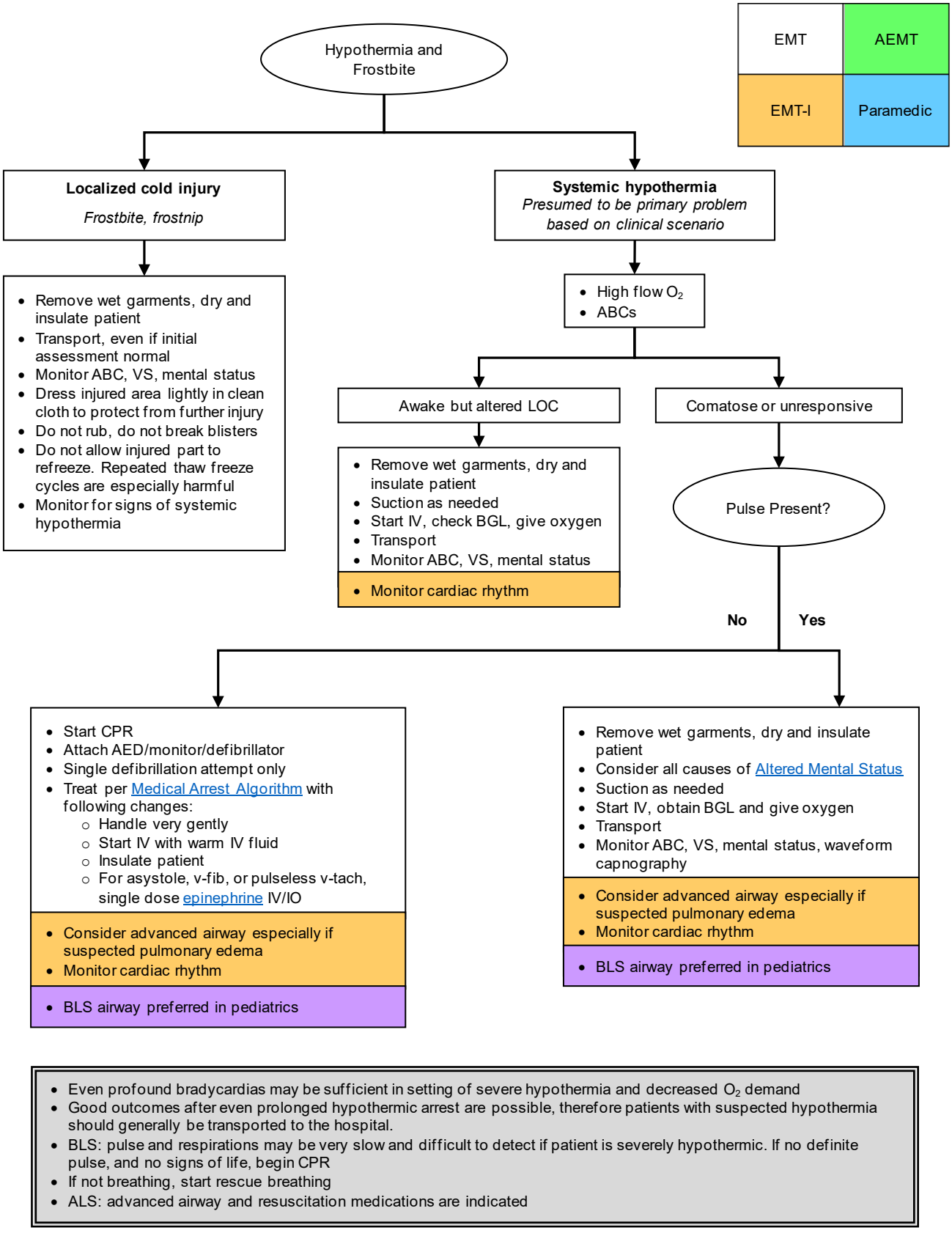
- Start CPR with manual ventilations
- Attach AED/monitor/defibrillator
- Single defibrillation attempt only if hypothermic
- Treat per Medical Arrest Algorithm with following changes if hypothermic:
  - Handle very gently
  - Start IV with warm IV fluid
  - Insulate patient
  - For asystole, v-fib, or pulseless v-tach, single dose epinephrine IV/IO
- Consider advanced airway especially if suspected pulmonary edema
- Monitor cardiac rhythm, waveform capnography
- BLS airway preferred in pediatrics

Yes

- Remove wet garments, dry and insulate patient
- Heimlich maneuver NOT indicated
- Consider all causes of Altered Mental Status
- Suction as needed
- Start IV, obtain BGL and give oxygen
- Monitor ABC, VS, mental status, waveform capnography
- Consider advanced airway especially if suspected pulmonary edema
- Monitor cardiac rhythm
- BLS airway preferred in pediatrics

- Drowning/submersion commonly associated with hypothermia.
- Even profound bradycardias may be sufficient in setting of severe hypothermia and decreased O_2 demand
- Good outcomes after even prolonged hypothermic arrest are possible, therefore patients with suspected hypothermia should generally be transported to the hospital.
- BLS: pulse and respirations may be very slow and difficult to detect if patient is severely hypothermic. If no definite pulse, and no signs of life, begin CPR
- If not breathing, start rescue breathing
- ALS: advanced airway and resuscitation medications are indicated

5010 HYPOTHERMIA



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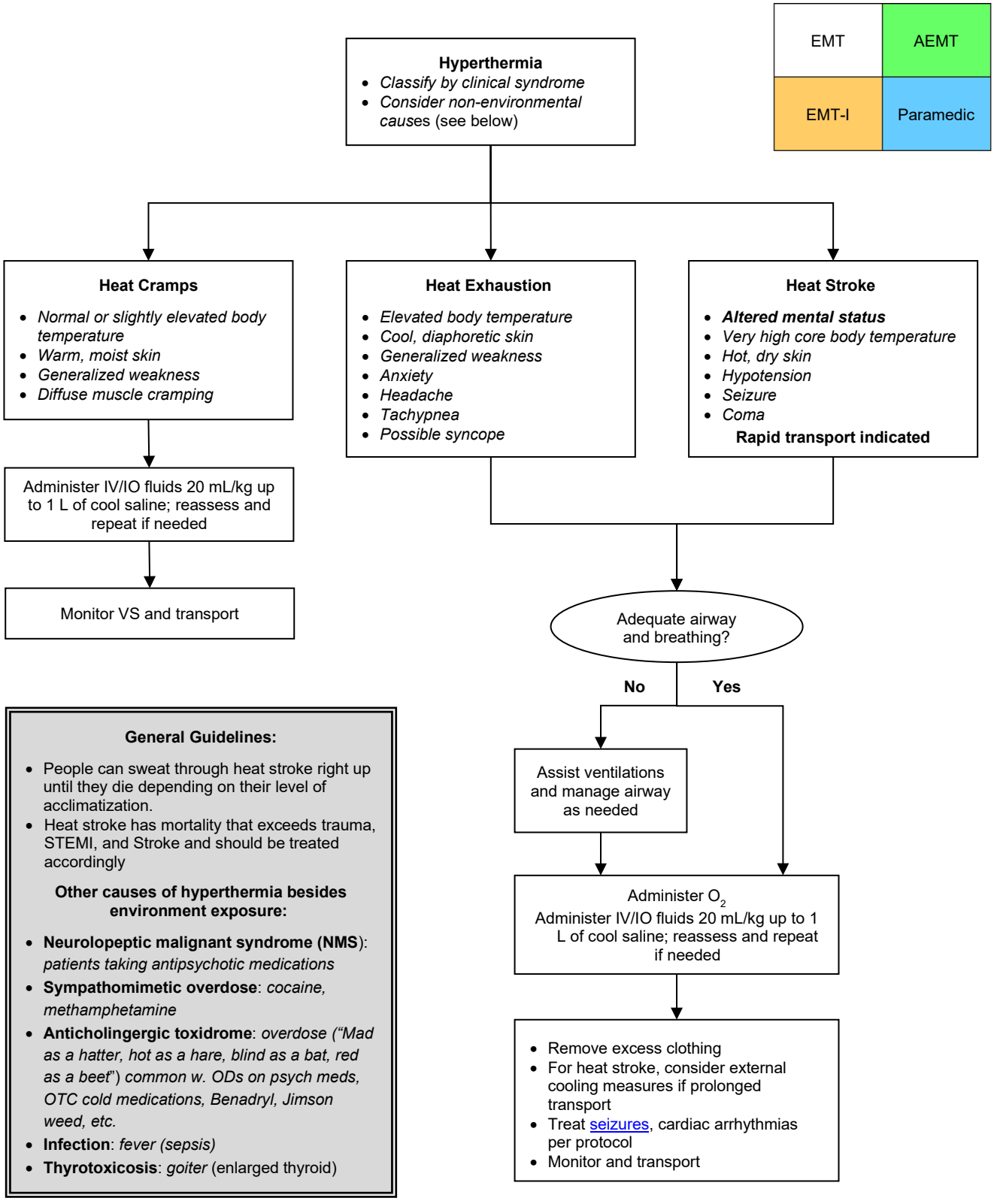
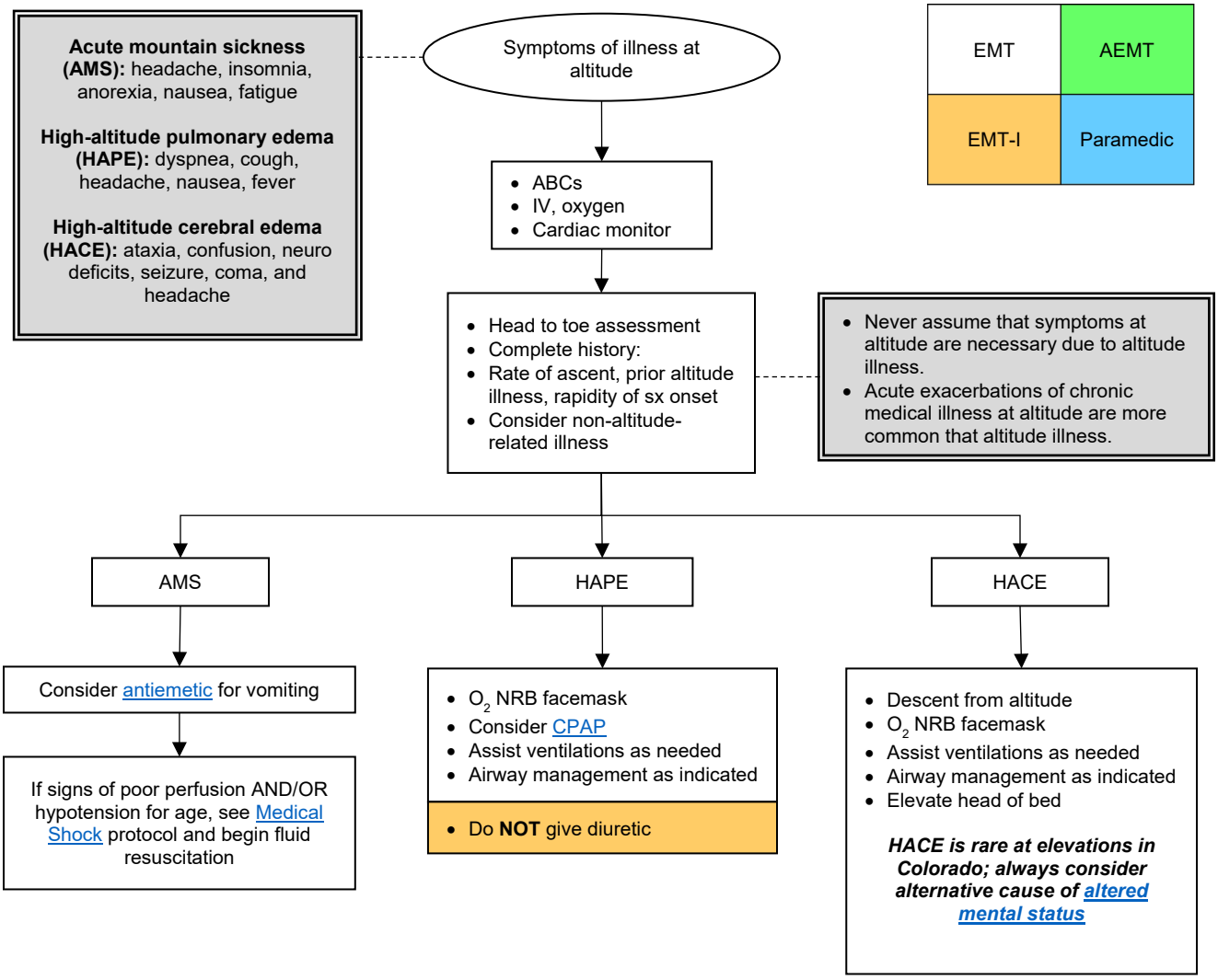
5020 HYPERTHERMIA



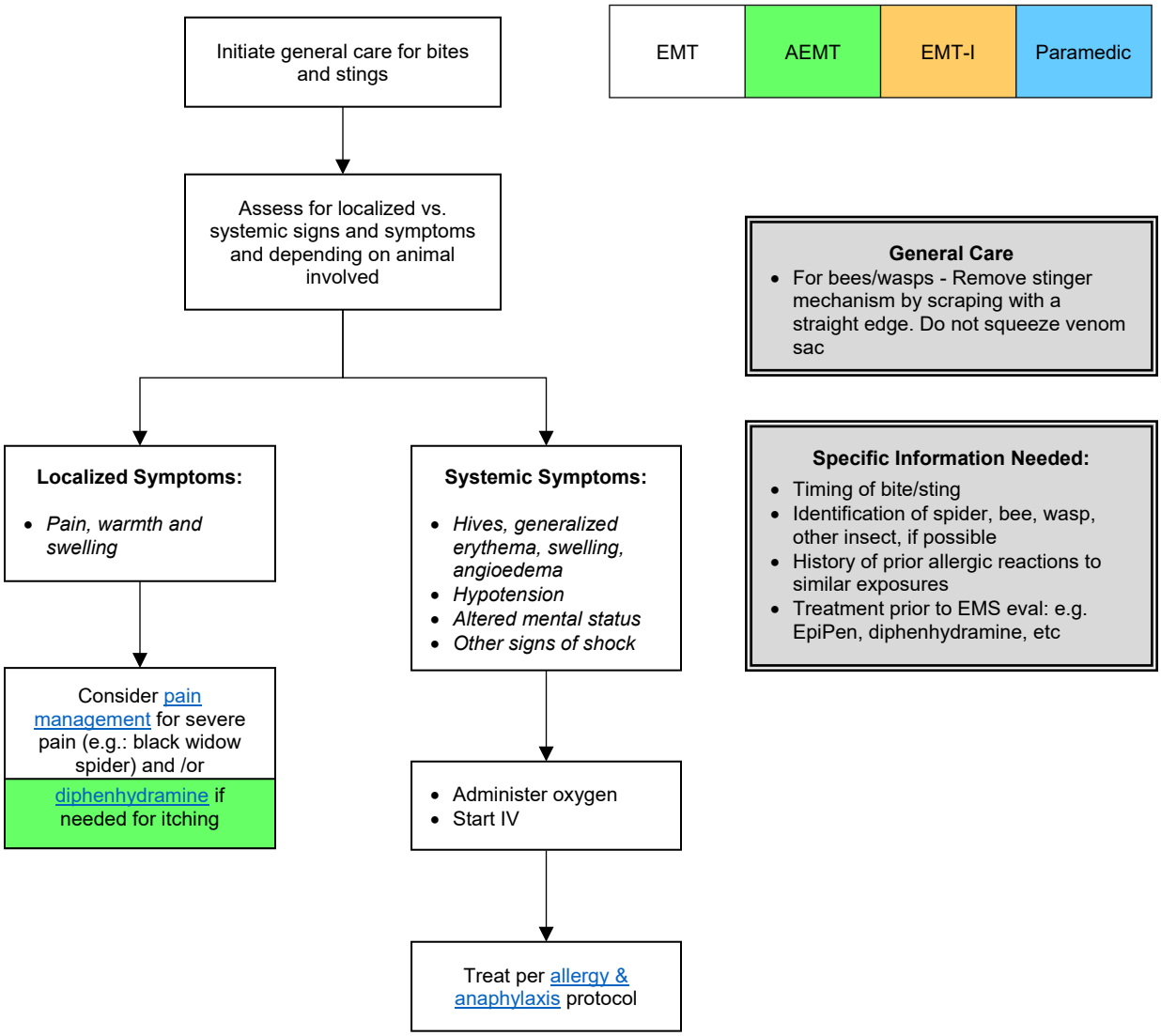
5030 HIGH ALTITUDE ILLNESS



Special Notes:

- There are no specific factors that accurately predict susceptibility to altitude sickness, but symptoms are worsened by exertion, dehydration, and alcohol ingestion.
- Acute Mountain Sickness (AMS) can begin to appear at around 6,500 ft above sea level, although most people will tolerate up to 8000 ft without difficulty. Altitude illness should not be suspected below 6,500 ft. AMS is the most frequent type of altitude sickness encountered. Symptoms often manifest themselves six to ten hours after ascent and generally subside in one to two days, but they occasionally develop into the more serious conditions.
- High altitude pulmonary edema (HAPE) and cerebral edema (HACE) are the most severe forms of high altitude illness. The rate of ascent, altitude attained, exertion, and individual susceptibility are contributing factors to the onset and severity of high-altitude illness
- Mild HAPE may be managed with high-flow oxygen and supportive care, and does not necessarily require descent from altitude.
- More severe forms of HAPE and all forms of HACE require descent

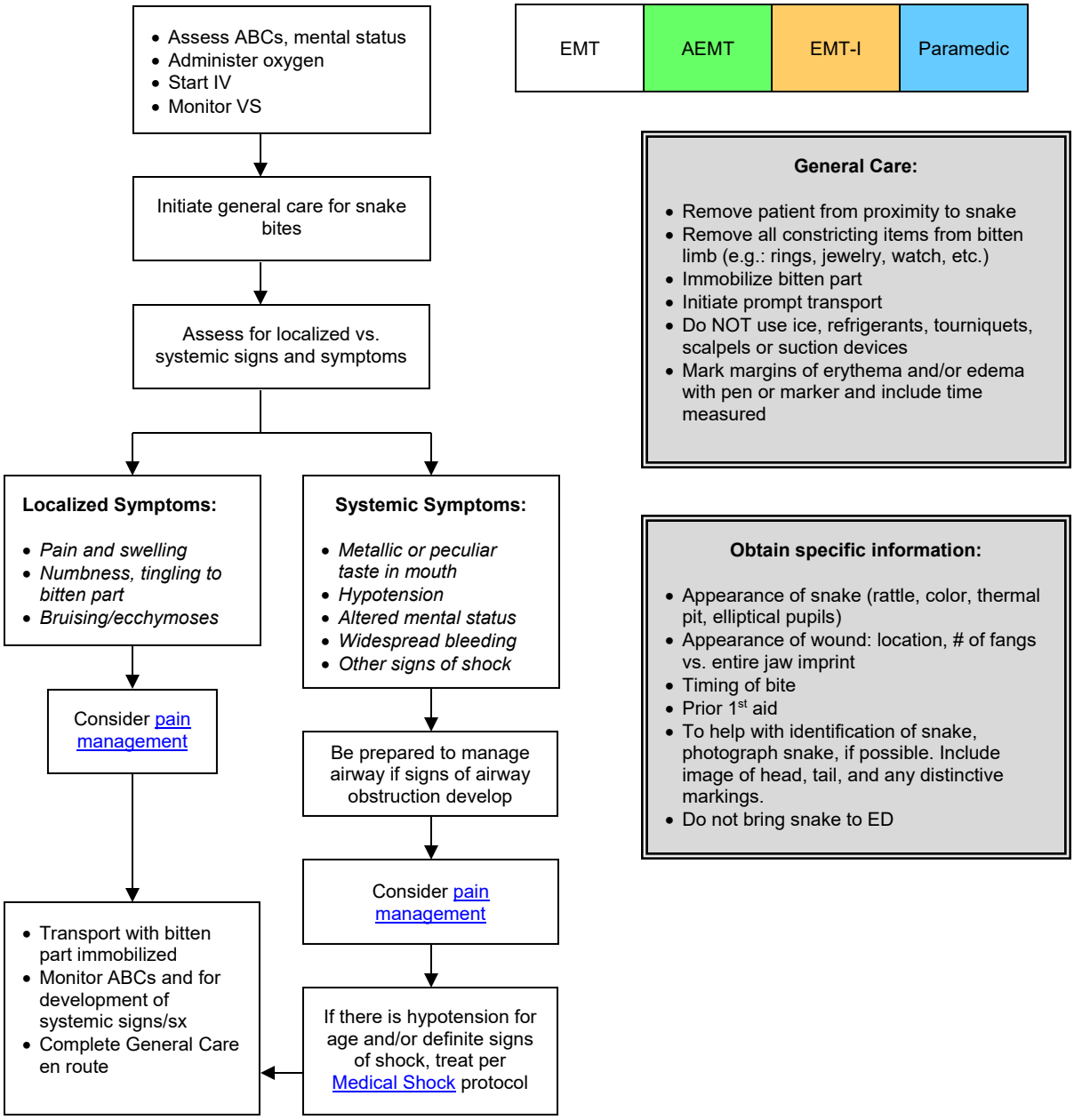
5040 INSECT/ARACHNID STINGS AND BITES PROTOCOL



Specific Precautions:

- For all types of bites and stings, the goal of prehospital care is to prevent further envenomation and to treat allergic reactions
- Anaphylactoid reactions may occur upon first exposure to allergen, and do not require prior sensitization
- Anaphylactic reactions typically occur abruptly, and rarely > 60 minutes after exposure

5050 SNAKE BITE PROTOCOL



Specific Precautions:

- The prairie rattlesnake is native to Denver Metro region and is most common venomous snake bite in the region.
- Exotic venomous snakes, such as pets or zoo animals, may have different signs and symptoms than those of pit vipers. In case of exotic snake bite, contact base and consult zoo staff or poison center for direction.
- **Take a picture of the snake, including images of head and tail. If an adequate photo can be taken, it is not necessary to bring snake to ED.**
- Never pick up a presumed-to-be-dead snake by hand. Rather, use a shovel or stick. A dead snake may reflexively bite and envenomate.
- > 25% of snake bites are “dry bites”, without envenomation.
- Conversely, initial appearance of bite may be deceiving as to severity of envenomation.
- Fang marks are characteristic of pit viper bites (e.g. rattlesnakes).
- Jaw prints, without fang marks, are more characteristic of non-venomous species.

