Denver Metropolitan
Prehospital Protocols

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.

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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.

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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.

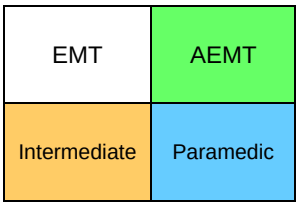
No protocol can account for every clinical scenario encountered, and the DMEMSMD recognize that in rare circumstances deviation from these protocols may be necessary and in a patient's best interest. Variance from protocol should always be done with the patient's best interest in mind and backed by documented 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.

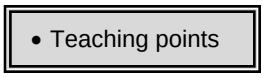
In order to keep protocols as uncluttered as possible, and to limit inconsistencies, individual drug dosing has not been included in the algorithms. It is expected the EMTs will be familiar with standard drug doses. Drug dosages are included with the medications section of the protocols as a reference.

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.

PEDIATRIC PROTOCOLS

For the purposes of these clinical care protocols, 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.

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.

Approved by Denver Metro EMS Medical Directors July 1, 2017. Next review January 2018

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.

0030 GENERAL GUIDELINES: CONSENT

General Principles: Adults

A. An adult in the State of Colorado is 18 years of age or older.
B. 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.
C. A person is deemed to have decision-making capacity if he/she has the ability to provide informed consent, i.e., the patient:
    1. Understands the nature of the illness/injury or risk of injury/illness.
    2. Understands the possible consequences of delaying treatment and/or refusing transport.
    3. Not intoxicated with drugs and/or alcohol
    4. Given the risks and options, the patient voluntarily refuses or accepts treatment and/or transport.
D. 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.
E. The odor of alcohol on a patient's breath does not, by itself, prevent a patient from refusing treatment.
F. **Implied Consent:** An unconscious adult is presumed to consent to treatment for life-threatening injuries/illnesses.
G. **Involuntary Consent:** a person other than the patient in rare circumstances may authorize Consent. This may include a court order (guardianship), authorization by a law enforcement officer for prisoners in custody or detention, or for persons under a mental health hold or commitment who are a danger to themselves or others or are gravely disabled.

Procedure: Adults

A. Consent may be inferred by the patient's actions or by express statements. If you are not sure that you have consent, clarify with the patient or **CONTACT BASE**. This may include consent for treatment decisions or transport/destination decisions.
B. Determining whether or not a patient has decision-making capacity to consent or refuse medical treatment in the prehospital setting can be very difficult. Every effort should be made to determine if the patient has decision-making capacity, as defined above.
C. For patients who do not have decision-making capacity, **CONTACT BASE**.
D. If the patient lacks decision-making capacity and the patient's life or health is in danger, and there is no reasonable ability to obtain the patient's consent, proceed with transport and treatment of life-threatening injuries/illnesses. If you are not sure how to proceed, **CONTACT BASE**.
E. For patients who refuse medical treatment, if you are unsure whether or not a situation of involuntary consent applies, **CONTACT BASE**.

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. The consent of a parent is not necessary to authorize hospital or emergency health care when an EMT in good faith relies on a minor's consent, if the minor is at least 15 years of age and emancipated or married.
    3. Minors may seek treatment for abortion, drug addiction, and venereal disease without consent of parents. Minors > 15 years may seek treatment for mental health.
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, and notify police 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:

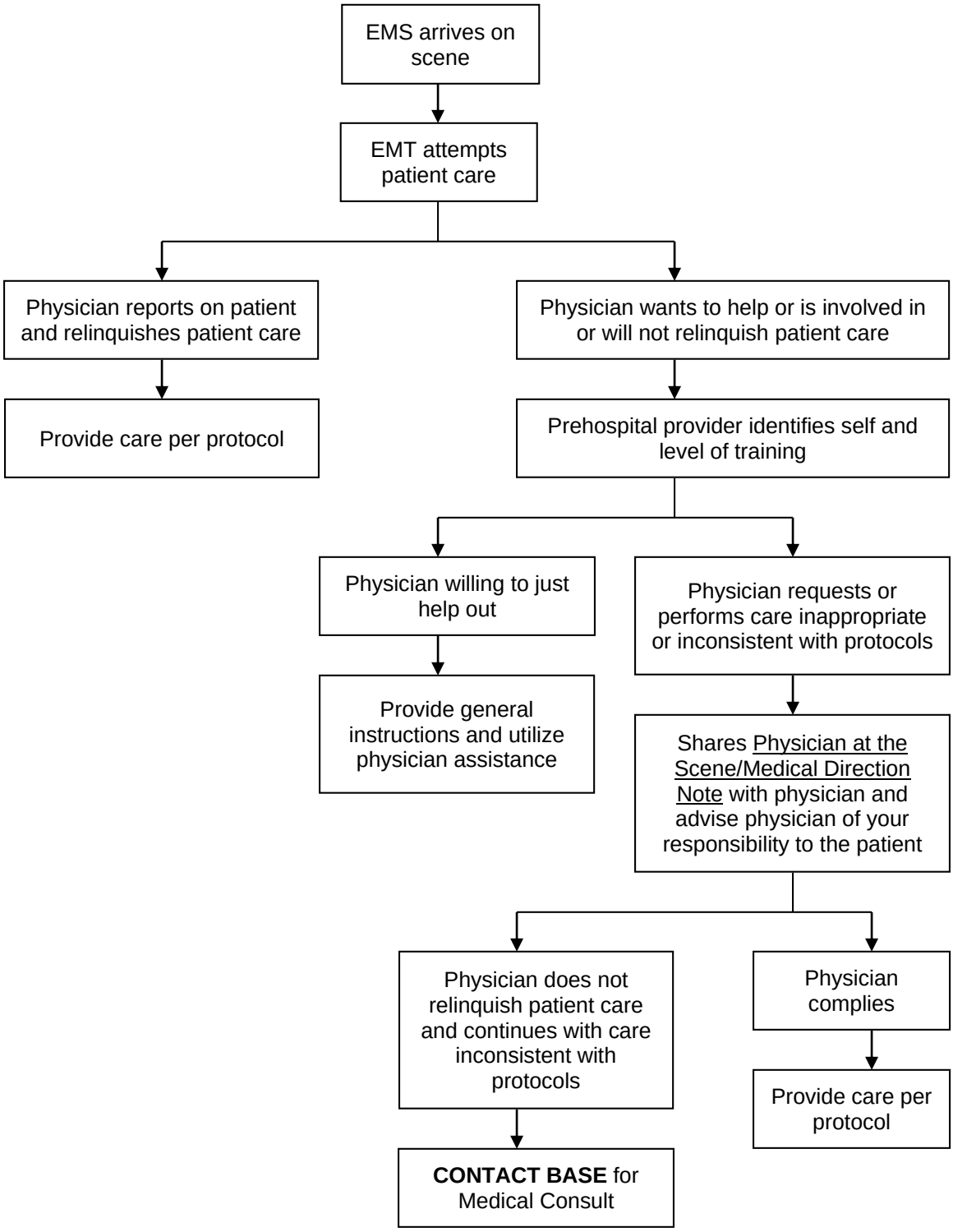
1. Offer your assistance or suggestions, but the prehospital care providers will remain under the medical control of their **base** physician, or
2. With the assistance of the prehospital care providers, talk directly to the **base physician** and offer to direct patient care and accompany the patient 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: TERMINATION OF RESUSCITATION AND FIELD PRONOUNCEMENT GUIDELINES

Purpose

A. To provide guidelines for resuscitation and field pronouncement of patients in cardiac arrest in the prehospital setting

General Principles

A. Agency policy determines base contact requirements for patients for whom resuscitative efforts are being withheld.
B. Attempt resuscitation for all patients found pulseless and apneic, unless any of the following are present:
    1. Physician orders as specified on the Colorado Medical Orders for Scope of Treatment (MOST) form: “No CPR. Do Not Resuscitate/DNR/Allow Natural Death”, present with the patient
    2. A valid CPR directive present with the patient
    3. Dependent lividity or rigor mortis
    4. Decomposition
    5. Decapitation
    6. Evidence of massive blunt head, chest, or abdominal trauma
    7. Third degree burns over more than 90% of the total body surface area

Termination of Resuscitation (TOR)

All cases described below require contact with a base physician to approve termination of resuscitation (TOR).

1. **Blunt Trauma Arrest**:
    a. Contact Base for TOR if patient found apneic and pulseless and no response to BLS care including chest compressions and bag valve mask ventilations.
2. **Penetrating Trauma Arrest**:
    a. Resuscitate and transport to a trauma facility.
        i. If time of arrest suspected to be > 10 minutes, and no signs of life or response to BLS care (as above), consider base contact for TOR.
3. **Medical Pulseless Arrest**:
    a. Resuscitate according to Universal Pulseless Arrest Algorithm on scene (unless unsafe) until one of the following end-points met:
        i. Return of spontaneous circulation (ROSC).
        ii. No ROSC despite 15 minutes of provision of ALS care or BLS care with an AED. If shockable rhythm still present, continue resuscitation and transport to closest emergency department.
        iii. Contact base for TOR at any point if continuous asystole for at least 15 minutes in any patient 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:
        i. No AED shock advised
        ii. No ROSC
        iii. Arrest unwitnessed by either EMS or bystanders
        iv. No bystander CPR before EMS arrival
    c. The following patients found pulseless and apneic warrant resuscitation efforts beyond 30 minutes and should be transported:
        i. Hypothermia
        ii. Drowning with hypothermia and submersion < 60 minutes
        iii. Pregnant patient with estimated gestational age ≥ 20 weeks
        iv. Lightning strike
        v. Avalanche victim
4. After pronouncement, do not alter condition in any way or remove equipment (lines, tubes, etc.), as the patient is now a potential coroner’s case.

0060 GENERAL GUIDELINES: ADVANCED MEDICAL DIRECTIVES

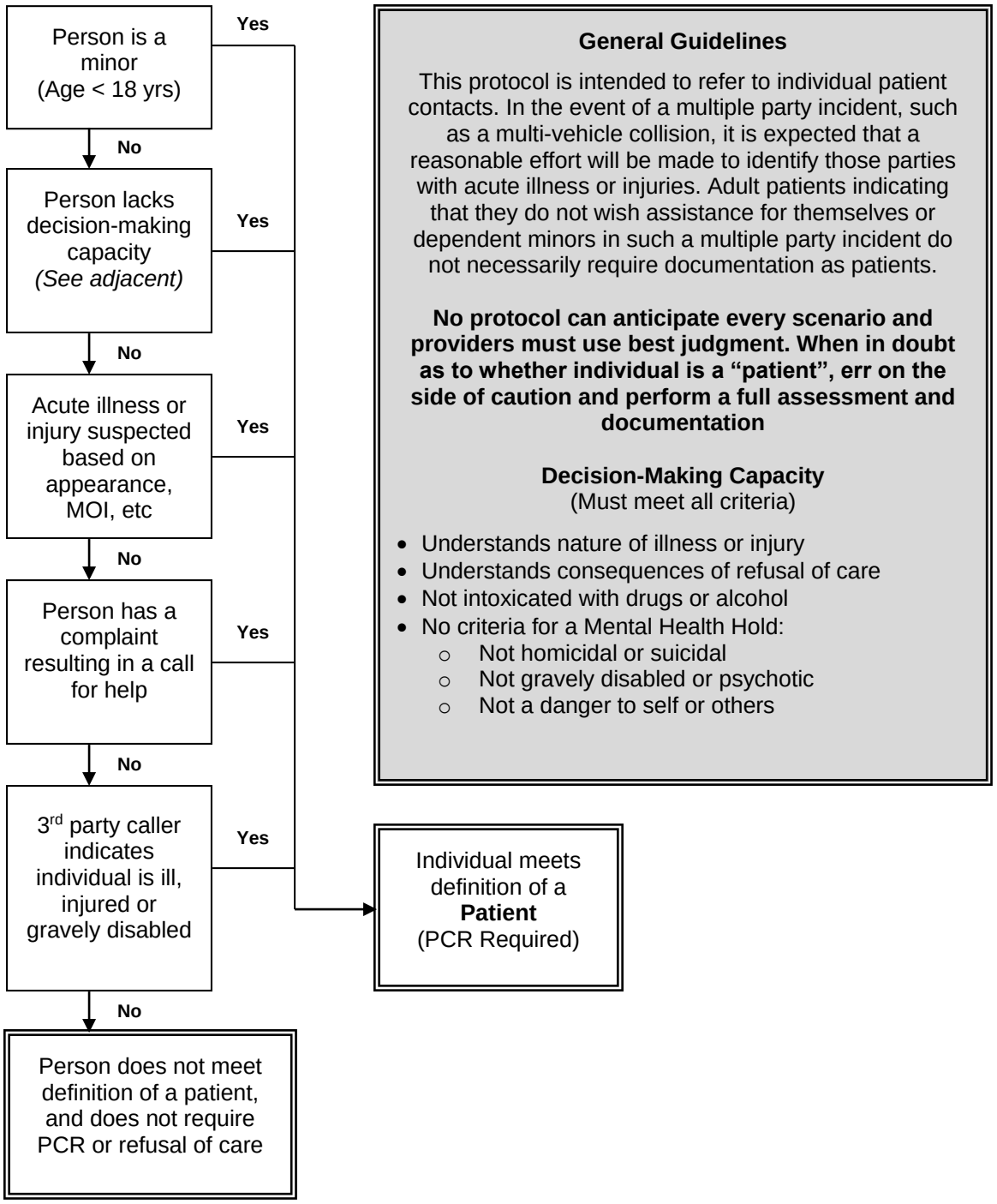
Advance Medical Directives

A. These guidelines apply to both adult and pediatric patients.
B. There are several types of advance medical directives (documents in which a patient identifies the treatment to be withheld in the event the patient is unable to communicate or participate in medical treatment decisions).
C. Some patients may have specific physician orders on a Colorado Medical Orders for Scope of Treatment (MOST) form. A MOST form order to withhold CPR or resuscitation should be honored by EMS.
D. Resuscitation may be withheld from, or terminated for, a patient who has a valid CPR Directive, Do Not Resuscitate Order (DNR), or other advance medical directive when:
    1. It is clear to the prehospital provider from the document that resuscitation is refused by the patient or by the patient's attending physician who has signed the document; and
    2. Base physician has approved withholding of or ceasing resuscitation.
E. Suspected suicide does not necessarily negate an otherwise valid CPR Directive, DNR order or other advanced medical directive. **CONTACT BASE**
F. The **Colorado CPR Directive** directs EMS providers to withhold CPR in the event of cardiac or respiratory arrest or malfunction.
    1. “Cardiopulmonary Resuscitation” (CPR) means measures to restore cardiac function or to support breathing in the event of cardiac or respiratory arrest or malfunction. “CPR” includes, but is not limited to, artificial ventilation, chest compression, delivering electric shock, placing tubes in the airway to assist breathing or other basic and advanced resuscitative therapies.
    2. CPR Directive bracelet or necklace may be used by an individual and shall be complied with in the same manner as a written CPR Directive.
    3. A signed CPR directive form that has been photocopied, scanned, faxed is valid.
G. A Living Will ("Declaration as to Medical or Surgical Treatment") requires a patient to have a terminal condition, as certified in the patient's hospital chart by two physicians.
H. Other types of advance directives may be a "Durable Medical Power of Attorney," or "Health Care Proxy". Each of these documents can be very complex and require careful review and verification of validity and application to the patient's existing circumstances. Therefore, the consensus is that resuscitation should be initiated until a physician can review the document or field personnel can discuss the patient’s situation with the base physician. **If there is disagreement at the scene about what should be done, CONTACT BASE for guidance.**
I. Verbal DNR "orders" are not to be accepted by the prehospital provider. In the event family or an attending physician directs resuscitation be ceased, the prehospital provider should immediately **CONTACT BASE**. The prehospital provider should accept verbal orders to cease resuscitation only from the **Base physician**.
J. There may be times in which the prehospital provider feels compelled to perform or continue resuscitation, such as a hostile scene environment, family members adamant that "everything be done," or other highly emotional or volatile situations. In such circumstances, the prehospital provider should attempt to confer with the base for direction and if this is not possible, the prehospital provider must use his or her best judgment in deciding what is reasonable and appropriate, including transport, based on the clinical and environmental conditions, and establish base contact as soon as possible.

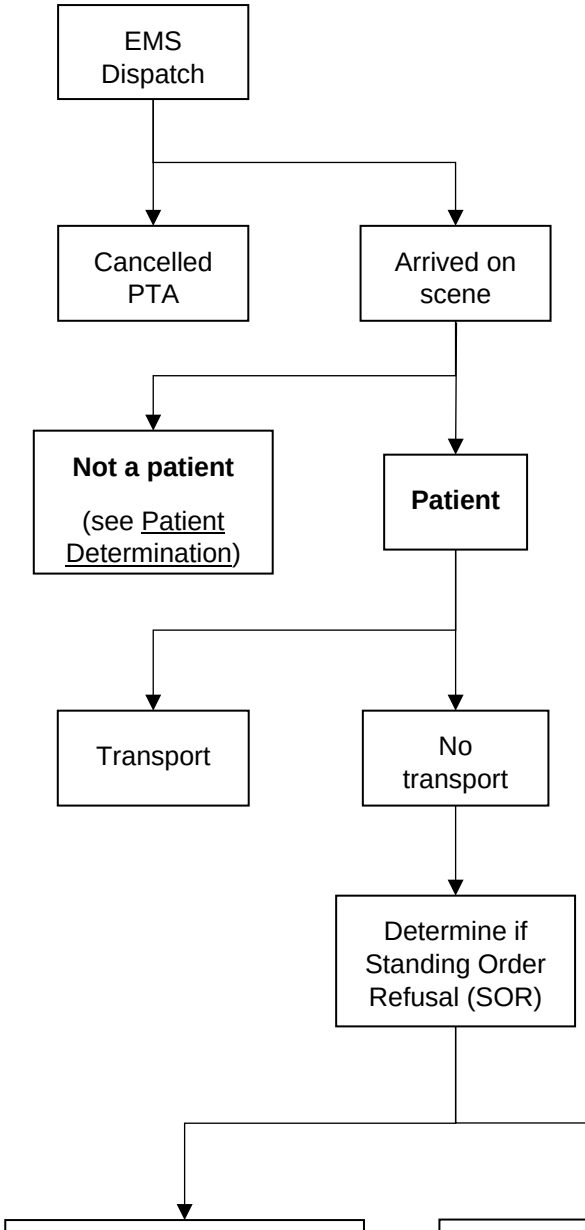
Additional Considerations:

A. Patients with valid DNR orders or advanced medical directives should receive supportive or comfort care, e.g. medication by any route, positioning and other measures to relieve pain and suffering. Also the use of oxygen, suction and manual treatment of an airway obstruction as needed for comfort.
B. Mass casualty incidents are not covered in detail by these guidelines. (See State Trauma Triage Algorithm).
C. 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.
D. Mechanisms for disposition of bodies by means other than EMS providers and vehicles should be prospectively established in each county or locale.
    1. 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

A person is deemed to have decision-making capacity if he/she has the ability to provide informed consent, i.e., the patient:

1. Understands the nature of the illness/injury or risk of injury/illness
2. Understands the possible consequences of delaying treatment and/or refusing transport
3. Given the risks and options, the patient voluntarily refuses or accepts treatment and/or transport.

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

For potentially intoxicated patients, refer to Drug/Alcohol Intoxication

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

Standing Order Refusal

No Base Contact required if ALL criteria met:

- 18 and older, or 5 and older if parent/guardian on scene
- Patient has decision-making capacity

Base Contact Required

- < 5 years old
- < 18 years old unless parent/guardian on scene
- If uncertain about patient's decision-making capacity

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 DIVERT AND ADVISORY

Purpose

A. To provide a standard approach to ambulance diversion that is practical for field use
B. To facilitate unobstructed access to hospital emergency departments 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 Principles

A. EMSystem, an internet-based tracking system, is used to manage diversion in the Denver Metro area
B. The State Trauma Triage Algorithms should be followed
C. The only time an ambulance can be diverted from a hospital is when that hospital is posted on EMSystem as being on official divert (RED) status.
D. Overriding factors: the following are appropriate reasons for a Paramedic to override ED Divert and, therefore, deliver a patient to an emergency department that is on ED divert:
    1. Cardiopulmonary arrest
    2. Imminent cardiopulmonary arrest
    3. Unmanageable airway emergencies
    4. Unstable trauma and burn patients transported to Level I and Level II Trauma Centers
    5. Patients meeting “Cardiac Alert“ criteria (participating hospitals)
    6. Patients meeting “Stroke Alert“ criteria (participating hospitals)
    7. Imminent delivery
E. Prehospital personnel should honor advisory categories, when possible, considering patient’s condition, travel time, and weather. Patients with specific problems that fall under an advisory category should be transported to a hospital not on that specific advisory when feasible.
F. There are several categories that are considered advisory (yellow) alert categories. These categories are informational only and should alert field personnel that a hospital listed as being on an advisory alert may not be able to optimally care for a patient that falls under that advisory category.
G. The following are advisory (yellow) categories recognized by the State. Individual facilities may not utilize these categories often, or ever:
    1. ICU (Intensive Care Unit)
    2. Psych (Psychiatric)
H. Zone saturation exists when all hospitals within that zone are on ED Divert.
I. A Zone Master is the designated hospital within a Zone responsible for determining and tracking hospital assignments when the zone is saturated.
J. When an ambulance is transporting a patient that the Paramedic feels cannot go outside the zone due to patient acuity or other concerns, the Paramedic should contact the Zone Master and request a destination assignment.
K. In general, patients contacted within a zone should be transported to an appropriate facility within the zone. Patients may be transported out of the primary zone at the Paramedic’s discretion, if it is in the patient’s best interest or if the transport to an appropriate facility is shorter.
L. The zones, hospitals in each zone, Zone Masters, and the Zone Master contact phone numbers are listed on EMSystem.

0100 GENERAL GUIDELINES: MANDATORY REPORTING OF ABUSE PATIENTS

Purpose

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

Definition of Abuse:

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.

Types of Abuse:

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

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. *He or she is to immediately report (within 24 hours) the information to local law enforcement or as directed by agency specific guidelines.* Report can be given in two ways:
   1. Verbal report
   2. Written report

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 alleged mistreatment and the situation
D. The nature and extent of any injuries—if known
E. Knowledge of previous cases of known or suspected abuse, neglect, or exploitation of the victim or others under the person's care
F. The family composition, including any siblings or others in the household
G. The name, address and/or contact phone number, and occupation of the person making the report
H. Relation of the person making report to the victim and/or how information was obtained
I. Any action taken by the reporting source
J. Any other information reporting person feels is important.

Additional Information:

A. 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 within 24 hours.
B. Any "suspected" or known incident of abuse, neglect, or exploitation must be reported
C. Protecting patient confidentiality does not legally justify a failure to report
D. There is established immunity for reporters "acting in good faith"
E. Domestic violence reporting is mandated if you are treating an adult with domestic assault injury

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. 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.

B. 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.

C. 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 covered by set protocol and outside the scope of practice or comfort level of care by 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.

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 precautions or lying flat**
   Perform spinal immobilization 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 immobilization is required, as upright positioning places additional axial load on the patient's neck and emergent airway intervention is not possible.

Approved by Denver Metro EMS Medical Directors July 1, 2017. Next review January 2018

0130 GENERAL GUIDELINES: TRANSPORTATION OF THE PEDIATRIC PATIENT

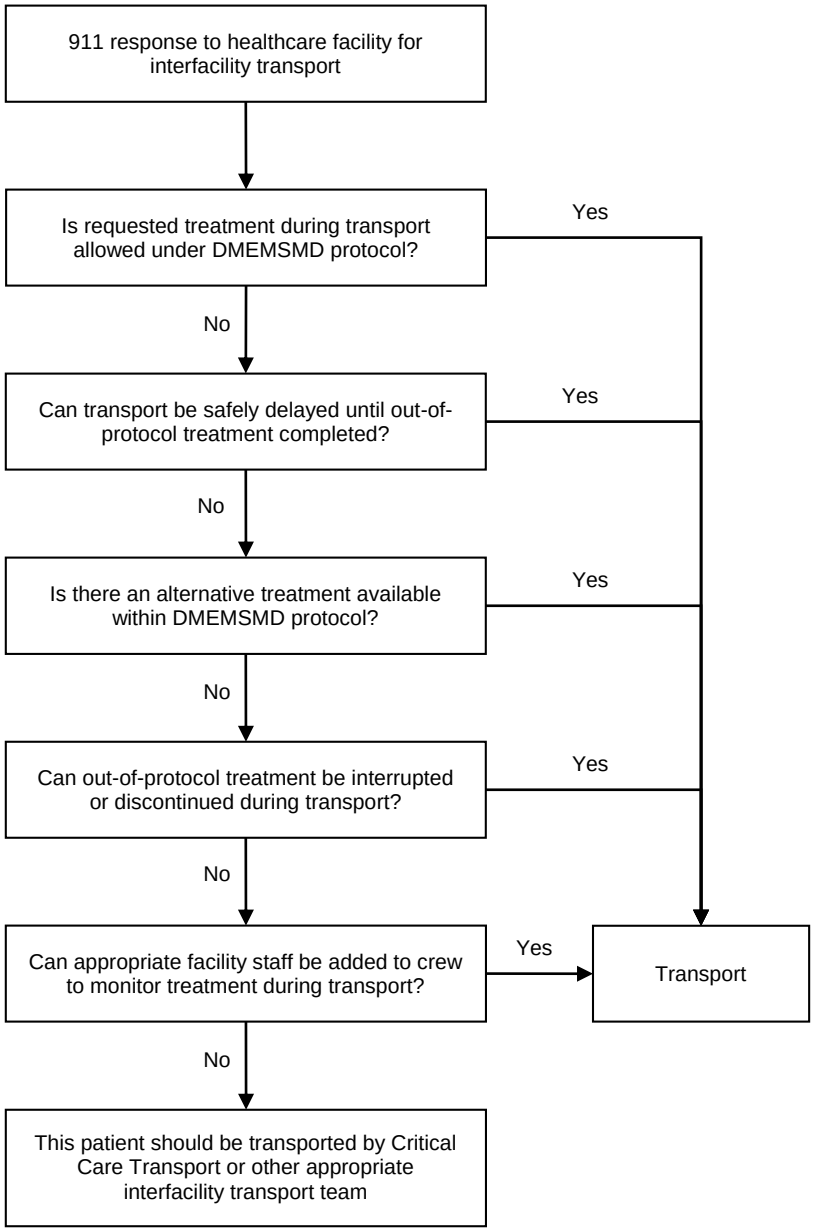
5. **For a child requiring transport as part of a multiple patient transport (newborn with mother, multiple children, etc.)**
   If possible, transport each as a single patient. When available resources prevent single patient transportation, transport patients using safe, designated space available exercising 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.