Approved by Denver Metro EMS Medical Directors July 1, 2022. Next review January 2023

6000 PSYCHIATRIC/BEHAVIORAL PATIENT PROTOCOL

EMT	AEMT
EMT-I	Paramedic

Scene Safety

A. Scene safety should be assured prior to initiating care. Consider police contact if scene safety is a concern.
B. Refer to restraint protocol as needed, especially as it relates to A.

Specific Information Needed

A. Obtain history of current event from patient, bystanders, family and or other first responders; inquire about recent crisis, toxic exposure, drugs, alcohol, emotional trauma, and suicidal or homicidal ideation.
B. Obtain past history; inquire about previous psychiatric and medical problems, medications.

Specific Objective Findings

A. Evaluate general appearance. Be aware that implicit bias may influence and effect your care. All patient regardless of appearance, age, sex, or ethnicity deserve equal and consistent care and compassion.
B. Evaluate vital signs: Is a particular toxidrome suggested, e.g., sympathomimetic?
C. Note medic alert tags, breath odors suggesting intoxication.
D. Consider known predictors of violence: Intoxicated, history of mental illness, seizure disorder, males 15-35 years old, paranoid, aggressive, or threatening behavior.
E. Assess for evidence of delirium
    1. Acute confusional state
        i. Disoriented to person, place, and/or time
        ii. Disorganized thinking, rambling speech, hallucinations, responding to internal stimuli
    2. Unaware or unable to respond to environment/ surroundings
        i. Is the patient aware of your presence and know why you are there?

Treatment

A. If patient agitated or combative, see agitated/combative patient protocol
B. Attempt to establish rapport
C. If agitated, attempt verbal calming and de-escalation techniques
D. Assess ABCs. If unstable vital signs, refer to appropriate treatment protocol.
E. Transport to closest appropriate Emergency Department
F. Be alert for possible elopement, all patient transports should occur with seatbelt in place and visible to provider at all times
G. Consider organic causes of abnormal behavior (trauma, overdose, intoxication, hypoglycemia)
H. If patient restraint considered necessary for patient or EMS safety, refer to restraint protocol.
I. Check blood sugar, vital signs, and assess for signs of toxidrome
J. If altered mental status, refer to universal altered mental status protocol

Transporting Patients Who Have a Behavioral Health Complaint

A. Maintaining patient respect and dignity is important. Attempt to conduct assessment, treatment, and transport in the safest and least restrictive manner possible.
B. Coordination with law enforcement in managing these delicate situations is vital for safety of the patient, scene, and first responders. Authority to make all medical and treatment decisions lies solely with EMS and not law enforcement. Sedation is entirely the responsibility and decision of EMS on scene. There may be certain situations in which a collaborative effort may need to occur between law enforcement and EMS for the safe management of a patient, however, all medical decisions will be made by EMS in these circumstances.
C. If a patient has an isolated mental health complaint (e.g., suicidality), and does not have a medical complaint or need specific medical intervention, then that patient may be appropriately transported by law enforcement according to their protocols or alternative means per agency specific guidelines.
D. If a patient has a psychiatric complaint with associated illness or injury (e.g., overdose, altered mental status, chest pain, etc.), then the patient should be transported by EMS.

E. It is sufficient to assume the patient lacks decision-making capacity if there is a reasonable concern when any person appears to have a mental illness and, as a result of such mental illness, appears to be an imminent danger to others or to himself or herself or appears to be gravely disabled. Effort should be made to obtain consent for transport from the patient, and to preserve the patient's dignity throughout the process. However, the patient may be transported over his or her objections and treated under involuntary consent if the patient does not comply. A patient being transported for psychiatric evaluation may be transported to any appropriate receiving emergency department.
F. The Denver Metropolitan EMS Medical Directors feel strongly that the risk of abandonment of a potentially suicidal or otherwise gravely impaired patient far outweighs the likelihood of accusations of patient abduction. Be sure to document your reason for taking the patient over their objections; that you believe that you are acting in the patient's best interests; and be sure to **Contact Base** if there are concerns.
G. Documentation supports your decision making, therefore document thoroughly.

Specific Precautions

A. Patients presenting with acute delirium often have an organic etiology. Rapid and through assessment of the patient is essential to potentially identify reversible causes of delirium. Be suspicious for hypoglycemia, hypoxia, head injury, intoxication, or toxic ingestion.
B. Providers transporting a patient over his or her objections should reassure the patient. The provider should strongly consider whether the patient may need restraint and/or sedation for safety. Beware of weapons. These patients can become combative.

Transporting Patients on a Mental Health Hold

A. By law, patients detained on a mental health hold may not refuse transport. Similarly, by law, patients on a mental health hold are required to be evaluated by a physician or psychologist and must be transported.
B. Although it is commonly believed that the original copy of the mental health hold form is required to accompany the patient, a legible copy of the mental health hold form is also sufficient.
C. The form documenting the mental health hold should be as complete as possible, including the correct date and time that the patient was detained. The narrative portion should be completed. A signature and license or badge number is also required. Assure that the form is complete before departing.
D. The mental health hold does not need to be started on patients who are intoxicated on drugs and/or alcohol. Nor is it required for patients who are physically incapable of eloping from care, such as those who are intubated, or physically unable.
E. The patient rights form does not need to accompany the patient. The receiving facility may complete this form if there are concerns.
F. If possible, seek direction from the sending facility regarding whether the patient may require sedation and restraint. Consider ALS transport if this is the case.
G. Recall that patients who are a danger to self/others or gravely disabled due to mental illness may be transported by EMS without a mental health hold, under involuntary consent.

6010 AGITATED/COMBATIVE PATIENT PROTOCOL

Principles:

While treating patients experiencing agitation, safety of EMS providers should be maximized while honoring patient dignity and treating the patient's medical condition in a professional manner.

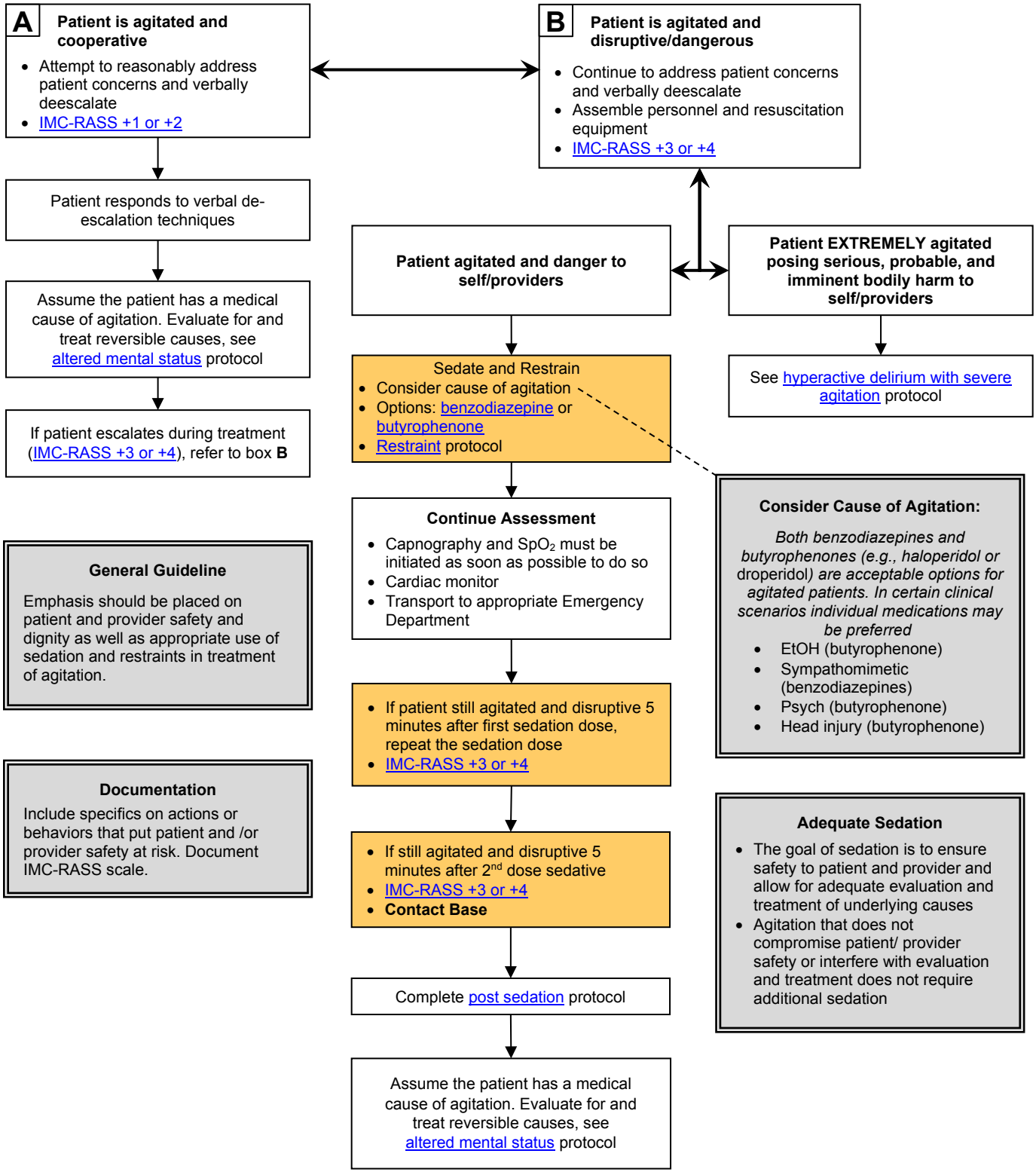
- EMS Safety. The safety of field personnel is paramount. Although EMS personnel have a duty to treat patients experiencing emergency medical conditions, they must not take risks that they are not comfortable with. Risks to personnel or scene safety should be commensurate to the benefit a patient may receive.
- Patient safety. Patient safety and the aid they receive from our care is the reason EMS exists. All treatments should be designed to reduce potential harm and maximize potential benefit.
- Dignity. All patients and providers deserve dignity and respect. Patient encounters for mental health and substance related emergencies are often challenging. It is essential that EMS professionals recognize our own biases. We owe it to our patients, especially those in disenfranchised groups, to provide equitable care. We strive to maximize the dignity of both patients and providers by practicing with clinical expertise and professionalism.

Initial Assessment:

The most critical initial step in managing agitation is the determination of an emergency medical condition.

- Patients assessed as having non-medical agitation do not require emergency medical intervention. EMS should never intervene solely for the support of another 911 function.
- EMS should only intervene in the medical management of agitation when the patient is assessed and suspected to have an emergency medical condition.
- Prior to any physical restraint or medication administration, all patients must first be assessed and suspected to have an emergent medical condition. Depending on the acuity of the situation, some initial assessments must be made in seconds while others may require more time.
- In some situations, it may be appropriate for EMS to stand by in case a person develops a medical emergency.
- Some patients with emergency medical conditions such as trauma or dyspnea may also exhibit agitation. That agitation should only be treated if the paramedic assesses that the patient lacks decision making capacity to care for their illness or injury.
- As soon as safely possible, EMS providers should assess and treat for underlying conditions that may present as agitation.
- EMS safety is paramount. In some uncommon circumstances it may be necessary to separate from an agitated patient in order to protect the patient and personnel on scene.
- When we have tension between the duty to treat and the safety of field personnel, we should apply the principles of EMS safety, patient safety and dignity.

6010 AGITATED/COMBATIVE PATIENT PROTOCOL



Improved Montgomery County Richmond Agitation Sedation Scale (IMC-RASS)			
Score	Term	Description	EMS Activity
+4	Combative	Overtly combative, violent, immediate danger to staff	Unsafe to care for patient without maximal assistance, require law enforcement assistance
+3	Very agitated	Pulls or removes tubes and catheters, aggressive	Struggles aggressively and forcefully against care. Routine EMS care impossible.
+2	Agitated	Frequent, non-purposeful movements, fights interventions	Resists EMS care, requires gentle physical redirection to allow for routine EMS care
+1	Restless	Anxious but movements are not aggressive or vigorous	Verbally redirectable, follows commands, routine EMS care possible
0	Alert and Calm		
-1	Drowsy	Not fully alert but has sustained awakening and eye contact to voice (>10 seconds)	Awakens to voice
-2	Light sedation	Briefly awakens with eye contact to voice (<10 seconds)	Awakens to bumps/potholes in roadway during transport or application of oxygen via NC or NRB
-3	Moderate Sedation	Movement or eye opening to voice (no eye contact)	Eyes open to physical exam, venous tourniquet application and/or BP cuff inflation
-4	Deep Sedation	No response to voice but movement or eye opening to physical stimulation	Responds to insertion of NPA or IV start
-5	Unarousable	No response to voice or physical stimulation	No response to insertion of OPA/NPA or IV start

6011 HYPERACTIVE DELIRIUM WITH SEVERE AGITATION

Hyperactive Delirium with Severe Agitation

Agitated patients who pose serious probable and imminent bodily harm to self/others. They will have some or all the following symptoms:

paranoia, disorientation, hyper- aggression, hallucination, tachycardia, diaphoresis, increased strength, hyperthermia

↓

Sedate and Restrain

- Administer:
  - 10 mg midazolam IM
    OR
  - 10 mg droperidol IM
- Goal is rapid tranquilization in order to minimize threat to patient and provider safety
- Restraint protocol

↓

Initiate Resuscitation

- Maintain airway
- High flow oxygen
- Capnography and SpO_2 monitoring
- Start 2 large bore IVs
- Administer 2 L NS bolus
- Check blood glucose
- Cardiac monitoring
- Rapid transport

↓

If still significantly agitated 5 minutes after medication, **Contact Base**

↓

Complete post sedation protocol

↓

Assume the patient has a medical cause of agitation. Evaluate for and treat reversible causes, see altered mental status protocol

EMT	AEMT	EMT-I	Paramedic

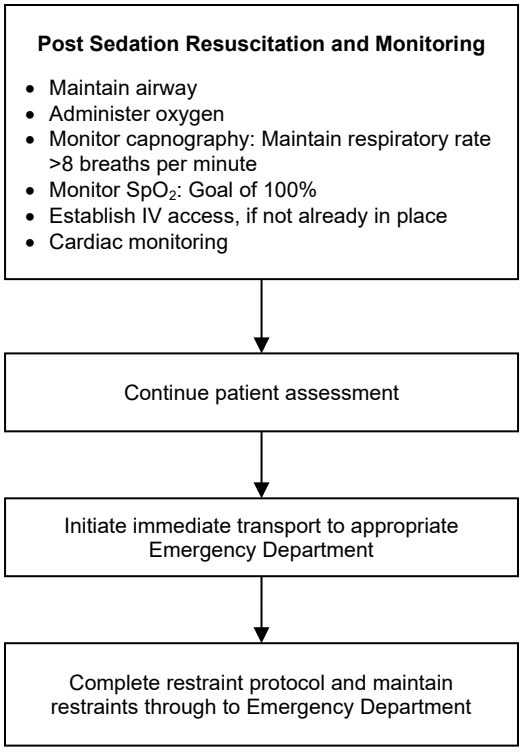
Special Considerations

- Give sodium bicarbonate if QRS>120 or cardiac arrest

Adequate Sedation

- The goal of sedation is to ensure safety to patient and provider and allow for adequate evaluation and treatment of underlying causes
- Agitation that does not compromise patient/ provider safety or interfere with evaluation and treatment does not require additional sedation

6015 POST SEDATION RESUSCITATION AND MONITORING



EMT	AEMT	EMT-I	Paramedic

Adequate Sedation

- The goal of sedation is to ensure safety to patient and provider and allow for adequate evaluation and treatment of underlying causes
- Agitation that does not compromise patient/ provider safety or interfere with evaluation and treatment does not require additional sedation

General Guidelines

- Patients receiving sedative medications have a broad range of responses both from the medication given and the underlying etiology of the agitation. They should be treated as high risk for respiratory or cardiovascular compromise.
- Goal is to initiate resuscitation/monitoring as soon as possible.
- Each individual element of post-sedation resuscitation/monitoring should be initiated as soon as possible to do so.

6020 TRANSPORT OF THE HANDCUFFED PATIENT

Purpose:

1. Guideline for transport of patients in handcuffs placed by law enforcement

Guideline:

1. Handcuffs are only to be placed by law enforcement. EMS personnel are not permitted to use handcuffs.
2. If the patient was placed in handcuffs by law enforcement due to agitation/ combativeness, altered mental status or a similar process, the patient should be evaluated for an underlying life-threatening emergency.
3. Request that law enforcement remain with the patient in the ambulance, if possible. If not possible, request that police ride behind ambulance so as to be readily available to remove handcuffs if needed in an emergency situation to facilitate medical care of the patient.
4. EMS personnel are not responsible for the law enforcement hold on these patients.
5. Handcuffs should only be removed for a medical emergency. EMS should assess the need for ongoing physical restraint for patient or provider safety.
6. Handcuffed patients will not be placed in the prone position.
7. Handcuffs may be used with spinal motion restriction. Medical priorities should take priority in the positioning of the handcuffs.

7000 CHILDBIRTH PROTOCOL

Overview:

- EMS providers called to a possible prehospital childbirth should determine if there is enough time to transport expectant mother to hospital or if delivery is imminent.
- If imminent, **stay on scene** and immediately prepare to assist with the delivery.

ABCs
O_2 15 liters via NRB
IV access

EMT	AEMT	EMT-I	Paramedic

Obtain obstetrical history (see adjacent)

Specific Information Needed:

- Obstetrical history:
  - Number of pregnancies (gravida)
  - Live births (PARA)
  - Expected delivery date
  - Length of previous labors
  - Narcotic use in past 4 hours

If suspected imminent childbirth:

- Allow patient to remain in position of comfort.
- Visualize perineum.
- Determine if there is time to transport.

Imminent Delivery

Delivery is imminent if there is crowning or bulging of perineum

Delivery not imminent

- Transport in position of comfort, preferably on left side to patient's requested hospital if time and conditions allow.
- Monitor for progression to imminent delivery.

Emergency Childbirth Procedure

- If there is a prolapsed umbilical cord or apparent breech presentation, go to obstetrical complications protocol and initiate immediate transport.
- For otherwise uncomplicated delivery:
- Position mother supine on flat surface, if possible.
- Do not attempt to impair or delay delivery.
- Support and control delivery of head as it emerges.
- Protect perineum with gentle hand pressure.
- Check for cord around neck, gently remove from around neck, if present.
- Suction mouth and nose only if signs of obstruction by secretions.
- If delivery not progressing, baby is "stuck", see obstetrical complications protocol and begin immediate transport.
- As shoulders emerge, gently guide head and neck downward to deliver anterior shoulder. Support and gently lift head and neck to deliver posterior shoulder.
- Rest of infant should deliver with passive participation – get a firm hold on baby.
- Dry baby and place skin-to skin on the mother. Assess breathing, tone, and activity.

Critical Thinking:

- If there is an infant in distress call for additional EMS resources to provide care to 2 patients.
- Normal pregnancy is accompanied by higher heart rates and lower blood pressures.
- Shock will be manifested by signs of poor perfusion.
- Labor can take 8-12 hours, but as little as 5 minutes if high PARA.
- The higher the PARA, the shorter the labor is likely to be.
- High risk factors include: no prenatal care, drug use, teenage pregnancy, DM, htn, cardiac disease, prior breech or C section, preeclampsia, twins.
- Note color of amniotic fluid for meconium staining.

Postpartum Care Infant

- Suction mouth and nose only if signs of obstruction by secretions.
- Respirations should begin within 15 seconds after stimulating reflexes. If not, begin artificial ventilations at 40-60 breaths/min.
- If apneic, cyanotic or HR < 100, begin neonatal resuscitation
- Healthy term babies should be managed skin-to-skin with their mothers. After birth, the baby should be dried and directly placed skin-to-skin with attention to warm coverings and maintenance of normal temperature.
- Clamp the cord after the infant is quickly dried, placed on the mother, and assessed for breathing and activity. Double clamp 6" from infant abdominal wall and cut between clamps with sterile scalpel. If no sterile cutting instrument available, lay infant on mother and do not cut clamped cord.
- Document 1- and 5-minute APGAR scores.
- Keep the baby covered, including cap over the head.

Postpartum Care Mother

- Placenta should deliver in 20-30 minutes. If delivered, collect in plastic bag and bring to hospital. Do not pull cord to facilitate placenta delivery and do not delay transport awaiting placenta delivery.
- If the perineum is torn and bleeding, apply direct pressure with sanitary pads.
- Postpartum hemorrhage – see obstetrical complications protocol.
- Initiate transport once delivery of child is complete and mother can tolerate movement.

Approved by Denver Metro EMS Medical Directors July 1, 2022. Next review January 2023

7010 OBSTETRICAL COMPLICATIONS

EMT	AEMT	EMT-I	Paramedic

For All Patients with obstetrical complications

- Do not delay: immediate rapid transport
- Give high-flow oxygen
- Start IV en route if time and conditions allow. Treat signs of shock w. IV fluid boluses per medical hypotension/shock protocol

Possible actions for specific complications (below)

- The following actions may not be feasible in every case, nor may every obstetrical complication by anticipated or effectively managed in the field. These should be considered "best advice" for rare, difficult scenarios. In every case, initiate immediate transport to definite care at hospital

Prolapsed Umbilical Cord

- Discourage pushing by mother
- Position mother in Trendelenburg or supine with hips elevated
- Place gloved hand in mother's vagina and elevate the presenting fetal part off of cord until relieved by physician
- Feel for cord pulsations
- Keep exposed cord moist and warm

Breech Delivery

- Never attempt to pull infant from vagina by legs
- IF legs are delivered gently elevate trunk and legs to aid delivery of head
- Head should deliver in 30 seconds. If not, reach 2 fingers into vagina to locate infant's mouth. Press vaginal wall away from baby's mouth to access an airway
- Apply gentle abdominal pressure to uterine fundus
- IF infant delivered see childbirth protocol – Postpartum care of infant and mother

Postpartum Hemorrhage

- Massage abdomen (uterine fundus) until firm
- Initiate rapid transport
- Note type and amount of bleeding
- Treat signs of shock with IV fluid boluses

Complications of Late Pregnancy

3rd Trimester Bleeding (6-8 months)

- High flow O_2 via NRB, IV access
- Suspect placental abruption or placenta previa
- Initiate rapid transport
- Position patient on left side
- Note type and amount of bleeding
- IV NS bolus for significant bleeding or shock

Pre-eclampsia/Eclampsia

- High flow O_2 via NRB, IV access
- SBP > 140, DBP > 90, peripheral edema, headache, seizure
- Transport position of comfort
- Treat seizures with magnesium sulfate
- See seizure protocol

Shoulder Dystocia

- Support baby's head
- Suction oral and nasal passages
- DO NOT pull on head
- May facilitate delivery by placing mother with buttocks just off the end of bed, flex her thighs upward and gentle open hand pressure above the pubic bone
- If infant delivered see childbirth protocol – Postpartum care of infant and mother

8000 GENERAL TRAUMA CARE

- BSI
- Scene safety
- Consider mechanism
- Consider need for additional resources

Control Exsanguinating Hemorrhage:

- Apply direct pressure
- Pack wounds with hemostatic agent or roller gauze as available
- Tourniquet protocol if indicated

- General impression
- ABCs and LOC
- Rapid Trauma Assessment
- Pelvic stabilization if suspected unstable pelvis based on physical exam
- Prepare for immediate transport
- SAMPLE history

- Give high flow oxygen
- Assist ventilations and manage airway as indicated
- Spinal motion restrictions if indicated
- IV access

Assess Disability and Limitation:

- Brief neuro assessment
- Extremity splinting if indicated

- Rapid transport to appropriate Trauma Center
- Consider pain management

If unstable see traumatic shock protocol

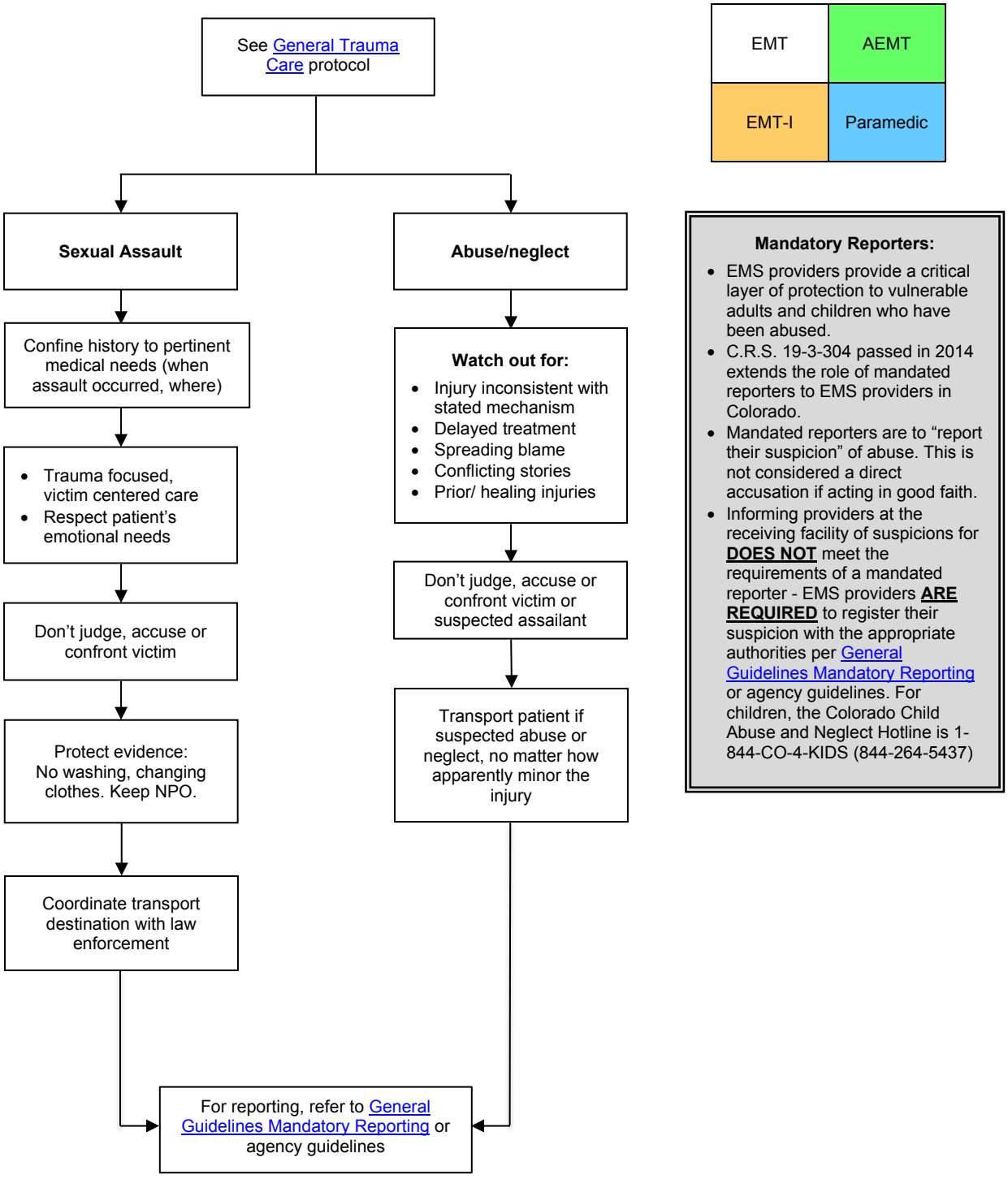
EMT	AEMT
EMT-I	Paramedic

Prolonged Entrapment:

- Crush syndrome can occur after cells have been under pressure from prolonged immobilization or crush injury for >4 hours when skeletal muscles can no longer survive from ischemia
- After release, intracellular potassium can be released into the systemic circulation causing life-threatening hyperkalemia and generating cardiac arrhythmias. 12-lead and continuous ECG monitoring are used to assess for hyperkalemia.
- Consider prior to release placing 1-2 large bore IVs or IOs and initiating a crystalloid fluid bolus.
- Prepare to administer treatment for hyperkalemia if patient develops signs of dysrhythmia or hemodynamic instability. Treatment should include IV calcium and sodium bicarbonate as well as nebulized albuterol

8010 SPECIAL TRAUMA SCENARIOS PROTOCOL

Coordinate transport destination with law enforcement



8020 TRAUMA IN PREGNANCY

EMT	AEMT
EMT-I	Paramedic

See General Trauma Care protocol

Pregnant Trauma (EGA < 20 weeks)

- Priority is mother.
- Transport all patients with any thoracic, abdominal, pelvic injury or complaint.

Pregnant Trauma (EGA ≥ 20 weeks)

- Priority is mother.
- Transport all patients.
- Assure hospital is aware of pregnancy and EGA

Patients with any thoracic, abdominal, or pelvic complaint or injury may require prolonged fetal monitoring in hospital, even if asymptomatic at time of evaluation, and even for seemingly minor mechanism

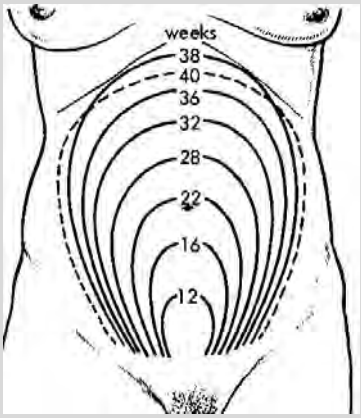
- Avoid supine position:
  - Place in left lateral recumbent position if possible
  - If immobilized tilt backboard 15 to 30 degrees to the left side

Interpret VS with caution. Pregnant patient has:

- *Increased heart rate*
- *Decreased blood pressure*
- *Increased blood volume*

Estimated Gestational Age (EGA)

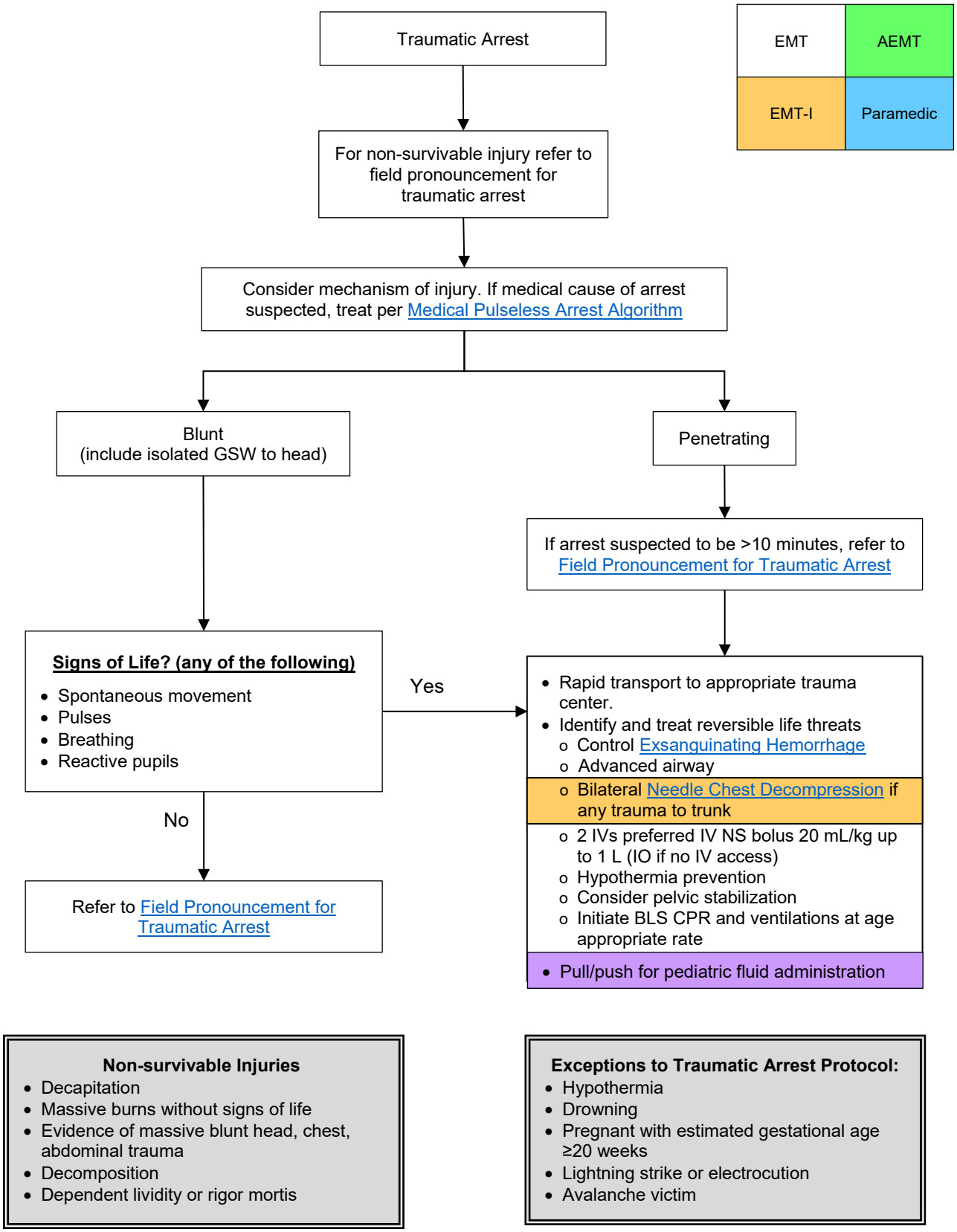
If EGA ≥ 20 weeks, consider two patients: mother and fetus. Estimation of gestational age may be made based on fundal height by palpating for top of uterus:



If uterus is at umbilicus then EGA > 20 weeks

Estimation by Last Menstrual Period:
Due Date = LMP + 9 months + 7 days
EGA = current date - date of last menstrual period
If available, utilize pregnancy wheel to determine EGA.

8030 TRAUMATIC ARREST



8040 TRAUMATIC SHOCK

EMT	AEMT	EMT-I	Paramedic

For trauma patients with hypotension for age or signs of shock:

- Initiate rapid transport to appropriate trauma center.
- Treat and stabilize in route to hospital.

Identify and treat reversible causes of shock:

- Control exsanguinating hemorrhage.
- Treat suspected tension pneumothorax with needle decompression.
- Apply pelvic compression device for suspected unstable pelvic fracture.

Complete General Trauma Care

- Correct hypoxia and manage the airway if needed.
- Keep patient warm.

IV Fluid Resuscitation

- Use IV fluid sparingly.
- Titrate small boluses of crystalloid to presence of peripheral pulses.
- ***However***, hypotension is particularly harmful to patients with severe TBI. In patients with TBI, more aggressive fluid resuscitation is justified to maintain a normal blood pressure
- Most pediatric trauma mortality is from TBI, therefore fluid resuscitation to normal BP is recommended
- Use pull/push technique to administer IV fluid boluses in children

Shock is defined as impaired tissue perfusion and may be manifested by any of the following:

- Altered mental status
- Tachycardia
- Poor skin perfusion
- Low blood pressure

Traditional signs of shock may be absent early in the process, therefore, maintain a high index of suspicion and be vigilant for subtle signs of poor perfusion

Do not use Trendelenburg's position routinely to treat hypotension. It is unnecessary and may impair respirations and/or aggravate injuries. Supine position preferred

Hypotension for Age

Age	Blood Pressure
<1 year	<70 mmHg
1-10 years	<70 + (2 x age in years)
>10 years	<90 mmHg

Tachycardia for Age

Age	Heart Rate
<1 year	>160 bpm
1-2 years	>150 bpm
2-5 years	>140 bpm
5-12 years	>120 bpm
>12 years	>100 bpm

Minimum Blood Pressure with TBI

Age	MAP (mmHg)	Minimum SBP (mmHg)
0-23 months	50-70	75
2-5 years	60-80	80
6-8 years	65-85	85
9-12 years	70-95	90
>12 years	≥80	≥110

Pediatric Fluid Administration

- For children <40 kg or not longer than length-based tape, hand pull/push fluid with a 60 mL syringe utilizing a 3 way stop cock
- Hypotension is a late sign in pediatric shock patients

Pediatric Shock

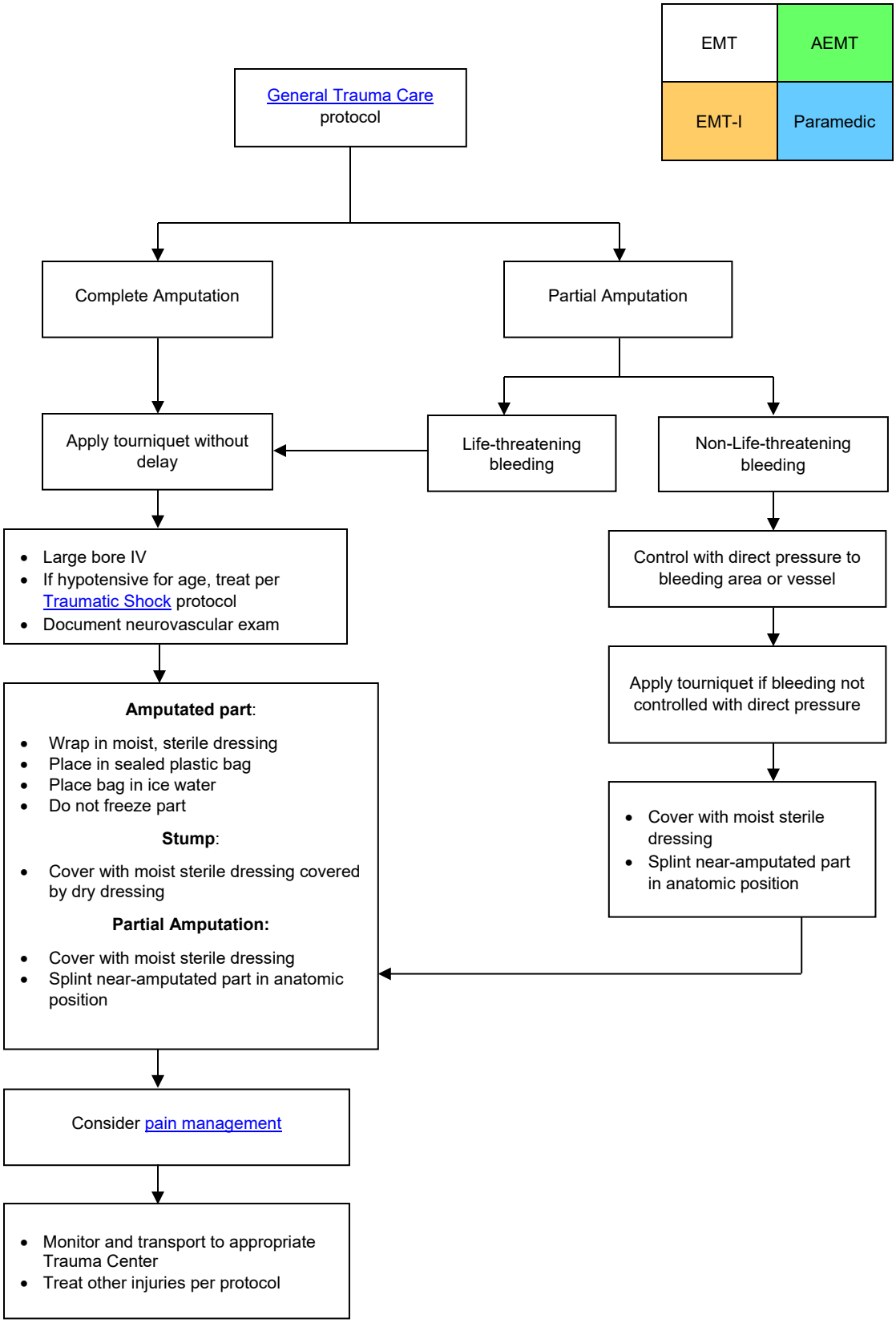
Signs of Compensated Shock

- Normal mental status
- Normal systolic blood pressure
- Tachycardia
- Prolonged (>2 seconds) capillary refill
- Tachypnea
- Cool and pale distal extremities
- Weak peripheral pulse

Signs of Decompensated Shock

- Decrease mental status
- Weak central pulses
- Poor color
- Hypotension for age

8050 AMPUTATIONS



8060 HEAD TRAUMA PROTOCOL

EMT | AEMT | EMT-I | Paramedic

General Trauma Care protocol

GCS < 8 or comatose?

Yes

Open airway and assist ventilations

Consider advanced airway if adequate ventilation and oxygenation cannot be achieved with basic airway maneuvers

BLS airway preferred in pediatrics

No

Support ventilations & maintain $ETCO_2$ 35-45 mmHg

Assess for hypotension and/or signs of shock and treat per Traumatic Shock protocol en route

- Correct hypoxia
- Treat hypotension
- Decrease ICP by elevating head 30° if possible. Use reverse Trendelenburg if spinal motion restriction needed
- Complete Rapid Trauma Assessment en route to hospital
- Treat other injuries per protocol

Monitor:
- ABCs, VS, mental status, $ETCO_2$
- Rapid transport to appropriate trauma center

- Monitor cardiac rhythm

Glasgow Coma Score (GCS)
(Minimum 3, Maximum 15)

Eyes:
1. Does not open eyes
2. Opens eyes to pain
3. Opens eyes to voice
4. Opens eyes spontaneously

Verbal:
1. No sounds
2. Incomprehensible sounds
3. Inappropriate words
4. Confused, disoriented
5. Oriented

Motor:
1. No movement
2. Extension to painful stimuli
3. Flexion to painful stimuli
4. Withdrawal to painful stimuli
5. Localizes to painful stimuli
6. Obeys commands

Pediatric GCS
(Minimum 3, Maximum 15)

Eyes:
1. Does not open eyes
2. Opens eyes to pain
3. Opens eyes to voice
4. Opens eyes spontaneously

Verbal:
1. No vocal response
2. Inconsolable, agitated
3. Inconsistently consolable, moaning.
4. Cries but consolable, inappropriate interactions.
5. Smiles, oriented to sounds, follows objects, interacts

Motor:
1. No motor response.
2. Extension to pain.
3. Flexion to pain.
4. Withdrawal from pain
5. Localizes pain.
6. Obeys Commands.