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
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

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
• 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
Adenosine (Adenocard)					
• Adult				B	S
• Pediatric				B	B
Albuterol sulfate (MDI and nebulizer)	B	B	B	B	S
Amiodarone					
• Pulseless arrest				B	S
• Tachyarrhythmia with poor perfusion					B
Antiemetic					
• Ondansetron (Zofran) ODT	B	B	S	S	S
• Ondansetron (Zofran) IV/IO			S	S	S
• Promethazine (Phenergan)				B	S
• Metoclopramide (Reglan)				B	S
• Droperidol - Adult				B	S
• Droperidol – Pediatric				B	B
Aspirin	S	S	S	S	S
Atropine sulfate					
• Hemodynamically unstable bradycardia				B	S
• Organophosphate poisoning and stable bradycardia				B	B

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0990 Quick Reference for Procedures and Medications Allowed by Protocol

Medications	B	BIV	AEMT	I	P
Benzodiazepines (midazolam, diazepam, lorazepam)					
• Seizure				B	S
• Sedation for transcutaneous pacing or cardioversion				B	S
• Sedation for severely agitated or combative patient – Adult				B	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
Dextrose		S	S	S	S
Diphenhydramine (Benadryl)			B	B	S
Dopamine					S
Droperidol					
• Adult				B	S
• Pediatric				B	B
Epinephrine					
• Pulseless arrest – IV/IO				S	S
• Pediatric bradycardia – IV/IO				B	B
• Asthma – IM			B	B	S
• Systemic allergic reaction – IM			B	B	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)				B	S
Hemostatic agents	S	S	S	S	S
Hydroxocobalamin (Cyanokit)				S	S
Ipratropium Bromide (Atrovent)			B	B	S
Lidocaine 2% Solution – Anesthetic for IO needle insertion			S	S	S
Magnesium sulfate					
• Torsades de pointes associated with prolonged QT interval					S
• Refractory severe bronchospasm					S
• Eclampsia				B	S
Methyprednisolone (Solu-Medrol)				B	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
Opioids					
• Adult				B	S
• Pediatric (1-12 years)				B	S
• Pediatric (<1 year)				B	B
Oral glucose (Glutose, Insta-glucose)	S	S	S	S	S
Oxygen	S	S	S	S	S
Phenylephrine (Intranasal)					
• Epistaxis	S	S	S	S	S
• Prior to nasotracheal intubation					S
Racemic epinephrine (Vaponepherine)				B	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
- Anticipated prolonged need for positive pressure ventilation

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.

Technique:

1. Initiate BLS airway sequence
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 immobilization 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. $ETCO_2$, preferably with waveform capnography
    b. Presence and symmetry of breath sounds
    c. Rising SpO_2
    d. Other means as needed
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
- Anticipated prolonged need for positive pressure ventilation

Contraindications:

- Apnea
- Severe mid-face trauma

Technique:

1. Initiate BLS airway sequence
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. $ETCO_2$, preferably with waveform capnography
    b. Presence and symmetry of breath sounds
    c. Rising SpO_2
    d. Other means as needed
15. Ventilate with BVM. Assess adequacy of ventilations
16. During transport, continually reassess ventilation, oxygenation and tube position with continuous $ETCO_2$ and SpO_2

Precautions:

- Before performing BNTI, consider if patient can be safely ventilated with non-invasive means such as CPAP or BVM
- 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
- Blind nasotracheal intubation is a very gentle technique. The secret to success is perfect positioning and patience.

1020 PROCEDURE PROTOCOL: PERCUTANEOUS CRICOTHYROTOMY

Paramedic

Introduction:

- Percutaneous 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.

Indications:

- A life-threatening condition exists AND advanced airway management is indicated, ***AND*** adequate oxygenation and ventilation cannot be accomplished by other less invasive means. ("CANNOT INTUBATE/CANNOT VENTILATE")

Contraindications:

- Age < 12, likelihood of success with a favorable outcome in the pediatric patient is exceedingly low. (see pediatric needle cricothyrotomy protocol for patients <12 years old)
- Anterior neck hematoma is a relative contraindication.

Technique:

1. Prepare skin using aseptic solution
2. Position the patient in a supine position, with in-line spinal immobilization if indicated. If cervical spine injury not suspected, neck extension will improve anatomic view
3. Perform cricothyrotomy according to manufacturer's instructions for selected device
4. Confirm and document tube placement by:
    a. $ETCO_2$, preferably with waveform capnography
    b. Breath sounds
    c. Rising pulse oximetry
    d. Other means as needed
5. Ventilate with BVM assessing adequacy of ventilation
6. Observe for subcutaneous air, which may indicate tracheal injury or extra- tracheal tube position
7. Secure tube with tube ties or device
8. 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

1030 PROCEDURE PROTOCOL: BOUGIE ASSISTED SURGICAL 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.

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 immobilization if indicated. If cervical spine injury not suspected, neck extension will improve anatomic view.
2. Using an aseptic technique (betadine/alcohol wipes), cleanse the area.
3. Standing on the left side of the patient, stabilize the larynx with the thumb and middle finger of your left hand, and identify the cricothyroid membrane, typically 4 finger-breadths 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.
6. Insert the bougie curved-tip first through the incision and angled towards the patient's feet

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 "hangup" 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: $ETCO_2$ (preferably with 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:

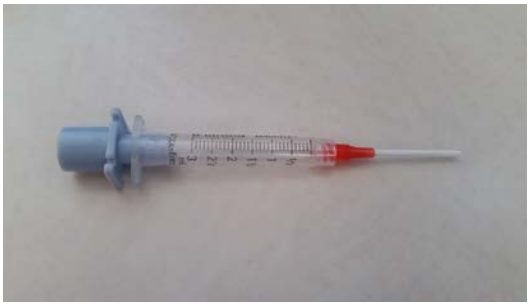
- Success of procedure is dependent on correct identification of cricothyroid membrane
- Bleeding will occur, even with correct technique. Straying from the midline is dangerous and likely to cause hemorrhage from the carotid or jugular vessels, or their branches.

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 needle hub
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. $ETCO_2$ preferably with 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 $ETCO_2$ (preferably with waveform capnography)
10. Continuously monitor $ETCO_2$ (preferably 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)
  - Dyspnea with hypoxia (SpO_2 less than 90% despite O_2)
  - Dyspnea with verbal impairment – i.e. cannot speak in 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

Indication:

A. **All** of the following clinical indicators must be present:
    1. Severe respiratory distress
    2. Hypotension
    3. Unilateral absent or decreased breath sounds

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 Universal 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 220 bpm in children < 8 years 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

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

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 with povidone-iodine.
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 and apply patient wristband included with kit to identify IO patient.

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 may be used to control potentially fatal hemorrhage only after other means of hemorrhage control have failed.

Precautions

A. A tourniquet applied incorrectly can increase blood loss.
B. Applying a tourniquet can cause nerve and tissue damage whether applied correctly or not. Proper patient selection is of utmost importance.
C. Injury due to tourniquet is unlikely if the tourniquet is removed within 1 hour. In cases of life-threatening bleeding, benefit outweighs theoretical risk.
D. 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. Other improvised tourniquets are not allowed.

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. Mark the time and date of application on the patient's skin next to the tourniquet.
    5. Keep tourniquet on throughout hospital transport – a correctly applied tourniquet should only be removed by the receiving hospital.

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 (e.g., verbal de-escalation should be used first if the situation allows).
B. **Paramedic:** Consider pharmacological sedation for agitated patients that require transport and are behaving in a manner that poses a threat to him/herself or others.
    1. See Agitated/Combative Patient Protocol: (The term “chemical restraint” is no longer preferred)
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.

Precautions:

A. When appropriate, involve law enforcement
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. 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.
B. Have all equipment and personnel ready (restraints, suction, a means to promptly remove restraints).
C. Use assistance such that, if possible, 1 rescuer handles each limb and 1 manages the head or supervises the application of restraints.
D. 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**.
E. 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

Document the following in all cases of restraint:

A. Description of the facts justifying restraint
B. Efforts to de-escalate prior to restraint
C. Type of restraints used
D. Condition of the patient while restrained, including reevaluations during transport
E. Condition of the patient at the time of transfer of care to emergency department staff
F. Any injury to patient or to EMS personnel

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
D. Excited Delirium Syndrome. This is a life-threatening medical emergency. These patients are truly out of control. They will have some or all of the following symptoms: paranoia, disorientation, hyper-aggression, hallucination, tachycardia, increased strength, and hyperthermia.

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1140 PROCEDURE PROTOCOL: OROGASTRIC TUBE INSERTION WITH ADVANCED AIRWAY

Paramedic

Indications:

- Gastric decompression in the intubated patient
- Gastric decompression with placement of King-LTSD 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 King-LTSD 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.

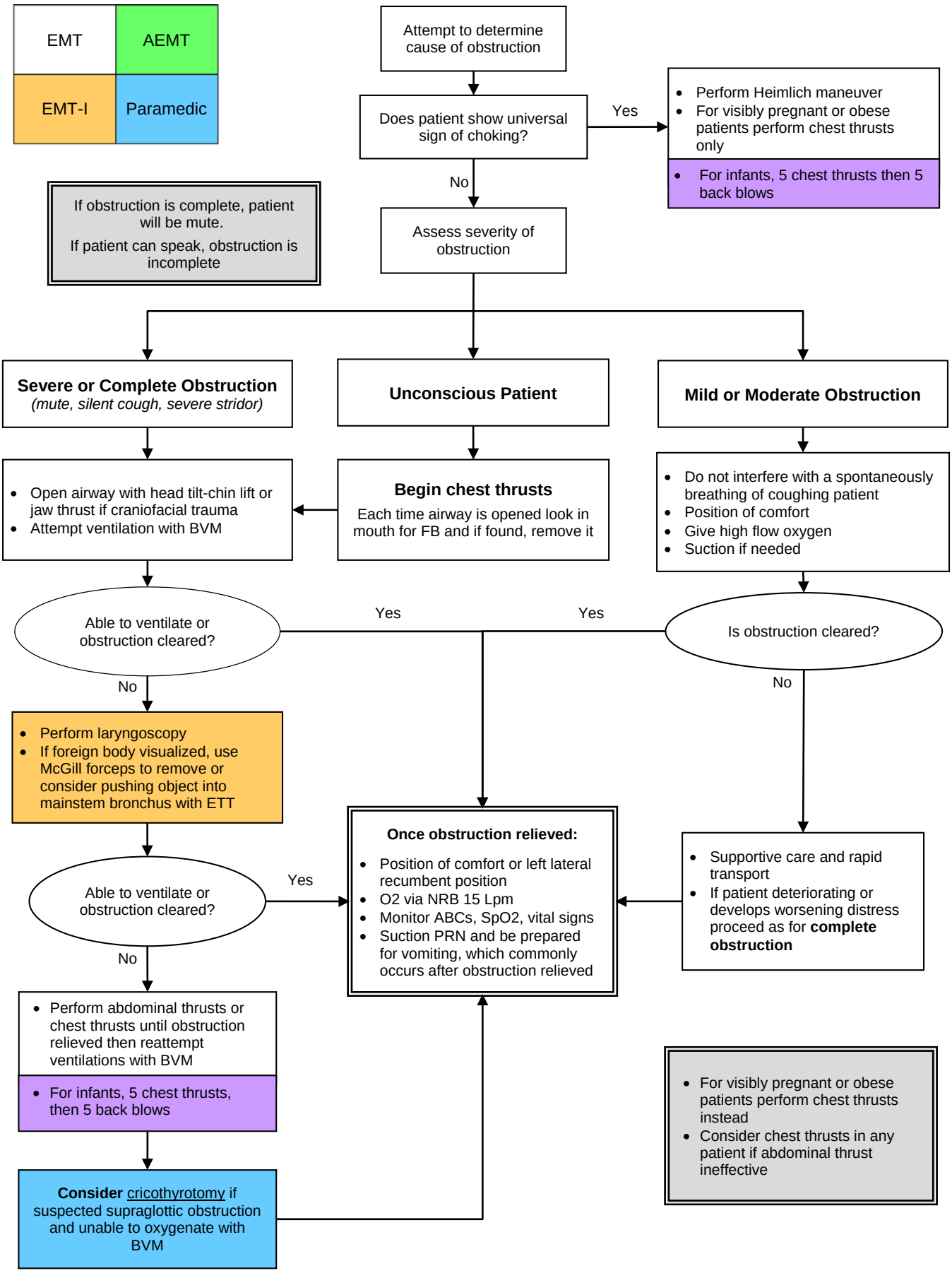
Contraindications

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

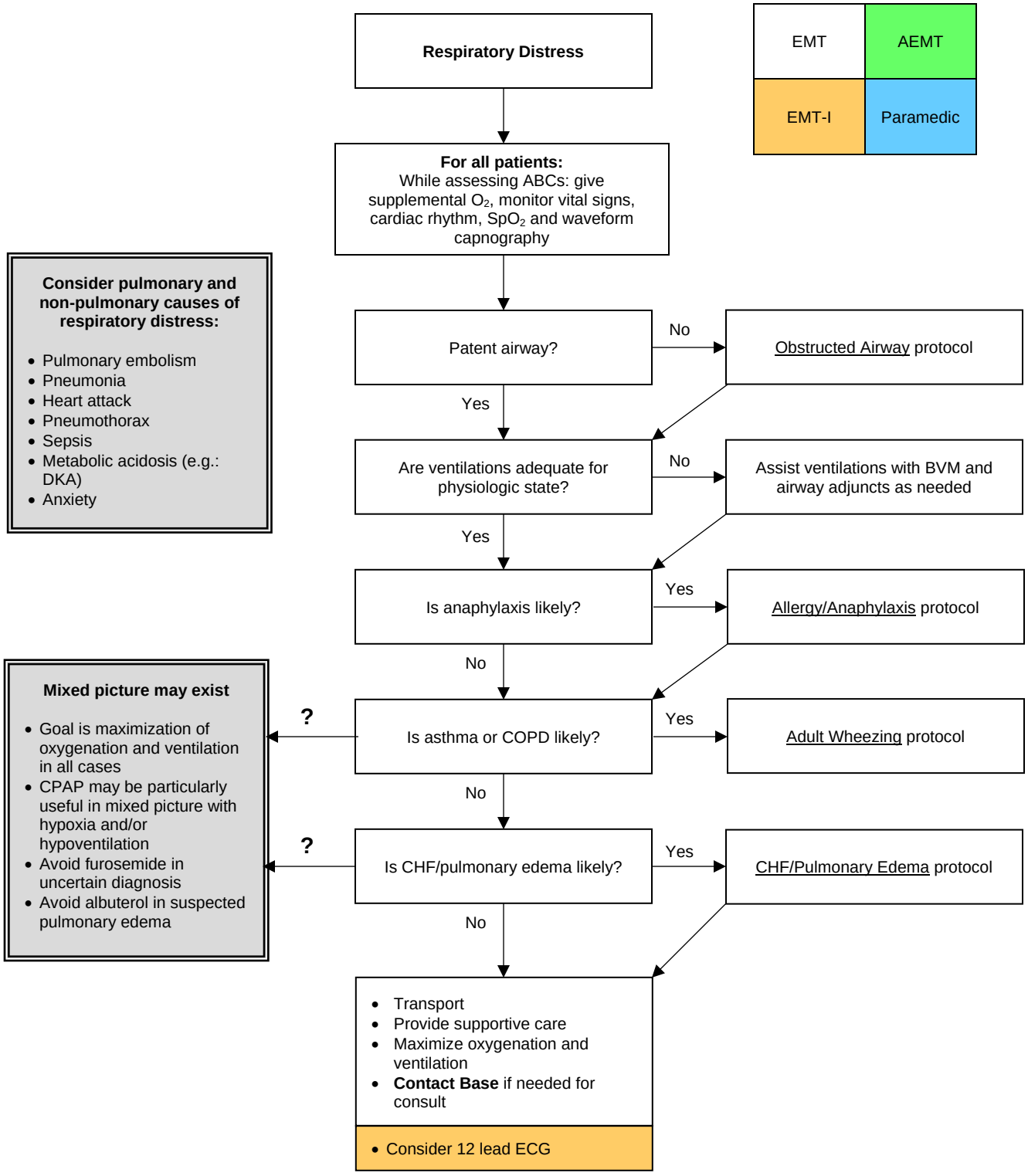
Technique

1. Confirm the TASER® has been shut off and the barb cartridge has been disconnected. .
2. Using a pair of shears cut the TASER® wires at the base of the probe.
3. Place one hand on the patient in 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.
4. In one uninterrupted motion, pull the probe out of the puncture site maintaining a 90° angle to the skin. Avoid twisting or bending the probe.
5. Repeat the process for any additional probes.
6. Once the probes are removed, inspect and assure they have been removed intact. In the event the probe is not removed intact or there is suspicion of a retained probe, the patient must be transported to the emergency department for evaluation.
7. Cleanse the probe site and surrounding skin with betadine and apply sterile dressing.
8. Advise patient to watch for signs of infection including increased pain at the site, redness swelling or fever.

2000 OBSTRUCTED AIRWAY



2010 ADULT UNIVERSAL RESPIRATORY DISTRESS



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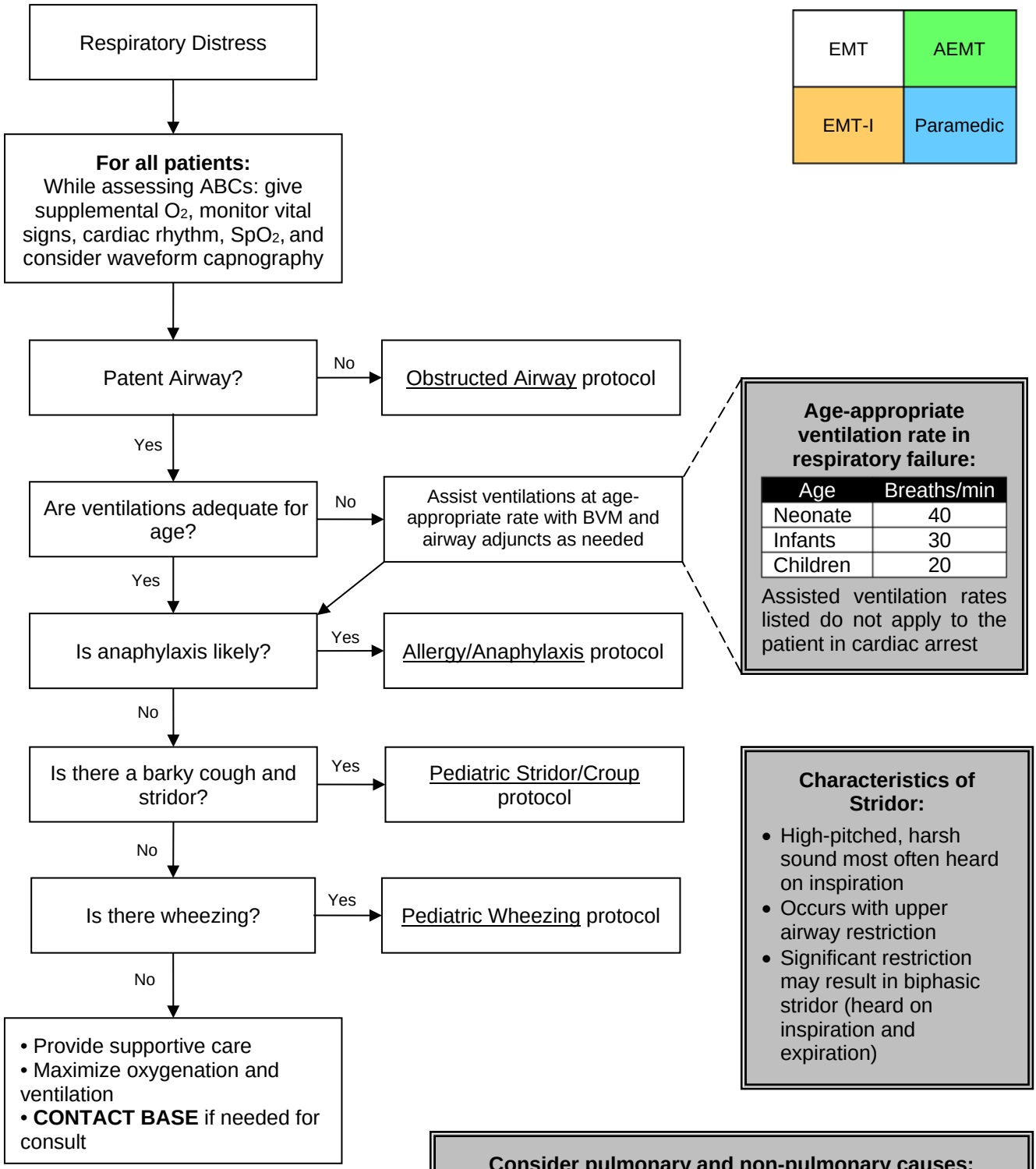
2020 PEDIATRIC UNIVERSAL RESPIRATORY DISTRESS



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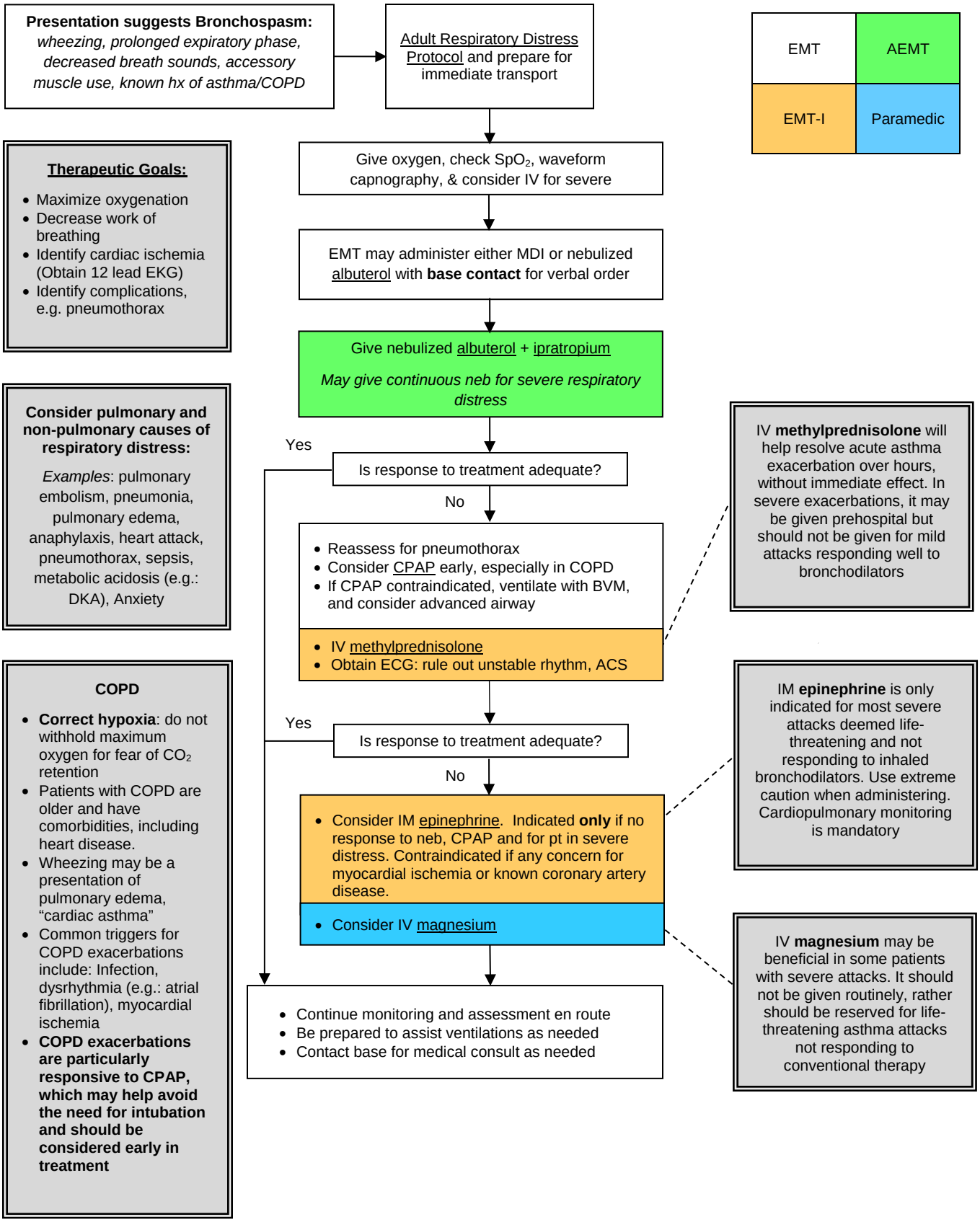
2030 ADULT WHEEZING