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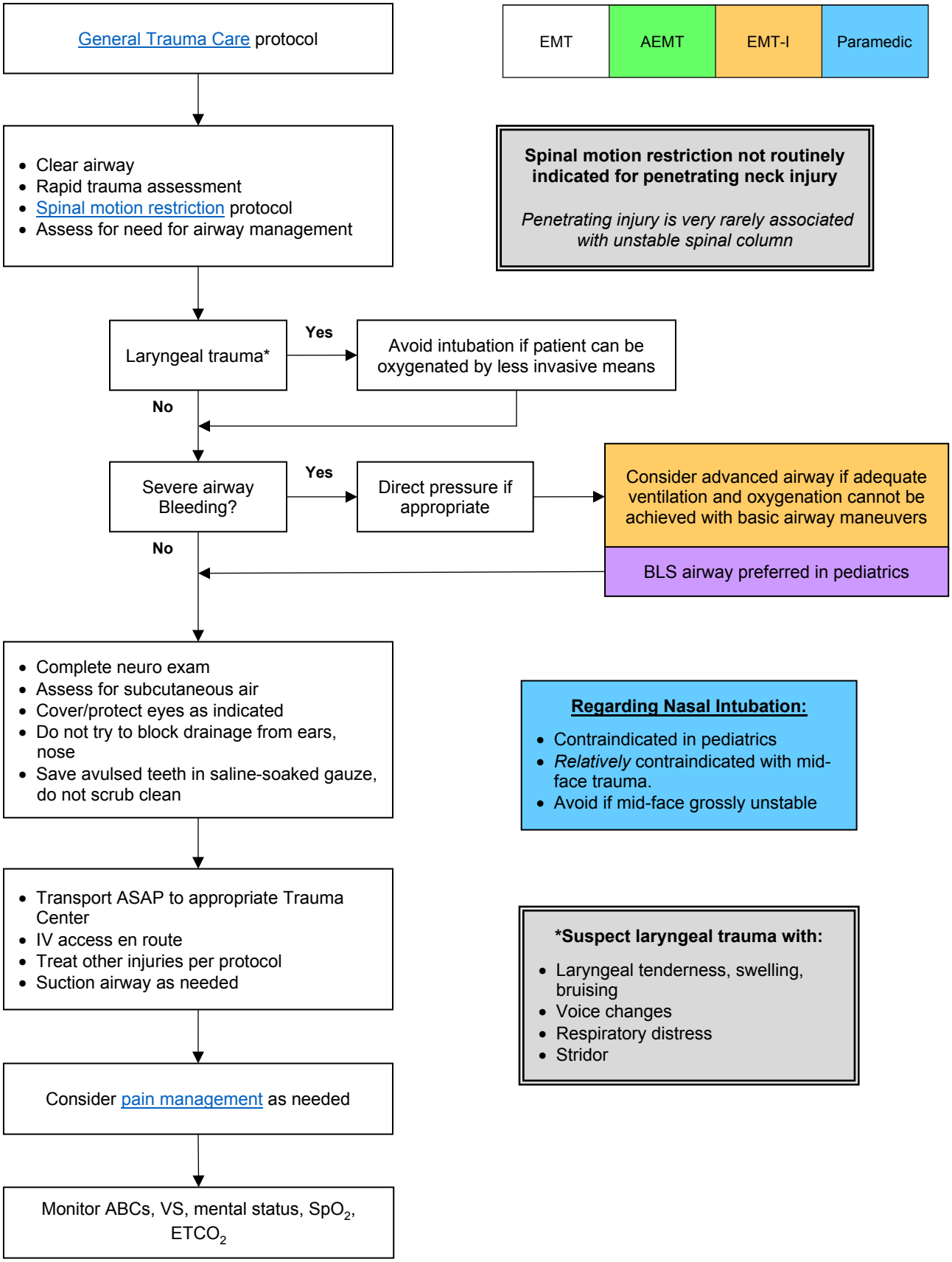
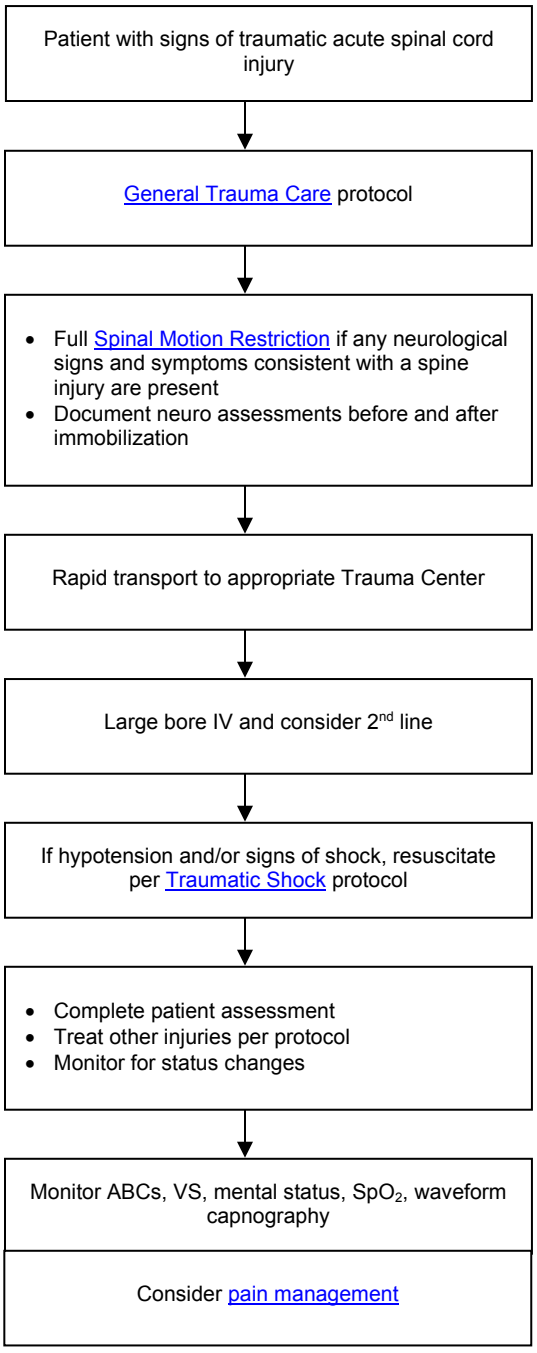
8070 FACE AND NECK TRAUMA



8080 SPINAL TRAUMA



EMT	AEMT
EMT-I	Paramedic

Signs of Spinal Cord Injury:

- Sensory loss, weakness and/or paralysis
- Typically bilateral, but may be asymmetrical
- Sensory changes typically have a level, corresponding to the level of the injury
- Numbness, tingling or painful burning in arms, legs
- **Central cord syndrome** is an incomplete spinal cord injury and causes painful burning or sensory changed in shoulders and upper extremities bilaterally and spares the lower extremities. It may be subtle

Spinal Motion Restriction not routinely indicated for penetrating neck injury

Penetrating injury is very rarely associated with unstable spinal column

8090 SPINAL MOTION RESTRICTION (SMR) PROTOCOL

EMT	AEMT	EMT-I	Paramedic

Does patient have any of the following:

- Midline C/T/L spine tenderness on palpation.
- Neurologic complaints or deficits. This includes sensory changes, weakness.
- Other injuries which are potentially distracting.
- Alteration in mentation or under influence of drugs or EtOH.
- Barrier to evaluate for spinal injury (*e.g., language or developmental barrier*).
- The provider feels there is a potential spinal injury (see **Notes** section).

Yes

Place c-collar on patient and ask them to not move neck

No

If **NONE** of above criteria, and you do not think patient has a spinal injury, cervical collar and other SMR may be omitted.

Is there an objective neurological deficit?

Yes

Full spinal motion restriction

No

Is the patient ambulatory on scene at time of EMS arrival?

Yes

Transport patient in a position of comfort on gurney with cervical collar

No

Is the patient able to comfortably lay still and comply with instructions?

Yes

Transport patient in a position of comfort on gurney with cervical collar

No

Full spinal motion restriction

Notes

- If for any reason you suspect the patient has a spinal injury, then take measures to prevent inadvertent movement of the spine: spinal motion restriction.
- Patients over the age of 65 are at higher risk of spinal injuries, even from ground-level falls.
- Use caution when assessing for spinal injury in elderly patients, who are at much higher risk and may have minimal or even no symptoms of neck pain despite c-spine injury.
- Consider spinal motion restriction for patients with high-risk mechanism.
- Communicate to receiving facility spinal motion restriction is in place.
- Neurological exam documentation is **MANDATORY** in **ALL** patients with potential spinal trauma.
- Cervical collar is not indicated in isolated *penetrating* neck trauma.
- If a standard cervical collar device cannot be used for some reason, consider use of alternative devices for cervical motion restriction (e.g. foam, towels, etc.)

Pediatric Considerations

- Age alone should not be a factor in decision-making for prehospital spinal care, both for the young child and the child who can reliably provide a history.
- Spinal motion restriction should be applied if the patient has any of the following in addition to the algorithm:
  - Patient not moving neck
  - Numbness and weakness
  - Torso injury or pelvic instability
  - High impact diving injury
- Additional padding under the shoulders is needed for infants and young children up to age 8 to avoid flexion of the neck
- A car seat is not acceptable for spinal motion restriction. If spinal motion restriction is deemed necessary, the child should be removed from the car seat and placed supine.

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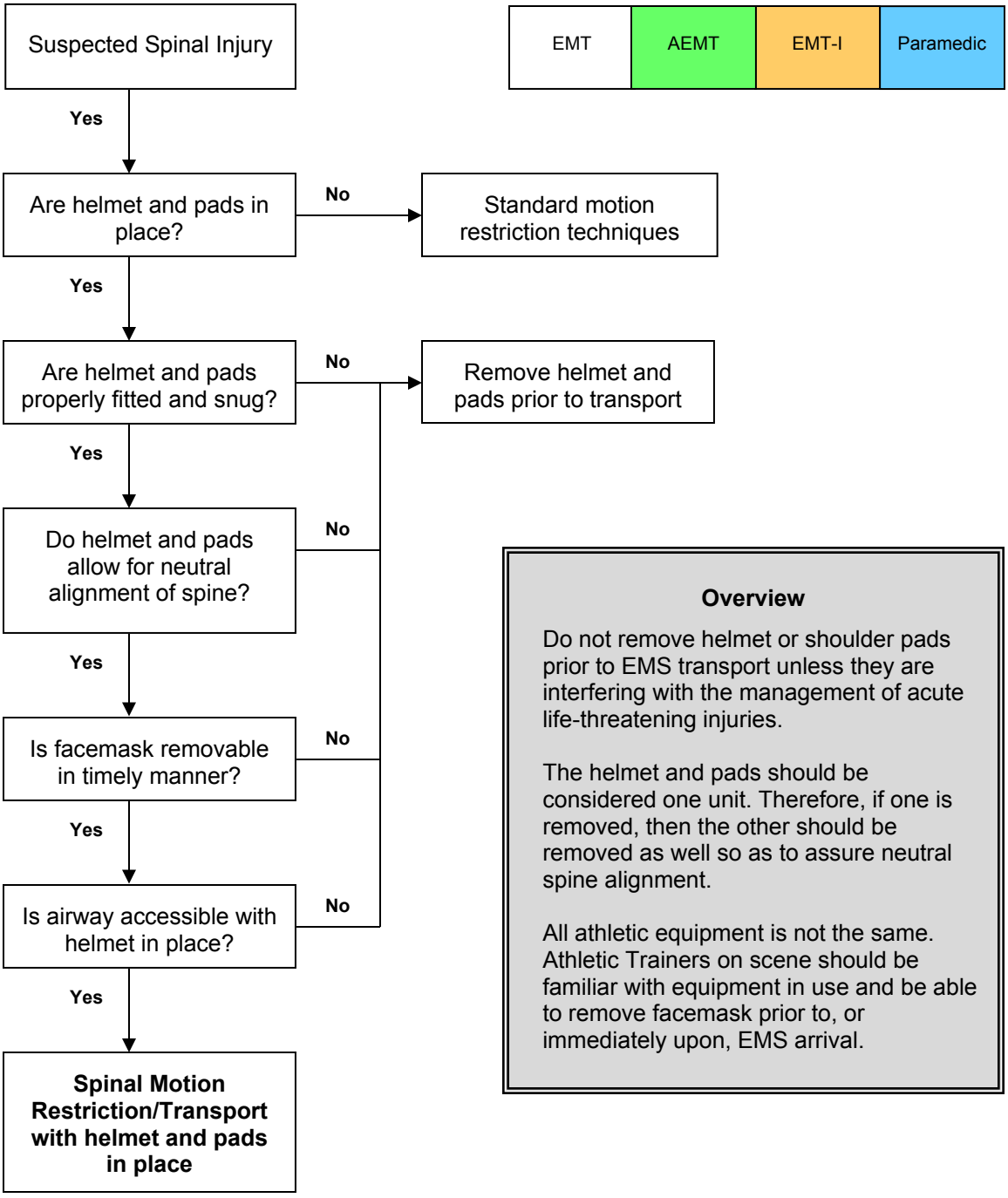
8100 SUSPECTED SPINAL INJURY WITH PROTECTIVE ATHLETIC EQUIPMENT IN PLACE



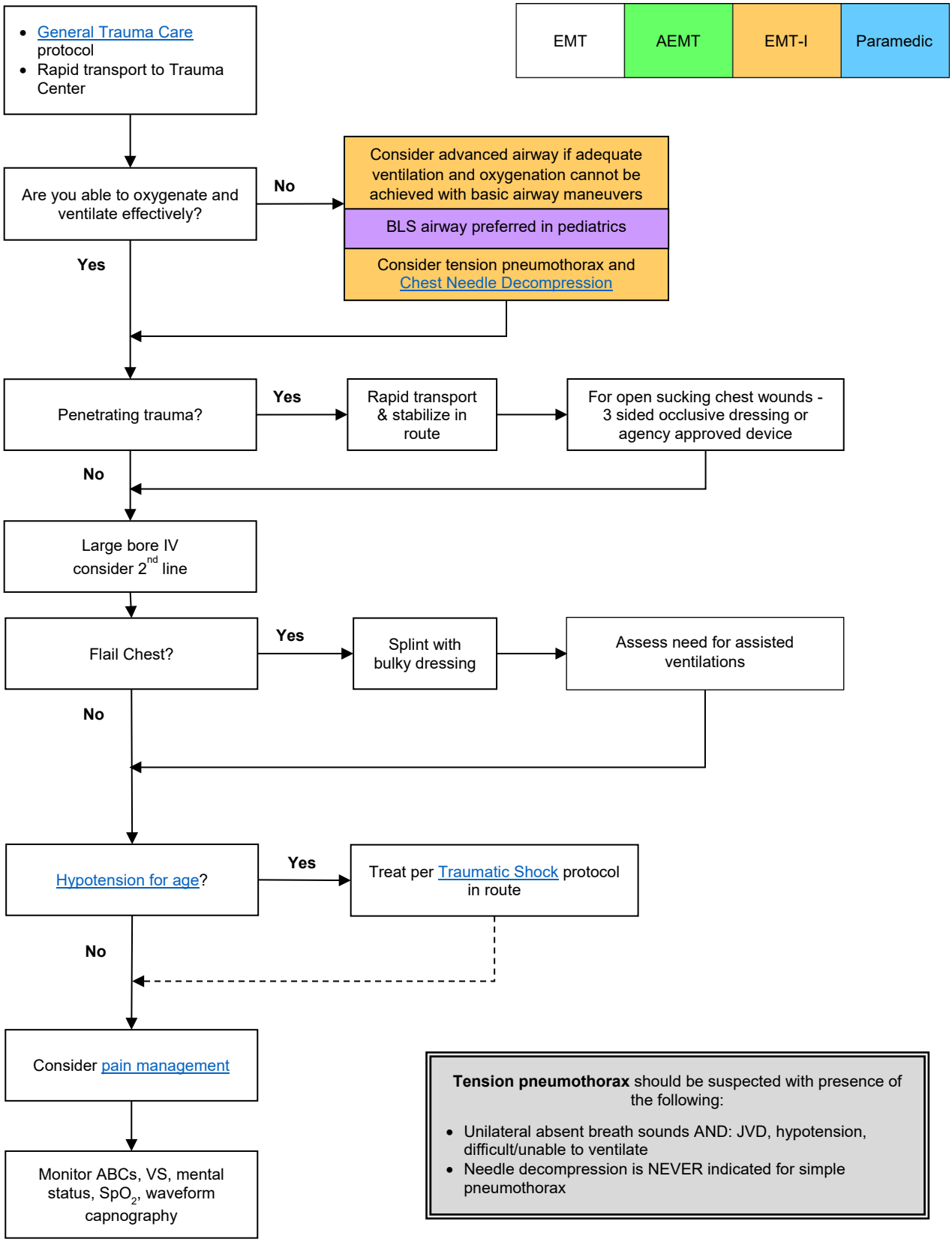
Overview

Do not remove helmet or shoulder pads prior to EMS transport unless they are interfering with the management of acute life-threatening injuries.

The helmet and pads should be considered one unit. Therefore, if one is removed, then the other should be removed as well so as to assure neutral spine alignment.

All athletic equipment is not the same. Athletic Trainers on scene should be familiar with equipment in use and be able to remove facemask prior to, or immediately upon, EMS arrival.

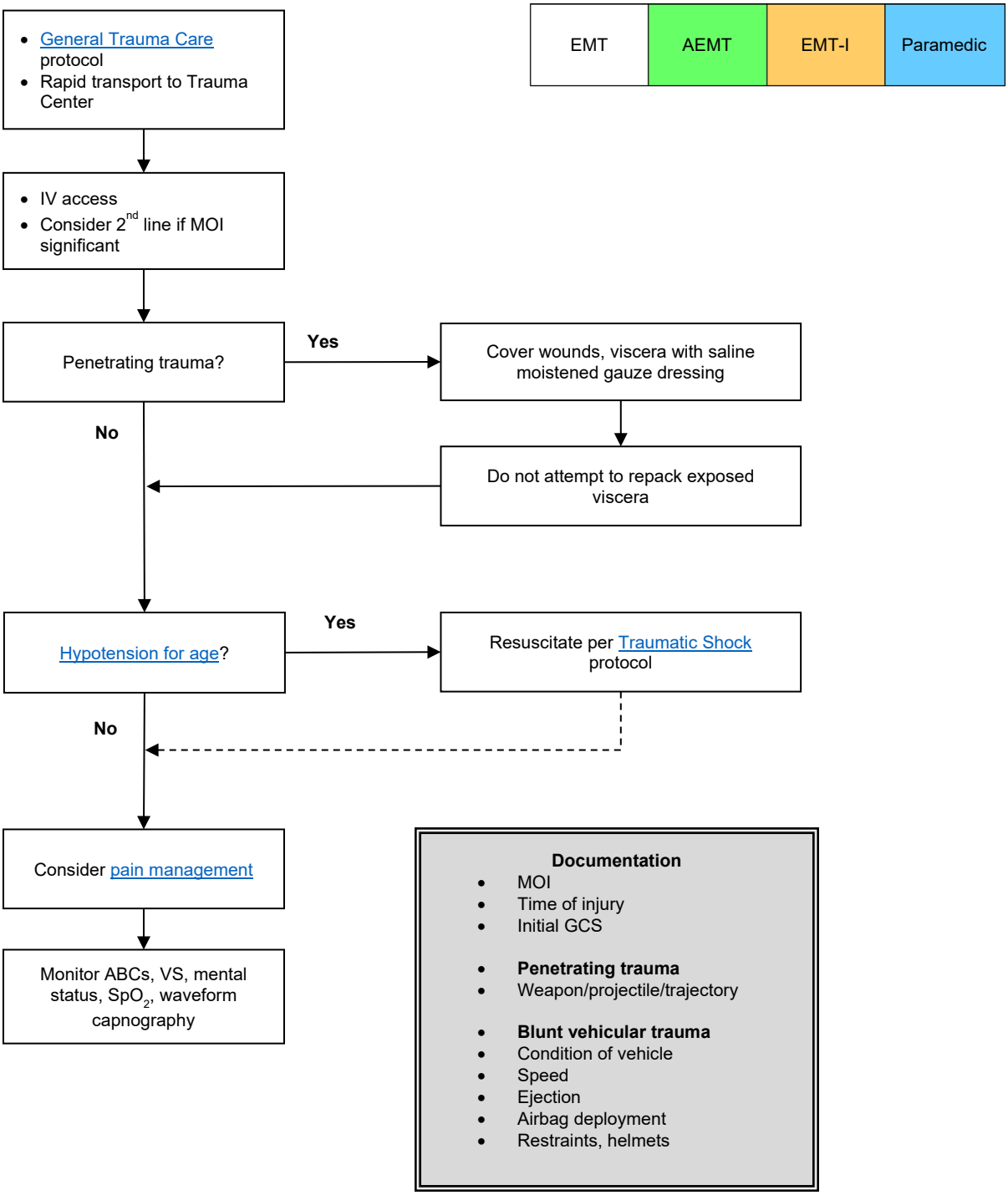
8110 CHEST TRAUMA



Tension pneumothorax should be suspected with presence of the following:

- Unilateral absent breath sounds AND: JVD, hypotension, difficult/unable to ventilate
- Needle decompression is NEVER indicated for simple pneumothorax

8120 ABDOMINAL TRAUMA



8130 BURNS

EMT	AEMT	EMT-I	Paramedic

- General Trauma Care protocol
- Rapid transport to Trauma Center

Stop burning process:
- Remove clothes if not adhered to patient's skin
- Flood with water only if flames/ smoldering present

Respiratory Distress hoarseness or stridor?

Yes
- O_2 NRB 15 Lpm
- Manage airway and assist ventilations as indicated
- Consider CO, CN

No

Evaluate degree and body surface are involved

Critical Burn*?

Yes
- Start 2 large-bore IVs
- Fluids per ABA recommendations (chart below)**

No

IV NS TKO

- Remove rings, jewelry, constricting items
- Dress burns with dry sterile dressings
- Treat other injuries per protocol
- Cover patient to keep warm

Consider opioid for pain control

Monitor ABCs, VS, mental status, SpO_2, waveform capnography

Document:
- Type and degree of burn(s)
- % BSA
- Respiratory status including any voice changes (hoarseness)
- Singed nares, soot in mouth
- SpO2
- PMH
- Confined space (assume CO)

***Critical Burn:**
- 2º > 30% BSA
- 3º > 10% BSA
- Respiratory injury, facial burn
- Associated injuries, electrical or deep chemical burns, underlying PMH (cardiac, DM), age < 10 or > 50 yrs.

Types of Burns:
- Thermal: remove from environment, put out fire
- Chemical: brush off or dilute chemical. Consider HAZMAT
- Electrical: make sure victim is de-energized and suspect internal injuries
- Assume CO if enclosed space
- Consider cyanide poisoning (CN) if unconscious or pulseless arrest

Designated Regional Burn Centers

Consider direct transport of isolated burns if time and conditions allow

- Children's Hospital Colorado: Age ≤ 14
- University of Colorado Hospital: Age ≥ 15
- Swedish Medical Center: Any age

**** ABA Recommended Prehospital Fluid Therapy**

14 and older	500 mL/hr NS or LR
5 - 13 years	250 mL/hr NS or LR
Younger than 5	125 mL/hr D5W, NS or LR

If no signs of clinical hypovolemia or shock, large volume of IV fluid not needed. For typical 30-minute prehospital time, give 250 mL bolus for patient age ≥ 14.