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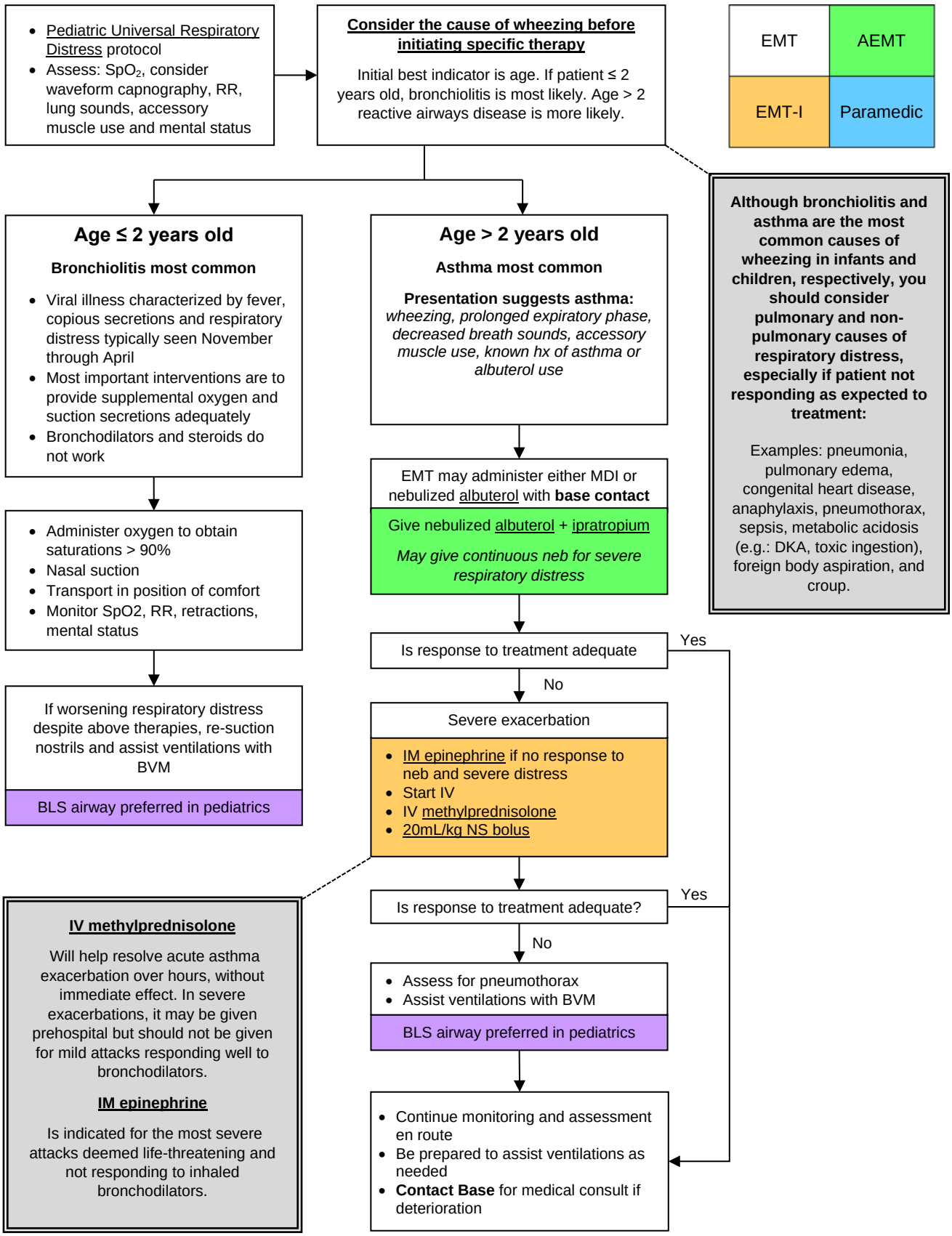
2040 PEDIATRIC WHEEZING



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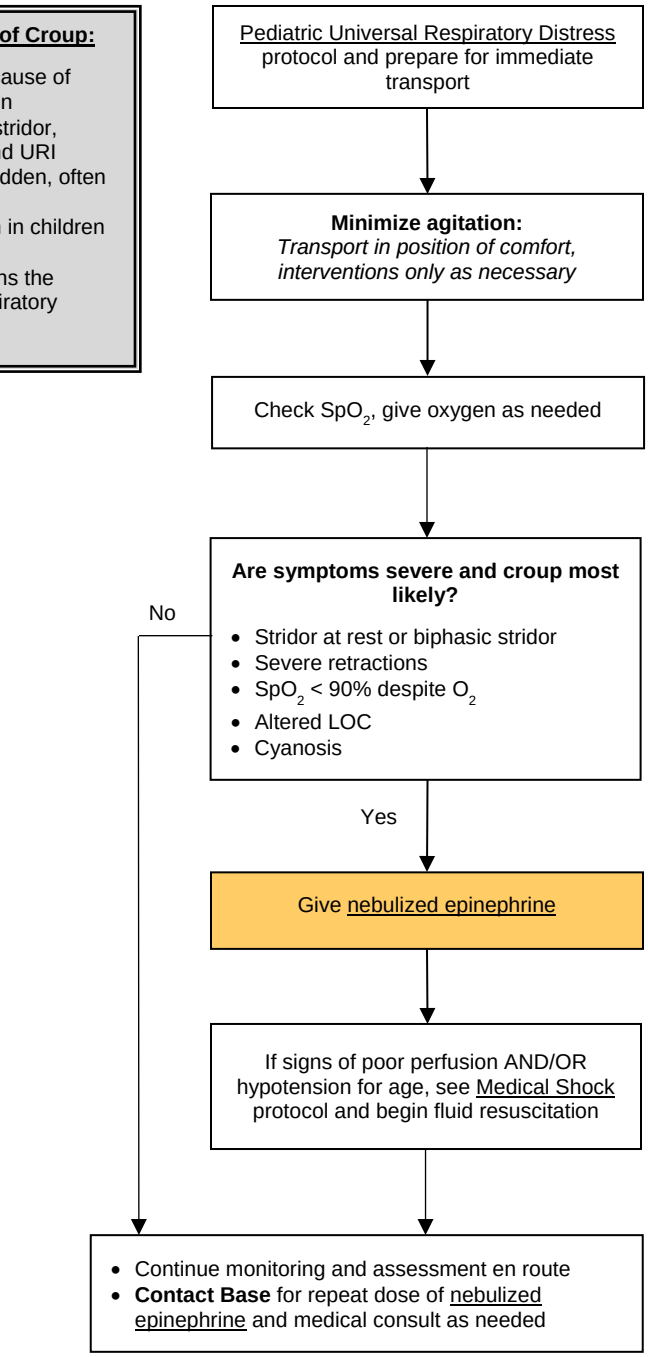
2050 PEDIATRIC STRIDOR/CROUP

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



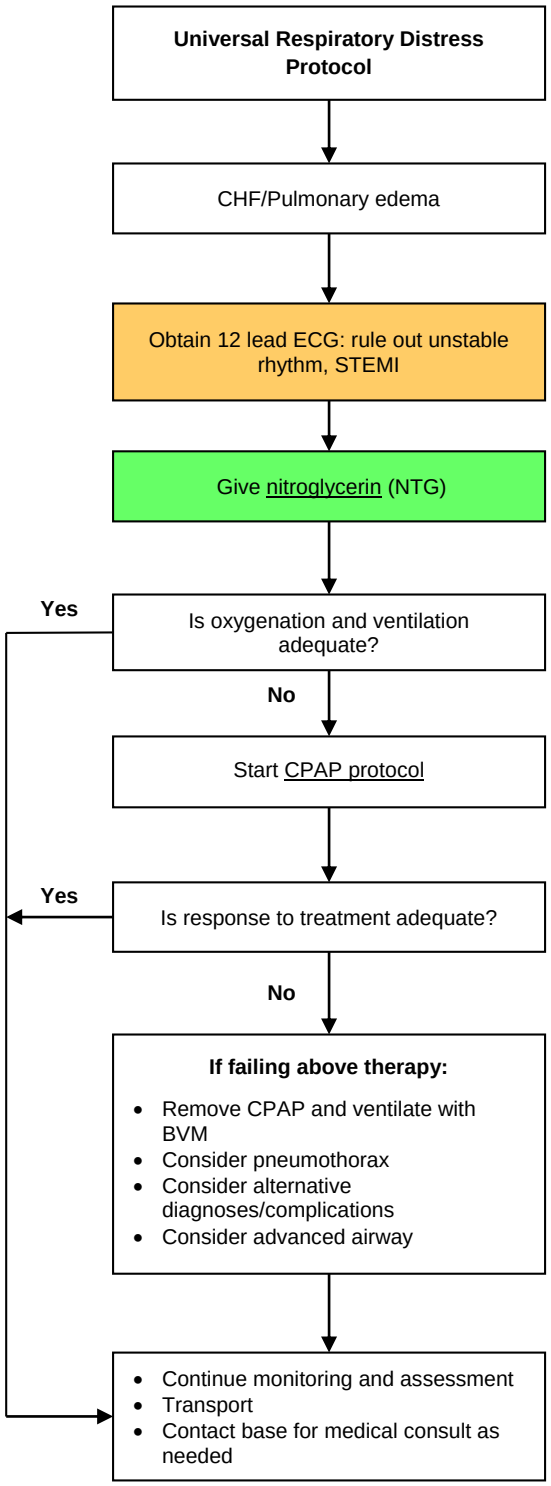
EMT	AEMT
EMT-I	Paramedic

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 preferred

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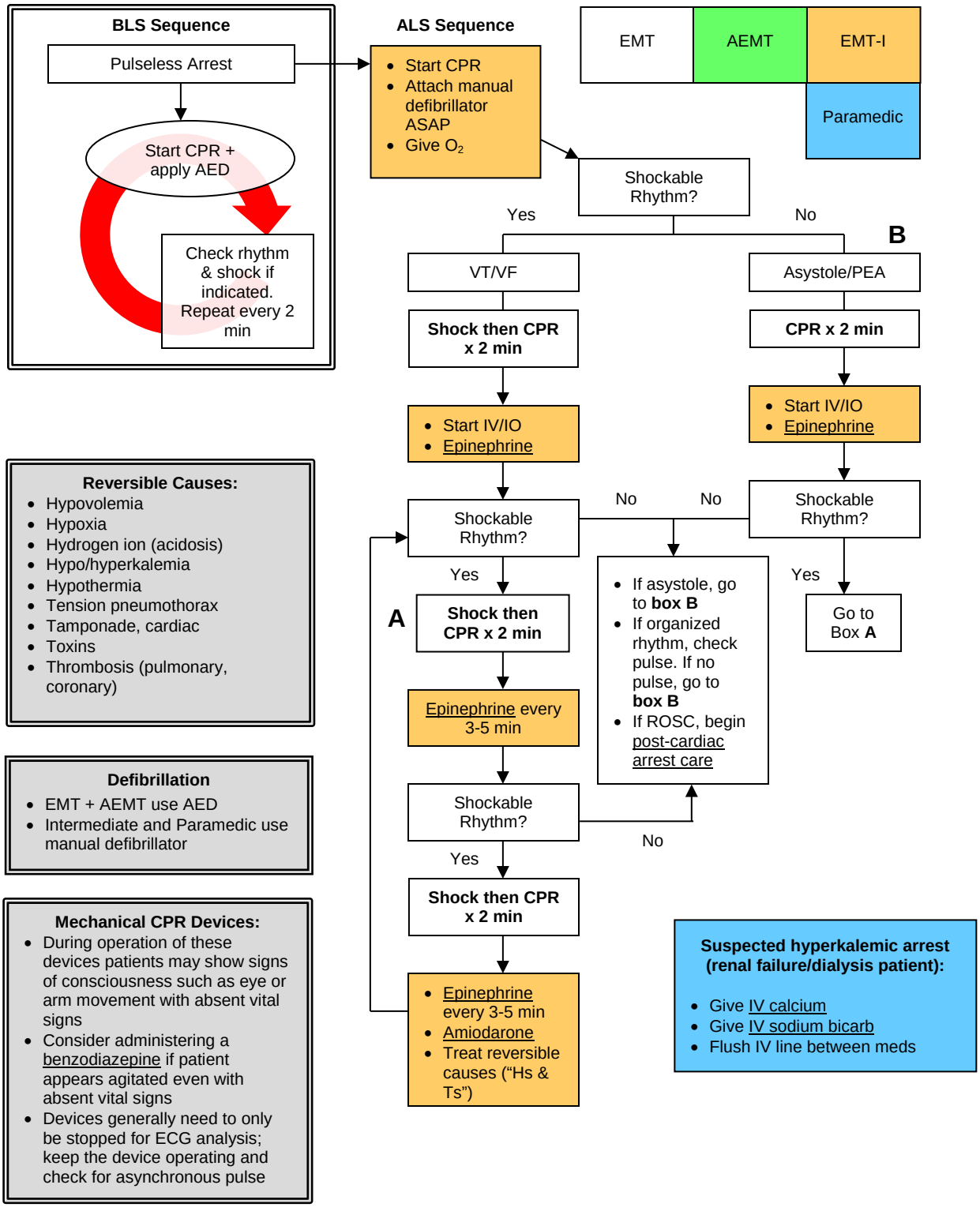
3000 UNIVERSAL PULSELESS ARREST ALGORITHM



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3010 UNIVERSAL 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

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 (King, LMA, 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

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 (e.g. King) may be placed as an alternative if BVM ventilations are inadequate

ROSC

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

Regarding where to work arrest and presence of family members:

- CPR in a moving ambulance or pram is ineffective
- 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 termination of resuscitation

Pacing

- Pacing is not indicated for asystole and PEA. Instead start chest compressions according to Universal Pulseless Arrest Algorithm.
- Pacing should **not** be undertaken if it follows unsuccessful defibrillation of VT/VF as it will only interfere with CPR and is not effective

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

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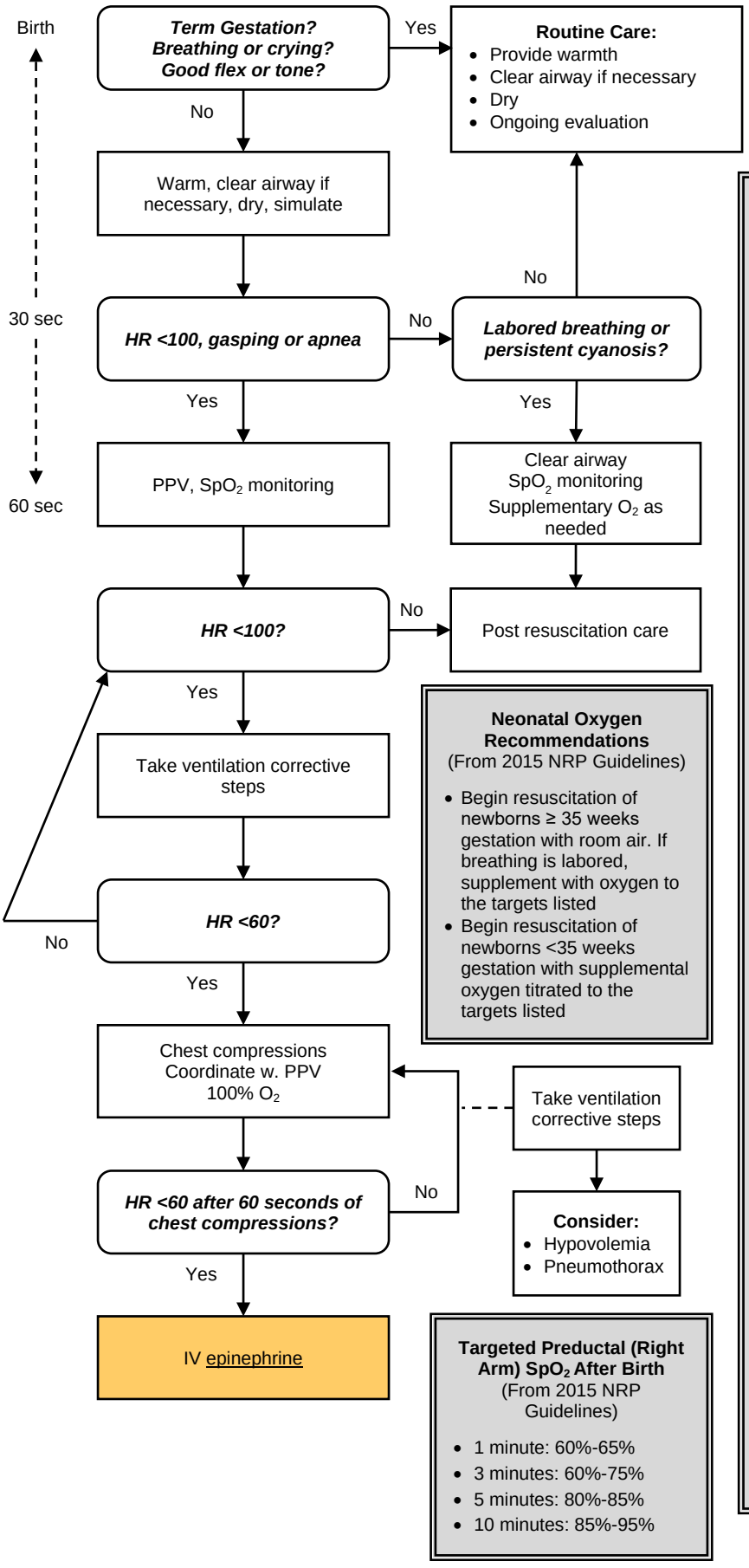
3020 NEONATAL RESUSCITATION



EMT	AEMT
EMT-I	Paramedic

Neonatal Oxygen Recommendations
(From 2015 NRP Guidelines)

- 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
(From 2015 NRP Guidelines)

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

General Considerations
(From 2015 AHA Guidelines)

- 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
- 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

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3030 POST-RESUSCITATION CARE WITH ROSC

Post-Cardiac 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

ROSC after cardiac arrest

EMT	AEMT
EMT-I	Paramedic

Perform 12 lead EKG

Is STEMI Present?

Yes → Initiate Cardiac Alert

No

- Assess for shock and volume status
- Peripheral access: IO/IV
- Oxygenation/Ventilation
  - o Secure advanced airway if indicated
  - o Avoid hyperventilation
  - o Avoid hyper/hypocapnia ($EtCO_2$)
  - o Correct hypoxemia
- Elevate head of bed at 30°

Is there hypotension for age and/or signs of shock?

Yes → Medical Hypotension/Shock protocol

No

Assess for dysrhythmia

Recurrent dysrhythmia?

Yes → Treat recurrent dysrhythmia per appropriate protocol

No

- Continuous rhythm monitoring and pulse checks
- Focused neuro exam (AVPU/GCS)
- Targeted Temperature Management (TTM) goal 33° - 36° C (91.4° - 96.8° F)
  - o Check patient temperature, if possible
  - o Avoid fever and provide passive cooling
  - o Place ice packs to neck, axillae, groin if needed for fever
- Transfer to closest appropriate facility

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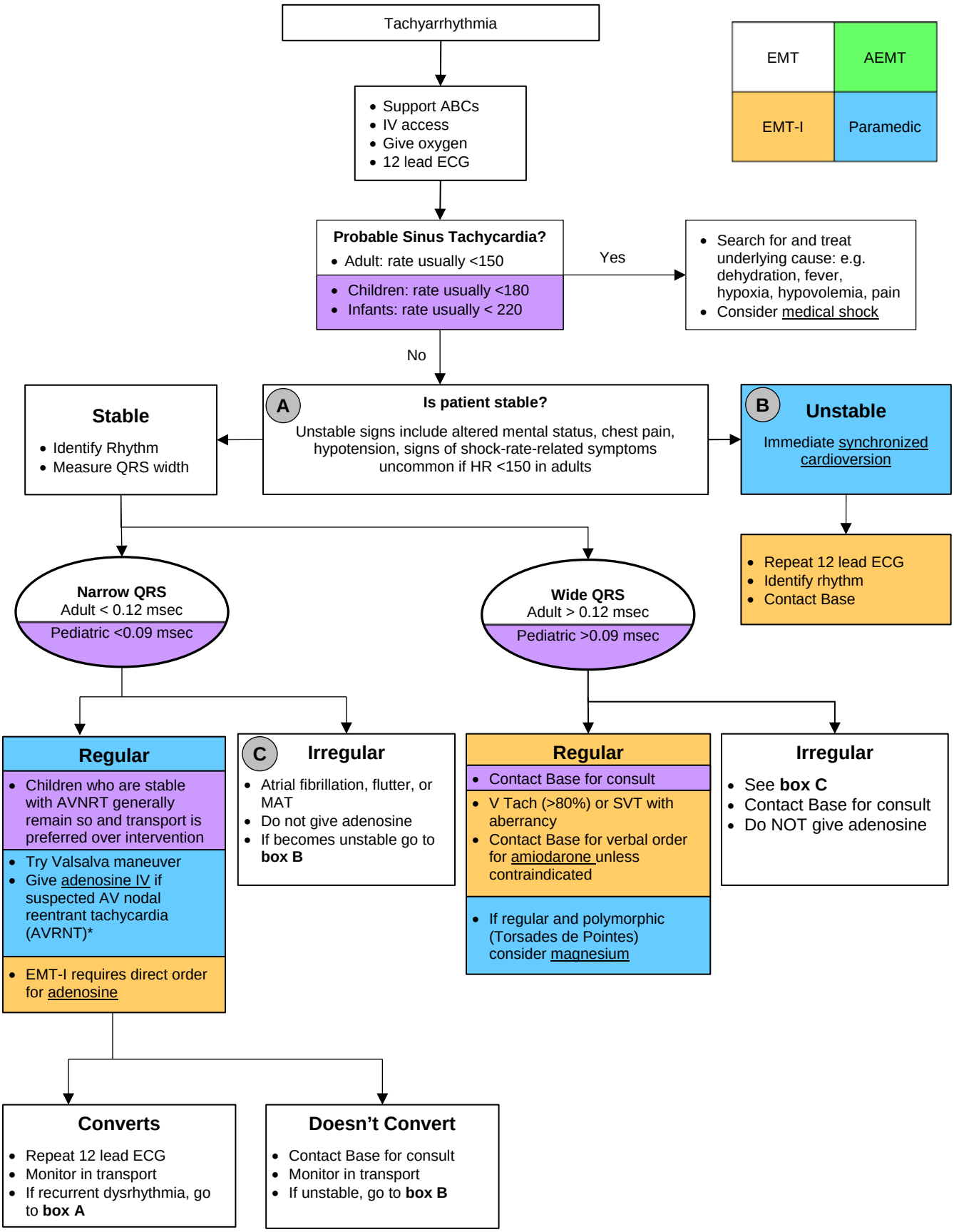
3040 TACHYARRHYTHMIA WITH POOR PERFUSION



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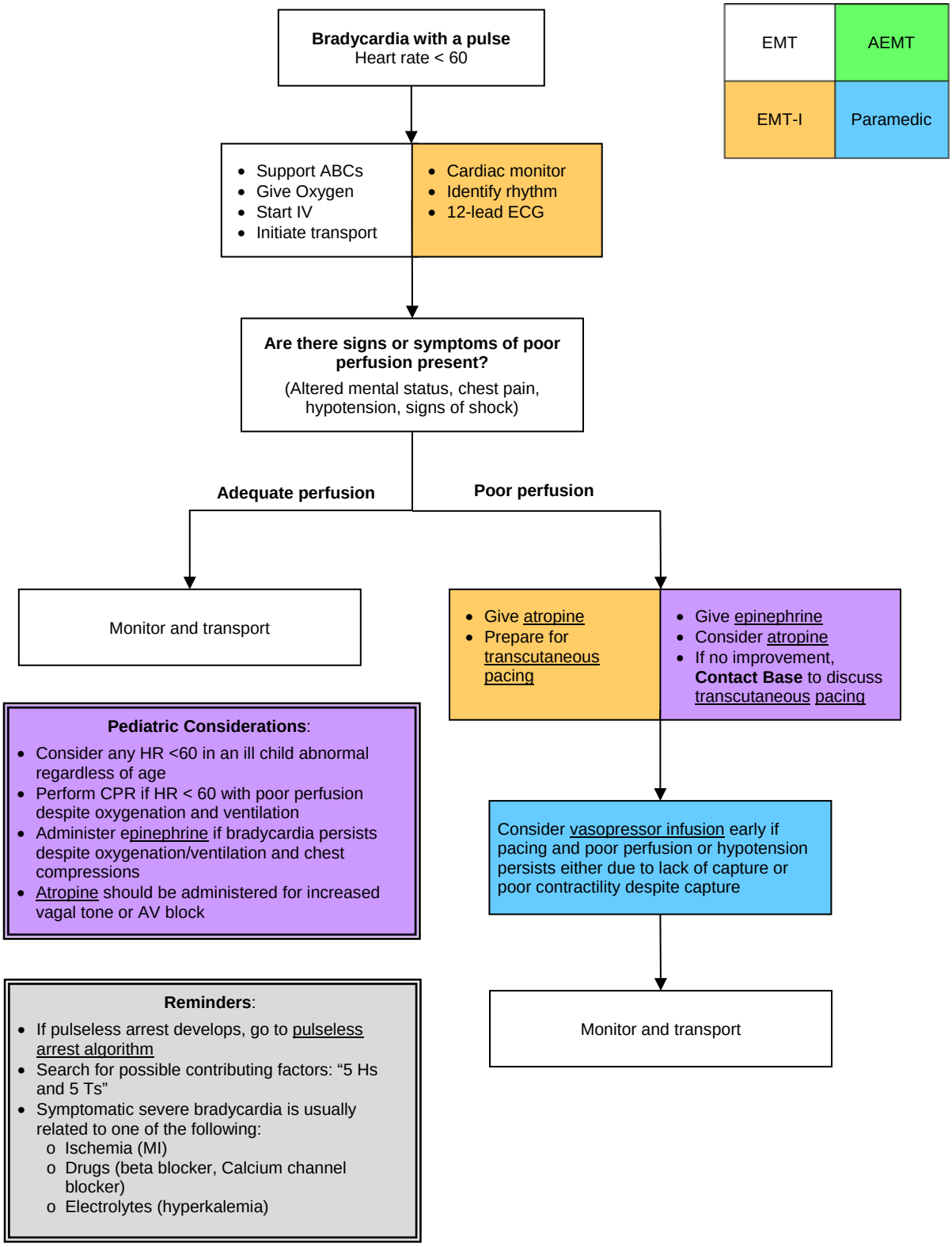
3050 BRADYARRHYTHMIA WITH POOR PERFUSION



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3060 CHEST PAIN

EMT	AEMT
EMT-I	Paramedic

Consider life threatening causes of chest pain in all patients

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

Life threatening causes of chest pain:

- Acute coronary syndrome (ACS)
- Pulmonary embolism
- Thoracic aortic dissection
- Tension pneumothorax

STEMI?