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9000 GENERAL GUIDELINES: MEDICATION ADMINISTRATION

Purpose

A. Provide guidance to EMS providers in the principles of administration, delivery, and safety of approved medications

General Principles

A. The appropriate procedure for safe medication administration includes:
    1. Verification of the “Six Rights” of medication administration (right patient, right drug, right dose, right route, right time, right documentation)
    2. Medication administration cross-check with practice partner verifying the Six Rights prior to drug administration. This should include verbal repeat-back of the order by the practice partner.
    3. Obtain repeat vital signs after any intervention.

B. The risk of dosing error is high in children, and we recommend the use of a standardized system to decrease the rate of error. This can include age-based, weight-based, or length-based systems that has standardize precalculated volume-based medication dosing and equipment. These should be utilized on every pediatric patient to guide medication dosing and equipment size.

C. Optional routes of medication administration are vast, and appropriateness given the clinical situation should be considered. Specific considerations include:
    1. Especially in children, intranasal (IN) administration may be faster and more efficacious with less pain compared to IV or intramuscular (IM) administration
    2. IM drug absorption and onset of action is erratic and unpredictable.

D. Ideally, expired medications should never be utilized for patient care. However, the nation is increasingly faced with the challenge of critical or potentially life-saving medication shortages. As such, the Denver Metro EMS Medical Directors have issued guidelines for the appropriate response to a national medication crisis. Approved medications required for potentially emergent conditions and for which no reasonable substitution is available may be used after the posted expiration date with the following restrictions:
    1. Medication should be approved for use by the agency’s EMS Medical Director.
    2. Expired medications will be used only after the supply of non-expired medications have been exhausted
    3. Standard medication storage, inspection and delivery practices should be maintained

E. EMS agencies should work to establish a system of Just Culture. This is an approach to work place safety that assumes humans, despite their best intentions to do the right thing, will make errors. Change and care improvement does not happen without accurate, honest reporting of error. A report of error should be treated with respect and examination of root cause, and not punitive action

ACETAMINOPHEN (TYLENOL)

Description

Acetaminophen elevates the pain threshold and readjusts hypothalamic temperature-regulatory center.

Onset & Duration

- Onset of analgesia: oral 20-30 minutes; IV within 5 minutes
- Peak effect: 1 hour
- Duration: 4 hours

Indications

- Mild pain, moderate, or severe pain. Consider IV administration for moderate or severe pain.

Contraindications

- History of allergy to acetaminophen
- Chronic liver disease
- Therapeutic dose of acetaminophen within past 6 hours or greater than 3 gm in last 24 hours.

Adverse Reactions

- Acetaminophen has a wide therapeutic window. Recommended maximum therapeutic doses are less than half the toxic dose.
  - Single toxic dose in a 70 kg adult is greater than 7 gm.
  - Single toxic dose in a child is greater than 150 mg/kg.
  - Chronic supratherapeutic acetaminophen poisoning is possible as many medications contain acetaminophen.
- Liver injury (hepatotoxicity) can occur from either a single large overdose or repeated supratherapeutic ingestion of acetaminophen. Therefore, it is important to determine if your patient has already taken a therapeutic dose of acetaminophen within past 6 hours before you administer.
- IV acetaminophen may cause headache, nausea, and vomiting.
- Hypersensitivity and allergic reactions have been reported but are rare

Drug Interactions

- Avoid concomitant administration with other acetaminophen-containing medication, such as many prescription opioids (e.g. Percocet) or OTC cough and cold medications.

Dosage and Administration

Adult:

1000 mg PO

OR

1000 mg IV infused over 15 minutes

Pediatric:

15 mg/kg PO – ***SEE CHART***

Weight	Age	PO Dose (160 mg/5 mL)
n/a	< 6 months	BASE CONTACT
5-8kg	6 months -12 months	2.5ml (80mg)
9-11kg	1-2 years	4ml (128mg)
12-16kg	2-3 years	5ml (160mg)
17-21kg	4-5 years	7.5ml (240mg)
22-27kg	6-8 years	10ml (320mg)
28-33kg	9-10 years	12.5ml (400mg)
34-43kg	11-12 years	15ml (480mg)

Protocol

- Pain management

ADENOSINE (ADENOCARD)

Description

Adenosine transiently blocks conduction through the AV node thereby terminating reentrant tachycardias involving the AV node. It is the drug of choice for AV nodal reentrant tachycardia (AVNRT, often referred to as “PSVT”). It will not terminate dysrhythmias that do not involve the AV node as a reentrant limb (e.g. atrial fibrillation).

Onset & Duration

- Onset: almost immediate
- Duration: 10 sec

Indications

- Narrow-complex supraventricular tachyarrhythmia after obtaining 12 lead ECG (This may be the only documented copy of the AVRNT rhythm)
- Pediatric administration requires call in for direct verbal order

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Contraindications

- Any irregular tachycardia. Specifically never administer to an irregular wide-complex tachycardia, which may be lethal
- Heart transplant

Adverse Reactions

- Chest pain
- Shortness of breath
- Diaphoresis
- Palpitations
- Lightheadedness

Drug Interactions

- Methylxanthines (e.g. caffeine) antagonize adenosine, a higher dose may be required
- Dipyridamole (persantine) potentiates the effect of adenosine; reduction of adenosine dose may be required
- Carbamazepine may potentiate the AV-nodal blocking effect of adenosine

---

Dosage and Administration

Adult:

12 mg IV bolus, rapidly, followed by a normal saline flush.
Additional dose of 12 mg IV bolus, rapidly, followed by a normal saline flush.
Contact medical control for further considerations

Pediatric:

Children who are stable with AVNRT generally remain so and transport is preferred over intervention.

CONTACT BASE 0.1 mg/kg IV bolus (max 6 mg), rapidly followed by normal saline flush.
Additional dose of 0.2 mg/kg (max 12 mg) rapid IV bolus, followed by normal saline flush.

Protocol

- Tachyarrhythmia with Poor Perfusion

Special Considerations

- Reliably causes short lived but very unpleasant chest discomfort. Always warn your patient of this before giving medication and explain that it will be a very brief sensation
- May produce bronchospasm in patients with asthma
- Transient asystole and AV blocks are common at the time of cardioversion
- Adenosine is not effective in atrial flutter or fibrillation
- Adenosine is safe in patients with a history of Wolff-Parkinson-White syndrome if the rhythm is regular and QRS complex is **narrow**
- A 12-lead EKG should be performed and documented, when available
- Adenosine requires continuous EKG monitoring throughout administration

ALBUTEROL SULFATE (PROVENTIL, VENTOLIN)

Description

- Albuterol is a selective ß-2 adrenergic receptor agonist. It is a bronchodilator and positive chronotrope.
- Because of its ß agonist properties, it causes potassium to move across cell membranes inside cells. This lowers serum potassium concentration and makes albuterol an effective temporizing treatment for unstable patients with hyperkalemia.

Onset & Duration

- Onset: 5-15 minutes after inhalation
- Duration: 3-4 hours after inhalation

Indications

- Bronchospasm
- Known or suspected hyperkalemia with ECG changes (i.e.: peaked T waves, QRS widening)
- Crush or suspension injury with suspected hyperkalemia

Contraindications

- Severe tachycardia is a relative contraindication

Adverse Reactions

- Tachycardia
- Palpitations
- Dysrhythmias

Drug Interactions

- Sympathomimetics may exacerbate adverse cardiovascular effects.
- ß-blockers may antagonize albuterol.

How Supplied

MDI: 90 mcg/metered spray (17-g canister with 200 inhalations)
Pre-diluted nebulized solution: 2.5 mg in 3 ml NS (0.083%)

Dosage and Administration

Adult and Pediatric:

Single Neb dose
Albuterol sulfate solution 0.083% (one unit dose bottle of 3.0 ml), by nebulizer, at a flow rate (6-8 lpm) that will deliver the solution over 5 to 15 minutes. May be repeated twice (total of 3 doses).

Continuous Neb dose
In more severe cases, place 3 premixed containers of albuterol (2.5 mg/3ml) for a total dose of 7.5 mg in 9 ml, into an oxygen-powered nebulizer and run a continuous neb at 6-8 lpm.

Protocol

- Adult Wheezing
- Pediatric Wheezing
- Allergy and Anaphylaxis
- General Trauma Care

Special Considerations

- Consider inline nebs for patients requiring endotracheal intubation or CPAP.
- May precipitate angina pectoris and dysrhythmias
- Should be used with caution in patients with suspected or known coronary disease, diabetes mellitus, hyperthyroidism, prostatic hypertrophy, or seizure disorder
- Wheezing associated with anaphylaxis should first be treated with epinephrine IM.

AMIODARONE (CORDARONE)

Description

Amiodarone has multiple effects showing Vaughn-Williams Class I, II, III and IV actions with a quick onset. The dominant effect is prolongation of the action potential duration and the refractory period.

Indications

- Pulseless arrest in patients with shock-refractory or recurrent VF/VT
- Wide complex tachycardia not requiring immediate cardioversion due to hemodynamic instability

---

Precautions

- Wide complex irregular tachycardia
- Sympathomimetic toxidromes, i.e. cocaine or amphetamine overdose
- NOT to be used to treat ventricular escape beats or accelerated idioventricular rhythms

---

Contraindications

- 2nd or 3rd degree AV block
- Cardiogenic shock

Adverse Reactions

- Hypotension
- Bradycardia

Dosage and Administration

Adult:

- **Pulseless Arrest (Refractory VT/VF):**
  - 300 mg IV bolus.
  - Administer additional 150 mg IV bolus in 3-5 minutes if shock refractory or recurrent VF/VT.
- **Symptomatic VT and undifferentiated wide complex tachycardia with a pulse:**
  - **CONTACT BASE** 150 mg IV bolus infusion over 10 minutes.

Pediatric:

- **Pulseless Arrest (Refractory VT/VF):**
  - 5mg/kg IV bolus.
  - **CONTACT BASE** for additional doses.

Protocol

- Medical Pulseless Arrest Algorithm
- Tachyarrhythmia with Poor Perfusion

Special Considerations

- A 12-lead EKG should be performed and documented, when available.
- Amiodarone is preferred to adenosine for treatment of undifferentiated WCT with a pulse.

ANTIEMETICS: ONDANSETRON (ZOFRAN), PROMETHAZINE (PHENERGAN), METOCLOPRAMIDE (REGLAN)

Description

- Ondansetron is a selective serotonin 5-HT3 receptor antagonist antiemetic. Ondansetron is the preferred antiemetic, if available.
- Promethazine is a non-selective central and peripheral H-1 type histamine antagonist with anticholinergic properties resulting in antiemetic and sedative effects.
- Metoclopramide is a dopamine antagonist that works by blocking the CNS vomiting chemoreceptor trigger zone (CRT).

Indications

- Nausea and vomiting

Contraindications

- Ondansetron: No absolute contraindication. Should be used with caution in first trimester of pregnancy and should be reserved for only those patients with severe dehydration and intractable vomiting
- Promethazine: age < 2 years, patients with respiratory or CNS depression or allergy to sulfites.
- Metoclopramide: age < 8 years or suspected bowel obstruction.

Adverse Effects:

- Ondansetron: Very low rate of adverse effects, very well tolerated.
- Promethazine: Hypotension, CNS depression, altered mental status, pain on injection, including tissue necrosis with extravasation, extrapyramidal symptoms, urinary retention
- Metoclopramide: Restlessness, agitation, extrapyramidal symptoms, sedation. Increased GI motility – do not use if suspected bowel obstruction.

Dosage and Administration

Ondansetron

Adult:
4 mg IV/IM/PO/ODT. May repeat x 1 dose as needed.

Pediatric ≥ 4 years old:
4 mg IV/PO/ODT

Pediatric 6 months to 4 years old:
2 mg IV/PO/ODT

Pediatric < 6 months:
BASE CONTACT

Promethazine

Adult:
12.5 mg IV/IM. May repeat x 1 dose as needed.

Pediatric 2-12 years old:
1 mg/kg IV/IM to a maximum single dose of 12.5 mg

Metoclopramide

Adult:
10 mg IV/IM.

Pediatric 8-12 years old:
5 mg IV/IM.

Droperidol

Refer to droperidol protocol for dosing

Protocol

- Abdominal Pain/Vomiting
- Altitude Illness

Promethazine and Metoclopramide Side effects/Special Notes:

- Drowsiness, dizziness, dry mouth and blurred or double vision are common.
- If hypotension occurs, administer fluid bolus.
- Dystonia and akathisia may occur and should be treated with diphenhydramine.
- Elderly may become agitated or disoriented. Consider reducing the dose in elderly patients.

ASPIRIN (ASA)

Description

Aspirin inhibits platelet aggregation and blood clotting and is indicated for treatment of acute coronary syndrome in which platelet aggregation is a major component of the pathophysiology. It is also an analgesic and antipyretic.

Indications

- Suspected acute coronary syndrome

Contraindications

- **Active** gastrointestinal bleeding
- Aspirin allergy

How Supplied

Chewable tablets 81mg

Dosage and Administration

- 324 mg PO

Protocol

- Chest Pain

Special Considerations

- Patients with suspected acute coronary syndrome taking warfarin (Coumadin), clopidogrel (Plavix) or novel oral anticoagulants may still be given aspirin.

ATROPINE SULFATE

Description

Atropine is a naturally occurring antimuscarinic, anticholinergic substance. It is the prototypical anticholinergic medication with the following effects:

- Increased heart rate and AV node conduction
- Decreased GI motility
- Urinary retention
- Pupillary dilation (mydriasis)
- Decreased sweat, tear and saliva production (dry skin, dry eyes, dry mouth)

Indications

- Symptomatic bradycardia
- 2nd and 3rd degree heart block
- Organophosphate poisoning

Precautions

- Should not be used without medical control direction for stable bradycardias
- Closed angle glaucoma

Adverse Reactions

- Anticholinergic toxidrome in overdose, think “blind as a bat, mad as a hatter, dry as a bone, red as a beet”

Dosage and Administration

Hemodynamically Unstable Bradycardia

Adult:

0.5 mg IV/IO bolus.

Repeat if needed at 3-5 minute intervals to a maximum dose of 3 mg. (Stop at ventricular rate which provides adequate mentation and blood pressure)

Pediatric:

0.02 mg/kg IV/IO bolus. Minimum dose is 0.1 mg, maximum single dose 0.5 mg

Poisoning/Overdose

Adult:

40kg and up: 2mg IV/IM for signs of moderate/severe toxicity. Contact base for additional doses.

Pediatric:

Under 40kg: 0.02mg/kg IV/IM moderate to severe toxicity. Minimum dose is 0.1 mg. Contact base for additional doses.

Protocol

- Bradyarrhythmia with poor perfusion
- Poisoning/Overdose

Special Considerations

- Atropine causes pupil dilation, even in cardiac arrest settings

BENZODIAZEPINES (DIAZEPAM, LORAZEPAM, MIDAZOLAM)

Description

- Benzodiazepines are sedative-hypnotics that act by increasing GABA activity in the brain. GABA is the major inhibitory neurotransmitter, so increased GABA activity *inhibits* cellular excitation. Benzodiazepine effects include anticonvulsant, anxiolytic, sedative, amnestic and muscle relaxant properties. Each individual benzodiazepine has unique pharmacokinetics related to its relative lipid or water solubility.
- Selection of specific agent as preferred benzodiazepine is at individual agency Medical Director discretion.

Onset & Duration

- Any agent given IV will have the fastest onset of action, typical time of onset 2-3 minutes
- Intranasal administration has slower onset and is less predictable compared to IV administration, however, it may still be preferred if an IV cannot be safely or rapidly obtained. Intranasal route has faster onset compared to intramuscular route.
    - Diazepam should not be given intranasally as it is not well absorbed.
- IM administration has the slowest time of onset.

Indications

- Status epilepticus
- Sedation of the severely agitated/combative patient
- Hyperactive delirium with severe agitation
- Sedation for cardioversion or transcutaneous pacing (TCP)
- Adjunctive agent for treatment of severe pain (e.g. back spasms) in adults that is uncontrolled by maximum opioid dose – **WITH CALL IN ONLY**

Contraindications

- Hypotension
- Respiratory depression

Adverse Reactions

- Respiratory depression, including apnea
- Hypotension
- Consider ½ dosing in the elderly for all benzodiazepines

Dosage and Administration

MIDAZOLAM:

Seizure or sedation for cardioversion or transcutaneous pacing:

Adult:

IV/IO route: 2 mg

- Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

IN/IM route (intranasal preferred): 5 mg

- Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

Pediatric:

IV/IO route 0.1 mg/kg

- Maximum single dose is 2 mg IV. Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

IN/IM route (intranasal preferred): 0.2 mg/kg.

- Maximum single dose is 5 mg IN or IM. Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

Sedation of severely agitated or combative patient

Adult:

IV route: 2 mg

IN/IM route: 5 mg

- Dose may be repeated x 1 after 5 minutes. **Contact Base** for additional sedation orders.

Pediatric:

- **Contact Base** before any consideration of sedation of severely agitated/combative child.

Hyperactive delirium with severe agitation

IM route: 10 mg. **Contact Base** for additional sedation orders.

DIAZEPAM:

Seizure or sedation for cardioversion or transcutaneous pacing:

Adult:

IV/IO route: 5 mg

- Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

Pediatric:

IV/IO route

- **Neonate:** Not indicated
- **>Neonate to <5 years:** 0.5 mg, dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.
- **5 to 12 years:** 1 mg, dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

Sedation of severely agitated or combative patient

Adult:

IV route: 5 mg

- Dose may be repeated x 1 after 5 minutes. **Contact Base** for additional sedation orders.

Pediatric:

- **Contact Base** before any consideration of sedation of severely agitated/combative child.

LORAZEPAM:

Seizure:

Adult:

IV/IO/IM route: 2 mg

- Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

Pediatric:

IV/IO route: 0.1 mg/kg

- Maximum single dose is 2 mg IV. Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

IM route: 0.1 mg/kg
- Maximum single dose is 2 mg IV. Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

Sedation for cardioversion or transcutaneous pacing:

Adult:

IV/IO route: 1 mg
- Dose may be repeated x 1 after 5 minutes. **Contact Base** for more than 2 doses.

IM route: 2 mg
- Dose may be repeated x 1 after 5 minutes. **Contact Base** for more than 2 doses.

Sedation of severely agitated or combative patient

Adult:

IV/IM route: 2 mg
- Dose may be repeated x 1 after 5 minutes. **Contact Base** for additional sedation orders.

Pediatric:
- **Contact Base** before any consideration of sedation of severely agitated/combative child.

Protocol
- Synchronized Cardioversion
- Transcutaneous Pacing
- Seizure
- Poisoning/Overdose
- Agitated/Combative Patient
- Hyperactive Delirium with Severe Agitation

Special Considerations
- All patients receiving benzodiazepines must have cardiac, pulse oximetry monitoring during transport. Continuous waveform capnography recommended.
- Sedative effects of benzodiazepines are increased in combination with opioids, alcohol, or other CNS depressants.
- Coadministration of opioids and benzodiazepines is discouraged and may only be done with direct physician verbal order.
- In elderly patients > 65 years old or small adults < 50kg, lower doses may be sufficient and effective. Consider ½ dosing in these patients.

CALCIUM

Description

- Cardioprotective agent in hyperkalemia.
- Calcium chloride contains 3 times the amount of elemental calcium contained in the same volume of calcium gluconate. Therefore, 1 g (10 mL) vial of calcium chloride 10% solution contain 273 mg of elemental calcium, whereas 1 g (10 mL) of 10% calcium gluconate contains 90 mg of elemental calcium. For this reason, larger doses of calcium gluconate are required.
- Doses below refer to dose of calcium solution, not elemental calcium.

Indications

- Adult pulseless arrest associated with any of the following clinical conditions:
  - Known or suspected hyperkalemia
  - Renal failure with or without hemodialysis history
  - Calcium channel blocker overdose
  - **Not indicated for routine treatment of pulseless arrest**
- Renal failure with known or suspected hyperkalemia
- Crush or suspension injury with known or suspected hyperkalemia
- Calcium channel blocker overdose with hypotension and bradycardia

Contraindications

- Known or suspected hypercalcemia
- Known or suspected digoxin toxicity (i.e. digoxin overdose)

Side Effects/Notes

- Extravasation of calcium chloride solution may cause tissue necrosis.
- Because of the risk of medication error, if calcium chloride is stocked, consider limiting to 1 amp per medication kit to avoid accidental overdose. Calcium gluconate solution will require 3 amp supply for equivalent dose.
- Must give in separate line from IV sodium bicarb to prevent precipitation/formation of calcium carbonate.
- In setting of digoxin toxicity, may worsen cardiovascular function.

Dosage and Administration

Calcium Gluconate 10% Solution

Adult:

- **Pulseless arrest assumed due to hyperkalemia**
  - 3 gm (30 mL) slow IV/IO push.
- **Renal Failure with known or suspected hyperkalemia**
  Crush or suspension injury with known or suspected hyperkalemia
  - 3 gm (30 mL) IV/IO over 5 minutes.
- **Calcium channel blocker overdose with hypotension and bradycardia**
  - **Contact Base** for order. 3 gm (30 mL) IV/IO over 5 minutes. Dose may be repeated every 5 minutes for total of 3 doses.

Pediatric:

- **Calcium channel blocker overdose with hypotension for age and bradycardia**
  - **Contact Base** for order. 60 mg/kg (0.6 mL/kg), **not to exceed 1 g**, IV/IO over 5 minutes. May repeat every 5 minutes for total of 3 doses.

Calcium Chloride 10% Solution

Adult:

- **Pulseless arrest assumed due to hyperkalemia**
  - 1 g (10 mL) slow IV/IO push

- **Renal failure with known or suspected hyperkalemia**
  Crush or suspension injury with known or suspected hyperkalemia
  - 1 gm (10 mL) IV/IO over 5 minutes.
- **Calcium channel blocker overdose with hypotension and bradycardia**
  - **Contact Base** for order. 1 g (10 mL) IV/IO over 5 minutes. Dose may be repeated every 5 minutes for total of 3 doses

Pediatric:

- **Calcium channel blocker overdose with hypotension for age and bradycardia**
  - **Contact Base** for order. 20 mg/kg (0.2 mL/kg), **not to exceed 1 g,** IV/IO over 5 minutes. May repeat every 5 minutes for total of 3 doses.

Protocol

- Universal Pulseless Arrest
- Poisoning/Overdose
- General Trauma Care

DEXTROSE

Description

Glucose is the body's basic fuel and is required for cellular metabolism. A sudden drop in blood sugar level will result in disturbances of normal metabolism, manifested clinically as a decrease in mental status, sweating and tachycardia. Further decreases in blood sugar may result in coma, seizures, and cardiac arrhythmias. Serum glucose is regulated by insulin, which stimulates storage of excess glucose from the blood stream, and glucagon, which mobilizes stored glucose into the blood stream.

Indications

- Hypoglycemia
- The unconscious or altered mental status patient with an unknown etiology.

Precautions

- None

Dosage and Administration

Adult:

25 gm (250 mL of a 10% solution) IV/IO infusion
Alternative: 25 gm (50 mL of a 50% solution) IV/IO bolus

Pediatric:

<50 kg administer 5 mL/kg of 10% solution (maximum of 250 mL)

Protocol

- Hypoglycemia
- Universal Altered Mental Status
- Seizures
- Poisoning/Overdose
- Psych/Behavioral

Special Considerations

- The risk to the patient with ongoing hypoglycemia is enormous. With profound hypoglycemia and no IV access consider IO insertion.
- Draw blood sample before administration, if possible.
- Use glucometer before administration, if possible.
- Extravasation may cause tissue necrosis; use a large vein and aspirate occasionally to ensure route patency.
- Dextrose can be irritable to the vein and the vein should be flushed after administration.

DIPHENHYDRAMINE (BENADRYL)

Description

Antihistamine for treating histamine-mediated symptoms of allergic reaction. Also, anticholinergic and antiparkinsonian effects used for treating dystonic reactions caused by antipsychotic and antiemetic medications (e.g.: haloperidol, droperidol, reglan, compazine, etc).

Indications

- Allergic reaction
- Dystonic medication reactions or akathisia (agitation or restlessness)

Precautions

- Asthma or COPD, thickens bronchial secretions
- Narrow-angle glaucoma
- Patients over 65 years old are at greater risks of serious side effects including confusion, urinary retention, and dizziness that could lead to fall risk. For these reasons, half dosing is recommended.

Side effects

- Drowsiness
- Dilated pupils
- Dry mouth and throat
- Flushing

Drug Interactions

- CNS depressants and alcohol may have additive effects.
- MAO inhibitors may prolong and intensify anticholinergic effects of antihistamines.

Dosage and Administration

Adults:
50 mg IV/IO/IM. For patients over 65 years old, administer half-dose of 25 mg IV/IO/IM.
Pediatrics:
1 mg/kg slow IV/IO/IM (not to exceed 50 mg)

Protocol

- Allergy/Anaphylaxis

DROPERIDOL (INAPSINE)

Description

- Droperidol is a butyrophenone closely related to haloperidol. Droperidol produces a dopaminergic blockage, a mild alpha-adrenergic blockage, and causes peripheral vasodilation. Its major actions are sedation, tranquilization, and potent anti-emetic effect.

Onset & Duration

- Onset: 3-10 minutes after IM administration.
- Duration: 2-3 hours

Indications

- Primary use for management of agitated/combative patients.
- Hyperactive delirium with severe agitation.
- Second line medication for management of intractable vomiting.
- Combative head injured patients

Contraindications

- Suspected acute myocardial infarction/ACS
- Systolic blood pressure under 100 mm/Hg, or the absence of a palpable radial pulse
- Signs of respiratory depression

Side Effects

- Due to the vasodilation effect, droperidol can cause a transient hypotension that is usually self-limiting and can be treated effectively with leg elevated position and IV fluids. Droperidol may cause tachycardia which usually does not require pharmacologic intervention.
- Some patients may experience unpleasant sensations manifested as restlessness, hyperactivity, or anxiety following droperidol administration. This is called akathisia and is treated with diphenhydramine.
- Extra-pyramidal reactions have been noted hours to days after treatment.
- Rare instances of neuroleptic malignant syndrome have been known to occur following treatment using droperidol.

Dosage and Administration

Agitation/Combative

Adult:
IV/IM route: 5 mg slow IV or IM administration. Dose may be repeated x1 after 5 minutes. **CONTACT BASE** for additional sedation orders.

Pediatric:
Less than 12 years, **CONTACT BASE**

Hyperactive Delirium with Severe Agitation

IM route: 10 mg IM administration. **CONTACT BASE** for additional sedation orders.

Antiemetic:

IV/IM route:
Adult: 1.25 mg slow push.

Pediatric: Not indicated.

Special Considerations

- Due to droperidol's potential effect on QT interval prolongation, all patients receiving droperidol should be placed on the cardiac monitor. Though it is understood that obtaining an ECG on the combative or agitated patient may be difficult, every effort should be made to do so.
- Avoid droperidol in frail or elderly patients due to increased risk of prolonged and over-sedation as well as increased risk of hypotension and prolonged QT. If it must be given, administer ½ typical dose.

Protocol

- Agitated/Combative Patient
- Hyperactive Delirium with Severe Agiation
- Antiemetics

DuoDote™ (NERVE AGENT ANTIDOTE KIT)

Description

Nerve agents can enter the body by inhalation, ingestion, and through skin. These agents are absorbed rapidly and can produce injury or death within minutes. The DuoDote™ Nerve Agent Antidote kit consists of one auto-injector for self and/or buddy administration. One Injector contains 2.1mg atropine and 600mg pralidoxime chloride (2-PAM)

Indications

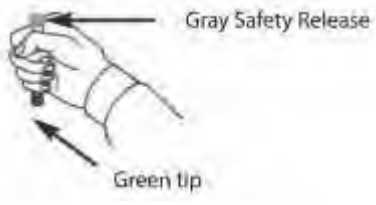
- Suspected nerve agent exposure accompanied with signs and symptoms of nerve agent poisoning

Injection sites

- Outer thigh- mid-lateral thigh (preferred site)
- Buttocks- upper lateral quadrant of buttock (gluteal) in thin individuals

Instructions

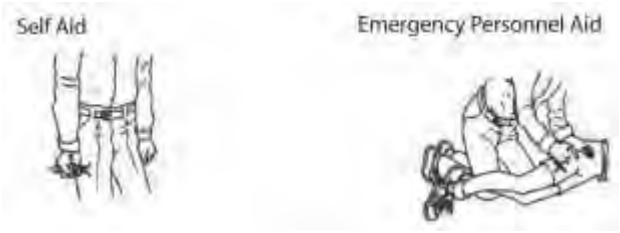
- Place the auto-injector in the dominate hand. Firmly grasp the center of the auto injector with the green tip (needle end) pointing down.



- With the other hand, pull off the gray safety release. The DuoDote™ auto-injector is now ready to be administered.

- The injection site is the mid-outer thigh. The DuoDote™ auto-injector can inject through clothing. However, make sure pockets at the injection site are empty.

- Swing and firmly push the green tip at a 90-degree angle against the mid-outer thigh. Continue to firmly push until you feel the auto injector trigger.



- No more than three (3) sets of antidotes should be administered.

Special Considerations

- Presence of tachycardia is not a reliable indicator of effective treatment due to potential nicotinic effects of nerve agent exposure. The end-point of treatment is clear dry lung sounds.
- Attempt to decontaminate skin and clothing between injections.

Protocol:

- Overdose and Acute Poisoning

EPINEPHRINE (ADRENALIN)

Description

Endogenous catecholamine alpha, beta-1, and beta-2 adrenergic receptor agonist. Causes dose-related increase in heart rate, myocardial contractility and oxygen demand, peripheral vasoconstriction and bronchodilation.

Indications

- Pulseless Arrest
- Anaphylaxis
- Asthma
- Bradycardia with poor perfusion

Adverse Reactions

- Tachycardia and tachydysrhythmia
- Hypertension
- Anxiety
- May precipitate angina pectoris

Drug Interactions

- Should not be added to sodium bicarbonate or other alkaloids as epinephrine will be inactivated at higher pH.

Dosage and Administration

Adult:

Pulseless Arrest

1 mg (10 ml of a 1:10,000 solution), IV/IO bolus.
Repeat every 3-5 minutes up to maximum of 3 doses. Additional dose may be considered for recurrent arrest after ROSC or narrow complex PEA.

Bradycardia with hypotension and poor perfusion refractory to other interventions

Continuous infusion titrated to effect: see Vasopressor infusion

Adult Wheezing:

0.3 mg (0.3 ml of a 1:1,000 solution) IM. May repeat dose x 1.

Systemic allergic reaction:

0.3 mg (0.3 ml of a 1:1,000 solution) IM. May repeat dose x 1.

Severe systemic allergic reaction (Anaphylaxis) refractory to IM epinephrine:

Continuous infusion titrated to effect: see Vasopressor infusion

ALTERNATIVE to racemic epinephrine: (for stridor at rest)

5 mL of 1:1,000 epinephrine via nebulizer x 1

Epinephrine Auto-Injector:

Systemic allergic reaction:

Adult: 0.3 mg IM with autoinjector (adult EpiPen, Auvi-Q)
Pediatric: 0.15 mg IM with autoinjector (EpiPen Jr., Auvi-Q)

Pediatric:

Pulseless arrest:

0.01 mg/kg IV/IO (0.1 ml/kg of 1:10,000 solution).
Subsequent doses repeated every 3-5min: 0.01 mg/kg IV/IO (0.1 ml/kg of 1:10,000 solution)

Bradycardia (CONTACT BASE)

0.01 mg/kg (0.1 ml/kg of 1:10,000 solution) IV/IO

Pediatric Wheezing 1 to 12 years old

0.01 mg/kg (0.01 ml/kg of 1:1,000 solution) IM. May repeat dose x 1 after 20 minutes.
Alternative: 0.15 mg (0.15 mL of 1:1,000) for <25 kg and 0.3 mg (0.3 mL of 1:1,000) for >25 kg. May repeat dose x 1 after 20 minutes.

Moderate to Severe Allergic Reactions

4 months to 12 years

0.01 mg/kg (0.01 ml/kg of 1:1,000 solution) IM. May repeat dose x 1 after 5 minutes.
Alternative: 0.15 mg (0.15 mL of 1:1,000) for <25 kg and 0.3 mg (0.3 mL of 1:1,000) for >25 kg. May repeat dose x 1 after 5 minutes.

Term to <4 months

0.01 mg/kg (0.01 ml/kg of 1:1,000 solution) IM. May repeat dose x 1 after 5 minutes.
Alternative: 0.1 mg (0.1 mL of 1:1,000) May repeat dose x 1 after 5 minutes.

Severe systemic allergic reaction (Anaphylaxis) refractory to IM epi (Contact Base):

0.01 mg/kg (0.1 ml/kg of 1:10,000 solution) IV/IO

ALTERNATIVE to racemic epinephrine: (for stridor at rest)

5 mL of 1:1,000 epinephrine via nebulizer x 1

Protocol

- Medical Pulseless Arrest Algorithm
- Bradyarrhythmia with poor perfusion
- Neonatal Resuscitation
- Allergy and Anaphylaxis Protocol
- Adult Wheezing
- Pediatric Wheezing
- Vasopressor Infusion

Special Considerations

- May increase myocardial oxygen demand and angina pectoris. Use with caution in patients with known or suspected CAD
- Intramuscular injection into the thigh is preferred route and site of administration. Intramuscular injection of epinephrine in the thigh results in higher concentrations of medication versus intramuscular or subcutaneous injection in the upper arm.

GLUCAGON

Description

Increases blood sugar concentration by converting liver glycogen to glucose. Glucagon also causes relaxation of smooth muscle of the stomach, duodenum, small bowel, and colon.

Onset & Duration

- Onset: variable

Indications

- Altered level of consciousness where hypoglycemia is suspected and IV access is unavailable.
- Hypotension, bradycardia from beta-blocker or calcium channel overdose.

Side Effects

- Tachycardia
- Headache
- Nausea and vomiting

Dosage and Administration

Adult:

Hypoglycemia:

- 1 mg IM

Beta Blocker/Calcium Channel overdose with hypotension and bradycardia:

- 2 mg IV bolus

Pediatric:

Hypoglycemia:

- < 25 kg: 0.5 mg IM.
- > 25 kg: 1 mg IM

Beta Blocker/Calcium Channel overdose with hypotension for age, signs of poor perfusion and bradycardia:

- 0.1 mg/kg IV

Protocol

- Hypoglycemia
- Poisoning/Overdose

HALOPERIDOL (HALDOL)

Description

Haloperidol is a butyrophenone antipsychotic medication. Haloperidol produces a dopaminergic blockade, a mild alpha-adrenergic blockade, and causes peripheral vasodilation. Its major actions are sedation and tranquilization.

Onset & Duration

- Onset: Within 10 minutes after IM administration. Peak effect within 30 minutes
- Duration: 2-4 hours (may be longer in some individuals)

Indications

- Sedation of a severely agitated and/or combative patient

Contraindications

- Suspected myocardial infarction
- Hypotension
- Respiratory or CNS depression
- Pregnancy

Precautions

- Haldol may cause hypotension, tachycardia, and prolongation of the QT interval. Use with caution in severe cardiovascular disease.
- Cardiac monitor and establish an IV as soon as possible with all administrations.
- Some patients may experience unpleasant sensations manifested as restlessness, hyperactivity, or anxiety following haloperidol administration.
- Rare instances of neuroleptic malignant syndrome (very high fever, muscular rigidity) have been known to occur after the use of haloperidol.

Dosage and Administration

Adults:
5 mg IM. Dose may be repeated x1 after 5 minutes. **CONTACT BASE** for additional sedation orders.

Pediatrics (not for use in children <6 years):
BASE CONTACT
Ages 6-12: 2 mg IM

BASE CONTACT must be made for additional doses (consider if no effects within 10 minutes)

Special Considerations

- Extra-pyramidal reactions have been noted hours to days after treatment, usually presenting as spasm of the muscles of the tongue, face, neck, and back. This may be treated with diphenhydramine.
- Hypotension and tachycardia secondary to haloperidol are usually self-limiting and should be treated with IV fluid bolus.
- Use one half dose in patients age ≥ 65 who are at increased risk of complications.

Protocol

- Agitated/Combative Patient

HEMOSTATIC AGENT (QuickClot, Celox, Bloodstop, Actcel, HemCon, ChitoGauze)

Description

QuickClot Combat Gauze is a standard roller or Z-fold gauze impregnated with a clotting agent such as kaolin (a clay containing the active ingredient aluminum silicate) which works on contact with blood to initiate the clotting process (intrinsic pathway) by activating factor XII. This reaction leads to the transformation of factor XII to its' activated form XIIa, which triggers the clotting cascade.

Mucoadhesive agents such as HemCon, ChitoGauze and Celox utilize a granular chitosan salt derived from the shells of marine arthropods (which are positively charged) to react with and bind to negatively charged red blood cells rapidly forming a cross-linked barrier clot to seal the injured vessels.

Used in conjunction with direct pressure and wound packing these products lead to hemostasis.

Onset and Duration

- Onset of action is 3-5 minutes after wound exposure and clotting action remains unless the dressing and/or the clot is disturbed.

Indications

- Active bleeding from open wounds with that cannot be controlled with direct pressure. Most often involving wounds to the scalp, face, neck, axilla, groin or buttocks.

Contraindications

- Not to be used to treat internal bleeding such as intra-abdominal, intra-thoracic or vaginal bleeding.
- Not to be used for minor bleeding that can be controlled by direct pressure.

Precautions

- Bleeding control is achieved via combination of direct pressure and hemostatic gauze packing for a minimum of 3-5 minutes.
- Stabilize patient per General Trauma Care protocol.
- If a tourniquet is indicated (refer to Tourniquet protocol), it should be applied first, before application of hemostatic agent.
- **DO NOT USE LOOSE GRANULAR OR POWDERED HEMOSTATIC AGENTS**. These are out date and will produce exothermic reactions that may cause burns and additional tissue damage.

Procedure

1. Manufacturers may have different recommendations on application of their products. Follow specific manufacturer guidelines for the particular product carried.

HYDROXOCOBALAMIN (CYANOKIT®)

Description

- Cyanide inhibits cytochrome oxidase, thereby arresting cellular respiration and forcing anaerobic metabolism, which leads to lactate production and acidosis and ultimately death. Hydroxocobalamin binds cyanide ions to form cyanocobalamin which is excreted in urine.

Indications

- Adult or pediatric patient with suspected cyanide poisoning from any route, including smoke inhalation in an enclosed space, with any of the following clinical signs:
  - Pulseless arrest
  - Coma/unresponsiveness
  - Signs of shock

Precautions

- Administer only after basic life support measures have been initiated and always in conjunction with other supportive treatment modalities.
- When possible, obtain dedicated line for hydroxocobalamin administration, as compatibility with other drugs is unknown. If this is not possible, flush line with 3-5ml NS flush before and after dose administered.

Adverse Reactions

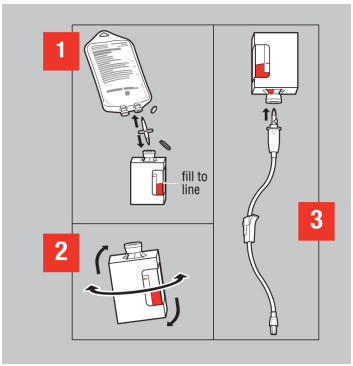
- Hypertension
- Allergic reaction/anaphylaxis

Dosage and Administration

- Dosing
  - **Adult** dose is 5 gm IV/IO
  - **Pediatric** dose is 70 mg/kg up to 5 gm IV/IO

Average Weight by Group	Grey 4 kg	Pink 6.5 kg	Red 8.5 kg	Purple 10.5 kg	Yellow 13 kg	White 16.5 kg	Blue 21 kg	Orange 26.5 kg	Green 33 kg	Adult
Dose	275mg	450 mg	600 mg	725 mg	900 mg	1150 mg	1475 mg	1850 mg	2300 mg	5 gm
Volume	11 mL	18 mL	24 mL	29 mL	36 mL	46 mL	59 mL	74 mL	92 mL	200 mL
Continuous Infusion Rate - Values are drops (gtt.) /min										
10 gtt./mL	7	12	16	19	24	31	39	49	61	133
15 gtt./mL	11	18	24	29	36	46	59	74	92	200
20 gtt./mL	15	24	32	39	48	61	79	99	123	267
Aliquot Administrations - Administer each dose every 3 minutes										
1st Dose	4 mL	6 mL	8 mL	10 mL	12 mL	16 mL	20 mL	25 mL	32 mL	
2nd Dose	3 mL	6 mL	8 mL	10 mL	12 ml	15 mL	20 mL	25 mL	30 mL	
3rd Dose	3 mL	6 mL	8 mL	9 mL	12 mL	15 mL	19 mL	24 mL	30 mL	

- Adult infusion instructions:
    1. Draw one tiger top tube, if practical.
    2. Reconstitute: Place the 5 gm vial of hydroxocobalamin in an upright position. Add 200 mL of 0.9% sodium chloride injection* to the vial using the transfer spike. Fill to the line.
        * 0.9% sodium chloride injection is the recommended diluent (diluent not included in the kit). Lactated Ringer's solution and 5% dextrose injection have also been found to be compatible with hydroxocobalamin.
    3. Mix: The vial should be repeatedly inverted or rocked, not shaken, for at least 60 seconds prior to infusion.
    4. Infuse Vial: Use vented intravenous tubing, hang, and infuse desired dose over 15 minutes.



- Pediatric infusion instructions:
    1. Draw one tiger top tube, if practical.
    2. Reconstitute and mix the 5 gm vial of hydroxocobalamin as noted above
    3. Optimal: Continuous Infusion Method. Remove desired volume based on pediatric dosing chart and insert into empty infusion bag. Attach drip set and infuse at rate listed in chart above. Desired dose should be infused over 15 min.
    4. If unable to infuse continuously: Aliquot Method. Divide entire dosing volume by 3 to make 3 separate aliquots. Flush line with 3-5 mL NS, administer 1 aliquot, flush with 3-5 mL NS. Repeat every 3 minutes until entire dosing volume administered.

Special Considerations

- It is understood that Cyanokit® may not be available to all agencies at all times and therefore is not considered standard of care. Notify receiving facility if Cyanokit® used.

Protocols

- Carbon Monoxide Exposure
- Burns

IPRATROPIUM BROMIDE (ATROVENT)

Description

Ipratropium is an anticholinergic bronchodilator chemically related to atropine.

Onset & Duration

- Onset: 5-15 minutes.
- Duration: 6-8 hours.

Indications

- Bronchospasm

Contraindications

- Soy or peanut allergy is a contraindication to the use of Atrovent metered dose inhaler, not the nebulized solution, which does not have the allergen contained in propellant.

Adverse Reactions

- Palpitations
- Tremors
- Dry mouth

How Supplied

Premixed Container: 0.5 mg in 2.5ml NS

Dosage and Administration

Adult
Bronchospasm:

0.5 mg along with albuterol in a nebulizer

Child (1 year – 12 years)
Moderate and Severe Bronchospasm

2-12 years: 0.5 mg along with albuterol in a nebulizer
1 to <2 years: 0.25 mg along with albuterol in a nebulizer
Not indicated for repetitive dose or continuous neb use

Child (<1 year)

Contact Base

Protocol

- Adult Wheezing
- Pediatric Wheezing

LIDOCAINE 2% SOLUTION

Description
Local anesthetic for relief of pain during intraosseous fluid administration.

Indications
- Analgesic for intraosseous infusion

Side Effects
- Seizures
- Drowsiness
- Tachycardia
- Bradycardia
- Confusion
- Hypotension

Precautions
- Lidocaine is metabolized in the liver. Elderly patients and those with liver disease or poor liver perfusion secondary to shock or congestive heart failure are more likely to experience side effects

Dosage and Administration
Adult:
- 50 mg slow IO push

Protocol
- Intraosseous Procedure

Special Notes
- Seizure from lidocaine toxicity likely to be brief and self-limited. If prolonged, or status epilepticus, treat per Seizure protocol
- Treat dysrhythmias according to specific protocol

Lidocaine Jelly 2%:

- Indication – Anesthetic lubricant for Nasotracheal Intubation
- Contraindication – Known history of hypersensitivity to local anesthetics
- Dosage and Administration
  - Apply a moderate amount of jelly to the endotracheal tube shortly before use.
  - Avoid introducing the jelly into the lumen of the tube
  - If jelly has dried before insertion, reapply

MAGNESIUM SULFATE

Description

Magnesium sulfate reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction. In cardiac patients, it stabilizes the potassium pump, correcting repolarization. It also shortens the Q-T interval in the presence of ventricular arrhythmias due to drug toxicity or electrolyte imbalance. In respiratory patients, it may act as a bronchodilator in acute bronchospasm due to asthma or other bronchospastic diseases. In patients suffering from eclampsia, it controls seizures by blocking neuromuscular transmission and lowers blood pressure as well as decreases cerebral vasospasm.