No

Yes

Notify receiving facility immediately if Cardiac Alert criteria met

Give SL nitroglycerin if suspected cardiac chest pain and no contraindication

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

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)

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

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 CARDIAC 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)

Inclusion Criteria:

- Chest discomfort consistent with ACS
- 12-lead ECG showing ST-segment elevation (STE) at least 1 mm in two or more anatomically contiguous leads
- Age 35-85 years old (If STEMI patient outside age criteria, contact receiving hospital for consult)

Exclusion Criteria:

- Wide complex QRS (paced rhythm, BBB, other)
- Symptoms NOT suggestive of ACS (e.g.: asymptomatic patient)
- If unsure if patient is appropriate for Cardiac Alert, discuss with receiving hospital MD

Actions:

- Treat according to chest pain protocol en route (cardiac monitor, oxygen, aspirin, nitroglycerin and opioid as needed for pain control).
- Notify receiving hospital ASAP with ETA and request CARDIAC 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
- Rapid transport
- If patient does not meet inclusion criteria, or has exclusion criteria, yet clinical scenario and ECG suggests true STEMI, request medical consult with receiving hospital emergency physician.

Additional Documentation Requirements:

- Time of first patient contact
- Time of first ECG

3080 HYPERTENSION

AEMT	EMT-I	Paramedic

Intent:

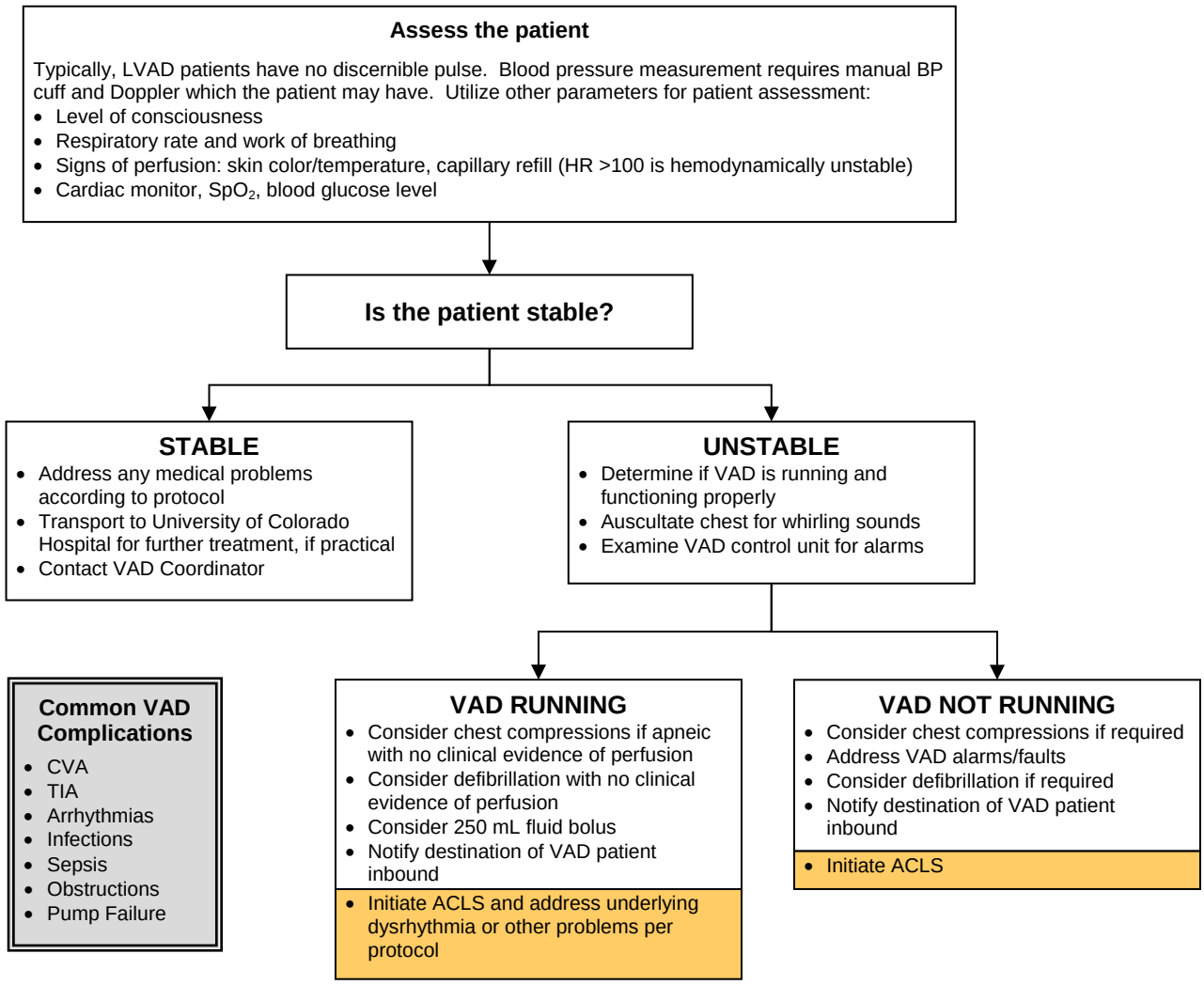
A. Even with extremes of blood pressure, treat the medical emergency **associated** with hypertension ("treat the patient, not the number")
    1. Treat chest pain, pulmonary edema, or stroke according to standard protocols (pain control will usually improve BP significantly)
B. Do not use medication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

3090 VENTRICULAR ASSIST DEVICES

EMT	AEMT
EMT-I	Paramedic

Ventricular Assist Device (VAD)

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



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**. 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/ems

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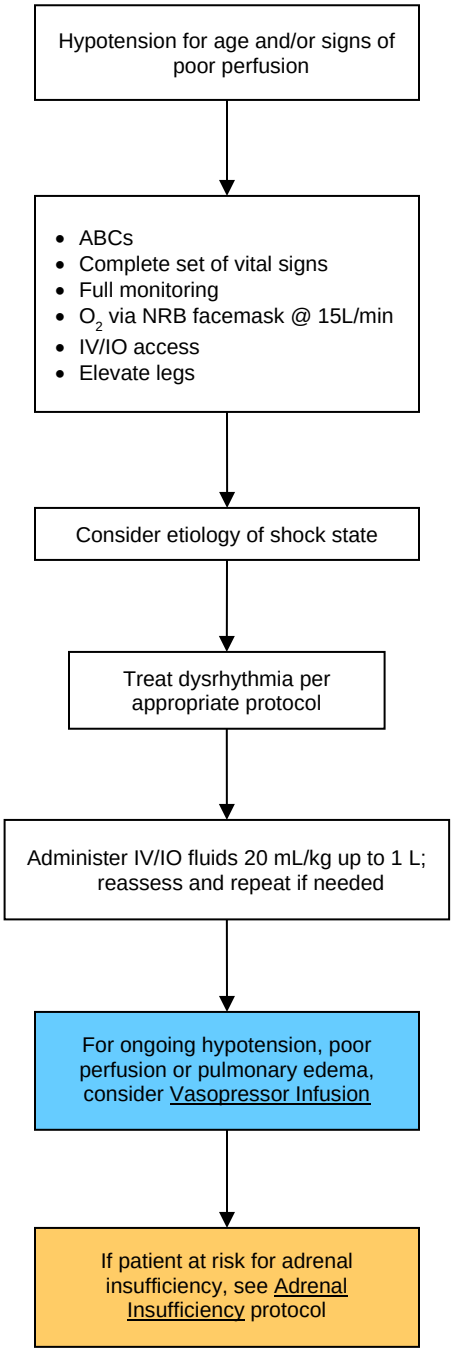
4000 MEDICAL SHOCK PROTOCOL



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

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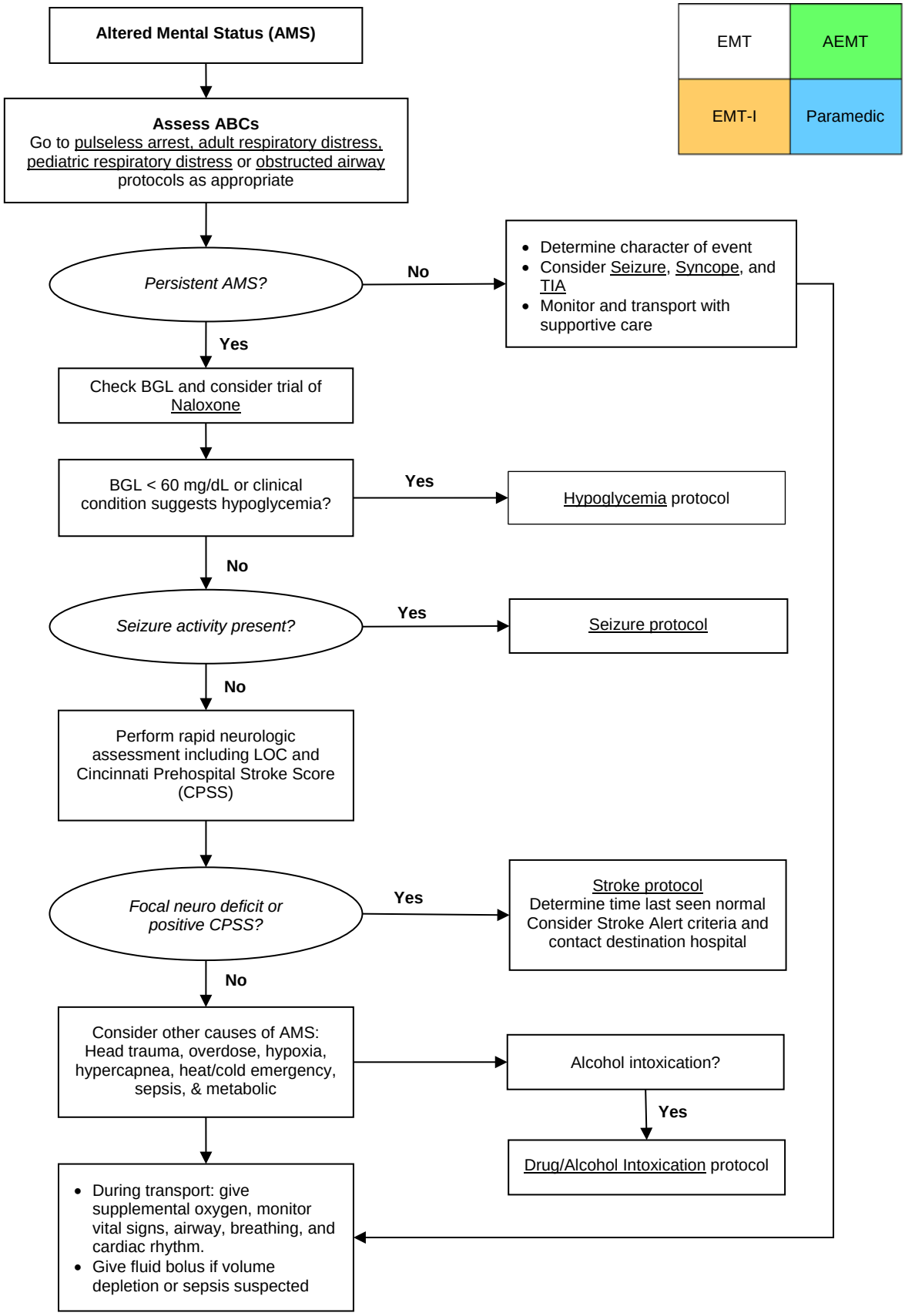
4010 UNIVERSAL ALTERED MENTAL STATUS



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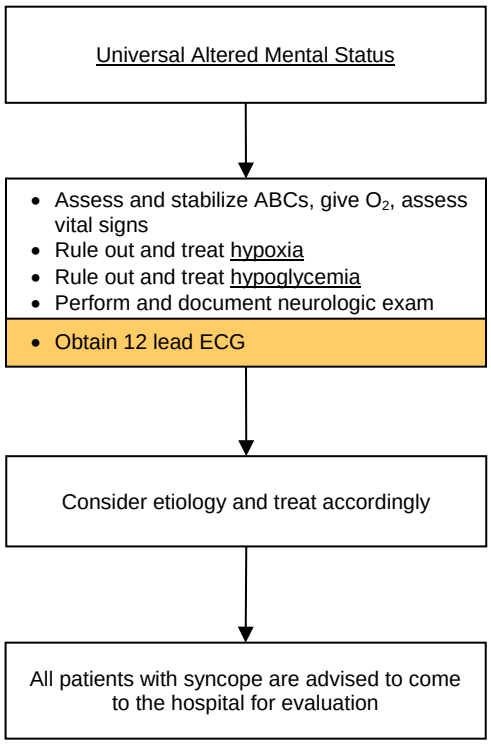
4020 SYNCOPE



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

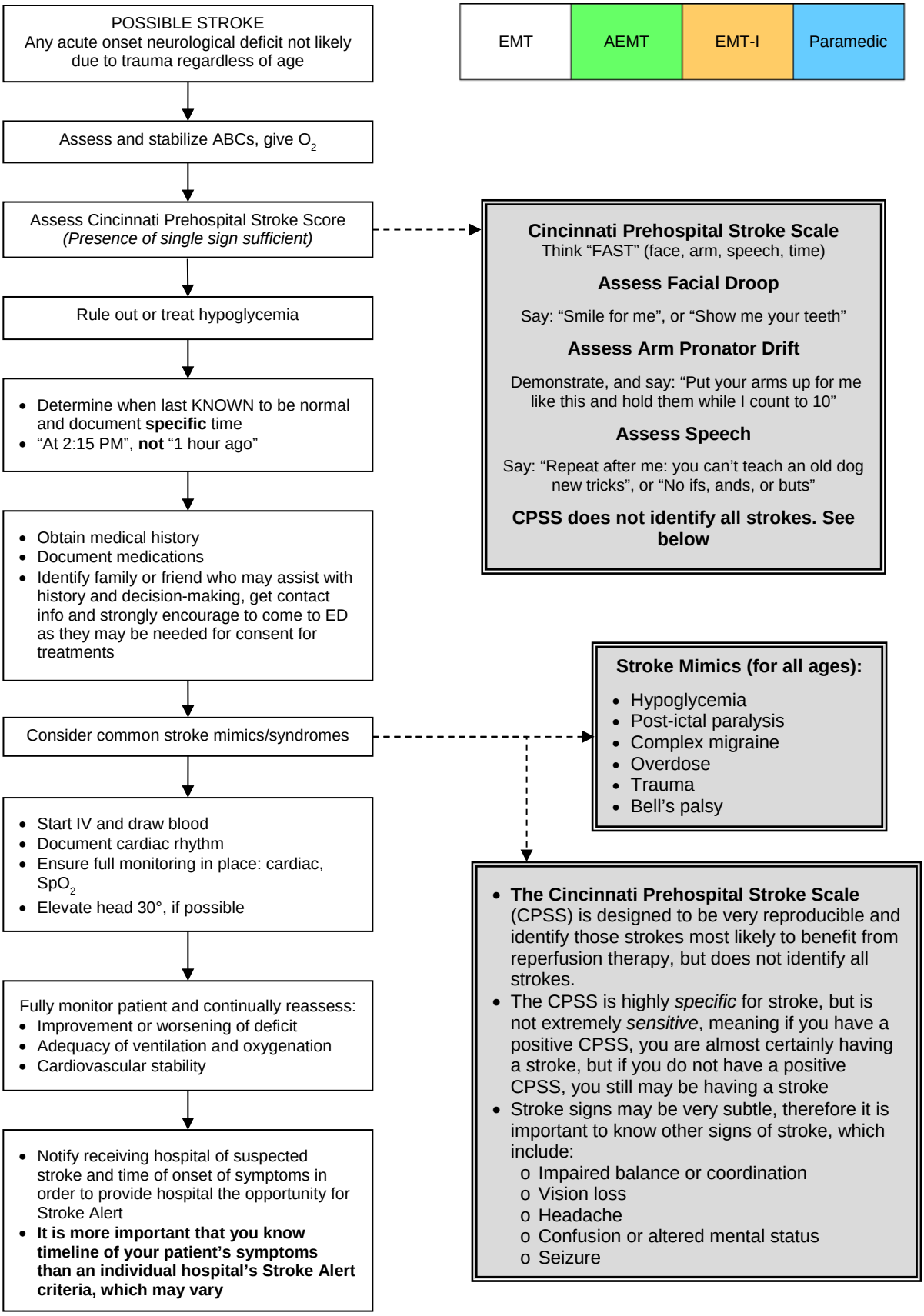
General Information:

- 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

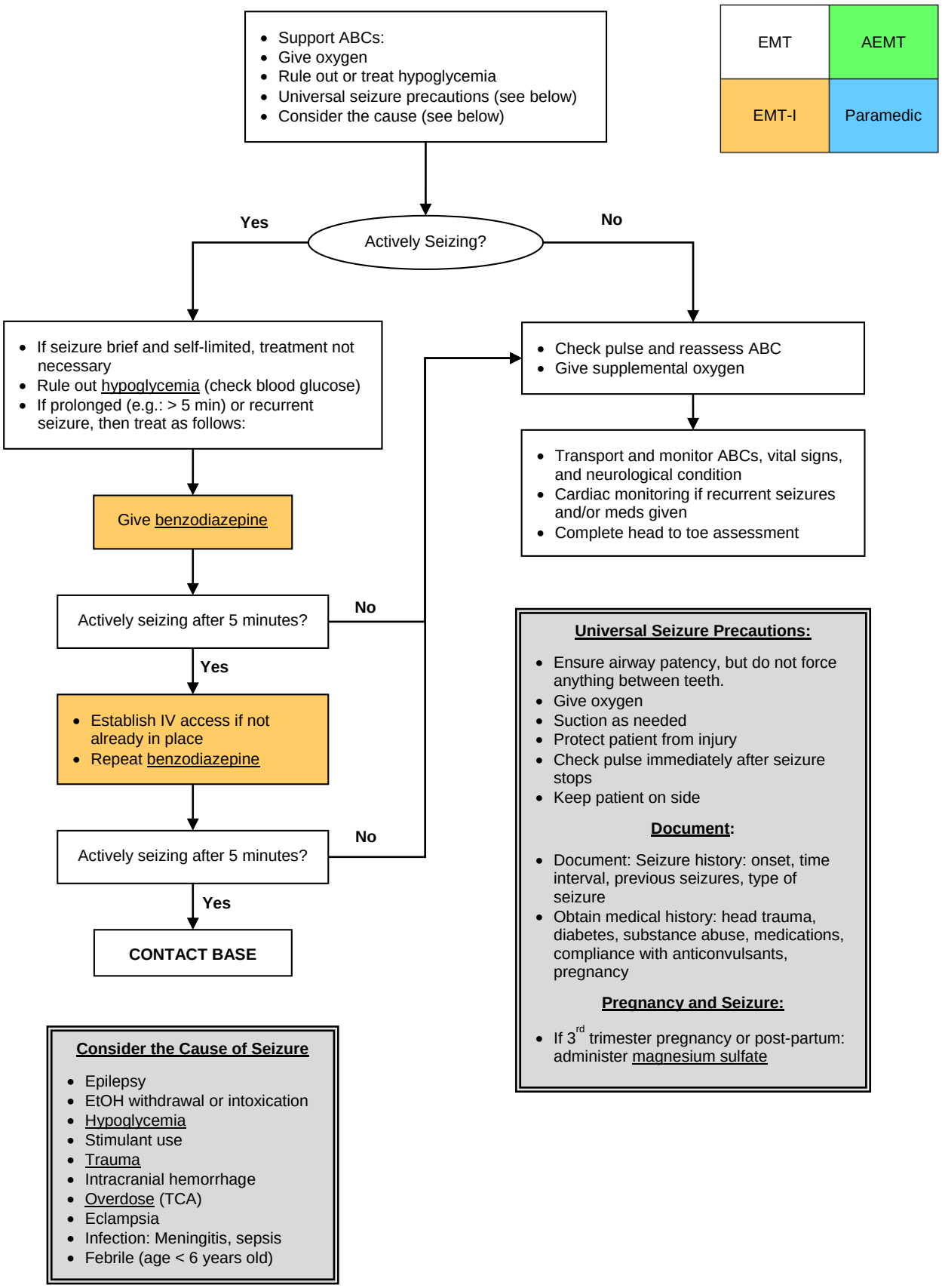
Pediatric Considerations:

- 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, give 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
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:
o Impaired balance or coordination
o Vision loss
o Headache
o Confusion or altered mental status
o 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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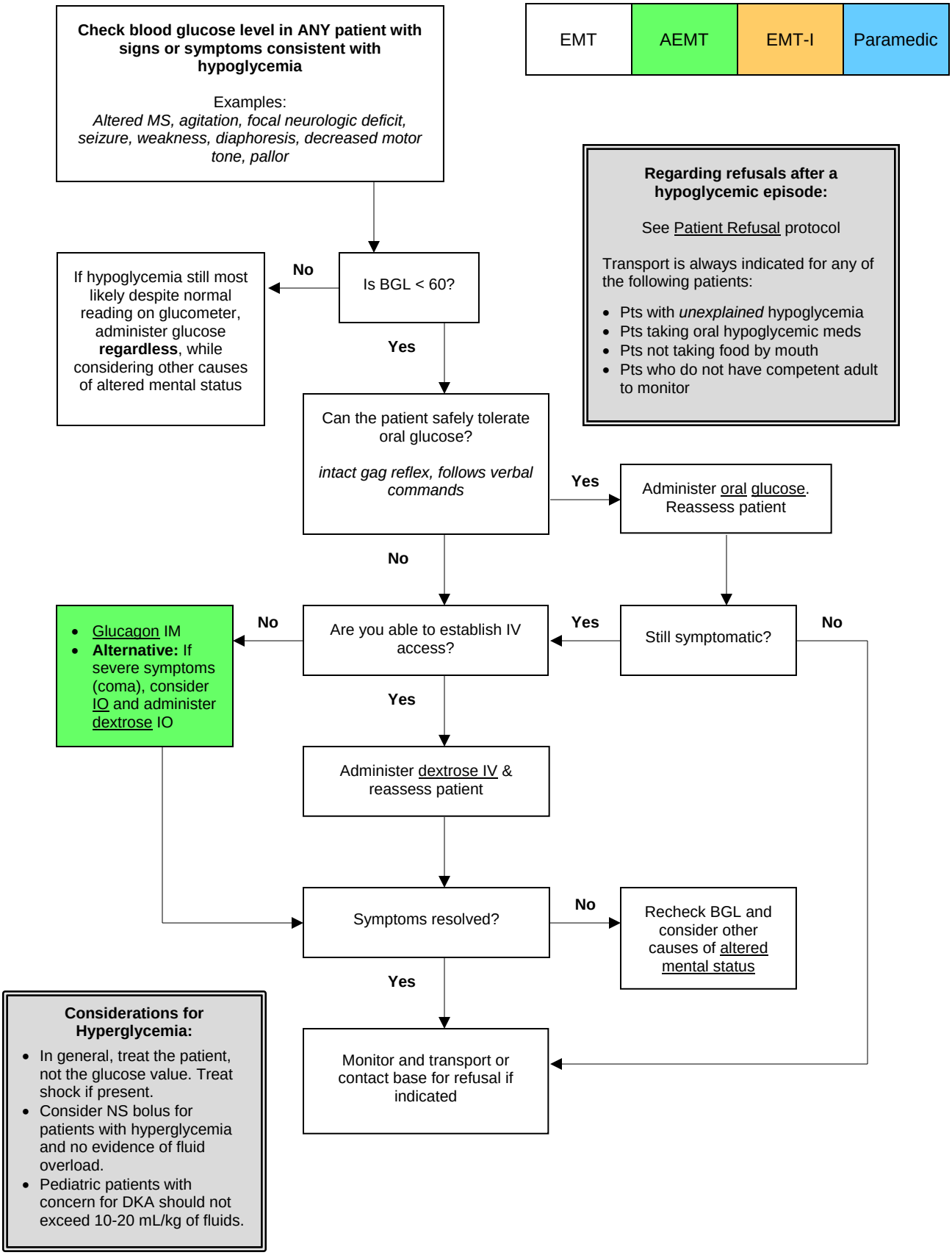
4050 HYPOGLYCEMIA



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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?

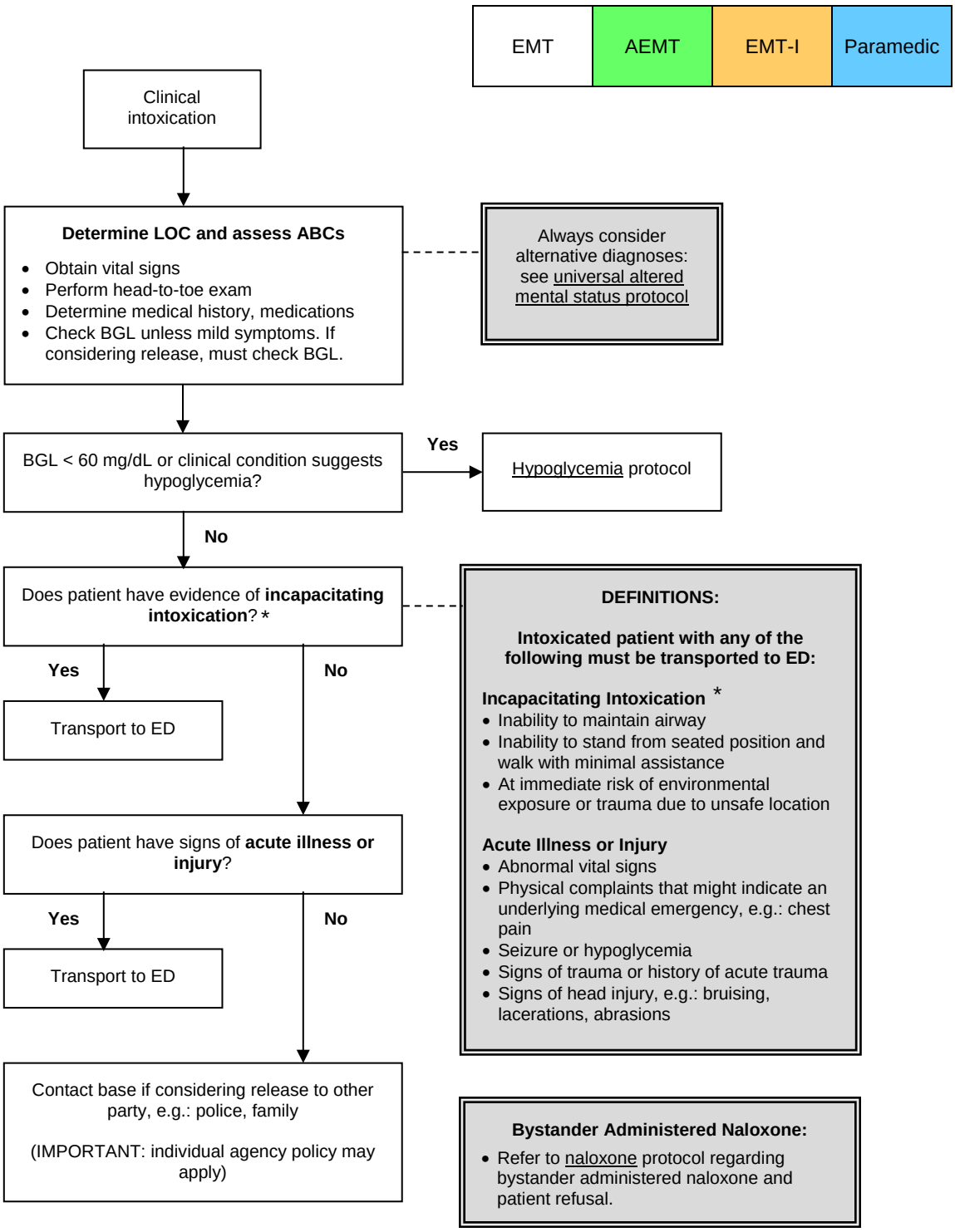
Past Medical History:

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

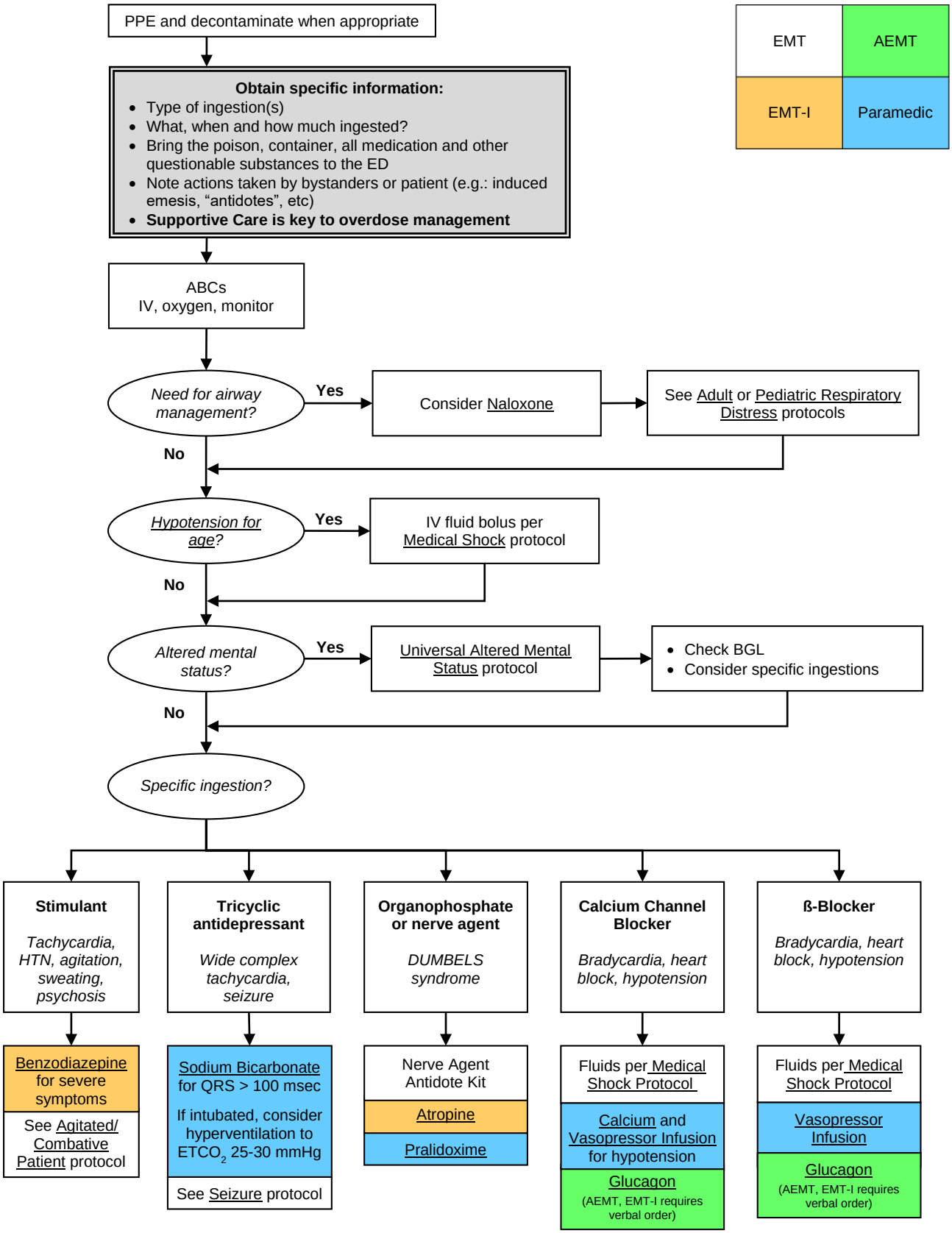
Examination/Assessment

- 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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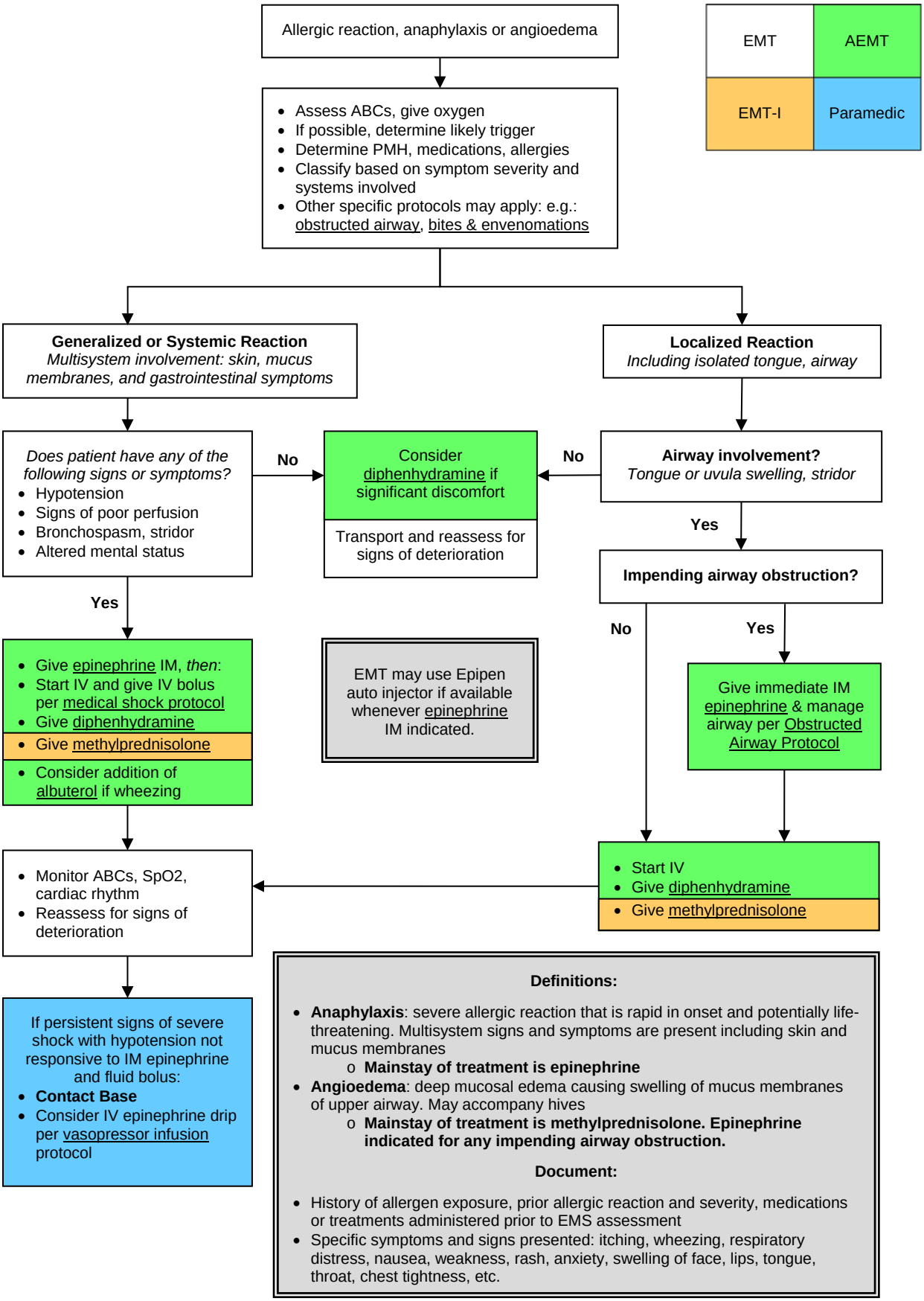
4090 ALLERGY AND ANAPHYLAXIS



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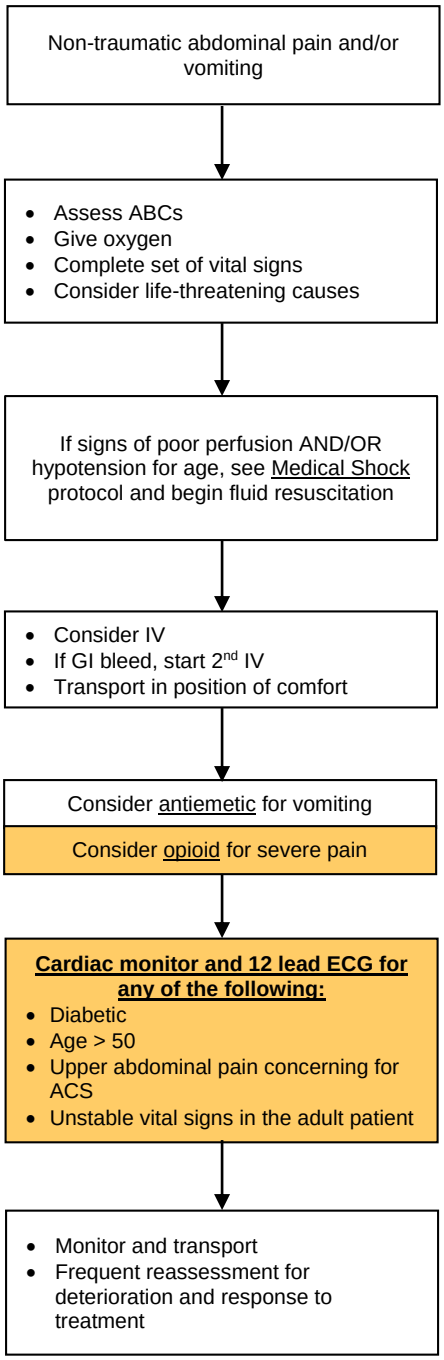
4100 NON-TRAUMATIC ABDOMINAL PAIN/VOMITING



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

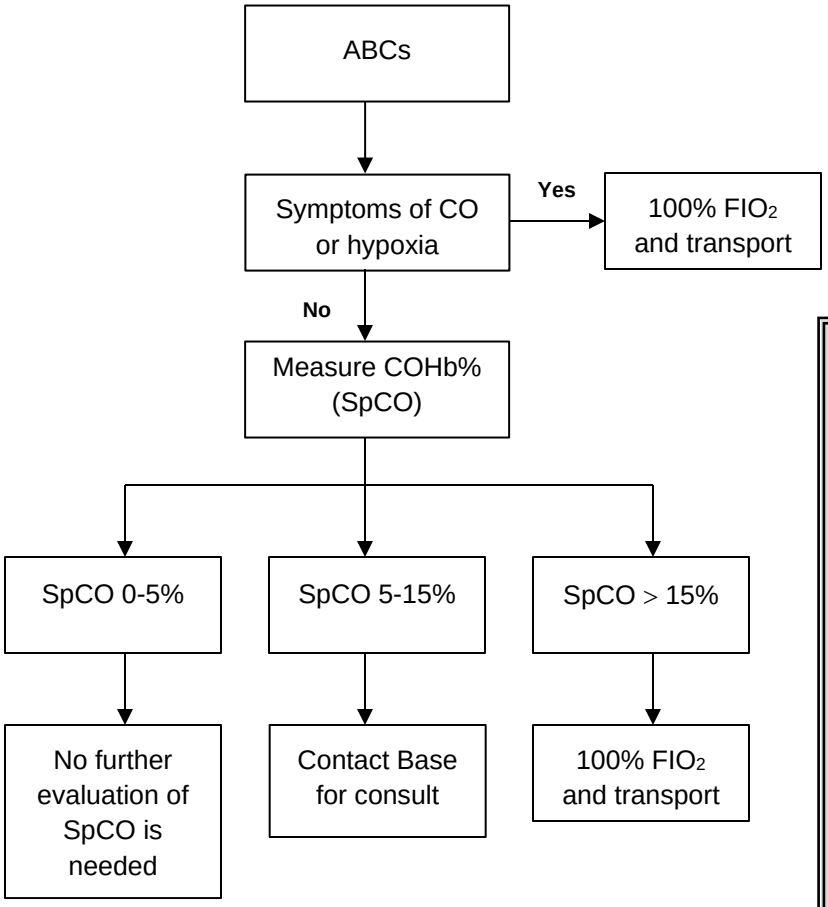
Pediatric Patients:

- 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

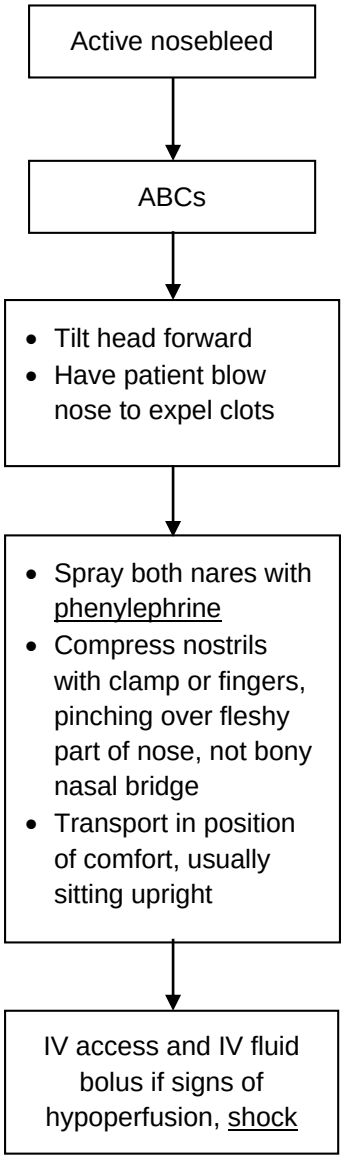
- Continue to monitor for development of hypoglycemia
- **Contact base** for consult if patient not responding to treatment

- Monitor 12 lead ECG for signs of hyperkalemia

EMT	AEMT
EMT	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

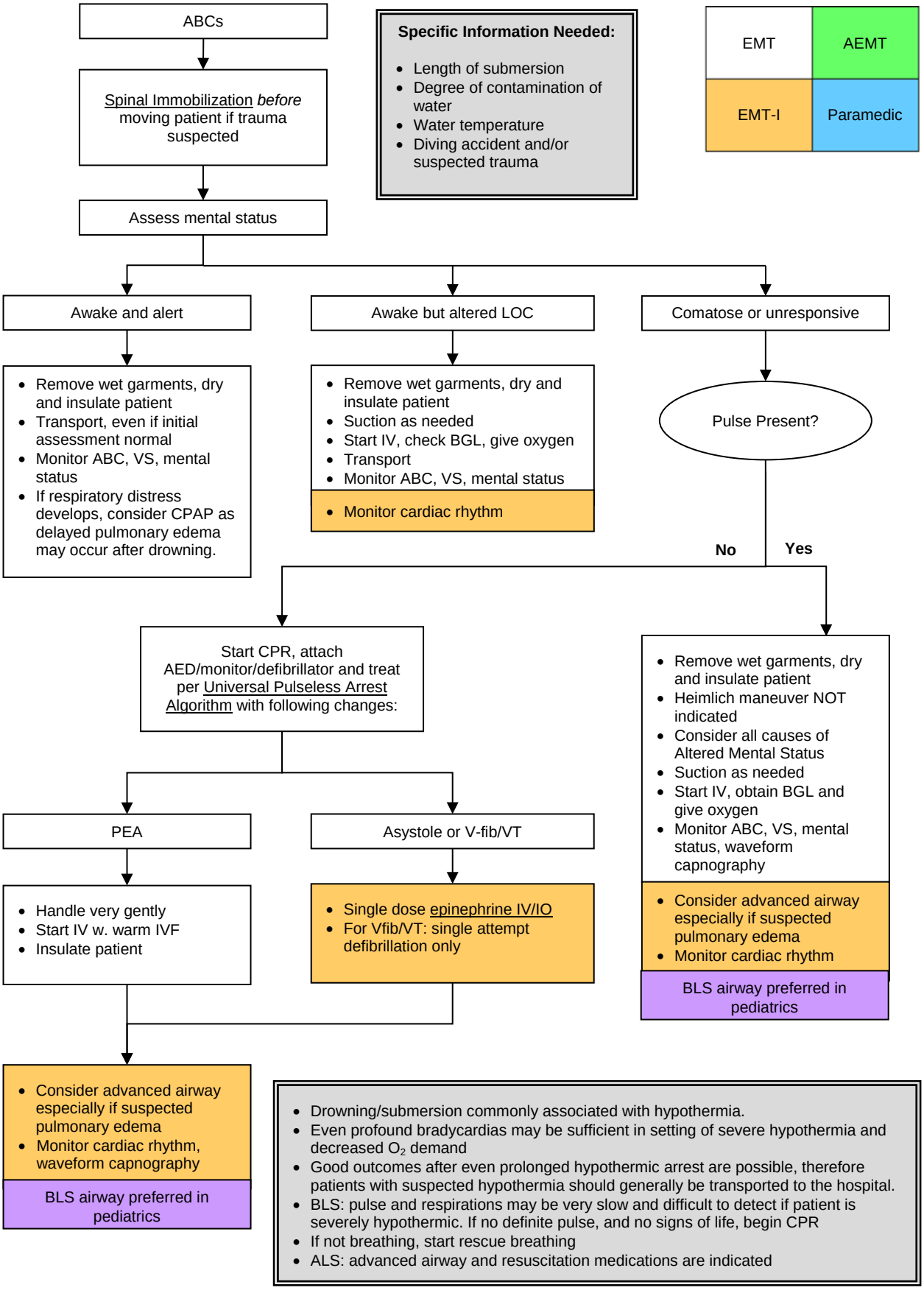


EMT	AEMT
EMT-I	Paramedic

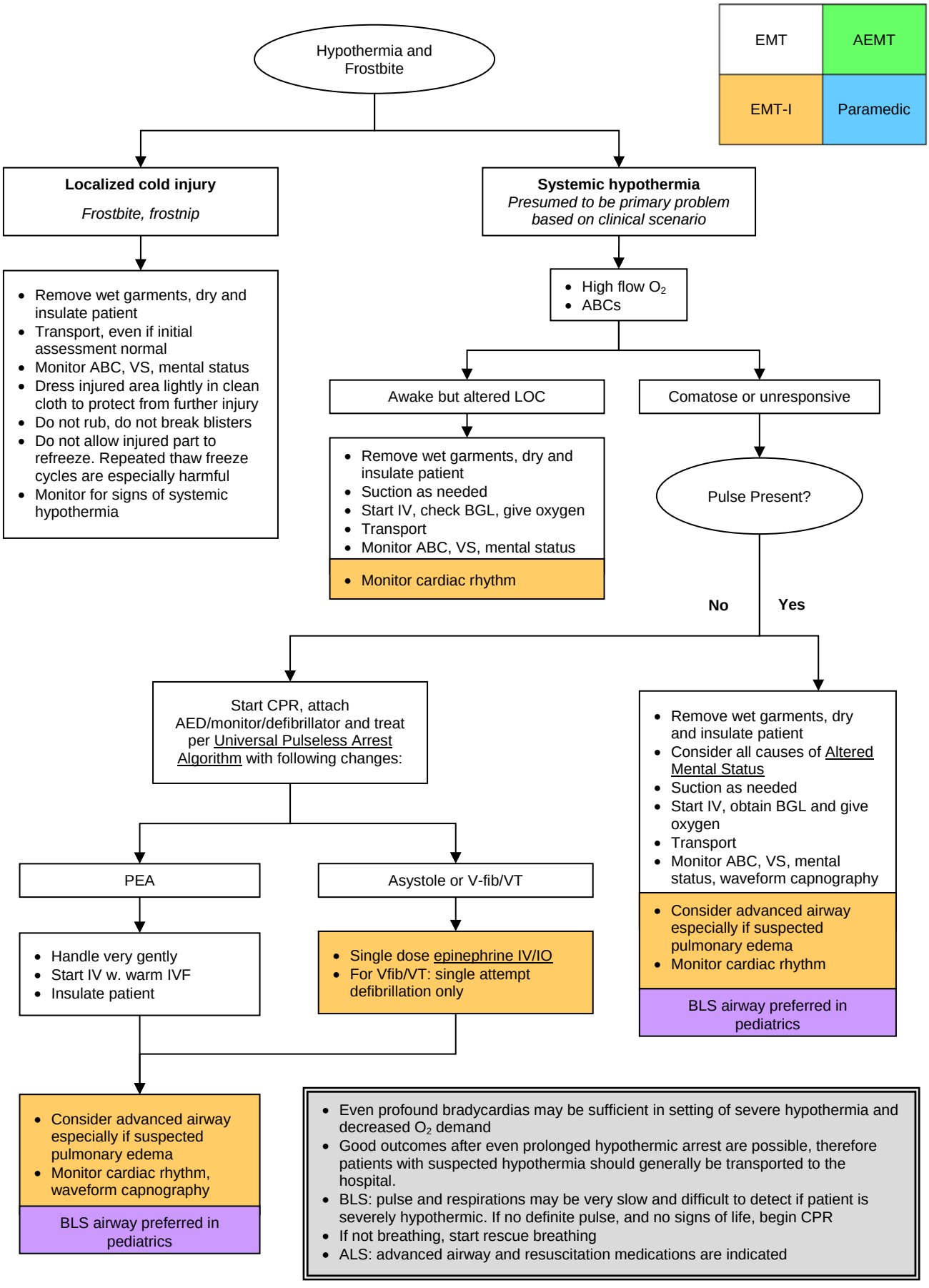
General Guidelines:

- 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.