Indications

Antiarrhythmic

- Torsade de pointes associated with prolonged QT interval

Respiratory

- Severe bronchospasm unresponsive to continuous albuterol, ipratropium, and IM epinephrine.

Obstetrics

- Eclampsia: Pregnancy ≥20 weeks gestational age or up to 6 weeks post-partum with seizures

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Precautions

- Bradycardia
- Hypotension
- Respiratory depression

Adverse Reactions

- Bradycardia
- Hypotension
- Respiratory depression

Dosage and Administration

- **Torsades de Pointes suspected caused by prolonged QT interval:**
  - **Adult:**
    2 gm, IV/IO bolus.
  - **Pediatric:**
    Not indicated
- **Refractory Severe Bronchospasm:**
  - **Adult:**
    2 gm, IV bolus, over 3-4 minutes
  - **Pediatric:**
    Not indicated
- **Eclampsia:**
  - 2 gm IV/IO over 2 minutes, then mix 4 gm diluted in 50 ml of normal saline (0.9 NS), IV/IO drip over 15 minutes

.

Protocol

- Medical Arrest Algorithm
- Adult Wheezing
- Obstetric Complications

METHYLPREDNISOLONE (SOLU-MEDROL)

Description

Methylprednisolone is a synthetic steroid that suppresses acute and chronic inflammation and may alter the immune response. In addition, it potentiates vascular smooth muscle relaxation by beta-adrenergic agonists and may alter airway hyperactivity.

Indications

- Anaphylaxis
- Severe asthma
- COPD
- Suspected Addisonian crisis (cardiovascular collapse in patient at risk for adrenal insufficiency)

Contraindications

- Evidence of active GI bleed

Adverse Reactions

Most adverse reactions are a result of long-term therapy and include:

- Gastrointestinal bleeding
- Hypertension
- Hyperglycemia

Dosage and Administration

Adult:

125 mg, IV/IO bolus, slowly, over 2 minutes

Pediatric:

2 mg/kg, IV/IO bolus, slowly, over 2 minutes to max dose of 125 mg

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Protocol

- Adult Wheezing
- Pediatric Wheezing
- Allergy and Anaphylaxis
- Medical Hypotension/Shock
- Adrenal Insufficiency

Special Considerations

- Must be reconstituted and used immediately
- The effect of methylprednisolone is generally delayed for several hours.
- Methylprednisolone is not considered a first line drug. Be sure to attend to the patient's primary treatment priorities (i.e. airway, ventilation, beta-agonist nebulization) first. If primary treatment priorities have been completed and there is time while in route to the hospital, then methylprednisolone can be administered. Do not delay transport to administer this drug

NALOXONE (NARCAN)

Description

Naloxone is a competitive opioid receptor antagonist.

Onset & Duration

Onset: Within 5 minutes
Duration: 1-4 hours

Indications

- For reversal of suspected opioid-inducted CNS and respiratory depression
- Coma of unknown origin with impaired airway reflexes or respiratory depression

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Adverse Reactions

- Tachycardia
- Nausea and vomiting
- Pulmonary Edema

Dosage and Administration

Adult:

0.5 mg IV/IO/IM/IN and titrate to desired effect, up to 2 mg total.
In cases of severe respiratory compromise or arrest, 2 mg bolus IV/IO/IM is appropriate, otherwise drug should be titrated.

With some newer synthetic opioid formulations, higher doses of naloxone may be required. In rare cases of confirmed or strongly suspected opioid overdose with insufficient response to 2mg, higher doses may be used, titrate to effect. Routine use of high dose naloxone should be avoided.

Pediatrics:

0.5 mg IV/IO/IM/IN and titrate to desired effect, up to 2 mg total

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Protocol

- Universal Altered Mental Status
- Drug/Alcohol Intoxication
- Poisoning/Overdose

Special Considerations

- Not intended for use unless respiratory depression or impaired airway reflexes are present. Reversal of suspected mild-moderate opioid toxicity is not indicated in the field as it may greatly complicate treatment and transport as narcotic-dependent patients may experience violent withdrawal symptoms.
- Patients receiving EMS administered naloxone **should** be transported to a hospital.
- In the State of Colorado, bystanders, law enforcement, and other first responders can administer naloxone if they feel a person is experiencing an opiate-related drug overdose event (Colorado Revised Statutes §12-36-117.7).

(**continued next page**)

- There are significant concomitant inherent risks in patients who have received naloxone, including:
    - Recurrent respiratory/CNS depression given short half-life of naloxone.
    - Co-existing intoxication from alcohol or other recreational or prescription drugs.
    - Acetaminophen toxicity from combination opioid/acetaminophen prescriptions.
    - Non-cardiogenic pulmonary edema associated with naloxone use.
    - Acute psychiatric decompensation, overdose, SI/HI or psychosis requiring ED evaluation.
    - Sudden abrupt violent withdrawal symptoms which may limit decision making capacity.
- Given the above risks, it is strongly preferred that patients who have received naloxone be transported and evaluated by a physician. However, if the patient clearly has decision-making capacity he/she does have the right to refuse transport. If adamantly refusing, patients must be warned of the multiple risks of refusing transport.
- If the patient is refusing transport contact base. If any concerns or doubts about decision-making capacity exist, err on the side of transport.

NITROGLYCERIN (NITROSTAT, NITROQUICK, etc)

Description

Short-acting peripheral venodilator decreasing cardiac preload and afterload

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Onset & Duration

Onset: 1-3 min.
Duration: 20-30 min.

Indications

- Pain or discomfort due to suspected Acute Coronary Syndrome
- Pulmonary edema due to congestive heart failure

Contraindications

- Suspected right ventricular ST-segment elevation MI (Inferior STEMI pattern plus ST elevation in right sided-precordial leads)
- Hypotension SBP < 100
- Recent use of erectile dysfunction (ED) medication (e.g. sildenafil (Viagra, Revatio), tadalafil (Cialis, Adcirca), vardenafil (Levitra, Staxyn), avanafil, (Stendra)

Adverse Reactions

- Hypotension
- Headache
- Syncope

Dosage and Administration

- **Chest Pain:** 0.4 mg (1/150 gr) sublingually, every 5 minutes
  PRN up to a total of 3 doses for persistent CP
- **Pulmonary Edema:** 0.4 mg (1/150 gr) sublingually, every 5 minutes PRN titrated to symptoms and blood pressure
- **Nitropaste:** system specific protocol

Protocol

- Chest Pain
- CHF/Pulmonary Edema

NONSTEROIDAL ANTI-INFLAMMATORY DRUGS: IBUPROFEN (ADVIL, MOTRIN), KETOROLAC (TORADOL)

Description

NSAIDs decrease pain and inflammation by several mechanisms. Their primary action is to inhibit the family of cyclooxygenase (COX) enzymes resulting in blockade of prostaglandin synthesis. COX inhibition also impacts renal blood flow and stomach acid secretion. NSAIDs may also inhibit chemotaxis, alter lymphocyte activity, decrease proinflammatory cytokine activity, and inhibit neutrophil aggregation; further contributing to anti-inflammatory activity.

Onset & Duration

- Onset of analgesia: oral 30-60 minutes, IV within 5 minutes
- Peak effect: 1 hour
- Duration: 4 hours

Indications

- Acute treatment of mild, moderate, or severe pain. Consider IV ketorolac for moderate to severe pain.
- Pain due to suspected kidney stones, acute exacerbations of chronic pain, musculoskeletal pain

Contraindications

- Allergy to NSAIDs including aspirin and naproxen (Naprosyn, Aleve)
- Pregnancy or breast feeding
- History of GI bleeding or active stomach ulcer
- History of chronic kidney disease or kidney transplant
- Anticoagulation/antiplatelet (patient taking blood thinners) or history of a blood clotting disorder
- In setting of multisystem trauma
- Acute head trauma or suspected intracranial bleed
- Ketorolac is contraindicated for ages less than 12-years-old and over 65-years-old
- Severe dehydration

Adverse Reactions

- Allergic reactions: anaphylaxis, urticaria, angioedema, bronchospasm, rash, hypotension, etc.
- Nausea and vomiting
- GI bleeding with chronic use
- Acute kidney injury

Drug Interactions

- Avoid concomitant administration with other NSAIDS or anticoagulant/antiplatelet medications such as apixaban (Eliquis), aspirin, dabigatran (Pradaxa), enoxaparin (Lovenox), heparin, rivaroxaban (Xarelto), warfarin (Coumadin).

Dosage and Administration

Ibuprofen

Adult:
600 mg PO

Pediatric:
10 mg/kg PO – ***SEE CHART***

Ketorolac

Adult:
15mg IV or IM

Pediatric:
Not indicated

Ibuprofen Dosing Chart

Weight	Age	Dose (100 mg/5 mL)
n/a	< 6 months	BASE CONTACT
5-8kg	6 months - 12 months	3 ml (60mg)
9-11kg	1-2 years	4 ml (80mg)
12-16kg	2-3 years	5 ml (100mg)
17-21kg	4-5 years	7.5 ml (150mg)
22-27kg	6-8 years	10 ml (200mg)
28-33kg	9-10 years	15 ml (300mg)
34-43kg	11-12 years	20 ml (400mg)

Protocol

- Pain management

OPIOIDS (FENTANYL, MORPHINE, HYDROMORPHONE)

Description

Opioid analgesics with desired effects of analgesia, euphoria and sedation as well as undesired effects of respiratory depression and hypotension. A synthetic opioid, fentanyl is 100 times more potent than morphine, and is less likely to cause histamine release.

Indications

- Treatment of hemodynamically stable patients with moderate to severe pain due to traumatic or medical conditions. (No AEMT administration of opioids for cardiac chest pain)

Contraindications

- Fentanyl - Hemodynamic instability or shock
- Morphine and hydromorphone – Hypotension, hemodynamic instability, or shock
- Respiratory depression

Caution/Comments:

- Opioids should only be given to hemodynamically stable patients and titrated slowly to effect.
- 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
- Respiratory depression, including apnea, may occur suddenly and without warning, and is more common in children and the elderly. **Start with ½ traditional dose in the elderly.**
- Coadministration of opioids and benzodiazepines 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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Dosage and Administration

<u>FENTANYL</u>:

- **Adult doses may be rounded to nearest 25 mcg increment**
- **Initial dose in adults typically 100 mcg**
- **Strongly consider ½ typical dosing in elderly or frail patient**

Adult:

IV/IO/IM route: 1-2 mcg/kg.

- Dose may be repeated after 5 minutes and titrated to clinical effect to a maximum cumulative dose of 3 mcg/kg
- Additional dosing requires BASE CONTACT

IN route: 1-2 mcg/kg.

- Administer a **maximum of 1 ml of fluid** per nostril
- Dose may be repeated after 10 minutes after initial IN dose to a maximum cumulative dose of 4 mcg/kg. IV route is preferred for repeat dosing.
- Additional dosing requires BASE CONTACT

Pediatric (1-12 years):

IV/IO/IM route: 1-2 mcg/kg.

- Dose may be repeated after 5 minutes and titrated to clinical effect to a maximum cumulative dose of 3 mcg/kg.
- Additional dosing requires BASE CONTACT

IN route: 2 mcg/kg.
- Administer a **maximum of 1 ml of fluid** per nostril
- Dose may be repeated after 10 minutes after initial IN dose to a maximum cumulative dose of 4 mcg/kg. IV route is preferred for repeat dosing.

Pediatric < 1 year: BASE CONTACT

MORPHINE:

Adult:

IV/IO/IM routes: 5-10 mg.
- Dose may be repeated after 10 minutes and titrated to clinical effect to a maximum cumulative dose of 10 mg.
- Additional cumulative dosing > 10 mg requires BASE CONTACT.
- **Morphine may not be given IN as it is poorly absorbed**

Pediatric (1-12 years):

IV/IO/IM routes: 0.1 mg/kg. Maximum single dose is 6 mg
- Dose may be repeated after 10 minutes and titrated to clinical effect up to maximum cumulative dose of 0.2 mg/kg or 10 mg.
- Additional cumulative dosing requires BASE CONTACT.
- **Morphine may not be given IN as it is poorly absorbed**

Pediatric < 1 year: BASE CONTACT

HYDROMORPHONE:

Adult:

IV/IO/IM routes: 0.5 mg
- Dose may be repeated after 10 minutes and titrated to clinical effect up to maximum cumulative dose of 1.5 mg.
- Additional cumulative dosing requires BASE CONTACT.

Pediatric:

Not indicated for pediatric patients

NOTE: IV route is preferred for all opioid administration because of more accurate titration and maximal clinical effect. IO/IM for all listed opioids and additionally IN for fentanyl are acceptable alternatives when IV access is not readily available. Repeat doses of IN Fentanyl can be given if IV access cannot be established. However greater volumes and repeat IN administration are associated with greater drug run off and may therefore be less effective. Continuous pulse oximetry monitoring is mandatory. Frequent evaluation of the patient's vital signs is also indicated. Emergency resuscitation equipment and naloxone must be immediately available.

Protocol

Extremity Injuries
Chest Pain
Post Resuscitation Care with ROSC
Abdominal Pain
Amputations
Burns
Bites/Stings
Snake Bites
Face and Neck Trauma
Chest Trauma
Abdominal Trauma
Spinal Trauma

ORAL GLUCOSE (GLUTOSE, INSTA-GLUCOSE)

Description

Glucose is the body's basic fuel and is required for cellular metabolism

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Indications

- Known or suspected hypoglycemia and able to take PO

Contraindications

- Inability to swallow or protect airway
- Unable to take PO meds for another reason

Administration

All ages: One full tube 15 g buccal.

Protocol

- Universal Altered Mental Status
- Hypoglycemia

OXYGEN

Description

Oxygen added to the inspired air increases the amount of oxygen in the blood, and thereby increases the amount delivered to the tissue. Tissue hypoxia causes cell damage and death. Conversely, hyperoxia has been linked with worsened outcomes in acute coronary syndromes and stroke. Therefore, oxygen should not be viewed as a harmless drug where more is better. EMS personnel should add additional oxygen when hypoxia, shock or respiratory distress are present titrating to a normal pulse oximetry reading above 90%.

Indications

- Hypoxemia or respiratory distress
- Hypotension/shock states
- Suspected carbon monoxide poisoning
- Obstetrical complications, childbirth
- Pre-intubation oxygenation

Precautions

- If the patient is not breathing adequately, the treatment of choice is assisted ventilation, not just oxygen.
- Do not withhold oxygen from any patient in respiratory distress, including COPD patients.

Administration

- Use the appropriate oxygen delivery method and flow rate to achieve SpO2 of 90-96% when oxygen therapy is indicated.

Special Notes

- Do not use permanently mounted humidifiers. If the patient warrants humidified oxygen, use a single patient use device.
- Adequate oxygenation is assessed clinically and with the SpO_2 while adequate ventilation is assessed clinically and with waveform capnography.

PHENYLEPHRINE (INTRANASAL)

Description

- Phenylephrine is an alpha adrenergic agonist. When administered intranasally, it causes vasoconstriction in the nasal mucosa and subsequently decreased bleeding and nasal decongestion.

Indications

- Prior to nasotracheal intubation to induce vasoconstriction of the nasal mucosa
- Nosebleed (epistaxis).

Precautions

- Avoid administration into the eyes, which will dilate pupil.

Dosage and Administration

- Instill two drops of 1% solution, or 2 sprays, in the nostril prior to attempting nasotracheal intubation.
- For patients with active nosebleed, first have patient blow nose to expel clots. Then, administer 2 sprays into affected naris(es).

Protocol

- Nasotracheal intubation
- Epistaxis

RACEMIC EPINEPHRINE

Description

Racemic epinephrine 2.25% is an aqueous solution that delivers 11.25 mg of racemic epinephrine per 0.5mL for use by **inhalation only**. Inhalation causes local effects on the upper airway as well as systemic effects from absorption. Vasoconstriction may reduce swelling in the upper airway, and ß effects on bronchial smooth muscle may relieve bronchospasm.

Onset & Duration

- Onset: 1-5 minutes
- Duration: 1-3 hours

Indications

- Stridor at rest

Side Effects

- Tachycardia
- Palpitations
- Muscle tremors

Dosage and Administration

0.5 ml racemic epinephrine (acceptable dose for all ages) mixed in 3 mL saline, via nebulizer at 6-8 LPM to create a fine mist and administer over 15 minutes.

Protocol

- Pediatric Stridor/Croup

Special Considerations

- Racemic epi is heat and photo-sensitive
- Once removed from the refrigerator, the unopened package is stable at room temperature until the expiration date stated on the package.
- Do not confuse the side effects with respiratory failure or imminent respiratory arrest.
- If no racemic epinephrine is available, consider 5 mL of 1:1,000 epinephrine x 1 via nebulizer at 6-8 LPM to create a fine mist and administer over 15 minutes.

SODIUM BICARBONATE

Description

Sodium bicarbonate is an alkalinizing solution used to treat metabolic acidosis, sodium channel poisoning and hyperkalemia. Sodium bicarb is no longer recommended for routine use in prolonged cardiac arrest.

Indications

- Sodium bicarbonate therapy is indicated in patients with tricyclic antidepressant (TCA) poisoning who develop widening of the QRS interval >120 msec, hypotension due to the TCA poisoning, or a ventricular arrhythmia.
- Suspected hyperkalemic pulseless arrest: consider in patients with known renal failure/dialysis.
- Hyperactive delirium with severe agitation that develops widening of QRS interval >120 msec or pulseless arrest
- Crush or suspension injury with known or suspected hyperkalemia

Contraindications

- Metabolic and respiratory alkalosis
- Hypocalcemia
- Hypokalemia

Adverse Reactions

- Metabolic alkalosis
- Paradoxical cerebral intracellular acidosis
- Sodium bolus can lead to volume overload

Drug Interactions

- May precipitate in calcium solutions.
- Alkalization of urine may increase half-lives of certain drugs.
- Vasopressors may be deactivated.

Dosage and Administration: 8.4% sodium bicarbonate solution

Adult and Pediatric:

- **Pulseless arrest suspected due to hyperkalemia** (e.g., typically patient with dialysis, end-stage renal disease, hyperactive delirium with severe agitation)
  - 1 mEq/kg slow IV push. Repeat if needed x 2 every 5 minutes.

- **TCA poisoning with wide QRS >120 msec or ventricular arrhythmia**
  Hyperactive delirium with severe agitation that develops wide QRS >120 msec
  Crush or suspension injury with known or suspected hyperkalemia
  - 1 mEq/kg slow IV push. Repeat if needed x 2 every 5 minutes or until QRS is narrowed.

Protocol

- Medical Pulseless Arrest
- Poisoning/Overdose
- Hyperactive Delirium with Severe Agitation

TOPICAL OPHTHALMIC ANESTHETICS

Description

Proparacaine and tetracaine are local anesthetics approved for ocular administration for relief of eye pain caused by corneal abrasion or chemical injury.

Indications

- Pain secondary to eye injuries and corneal abrasions.
- Topical anesthetic to facilitate eye irrigation.

Contraindications

- Known allergy to local anesthetics.
- Globe lacerations or rupture.

Precautions

- Transient burning/stinging when initially applied.

Dosage and Administration

- Instill 2 drops into affected eye. **Contact Base** for repeat dosing.

Special Considerations

- This is single patient use. Unused portions should be discarded and only new bottles may be used.
- Do not administer until patient consents to transport and transport has begun.
- Topical ophthalmic anesthetics should never be given to a patient for self-administration.

VASOPRESSOR CONTINUOUS INFUSION – ADULT PATIENTS ONLY

Description:

Epinephrine: Preferred vasopressor for all indications.

- Endogenous catecholamine alpha, beta-1, and beta-2 adrenergic receptor agonist. Causes dose-related increase in heart rate, myocardial contractility and oxygen demand, peripheral vasoconstriction and bronchodilation

Dopamine: may be used as an alternative vasopressor for indications of hypotension or bradycardia, but not for anaphylaxis or status asthmaticus.

- Endogenous catecholamine chemically related to epinephrine and norepinephrine. Increases blood pressure through combination of dopamine, alpha and beta receptor effects leading to increased heart rate, contractility and peripheral vasoconstriction.

Indications:

Epinephrine:

- Severe Allergic Reaction/Anaphylaxis
- Hypotension with poor perfusion refractory to adequate fluid resuscitation (typically 30 mL/kg crystalloid)
- Bradycardia with signs of poor perfusion

Dopamine:

- Hypotension with poor perfusion refractory to adequate fluid resuscitation (typically 30 mL/kg crystalloid)
- Bradycardia with signs of poor perfusion

Contraindications:

- **Do not use vasopressor infusion in PEDIATRIC patients (age less than 12 years)**

Adverse Reactions

- Dysrhythmia
- Hypertension
- Anxiety
- Angina

Drug Interactions

- Do not add to sodium bicarbonate or other alkaloids as epinephrine will be inactivated at higher pH.

Dosage and Administration:

Epinephrine:

- **Mix**: inject 1 mg epinephrine into 1000 mL Normal Saline bag to achieve 1mcg/mL concentration (This means 1 mL of 1:1000 or 10 mL of 1:10,000 – either way 1 mg of drug). Use macro drip set.
- **Adult IV/IO**: Begin IV/IO infusion wide open to gravity to give small aliquots of fluid. **Typical volumes are less than 100 mL of total fluid**, as typical doses are expected to be < 100 mcg. Titrate to desired hemodynamic effect with goal BP of > 90 mmHg systolic, improved respiratory status (bronchodilation), and improved perfusion/mentation.