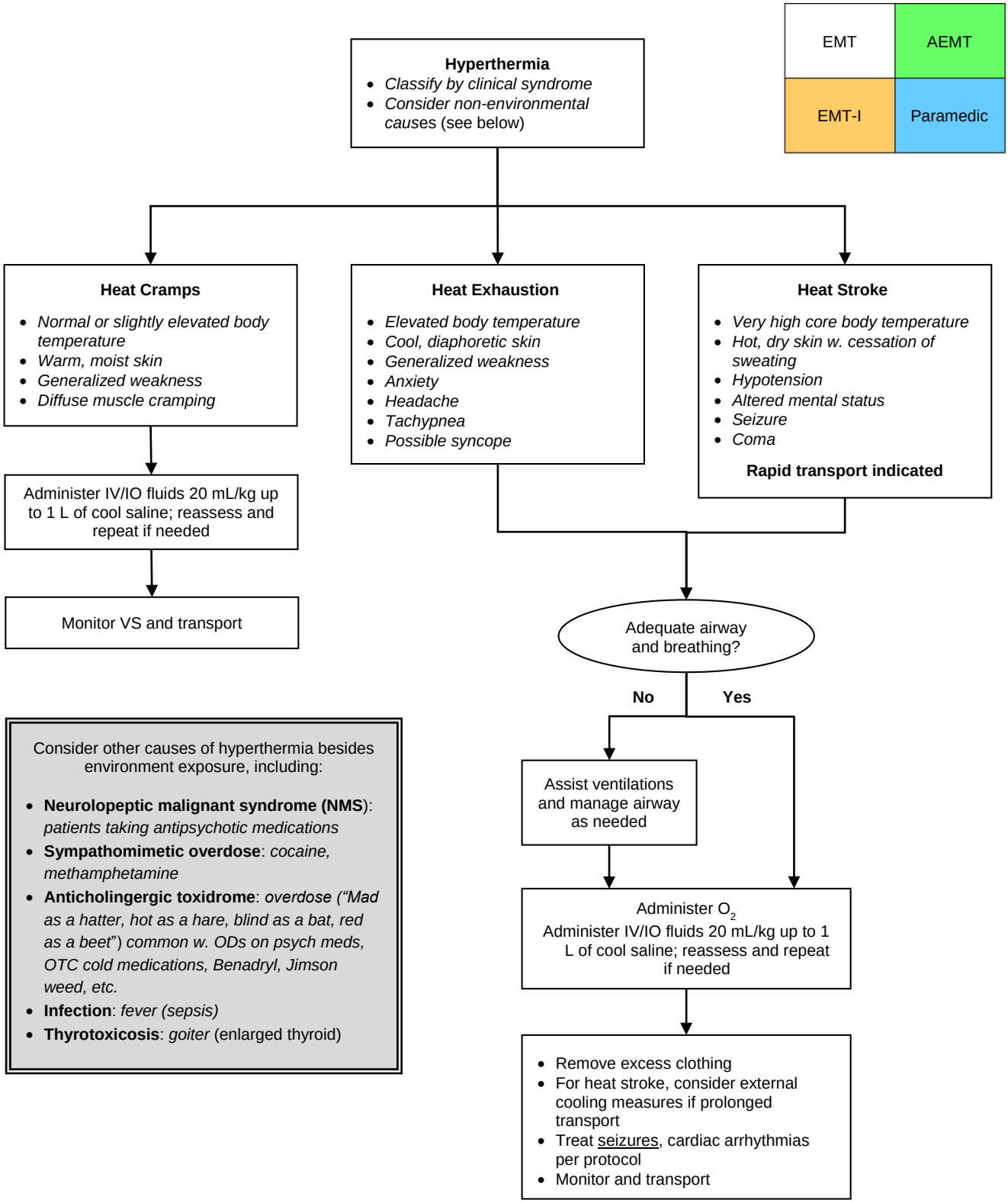
5000 DROWNING



5010 HYPOTHERMIA



5020 HYPERTHERMIA



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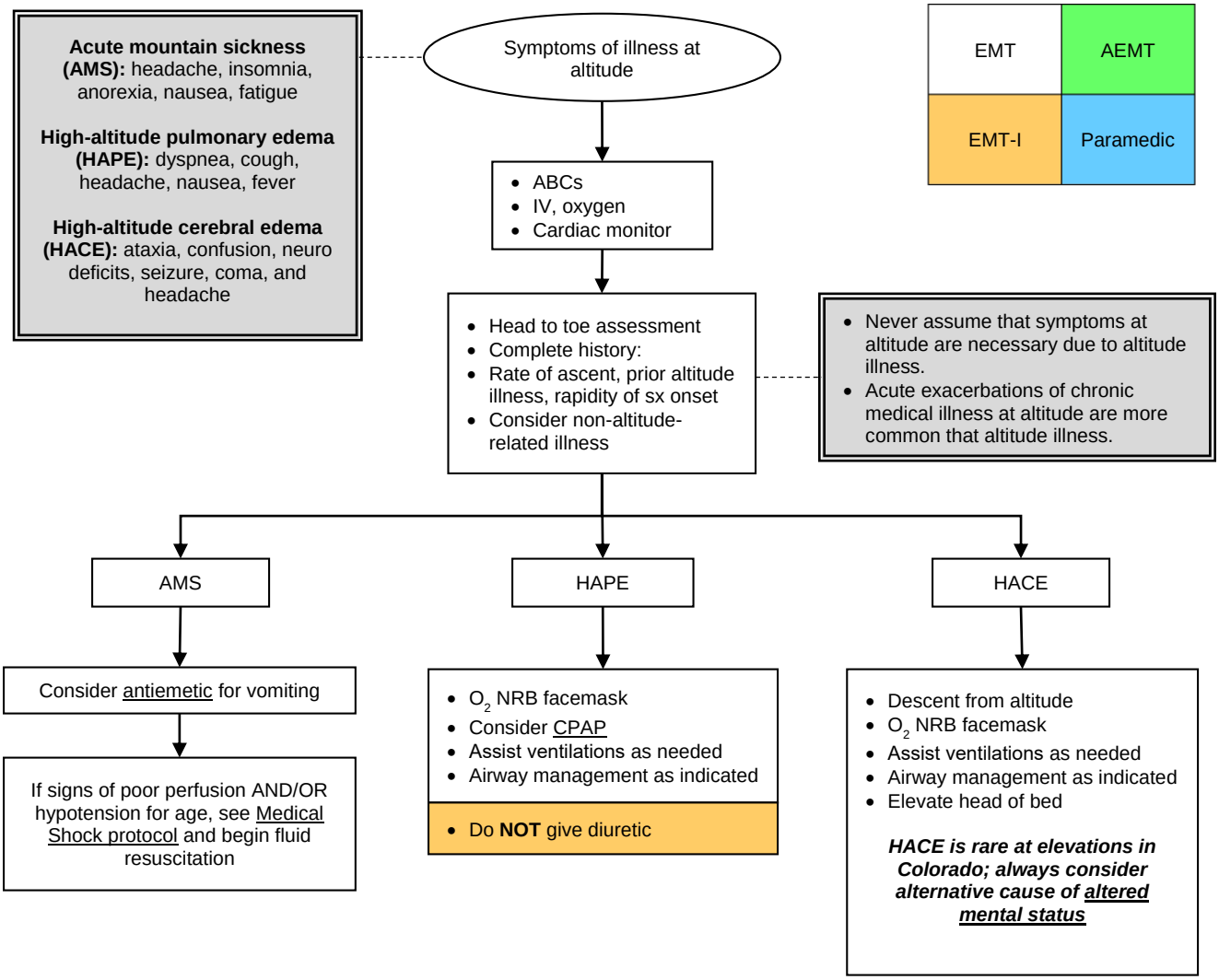
5030 HIGH ALTITUDE ILLNESS



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

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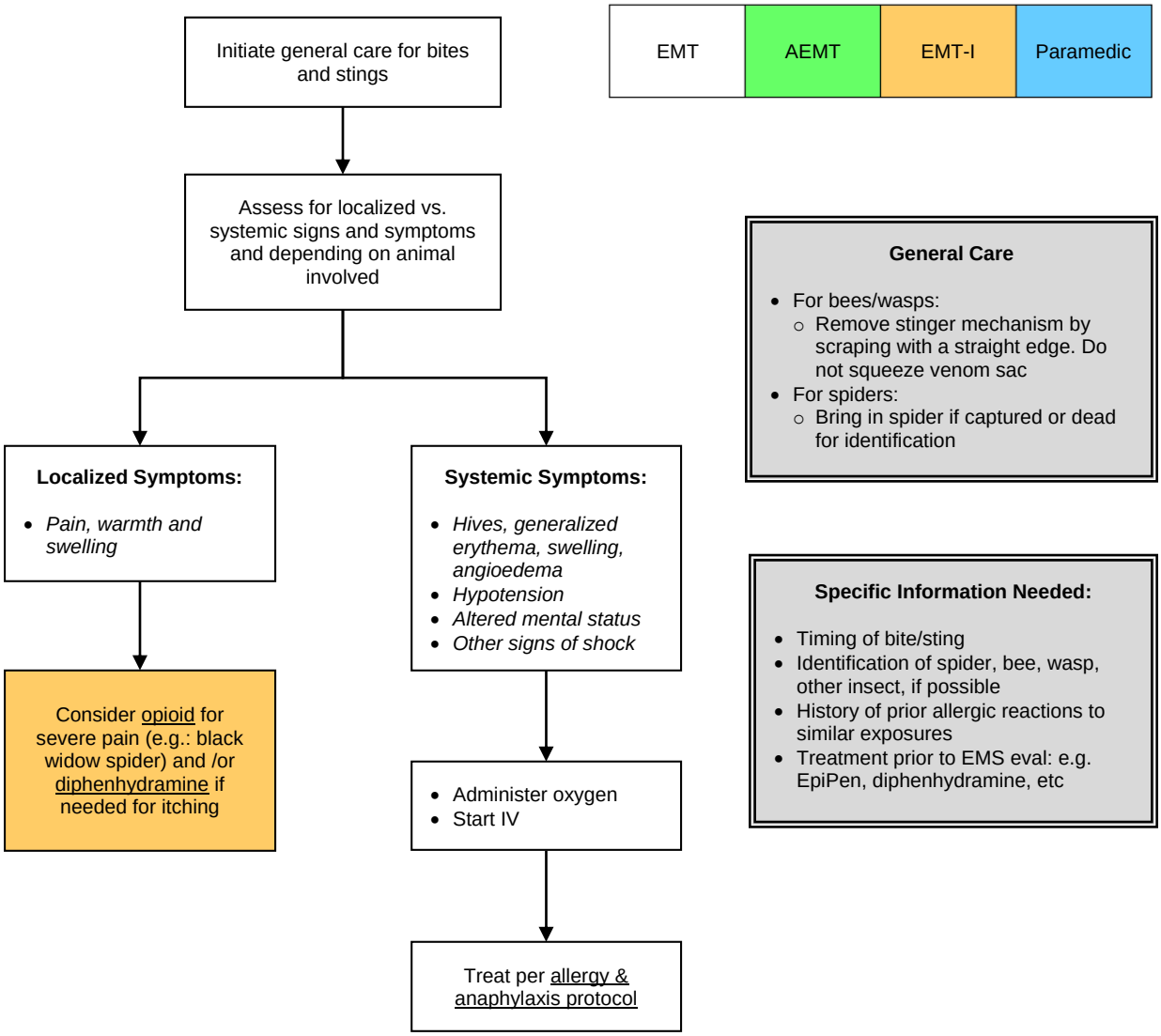
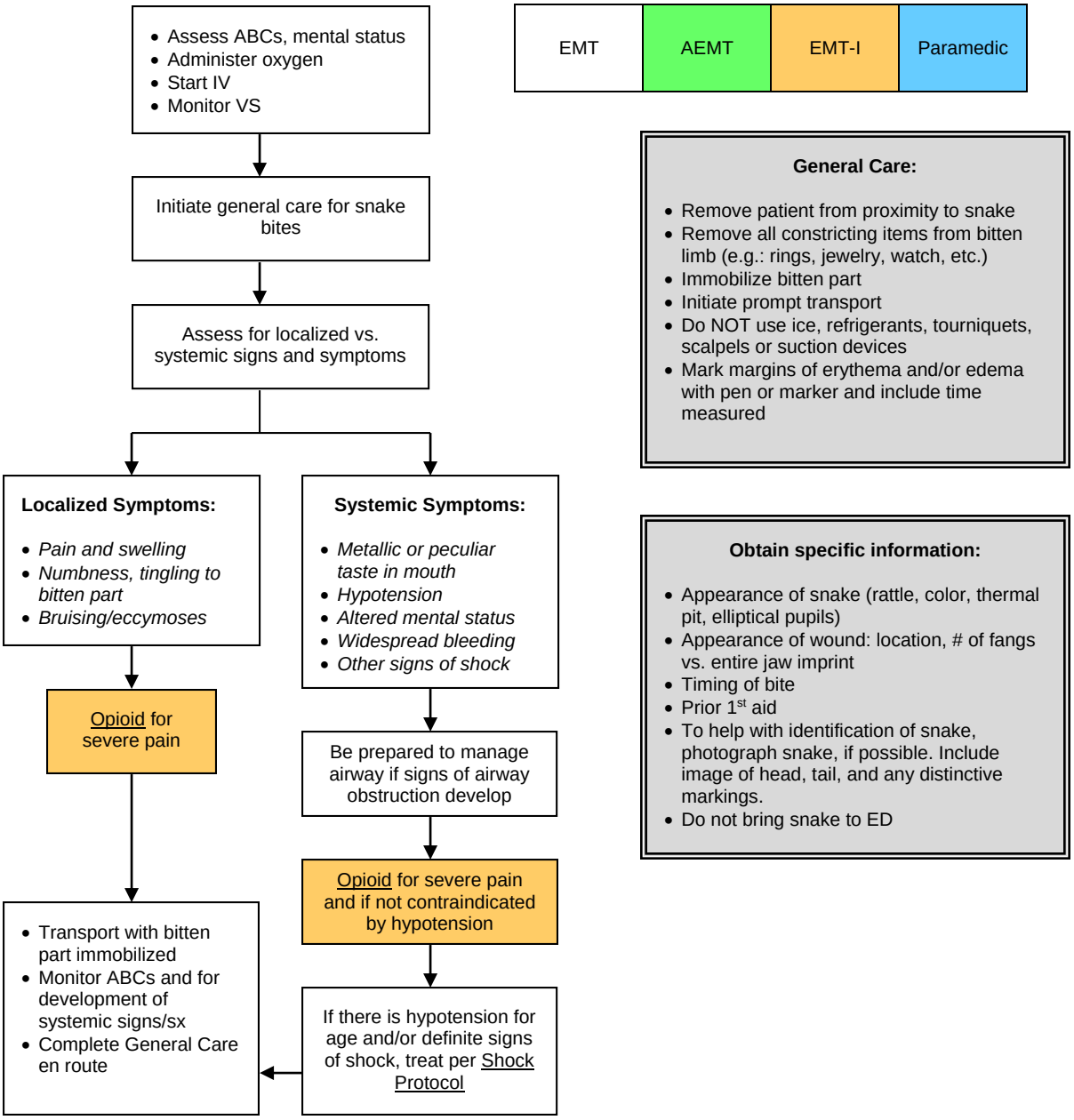
5040 INSECT/ARACHNID STINGS AND BITES PROTOCOL



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 envenomations.
- 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.

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6000 PSYCHIATRIC/BEHAVIORAL PATIENT PROTOCOL

EMT	AEMT
EMT-I	Paramedic

Scene Safety

A. Scene safety and provider safety are a priority. 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; 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
    1. E.g.: Well groomed, disheveled, debilitated, bizarrely dressed
B. Evaluate vital signs.
    1. Is a particular toxidrome suggested, e.g.: symphathomimetic?
C. Note medic alert tags, breath odors suggesting intoxication.
D. Determine ability to relate to reality.
    1. Does the patient know who s/he is, where s/he is, who you are and why you are there?
    2. Does the patient appear to be hallucinating or responding to internal stimuli?
E. Note behavior. Consider known predictors of violence:
    1. Is the patient male, intoxicated, paranoid or displaying aggressive or threatening behavior or language?

Treatment

A. If patient agitated or combative, see Agitated/Combative Patient Protocol
B. Attempt to establish rapport
C. Assess ABCs
D. Transport to closest appropriate Emergency Department
E. Be alert for possible elopement
F. Consider organic causes of abnormal behavior (trauma, overdose, intoxication, hypoglycemia)
G. If patient restraint considered necessary for patient or EMS safety, refer to Restraint Protocol.
H. Check blood sugar
I. If altered mental status or unstable vital signs:
    1. Administer oxygen.
    2. Establish venous access.
    3. Refer to Universal Altered Mental Status Protocol.

Transporting Patients Who Have a Psychiatric Complaint

A. 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.
B. 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
C. Reasonable concern for suicidal or homicidal ideation, or grave disability from psychiatric decompensation, is sufficient to assume that the patient may lack medical decision-making capacity to refuse ambulance transport. 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 implied consent if patient does not comply.
D. A patient being transported for psychiatric evaluation may be transported to any appropriate receiving emergency department.
E. Accusations of kidnapping or assault of the patient are only theoretical and rarely occur. The Denver Metropolitan EMS Medical Directors feel strongly that the risk of abandonment of a potentially suicidal or otherwise gravely impaired patient is far greater. 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 consult a BASE PHYSICIAN if there are concerns.

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6000 PSYCHIATRIC/BEHAVIORAL PATIENT PROTOCOL

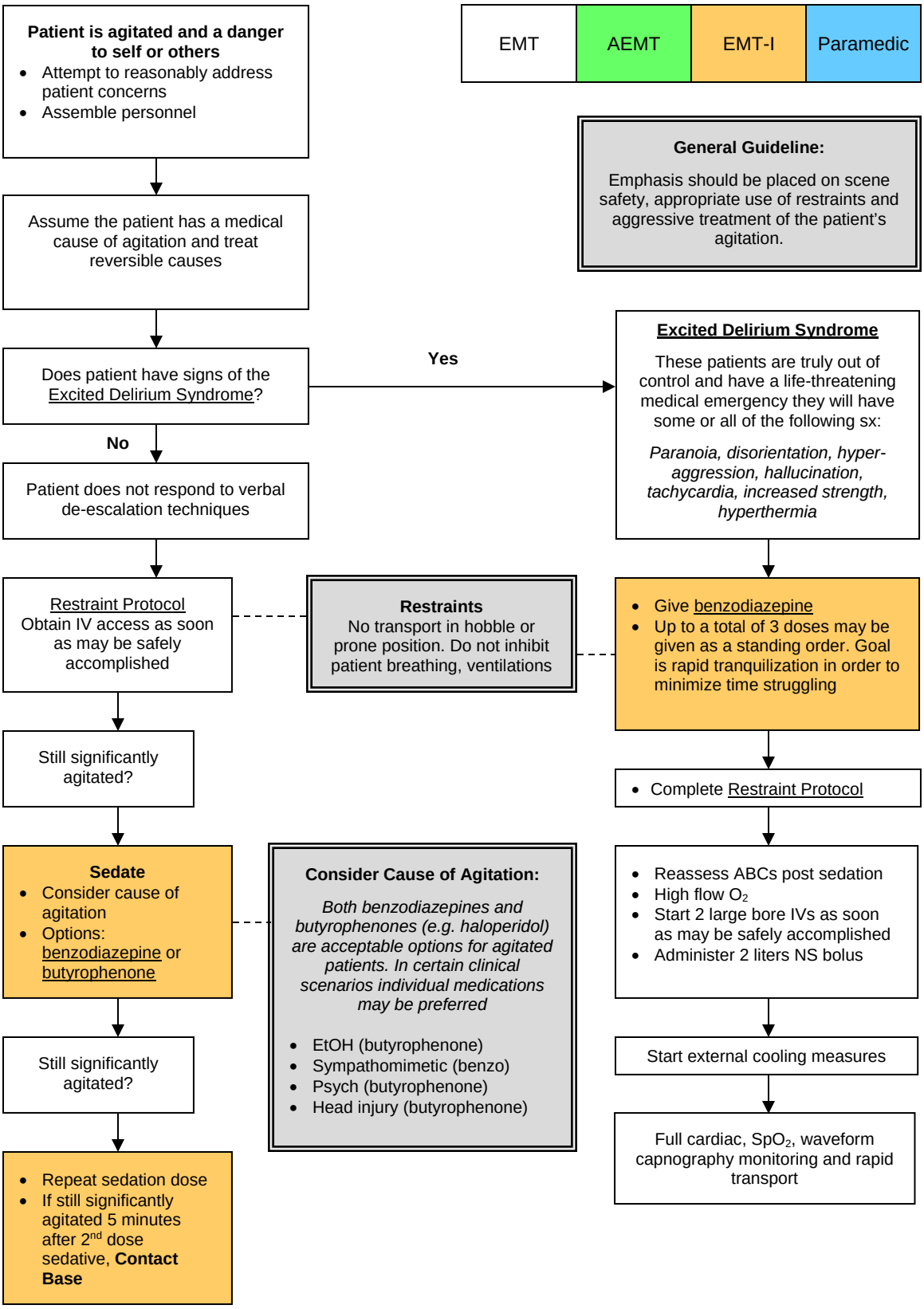
Specific Precautions

A. Patients presenting with psychiatric decompensation often have an organic etiology. 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 M-1) is required to accompany the patient, a legible copy of the M-1 is also sufficient if the original cannot be found.
C. The M-1 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 (M-2) 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 implied consent.

6010 AGITATED/COMBATIVE PATIENT PROTOCOL



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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. 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.
3. EMS personnel are not responsible for the law enforcement hold on these patients.
4. Handcuffed patients will not be placed in the prone position.
5. Handcuffs may be used with spinal immobilization. Medical priorities should take priority in the positioning of the handcuffs.

Approved by Denver Metro EMS Medical Directors July 1, 2017. Next review January 2018

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, then nose of infant as soon as head is delivered
- 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
- Keep newborn at level of mother's vagina until cord stops pulsating and is double clamped

Critical Thinking:

- 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 30-40 breaths/min
- If apneic, cyanotic or HR < 100, begin neonatal resuscitation
- Dry baby and wrap in warm blanket
- After umbilical cord stops pulsating, double clamp 6" from infant abdominal wall and cut between clamps with sterile scalpel. If no sterile cutting instrument available, lay infant on mother's abdomen and do not cut clamped cord
- Document 1 and 5 minute APGAR scores

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

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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 Trendelenberg 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

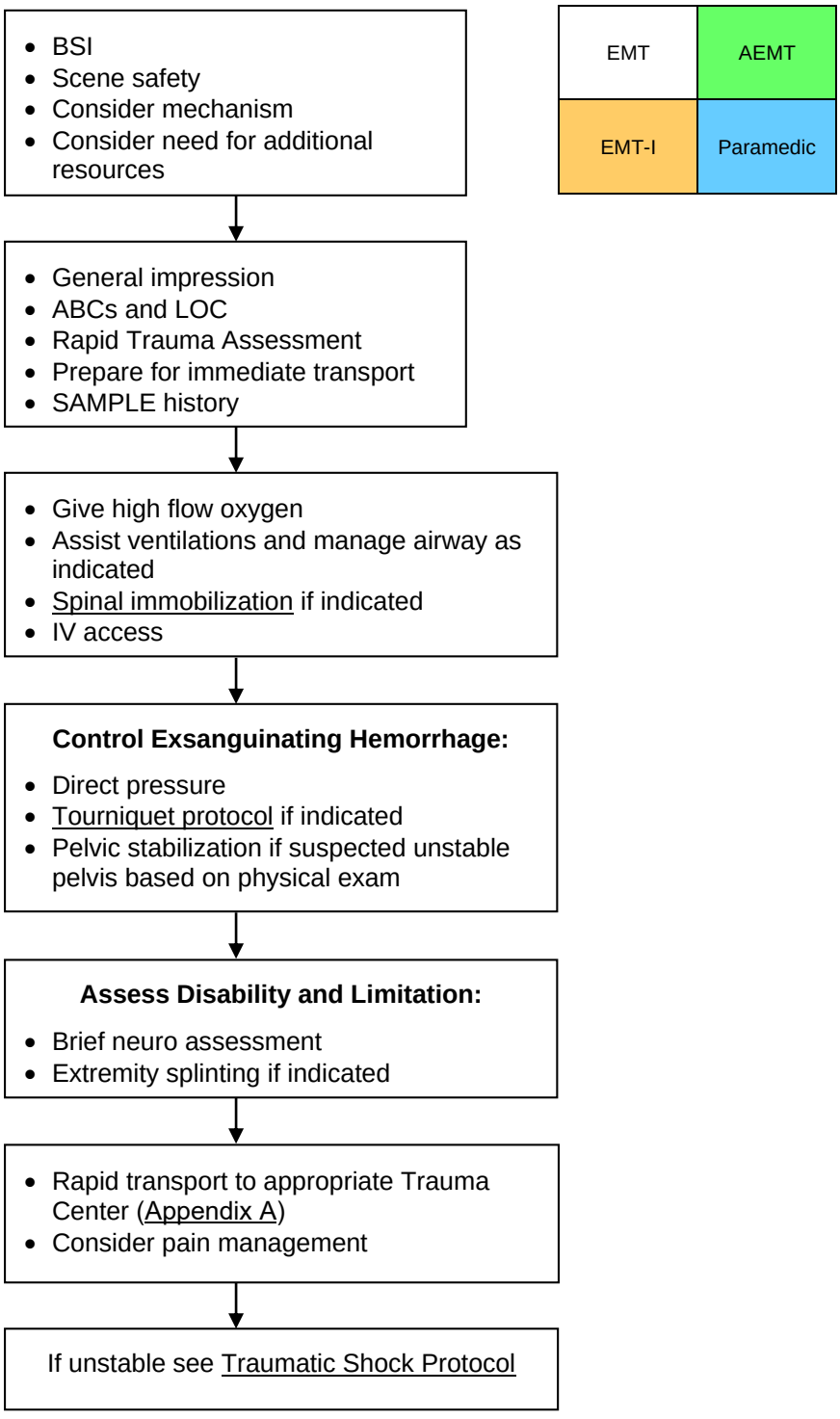
Eclampsia/Toxemia

- 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

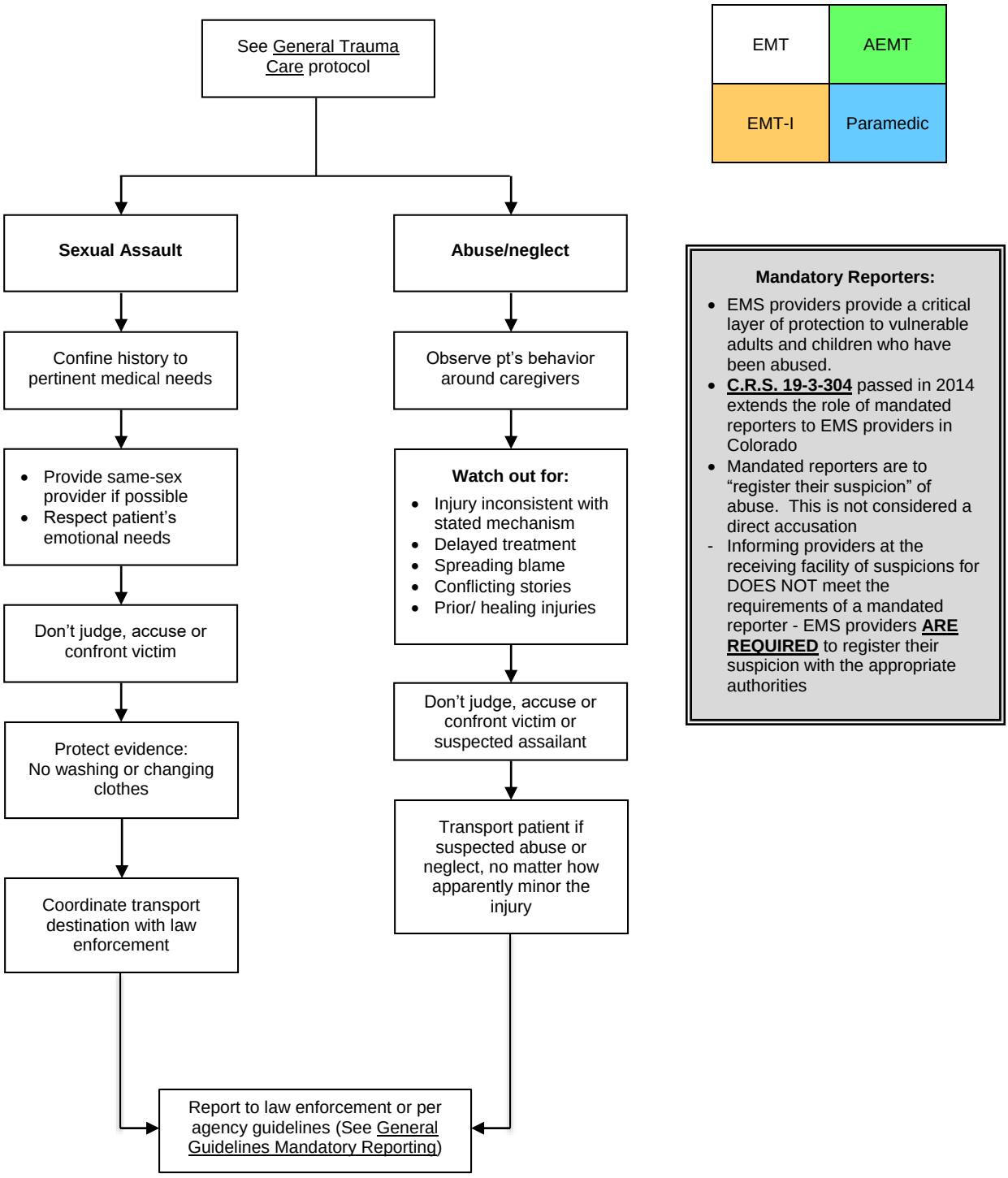
- Support baby's head
- Suction oral and nasal passages
- DO NOT pull on head
- May facilitate delivery by placing mother with buttocks just off the end of bed, flex her thighs upward and gentle open hand pressure above the pubic bone
- IF infant delivered see childbirth protocol – Postpartum care of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

8000 GENERAL TRAUMA CARE



8010 SPECIAL TRAUMA SCENARIOS PROTOCOL

Coordinate transport destination with law enforcement



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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

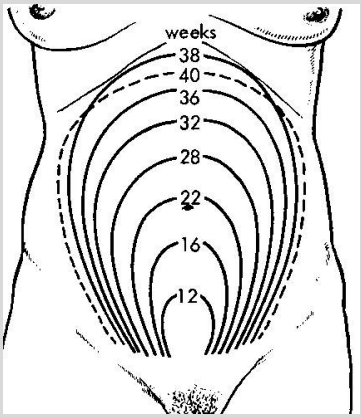
- Avoid supine position:
  - Place in left lateral recumbent position if possible
  - If immobilized tilt backboard 15 to 30 degrees to the left side

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.