Dopamine:

- **Mix:** 400 mg in 250 ml NS or 800 mg in 500 ml NS to produce concentration of 1600 mcg/mL.
- **Adult IV/IO:** 5-20 mcg/kg/min, start at 5 mcg/kg/min, Titrate dose up 5 mcg/kg/min every 5 min to a max of 20 mcg/kg/min to desired hemodynamic effect.

Protocol

- Post-Resuscitation Care with ROSC
- Bradyarrhythmia with Poor Perfusion
- Allergy and Anaphylaxis
- Medical Hypotension/Shock
- Overdose and Acute Poisoning

Special Considerations

- May increase myocardial oxygen demand and angina pectoris. Use with caution in patients with known or suspected CAD

Foothills Regional Emergency Medical & Trauma Advisory Council (FRETAC)

Serving Boulder, Clear Creek, Gilpin, Grand, & Jefferson Counties

Foothills RETAC

Prehospital
Trauma Destination Policy Narrative

Overview: The Colorado Department of Public Health and Environment (CDPHE), in conjunction with the State Emergency Medical & Trauma Advisory Council (SEMTAC), require each Regional Emergency Medical & Trauma Advisory Council (RETAC) to formulate patient movement policies. This Prehospital Trauma Triage Algorithm and Policy were developed by the Foothills RETAC to aid and promote appropriate destinations for trauma patients originating within our five-county region.

Explanation of Algorithm: The left side of the attached algorithm was developed by SEMTAC and approved by the Board of Health to quickly identify the trauma patient, and what priority is given to trauma patients, utilizing physiological findings, mechanisms of injury, and co-morbid factors. The left side of the algorithm was used for each RETAC to develop their own individual algorithm, staying within this framework. The right side of this algorithm was developed by the Foothills RETAC. The "right" side is kept deliberately general in order to accommodate the diverse areas/counties within our region.

Explanation of Terms used by the RETAC: The Foothills RETAC chose to insert the words ***"most rapidly accessible"*** instead of others such as closest or nearest. Many factors are taken into consideration when transporting a trauma patient. These include, but are not limited to, weather, geography, number of patients, number of prehospital personnel, training level of prehospital personnel, and other factors that influence decision making.

Oversight: It is expected that each transporting agency within the Foothills RETAC will use this algorithm to transport trauma patients in an effective time-sensitive manner, and that patients will be taken to the ***"most appropriate"*** trauma center given the above mentioned factors. The Foothills RETAC, in conjunction with Agency and Facility Medical Directors will monitor patient destinations through a Continuous Quality Improvement (CQI) program when developed.

Possible Exemptions to Destination Policies: In the case of a facility that is actively pursuing trauma center designation it is up to the discretion of the Medical Director for the transport agency to decide what is the most appropriate rapidly accessible facility for the trauma patient. When facilities undergo changes to their trauma designation level, those will be considered on a case to case basis as the situations arise.

Boulder County Trauma: Boulder County is fortunate to have 5 Trauma Centers. There are two Level II Trauma Centers: Boulder Community Hospital and Good Samaritan Medical Center. They also have three Level III Trauma Centers: Longmont United Hospital, Longs Peak Hospital, and Avista Hospital. For High-Level trauma patients, prehospital personnel should transport to the most appropriate Trauma Center they can reach in the least amount of time accounting for traffic, weather, training level of provider, or other conditions.

Clear Creek County Trauma: Clear Creek County does not have medical facilities within their county. Most trauma patients are transported via Interstate 70 to the Denver Metropolitan region. Occasionally, depending on circumstances, a patient may be transported east along US Highway 6 coming into the Golden area or Interstate 70 west into Summit County to Summit Medical Center depending on the location of the trauma incident.

Gilpin County Trauma: Gilpin County does not have medical facilities within their county. Most trauma patients are transported via Interstate 70 to the Denver Metropolitan region. Occasionally, depending on circumstances, a patient may be transported east along US Highway 6 coming into the Golden area or Interstate 70 west into Summit County depending on the location of the trauma incident. They may also be transported into Boulder County via Highway 119 depending upon the location of the trauma incident.

Grand County Trauma: Grand County has Middle Park Medical Center-Kremmling, a Level IV Trauma Center, and Middle Park Medical Center-Granby a Level IV Trauma Center, and Denver Health East Grand Community Clinic and Emergency Center, a Level V Trauma Center. Each of these medical facilities is located in very separate areas of the county and travel time between facilities is approximately 30 minutes via ground ambulance. Middle Park Medical Center-Kremmling is located in Kremmling, in the western side of the county, Middle Park Medical Center Granby is located in Granby in the middle of the county and Denver Health East Grand Community Clinic and Emergency Center is located in Winter Park in the eastern part of the county. Denver Health East Grand Community Clinic and Emergency Center, when open, has all of the capabilities of any Level IV trauma facility. When Denver Health East Grand Community Clinic and Emergency Center is open, Grand County Ambulance transports to the nearest one of their trauma centers for traumas within the county. At the western most, southern, and eastern most regions, where Grand borders other counties on Rabbit Ears and Berthoud Pass, and Highway 9, a decision must be made weighing all factors, if the patient should be taken out of county to a higher level of care. Discretion within this algorithm is given to the ambulance agency, with the knowledge that CQI, when developed, will monitor trauma transports.

Jefferson County Trauma: Jefferson County currently has two Trauma Centers. These are: Saint Anthony Hospital, a level I Trauma Center located in Lakewood, and Lutheran Medical Center, a Level III Trauma Center located in Wheatridge. The choice of which trauma center to transport to by the individual transporting agency is made using the Trauma Triage Algorithm, taking into consideration numerous variables such as weather, level of prehospital personnel, road obstructions, and scene times. Jefferson County is an exceptionally large diverse county, and transport decisions will reflect the individual incident, while following this algorithm. Trauma patients requiring EMS transport on the borders of Jefferson may find it appropriate to transport outside of the Foothills RETAC.

Air Transport: The FRETAC protocols for Air Transport take into consideration the advanced level of care given to patients by flight crews. The Foothills RETAC currently has one Level I Trauma Center located in Jefferson County. We leave it to the discretion of requesting prehospital ground transport agency and the flight crews, and their medical directors as to which Trauma Center they are flown to for scene transport of the trauma patient. We also recognize that flight crews may have many other factors to consider in triage decisions. These include such things as: wind, weather, number of patients, agency request, and especially patient presentation. Therefore, the air transport algorithms are far more lenient in providing guidelines, not mandates, in choosing the most appropriate patient destination. When developed at CDPHE, and our FRETAC CQI program when developed will monitor destinations for their appropriateness.

Pediatric Care: There are currently no Pediatric Level I or II Trauma Centers within the Foothills RETAC. Transportation destination for Pediatric patients will be dependent upon numerous factors with location of traumatic incident and patient condition being the most important. Pediatric destinations must be left to the EMS agency and their Medical Director using solid QI Programs for patient destination.

EMS Medical Direction: It is the expectation of the Foothills RETAC that the EMS Medical Directors will be actively involved in trauma destination decisions and oversight of the EMS agencies for which they are responsible. Active EMS Agency QI Programs with Trauma Destination review are also expected.

Foothills RETAC

Prehospital Trauma Triage Transport Algorithm Guideline

Adult Patients (Ages 15 and older)

UNABLE TO ADEQUATELY VENTILATE

Yes → Transport to most rapidly accessible appropriate Medical Facility

No

ANY PHYSIOLOGIC CRITERIA

1. Intubation or assisted ventilation
2. Respiratory rate < 10 or > 29
3. Systolic BP < 90 or < 110 for age 65 plus
4. GCS **motor score** ≤ 5

Yes → Transport to most rapidly accessible appropriate Trauma Center

No

ANY ANATOMIC CRITERIA

Known or Suspected:

1. Penetrating injuries to the head, neck, torso or extremities above the elbow or knee
2. Flail chest (chest wall instability or deformity)
3. Two or more proximal long bone fractures
4. Unstable pelvic fracture
5. Paralysis or neurologic deficit
6. Amputation above the wrist or ankle
7. Crushed, degloved, mangled, or pulseless extremity
8. Open or depressed skull fracture

Yes → Transport to most rapidly accessible appropriate Trauma Center

No

ANY MECHANISM OF INJURY CRITERIA

1. Falls > 20 feet
2. High risk auto crash, with such components as:
   - --Intrusion of vehicle of ≥ 12 inches in occupant compartment; >18 inches any site
   - --Ejection (partial or complete) from automobile
   - --Death in same passenger compartment
3. Auto vs. pedestrian/bicyclist thrown, run over, or with significant impact
4. Motorcycle crash > 20 mph
5. Events involving high energy dissipation, such as:
   - --Ejection from motorcycle, ATV, animal, etc.
   - --Striking a fixed object with momentum
   - --Blast or explosion
6. High energy electrical injury

Yes → Transport to most rapidly accessible appropriate Trauma Center

No

OTHER CONSIDERATIONS

1. Older adult: The risk of death increases after age 55 years
2. Anticoagulation or bleeding disorders
3. End-stage renal disease requiring dialysis
4. Pregnancy >20 weeks
5. Suspicion of hypothermia
6. Suspicion of abdominal injury/seatbelt sign
7. Burns > 10% TBSA (2^{nd} or 3^{rd} degree) and/or burns to the hands, face, feet, groin and/or inhalation burns
8. EMS provider judgment for triage to a higher level trauma center
9. Low impact mechanisms for older adults with suspicion of injury
10 Suspicion of nonaccidental trauma

Yes → Transport to most appropriate Trauma Center

No → Transport to any appropriate medical facility based on EMS Agency Medical Control Policy

Foothills RETAC
Prehospital Trauma Triage Algorithm Guideline
Pediatric Patients (Less than 15 years old)

UNABLE TO ADEQUATELY VENTILATE

Yes → Transport to most rapidly accessible appropriate Medical Facility

No ↓

ANY PHYSIOLOGIC CRITERIA

1. Intubation or assisted ventilation
2. Signs or symptoms of respiratory insufficiency, such as:
   --Severe hypoxia
   --Accessory muscle use, grunting or abdominal breathing
3. Any signs or symptoms of abnormal perfusion, such as:
   --Decreased capillary refill (> 2 sec)
   --Low systolic BP for age
4. Only responsive to pain or unresponsive [AVPU]

Age	SBP (mmHg)
<1 year	<60
1-10 years	<70 + 2 x Age
>10 years	<90

Yes → Transport to most rapidly accessible appropriate Trauma Center

No ↓

ANY ANATOMIC CRITERIA

Known or Suspected:

1. Penetrating injuries to the head, neck, torso or extremities above the elbow or knee
2. Flail chest (chest wall instability or deformity)
3. Two or more proximal long bone fractures
4. Unstable pelvic fracture
5. Paralysis or neurologic deficit
6. Amputation above the wrist or ankle
7. Crushed, degloved, mangled, orb pulseless extremity
8. Open or depressed skull fracture

Yes → Transport to most rapidly accessible appropriate Trauma Center

No ↓

ANY MECHANISM OF INJURY CRITERIA

1. Falls > 15 feet or 3x the height of the child
2. High risk auto crash, with such components as:
   --Intrusion of vehicle of ≥ 12 inches in occupant compartment; >18 inches any site
   --Ejection (partial or complete) from automobile
   --Death in same passenger compartment
   --Moderate/high speed crash with unrestrained or improperly restrained child
3. Auto vs. pedestrian/bicyclist thrown, run over, or with significant impact
4. Motorcycle crash > 20 mph
5. Events involving high energy dissipation, such as:
   --Ejection from motorcycle, ATV, animal, etc.
   --Striking a fixed object with momentum
   --Blast or explosion
6. High energy electrical injury

Yes → Transport to most rapidly accessible appropriate Trauma Center

No ↓

OTHER CONSIDERATIONS

1. Suspicion for non-accidental trauma
2. Anticoagulation or bleeding disorders
3. End-stage renal disease requiring dialysis
4. Pregnancy >20 weeks
5. Suspicion of hypothermia
6. Intra-abdominal injury: abdominal tenderness, distension or seatbelt mark on the torso
7. Burns > 10% TBSA (2nd or 3rd degree) and/or burns to the hands, face, feet, or groin; or inhalation injury
8. EMS provider judgment for triage to a higher level trauma center

Yes → Transport to most appropriate Trauma Center

No → Transport to any appropriate medical facility based on EMS Agency Medical Control Policy

2020 MHRETAC Prehospital Trauma Triage Algorithm Guideline
Adult Patients (Ages 15 and older)

DESTINATION INSTRUCTIONS PER MHRETAC PROTOCOL

UNABLE TO ADEQUATELY VENTILATE

YES → Transport to the most rapidly accessible appropriate medical facility

NO

ANY PHYSIOLOGIC CRITERIA

1. Intubation or assisted ventilation
2. Respiratory rate < 10 or > 29
3. Systolic BP < 90 or <110 for age 65 plus
4. GCS motor score ≤ 5

YES → Transport to the most rapidly accessible appropriate Level I or II trauma center

NO

ANY ANATOMIC CRITERIA

Known or Suspected:

1. Penetrating injuries to the head, neck, torso or extremities above the elbow or knee
2. Flail chest (chest wall instability or deformity)
3. Two or more proximal long bone fractures
4. Unstable pelvic fracture
5. Paralysis or neurologic deficit
6. Amputation above the wrist or ankle
7. Crushed, degloved, mangled, or pulseless extremity
8. Open or depressed skull fracture

YES → Transport to the most rapidly accessible appropriate Level I or II trauma center

NO

ANY MECHANISM OF INJURY CRITERIA

1. Falls > 20 feet
2. High risk auto crash, with such components as:
   - Intrusion of vehicle or ≥ 12 inches in occupant compartment; > 18 inches any site
   - Ejection (partial or complete) from automobile
   - eath in same passenger compartment
3. Auto vs. pedestrian/bicyclist thrown, run over, or with significant impact
4. Motorcycle crash > 20 mph
5. Events involving high energy dissipation, such as:
   - Ejection from motorcycle, ATV, animal, etc.
   - Striking a fixed object with momentum
   - Blast or explosion
6. High energy electrical injury

YES → Transport to the most rapidly accessible appropriate trauma center

NO

OTHER CONSIDERATIONS

1. Older adult: Risk of death increases after age 55 years
2. Anticoagulation or bleeding disorders
3. End-stage renal disease requiring dialysis
4. Pregnancy > 20 weeks
5. Suspicion of hypothermia
6. Suspicion of abdominal injury/seatbelt sign
7. Burns > 10% TBSA (2^{nd} or 3^{rd} degree) and/or burns to the hands, face, feet, or groin; and/or inhalation burns
8. EMS provider judgement for triage to a higher-level trauma center
9. Low impact mechanisms for older adults with suspicion of injury
10. Suspicion of nonaccidental trauma

YES → Transport to most appropriate trauma center

NO → Transport to any appropriate acute care facility

Mile-High Regional Emergency Medical and Trauma Advisory Council (MHRETAC)

Adult Trauma Triage Algorithm Overview
September 17, 2020

The MHRETAC contains the most and the highest-level trauma centers in the state of Colorado. The counties included are Adams, Arapahoe, Broomfield, Denver, Douglas and Elbert. The region has most the Level I trauma centers, the only Level I Regional Pediatric Trauma Center in Colorado, and a majority of Level II trauma centers. Numerous level III and IV trauma centers are within the MHRETAC. This region includes Non-Designated trauma centers, specialty facilities and numerous Non-Designated Free-Standing Emergency Rooms (CCEC- Licensed Community Clinics with Emergency Care). There are also free-standing emergency departments (FSED) that may include both licensed emergency departments that accept EMS traffic as an extension of an affiliated hospital, as well as independent emergency departments unaffiliated with a hospital.

Most Rapidly Accessible Appropriate- The MHRETAC chose to insert the words "most rapidly accessible appropriate" instead of others such as closest or nearest. Many factors are taken into consideration when transporting a trauma patient. These include, but are not limited to weather, geography, number of patients, special needs of patients, number of prehospital personnel, level of prehospital personnel and other factors that influence decision making. The MHRETAC actively supports and promotes the Medical Directors in defining the guidance for following the MHRETAC trauma destination policy.

Interfacility Transfers- The MHRETAC recognizes that compliance with this algorithm may require interfacility transfers.

EMS Medical Direction- It is the expectation of the MHRETAC that the EMS Medical Directors will be active and involved in trauma destination decisions and oversight of the agencies for which they are responsible. The MHRETAC expects EMS medical directors use medical expertise and patient centered principles in all their decisions. Transport to Non-Designated Free-Standing Emergency Rooms and Free-Standing Emergency Departments with or without hospital affiliation are at the discretion and guidelines of the Medical Director for each agency.

Approved by Mile-High RETAC Clinical Care Committee on September 17, 2020
Approved by Mile-High RETAC Board of Directors on September 17, 2020
Reviewed by Regional Medical Direction & Denver Metro EMS Medical Directors Group on November 4, 2020

2020 MHRETAC Prehospital Trauma Triage Algorithm Guideline
Pediatric Patients (Less than 15 years old)

DESTINATION INSTRUCTIONS PER MHRETAC PROTOCOL

UNABLE TO ADEQUATELY VENTILATE

YES → Transport to most rapidly accessible appropriate facility

NO ↓

ANY PHYSIOLOGIC CRITERIA

1. Intubation or assisted ventilation
2. Signs or symptoms of respiratory insufficiency, such as:
   - Severe hypoxia
   - Accessory muscle use, grunting or abdominal breathing
3. Signs or symptoms of abnormal perfusion such as:
   - Decreased capillary refill (> 2 sec)
   - Low systolic BP for age

AGE	SBP (mmHg)
< 1 year	< 60
1-10 years	< 70 + (2x age in yrs)
> 10 years	< 90

4. Only responsive to pain or unresponsive [AVPU]

YES →
- Transport to most rapidly accessible appropriate designated pediatric Level I or II trauma center
- Transport to most rapidly accessible appropriate Level I or II trauma center

NO ↓

ANY ANATOMIC CRITERIA

Known or suspected:

1. Penetrating injuries to the head, neck, torso or extremities above the elbow or knee
2. Flail chest (chest wall instability or deformity)
3. Two or more proximal long bone fractures
4. Unstable pelvis fracture
5. Paralysis or neurologic deficit
6. Amputation above the wrist or ankle
7. Crushed, degloved, mangled or pulseless extremity
8. Open or depressed skull fracture

YES →
- Transport to most rapidly accessible appropriate designated pediatric Level 1 or II trauma center
- Transport to most rapidly accessible appropriate Level I or II trauma center

NO ↓

ANY MECHANISM OF INJURY CRITERIA

1. Falls > 15 feet or 3x the height of the child
2. High risk auto crash, with such components as:
   - Intrusion of vehicle or ≥ 12 inches in occupant compartment; > 18 inches any site
   - Ejection (partial or complete) from automobile
   - Death in same passenger compartment
   - Moderate/high speed crash with unrestrained or improperly restrained child
3. Auto vs. pedestrian/bicyclist thrown, run over or with significant impact
4. Motorcycle crash > 20 mph
5. Events involving high energy dissipation, such as:
   - Ejection from motorcycle, ATV, animal, etc.
   - Striking a fixed object with momentum
   - Blast or explosion
6. High energy electrical injury

YES → Transport to most rapidly accessible appropriate level trauma center

NO ↓

OTHER CONSIDERATIONS

1. Suspicion for non-accidental trauma
2. Anticoagulation or bleeding disorders
3. End-stage renal disease requiring dialysis
4. Pregnancy > 20 weeks
5. Suspicion of hypothermia
   Intra-abdominal injury: abdominal tenderness, distension or seatbelt sign on the torso
6. Burns > 10% TBSA (2nd or 3rd degree) and/or burns to the hands, face, feet, or groin; and/or inhalation burns
7. EMS provider judgement for triage to a higher-level trauma center

YES → Transport to appropriate trauma center

NO ↓

Transport to any appropriate acute care facility

Mile-High Regional Emergency Medical and Trauma Advisory Council (MHRETAC)

Proposed Pediatric Trauma Triage Algorithm Overview
September 2020

The MHRETAC contains the most and the highest-level trauma centers in the state of Colorado. The counties included are Adams, Arapahoe, Broomfield, Denver, Douglas and Elbert. The region has most the Level I trauma centers, the only Level I Regional Pediatric Trauma Center in Colorado, and a majority of Level II trauma centers. Numerous level III and IV trauma centers are within the MHRETAC. This region includes Non-Designated trauma centers, specialty facilities and numerous Non-Designated Free-Standing Emergency Rooms (CCEC- Licensed Community Clinics with Emergency Care). There are also free-standing emergency departments (FSED) that may include both licensed emergency departments that accept EMS traffic as an extension of an affiliated hospital, as well as independent emergency departments unaffiliated with a hospital.

Most Rapidly Accessible Appropriate- The MHRETAC chose to insert the words “most rapidly accessible appropriate” instead of others such as closest or nearest. Many factors are taken into consideration when transporting a trauma patient. These include, but are not limited to weather, geography, number of patients, special needs of patients, number of prehospital personnel, level of prehospital personnel and other factors that influence decision making. The MHRETAC actively supports and promotes the Medical Directors in defining the guidance for following the MHRETAC trauma destination policy.

Interfacility Transfers- The MHRETAC recognizes that compliance with this algorithm may require interfacility transfers.

EMS Medical Direction- It is the expectation of the MHRETAC that the EMS Medical Directors will be active and involved in trauma destination decisions and oversight of the agencies for which they are responsible. The MHRETAC expects EMS medical directors use medical expertise and patient centered principles in all their decisions. Transport to Non-Designated Free-Standing Emergency Rooms and Free-Standing Emergency Departments with or without hospital affiliation are at the discretion and guidelines of the Medical Director for each agency.

Pediatrics- The Children’s Hospital Colorado is recognized as a specialized resource for pediatric patients less than 15 yrs of age.

Approved by Mile-High RETAC Clinical Care Committee on September 17, 2020
Approved by Mile-High RETAC Board of Directors on November 19, 2020
Approved by Regional Medical Direction & Denver Metro EMS Medical Directors Group on November 4, 2020