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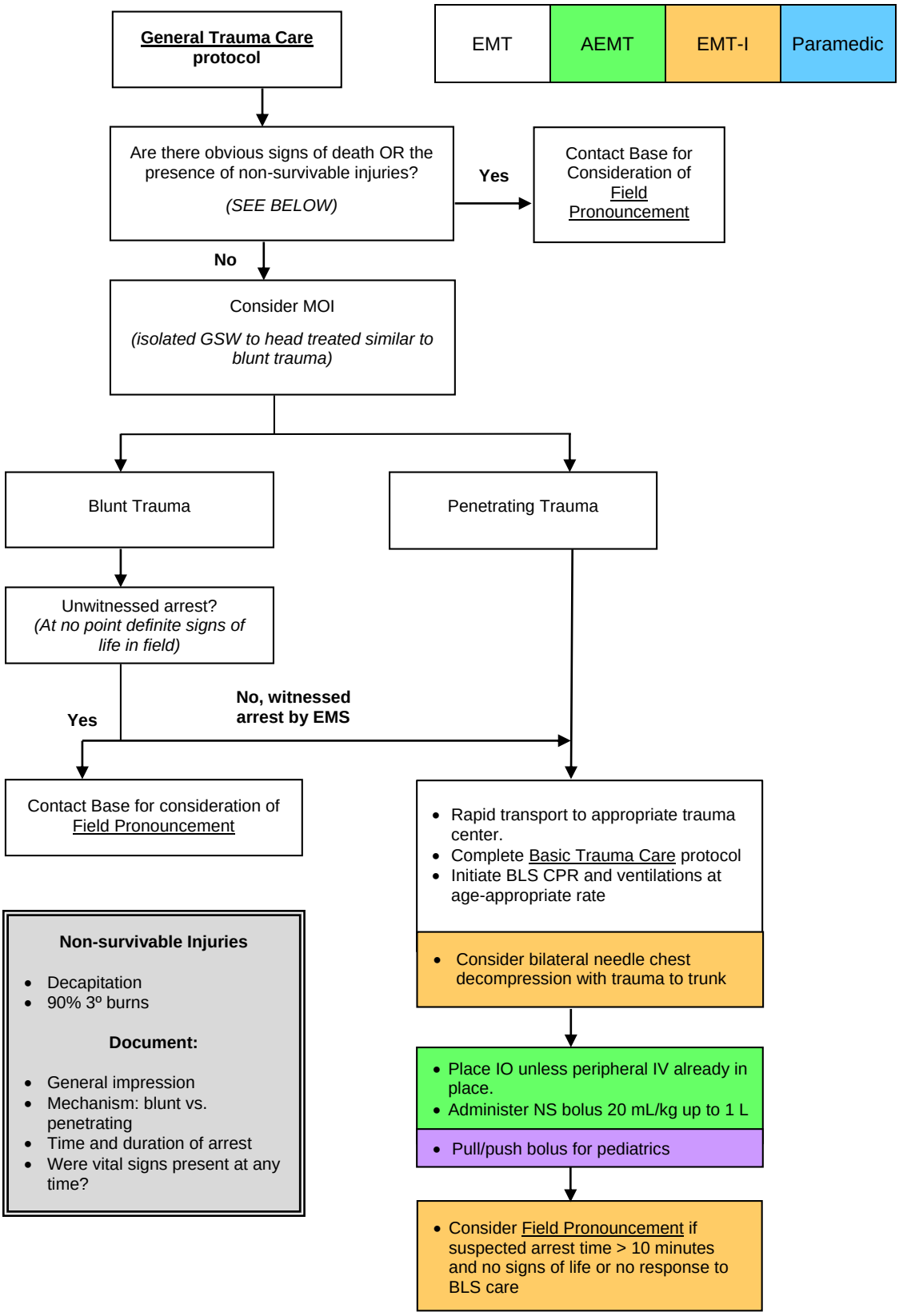
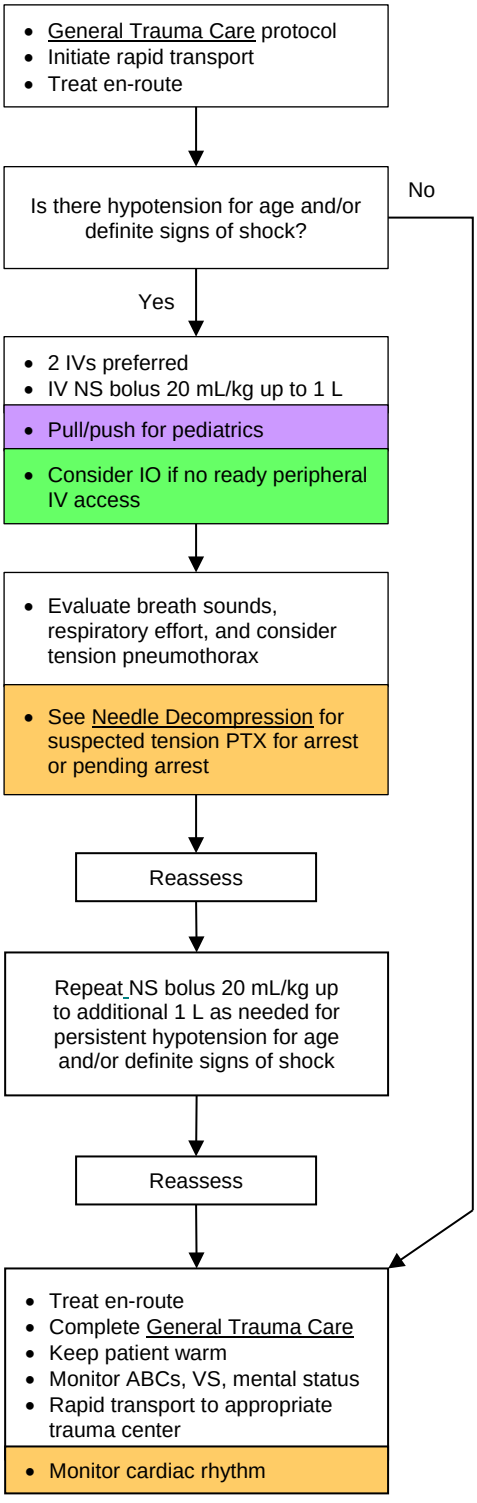
8030 TRAUMATIC PULSELESS ARREST



8040 TRAUMATIC SHOCK



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

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

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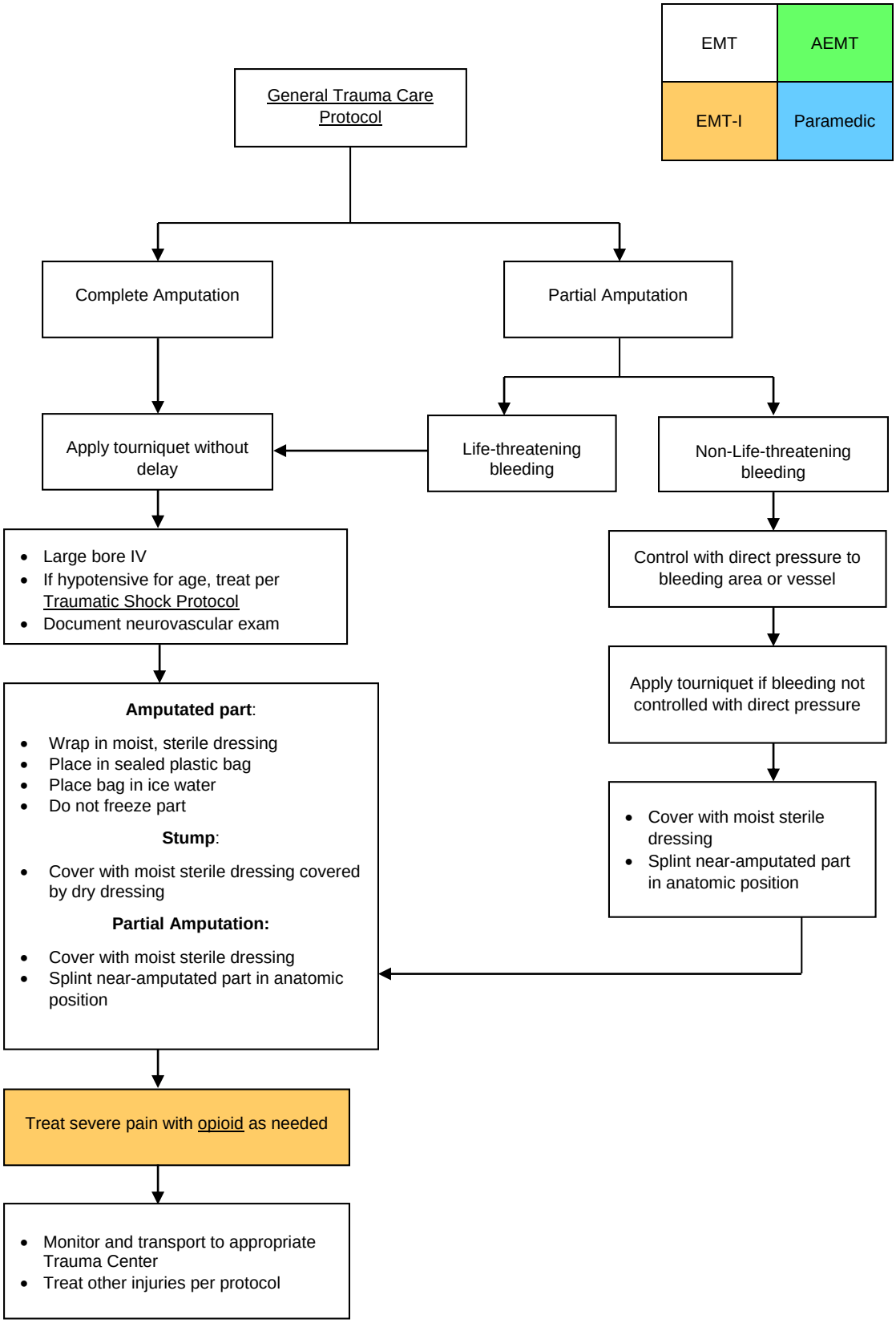
8050 AMPUTATIONS



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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

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

Support ventilations & maintain $ETCO_2$ 35-45 mmHg

- Obtain IV access
- Support ventilations PRN
- Correct hypoxia
- Treat hypotension
- Decrease ICP by elevating head 30° if possible. Use reverse Trendelenburg if spinal precautions 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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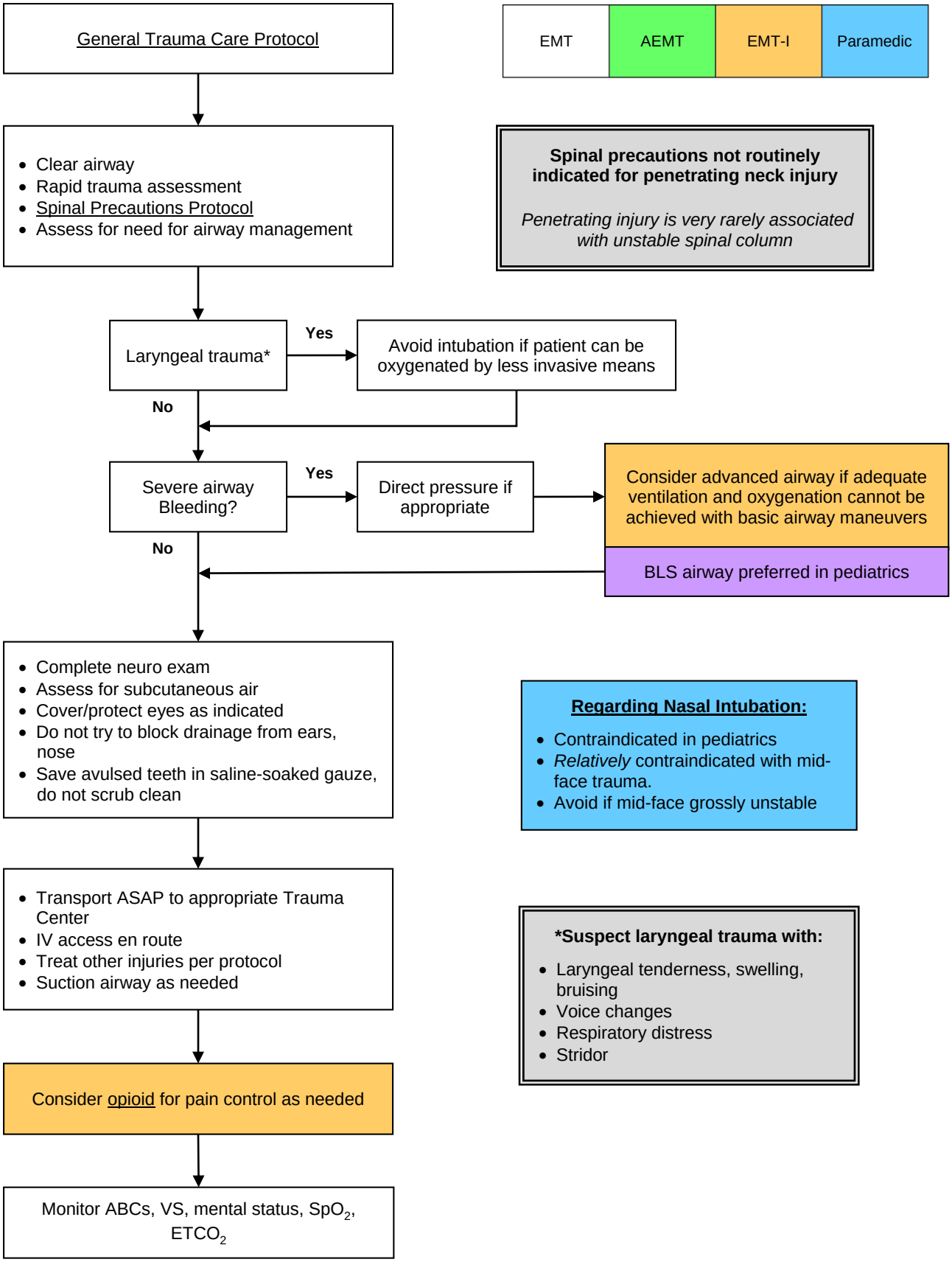
8070 FACE AND NECK TRAUMA



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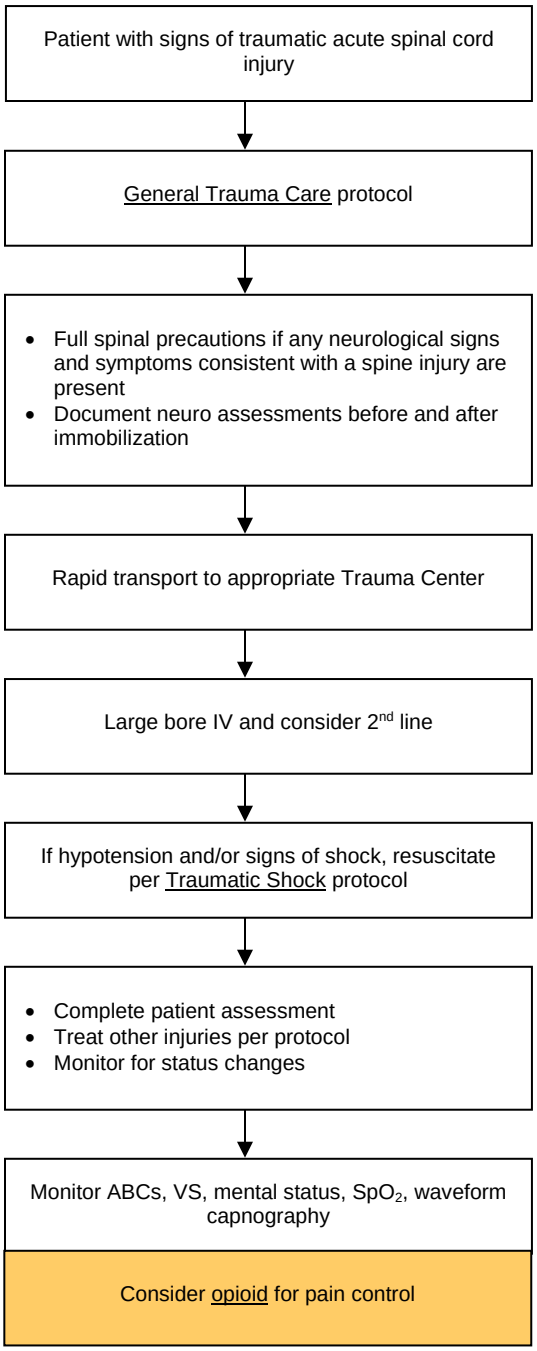
8080 SPINAL TRAUMA



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 Immobilization not routinely indicated for penetrating neck injury

Penetrating injury is very rarely associated with unstable spinal column

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8090 SPINAL PRECAUTIONS PROTOCOL

EMT	AEMT	EMT-I	Paramedic

Does patient have/complain of any of the following:

- Midline C/T/L spine tenderness on palpation
- Neurologic complaints or deficits
- 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*)

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

No → If **NONE** of above criteria, and you think patient is not likely to have a spinal injury, no spinal precauations required

Place c-collar on patient and ask them to not move neck → Is there an objective neurological deficit?

Yes → Full spinal immobilization

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 immobilization

Notes:

- Backboards have not been shown to be any benefit for spinal injuries, and may cause harm.
- Backboards/scoops are useful tools for carrying non-ambulatory patients to a gurney. Patients who do not need a backboard should be gently slid off of backboard/scoop onto gurney.
- Self-extrication from a vehicle with assistance is likely better than standard extrication procedures.
- Vacuum mattresses should be used preferentially over a backboard if readily available.
- Use caution when assessing for spinal injury in elderly patients, who are at much higher risk and may have minimal symptoms.
- Consider improvised cervical spine immobilization such as towel rolls and tape or a SAM splint if needed to prevent airway compromise or worsening spinal injury if the rigid cervical collar cannot be correctly sized to the patient
- Neurological exam documentation is MANDATORY in patients with potential spinal trauma, including serial exams.
- Cervical collar is not indicated in isolated penetrating trauma
- Full spinal immobilization includes backboard, scoop, vacuum splint, or agency approved device

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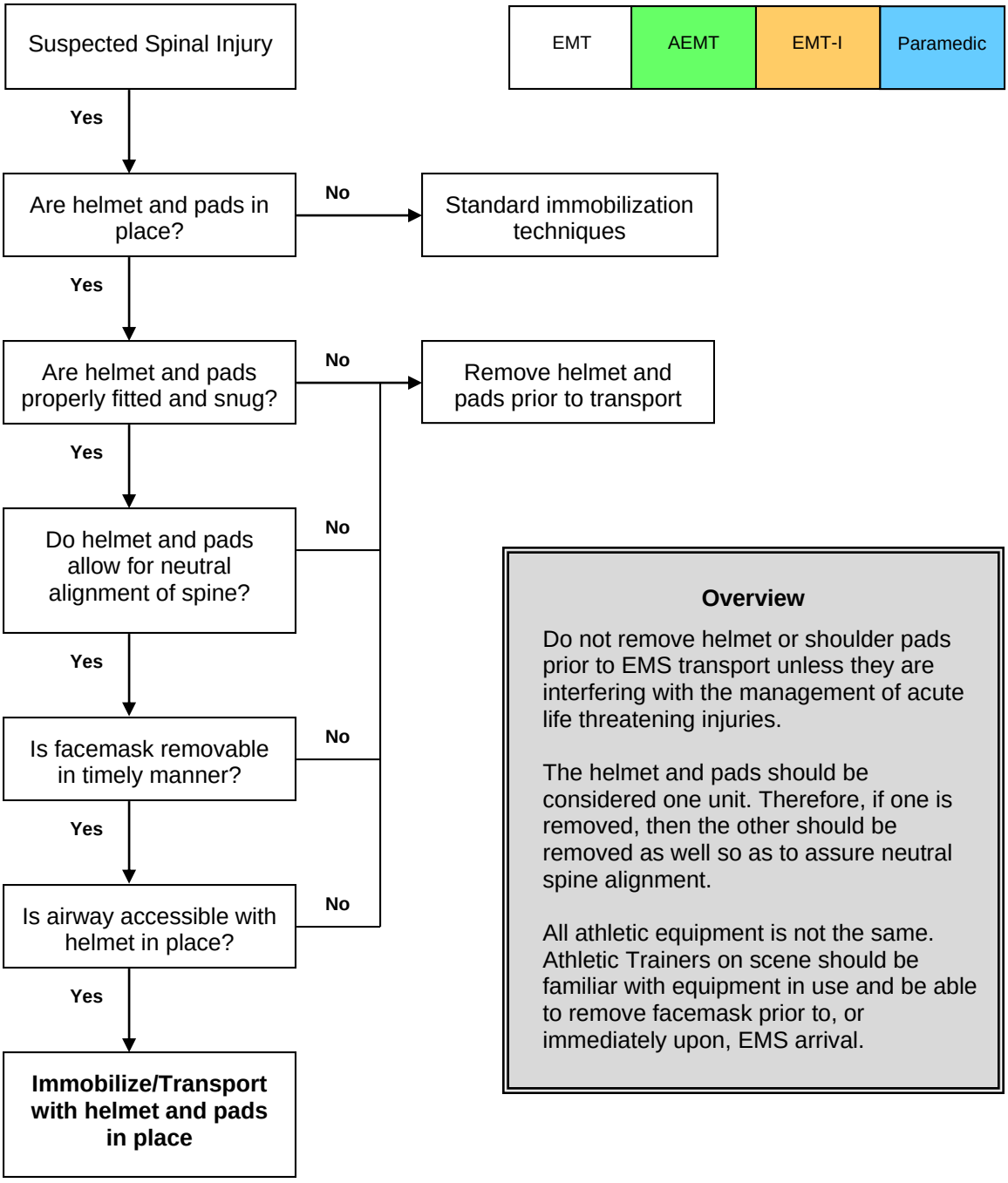
8100 SUSPECTED SPINAL INJURY WITH PROTECTIVE ATHLETIC EQUIPMENT IN PLACE



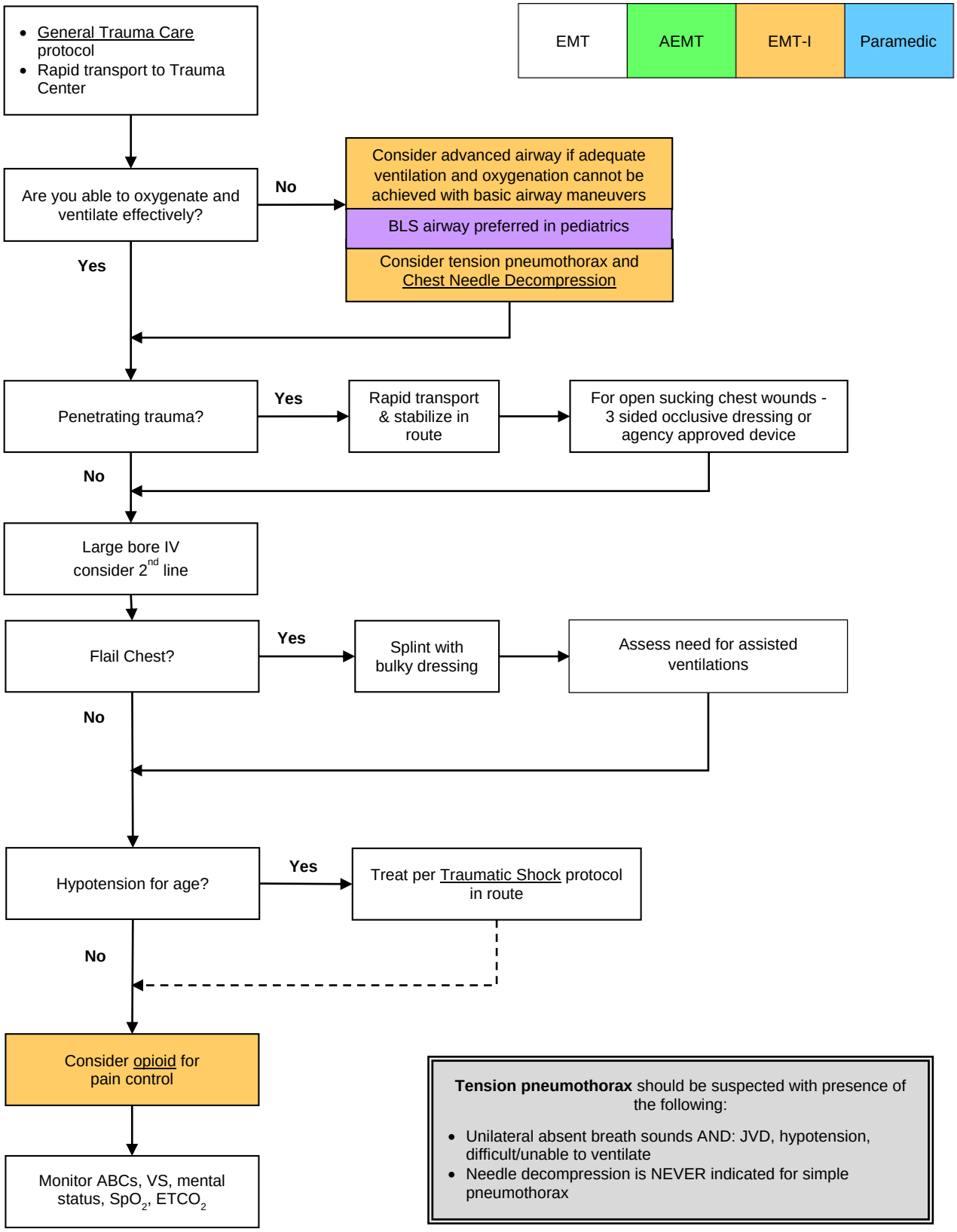
Overview

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



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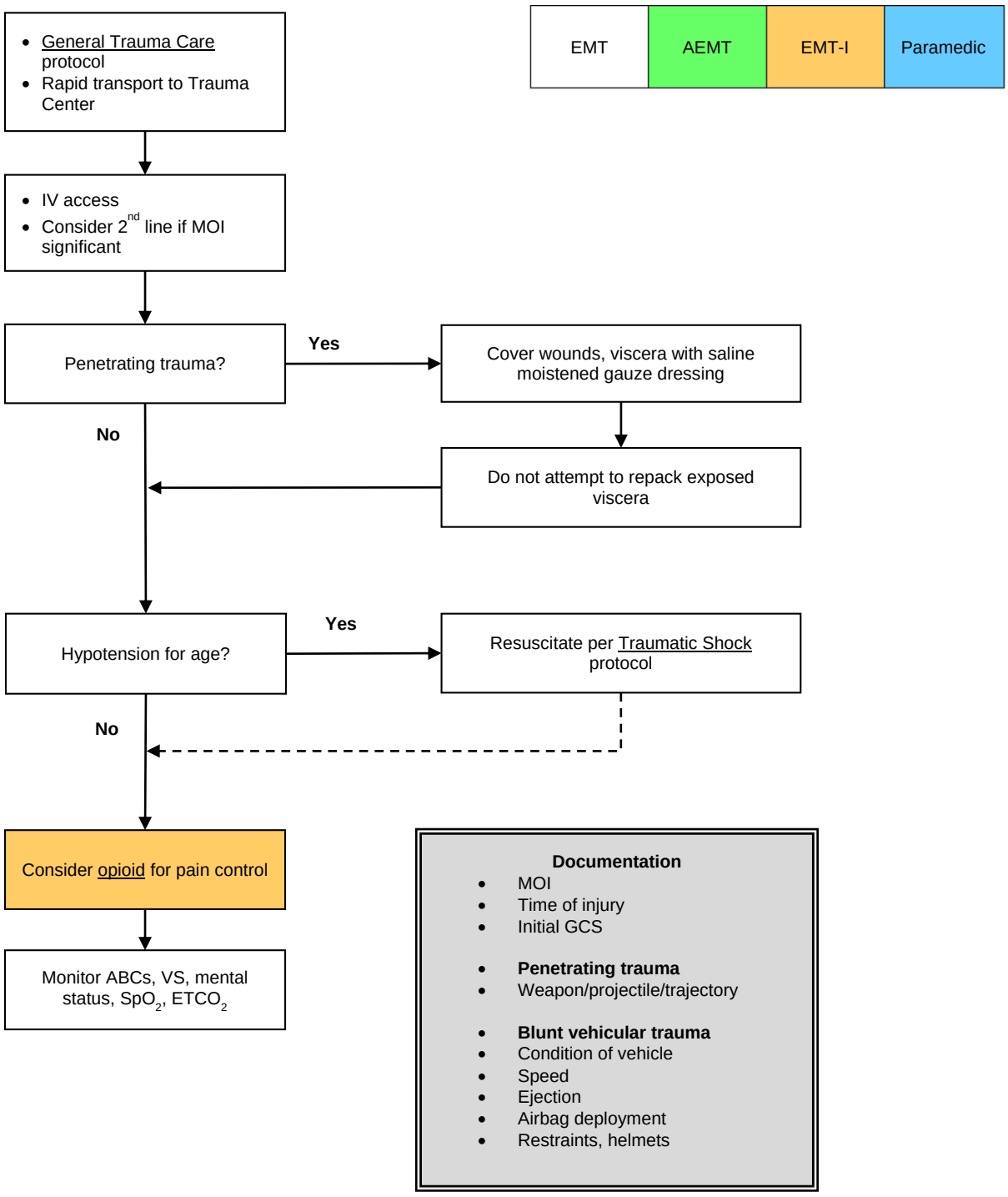
8120 ABDOMINAL TRAUMA



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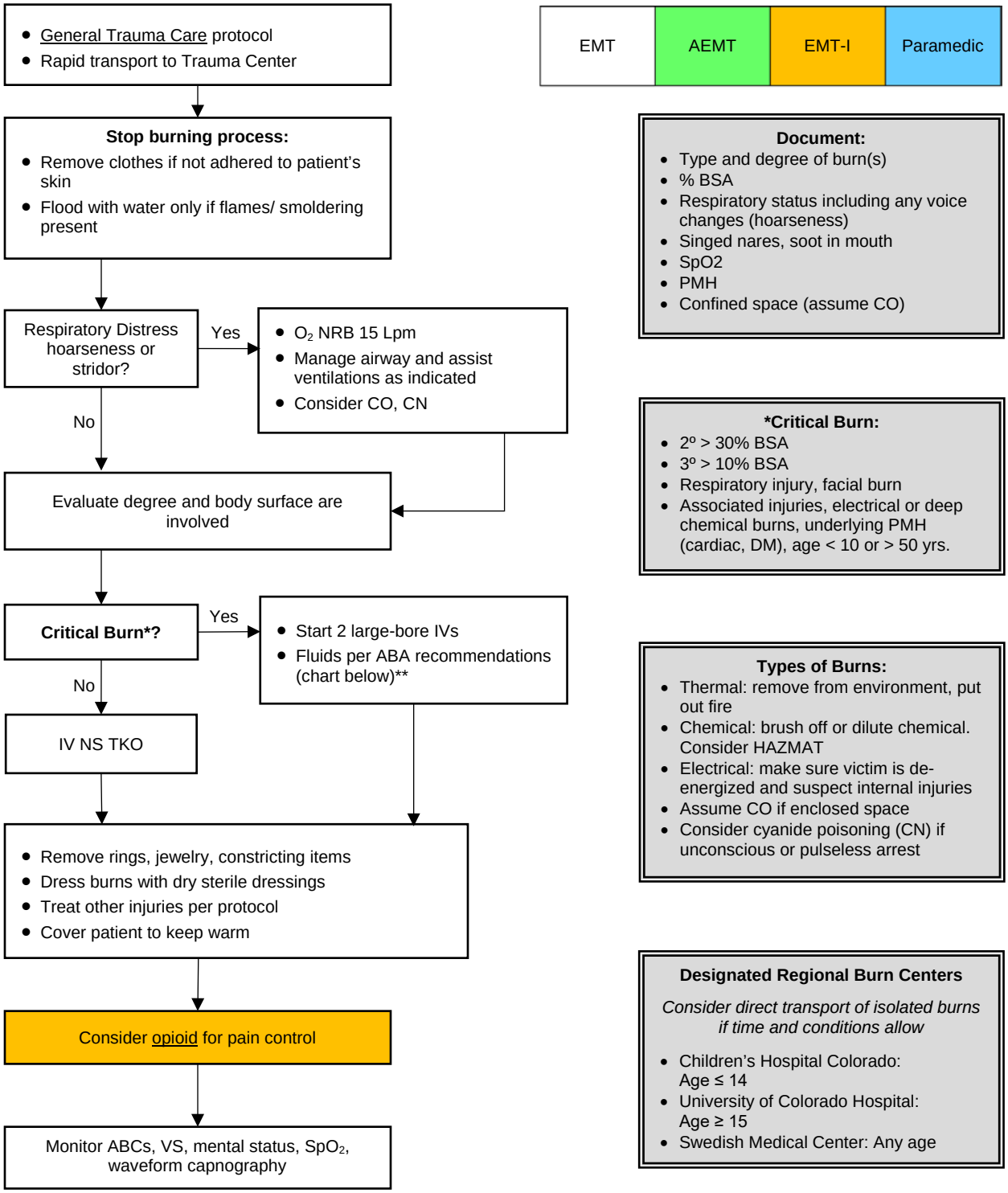
8130 BURNS



**** 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.

Approved by Denver Metro EMS Medical Directors July 1, 2017. Next review January 2018

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.

B. Pediatric medication dosing and equipment size recommendations vary by length and/or weight. As such, an assessment tool such as a length-based tape 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. Intranasal (IN) administration often results in more rapid resolution or improvement in symptoms compared to IV or intramuscular (IM) administration
    2. IM drug absorption and onset of action is often the slowest, as vascular absorption from fat tissue is prolonged

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 the treatment of potentially life-threatening 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 and a detailed list of post-expiration medications maintained
    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
    4. Details of this policy are available at http://www.dmemsmd.org

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

9010 MEDICATIONS

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

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.

9010 MEDICATIONS

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

9020 MEDICATIONS

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)

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:

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.

Pediatric:

Single Neb dose
Albuterol sulfate 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 5-15 minutes. May be repeated twice during transport (total of 3 doses).

9020 MEDICATIONS

Protocol

- Adult Wheezing
- Pediatric Wheezing
- Allergy and Anaphylaxis

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.

9030 MEDICATIONS

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

- Universal Pulseless Arrest Algorithm
- Tachycardia 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.

9040 MEDICATIONS

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 patient 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:
2 mg IV/PO/ODT

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

Promethazine

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

Pediatric > 2 years old:
0.25-0.5 mg/kg IV/IM to a maximum of 6.25 mg.

Metoclopramide

Adult:
10 mg IV/IM.

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

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.

9050 MEDICATIONS

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

- 324mg 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.

9060 MEDICATIONS

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

Stable Bradycardia and Poisoning/Overdose

CONTACT BASE

Protocol

- Bradycardia with poor perfusion
- Poisoning/Overdose

Special Considerations

- Atropine causes pupil dilation, even in cardiac arrest settings

9070 MEDICATIONS

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
- 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 more than 2 doses, unless **Excited Delirium Syndrome** present, in which case up to a total of 3 doses may be given as standing order in order to rapidly sedate patient.

Pediatric:

- **CONTACT BASE** before any consideration of sedation of severely agitated/combative child

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 0.3 mg/kg

- Maximum single dose is 5 mg IV. 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 more than 2 doses, unless **Excited Delirium Syndrome** present, in which case up to a total of 3 doses may be given as standing order in order to rapidly sedate patient

Pediatric:

- **CONTACT BASE** before any consideration of sedation of severely agitated/combative child

LORAZEPAM:

Seizure or sedation for cardioversion or transcutaneous pacing:

Adult:

IV/IO route: 1 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): 2 mg

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

Pediatric:

IV route: 0.05 mg/kg

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

IN/IM route (intranasal preferred): 0.1 mg/kg

- 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: 2 mg

- Dose may be repeated x 1 after 5 minutes. **Contact base** for more than 2 doses, unless **Excited Delirium Syndrome** present, in which case up to a total of 3 doses may be given as standing order in order to rapidly sedate patient

Pediatric:

- **CONTACT BASE** before any consideration of sedation of severely agitated/combative child

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Protocol

- Synchronized Cardioversion
- Transcutaneous Pacing
- Seizure
- Agitated/Combative Patient
- Poisoning/Overdose

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.

9080 MEDICATIONS

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 hyperkalemia
  - Renal failure with or without hemodialysis history
  - Calcium channel blocker overdose
- **Not indicated for routine treatment of pulseless arrest**
- Calcium channel blocker overdose with hypotension and bradycardia

Contraindications

- Known hypercalcemia
- 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 g (30 mL) slow IV push
- **Calcium channel blocker overdose with hypotension and bradycardia:**
  - **Contact Base** for order. 3 g (30 mL) slow IV/IO push. Dose may be repeated every 10 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** slow IV/IO push not to exceed 2 mL/minute, may repeat every 10 minutes for total of 3 doses

Calcium Chloride 10% Solution

Adult:

- **Pulseless arrest assumed due to hyperkalemia:**
  - 1 g (10 mL) slow IV push
- **Calcium channel blocker overdose with hypotension and bradycardia:**
  - **Contact Base** for order. 1 g (10 mL) slow IV/IO push. Dose may be repeated every 10 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** slow IV/IO push not to exceed 1 mL/min, may repeat every 10 minutes for total of 3 doses.

Protocol

- Universal Pulseless Arrest
- Poisoning/Overdose

9090 MEDICATIONS

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.

9100 MEDICATIONS

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

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
Pediatrics:
< 8 years: 1-2 mg/kg slow IV/IO/IM (not to exceed 50 mg)

Protocol

- Allergy/Anaphylaxis

9110 MEDICATIONS

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.
- Second line medication for management of intractable vomiting requiring base contact.
- Combative head injured patients.

Contraindications

- Any patient with:
  - 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 Benadryl.
- 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. **CONTACT BASE** for repeat dose if desired effect not achieved after 10 minutes.

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

Antiemetic:

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

Pediatric: CONTACT BASE for orders. Dose 0.05 mg/kg slow push.

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 Protocol

9120 MEDICATIONS

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.
Bradycardia with hypotension and poor perfusion refractory to other interventions
Continuous infusion titrated to effect: see Vasopressor infusion
Asthma:
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
Asthma
0.01 mg/kg (0.01 ml/kg of 1:1,000 solution) IM
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

9120 MEDICATIONS

Moderate to Severe Allergic Reactions
0.01 mg/kg (0.01 ml/kg of 1:1,000 solution) IM
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
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

- Universal Pulseless Arrest Algorithm
- Bradycardia 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

9130 MEDICATIONS

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

9140 MEDICATIONS

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
- Children < 8 years old

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 and Pediatrics > 8 years old: 5 - 10 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 Protocol

9150 MEDICATIONS

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.

9160 MEDICATIONS

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

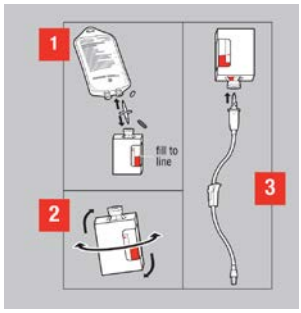
Precautions

- Administer only after basic life support measures have been initiated and always in conjunction with other supportive treatment modalities.

Adverse Reactions

- Hypertension
- Allergic reaction/anaphylaxis

Dosage and Administration



- **Adult** dose is 5 gm IV
- **Pediatric** dose is 70 mg/kg up to 5 gm IV
  - Cyanokit consists of either a single 5 gm vial or 2 x 250 mL vials each containing 2.5 gm of hydroxocobalamin.
- Single 5 gm vial Instructions:
  1. Reconstitute: Place the vial 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.
  2. Mix: The vial should be repeatedly inverted or rocked, not shaken, for at least 60 seconds prior to infusion.
  3. Infuse Vial: Use vented intravenous tubing, hang and infuse desired dose over 15 minutes.
- 2 x 2.5 gm vials instructions:
  1. Reconstitute: Add 100 mL of 0.9% Sodium Chloride Injection* to the vial using the transfer spike. Fill to the line.
  2. Mix: The vials should be repeatedly inverted or rocked, not shaken, for at least 30 seconds prior to infusion.
  3. Infuse 1st vial: Use vented intravenous tubing, hang and infuse desired dose over 7.5 min.
  4. Infuse 2nd vial (repeat steps 1 and 2 before 2nd infusion) to desired dose over 7.5 min.

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

9170 MEDICATIONS

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

- Do not administer to children < 2 years
- 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:

Ipratropium (0.5 mg/2.5 ml) along with albuterol in a nebulizer

Child (2 yrs – 12 yrs)
Mod and Severe Bronchospasm

Ipratropium (0.5 mg/2.5 ml) along with albuterol in a nebulizer
Not indicated for repetitive dose or continuous neb use

Protocol

- Adult Wheezing
- Pediatric Wheezing

9180 MEDICATIONS

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 and Pediatric:

- 0.5 mg/kg IO bolus, slowly, maximum dose is 50 mg

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

9190 MEDICATIONS

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 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:**
  - 2 gm, IV bolus.
- **Refractory Severe Bronchospasm:**
  - 2 gm, IV bolus, over 2 minutes.
- **Eclampsia:**
  - 2 gm, IV bolus slowly
  - Mix 4 gm, diluted in 50 ml of Normal Saline (0.9 NS), IV drip over 15-30 minutes.

Protocol

- Universal Pulseless Arrest Algorithm
- Adult wheezing
- Obstetric Complications

9200 MEDICATIONS

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

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

9210 MEDICATIONS

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**)

9210 MEDICATIONS

- 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.

9220 MEDICATIONS

NITROGLYCERIN (NITROSTAT, NITROQUICK, etc)

Description
Short-acting peripheral venodilator decreasing cardiac preload and afterload

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. Viagra, Cialis)

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

9230 MEDICATIONS

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, including cardiac conditions, abdominal pain, back pain, etc.
- Treatment of shivering with Targeted Temperature Management (TTM).

Contraindications

- 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

FENTANYL:

- **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 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.

- Dose may be repeated after 10 minutes after initial IN dose to a maximum cumulative dose of 3 mcg/kg. IV route is preferred for repeat dosing.
- Additional dosing requires BASE CONTACT

Pediatric (1-12 years):

IV/IO 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 1-12 years and ≥ 10kg:

IV/IO/IM routes: 0.2 mg
- Repeat dosing requires BASE CONTACT.

Pediatric < 1 years or < 10kg:

IV/IO/IM routes: with verbal order only. BASE CONTACT for any administration

NOTE: IV route is preferred for all opioid administration because of more accurate titration and maximal clinical effect. IO/IN/IM 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

9240 MEDICATIONS

ORAL GLUCOSE (GLUTOSE, INSTA-GLUCOSE)

Description

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

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

9250 MEDICATIONS

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. Breathing, in most people, is regulated by small changes in the acid-base balance and CO_2 levels. It takes relatively large decreases in oxygen concentration to stimulate respiration.

Indications

- Suspected hypoxemia or respiratory distress from any cause
- Acute chest or abdominal pain
- Hypotension/shock states from any cause
- Trauma
- Suspected carbon monoxide poisoning
- Obstetrical complications, childbirth

Precautions

- If the patient is not breathing adequately, the treatment of choice is assisted ventilation, not just oxygen.
- When pulse oximetry is available, titrate SpO_2 to ≥ 90%. This may take some time.
- Do not withhold oxygen from a COPD patient out of concerns for loss of hypoxic respiratory drive. This is never a concern in the prehospital setting with short transport times

Administration

Flow	LPM Dosage	Indications
Low Flow	1-2 LPM	Minor medical / trauma
Moderate Flow	3-9 LPM	Moderate medical / trauma
High Flow	10-15 LPM	Severe medical / trauma

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.

OXYGEN FLOW RATES		
METHOD	FLOW RATE	OXYGEN INSPIRED AIR (approximate)
Room Air		21%
Nasal Cannula	1 LPM 2 LPM 6 LPM	24% 28% 44%
Simple Face Mask	8 - 10 LPM	40-60%
Non-rebreather Mask	10 LPM	90%
Bag/Valve/Mask (BVM)	Room Air 12 LPM	21% 40%
Bag/Valve/Mask with Reservoir	10-15 LPM	90-100%
Oxygen-powered breathing device	hand-regulated	100%

9260 MEDICATIONS

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

9270 MEDICATIONS

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.

9280 MEDICATIONS

SODIUM BICARBONATE

Description

Sodium bicarbonate is an alkalotic solution, which neutralizes acids found in the body. Acids are increased when body tissues become hypoxic due to cardiac or respiratory arrest.

Indications

- Tricyclic overdose with arrhythmias, widened QRS complex or hypotension.
- Suspected hyperkalemic pulseless arrest: consider in patients with known renal failure/dialysis.

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

Adults and children (> 10 kg), 8.4%

Tricyclic OD with hypotension or prolonged QRS > 0.10 sec or suspected hyperkalemia-related pulseless arrest:

- 1 mEq/kg slow IV push. Repeat if needed in 10 minutes.

Protocol

- Universal Pulseless Arrest
- Poisoning/Overdose

Special Considerations

- Sodium bicarbonate administration increases CO_2 which rapidly enters cells, causing a paradoxical intracellular acidosis.
- Sodium bicarb is no longer recommended for routine use in prolonged cardiac arrest. Its use in pulseless arrest should be limited to known or suspected hyperkalemia (e.g. dialysis patient), or arrest following tricyclic overdose.

9290 MEDICATIONS

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.

9300 MEDICATIONS

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.

9300 MEDICATIONS

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
- Bradycardia 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 Pre-Hospital Trauma Triage Algorithm and Policy were developed by the Foothills RETAC to aid and promote appropriate destinations for trauma patients 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, 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. 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.

Possible Exemptions to Destination Policies: 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 two Level III Trauma Centers: Longmont United Hospital and Avista Hospital. They also have two Level II Trauma Centers: Boulder Community Hospital and Exempla Good Samaritan Medical Center. For High-Level trauma patients, prehospital personnel should transport to the most appropriate Trauma Center they can reach in the least amount of time with the least amount of effort.

Clear Creek County Trauma: Clear Creek County does not have any 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 any emergency 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 Exempla 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 a very large diverse county, and transport decisions will reflect the individual incident, while following this algorithm.

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 the requesting prehospital ground transport agency and the flight crews, and their medical directors as to which Trauma Center they are flown to. 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, our FRETAC CQI program will monitor destinations for their appropriateness.

Pediatric Care: There is currently no Pediatric Level I or II Trauma Center~~s~~ 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 Algorithm Guideline

Adult Patients (Ages 15 and older)

UNABLE TO ADEQUATELY VENTILATE

Yes → Transport to most rapidly accessible appropriate Medical Facility

No ↓

PHYSIOLOGIC CRITERIA

Any one of the following:

1. Intubation or assisted ventilation
2. Respiratory rate < 10 or > 29
3. Systolic BP < 90
4. GCS **motor score** < 5

Yes → Transport to most rapidly accessible appropriate Trauma Center

No ↓

ANATOMIC CRITERIA

Any one of the following (known or suspected):

1. Penetrating injuries to the head, neck, torso or extremities above the elbow or knee
2. Flail chest
3. Two or more proximal long bone fractures (humerus and/or femur)
4. Unstable pelvic fracture
5. Paralysis or other evidence of spinal cord injury
6. Amputation above the wrist or ankle
7. Crushed, degloved or mangled extremity
8. Open or depressed skull fracture

Yes → Transport to most rapidly accessible appropriate Trauma Center

No ↓

MECHANISM OF INJURY CRITERIA

Any one of the following:

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 (auto going >20 mph)
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

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

PHYSIOLOGIC CRITERIA

Any one of the following:

1. Intubation or assisted ventilation
2. Any 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

ANATOMIC CRITERIA

Any one of the following (known or suspected):

1. Penetrating injuries to the head, neck, torso or extremities above the elbow or knee
2. Flail chest
3. Two or more proximal long bone fractures (humerus and/or femur)
4. Unstable pelvic fracture
5. Paralysis or other evidence of spinal cord injury
6. Amputation above the wrist or ankle
7. Crushed, degloved or mangled extremity
8. Open or depressed skull fracture

Yes → Transport to most rapidly accessible appropriate Trauma Center

No

MECHANISM OF INJURY CRITERIA

Any one of the following 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 (auto going >20 mph)
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

MHRETAC Prehospital Trauma Triage Algorithm Guideline, 4/7/10
Adult Patients (Ages 15 and older)

DESTINATION INSTRUCTIONS PER MHRETAC PROTOCOL

UNABLE TO ADEQUATELY VENTILATE

Yes → Transport to appropriate facility

No ↓

PHYSIOLOGIC CRITERIA

Any one of the following:

1. Intubation or assisted ventilation
2. Respiratory rate < 10 or > 29
3. Systolic BP < 90
4. GCS motor score < 5

Yes → -Transport to a Level I or II trauma center

No ↓

ANATOMIC CRITERIA

Any one of the following (known or suspected):

1. Penetrating injuries to the head, neck, torso or extremities above the elbow or knee
2. Flail chest
3. Two or more proximal long bone fractures (humerus and/or femur)
4. Unstable pelvic fracture
5. Paralysis or other evidence of spinal cord injury
6. Amputation above the wrist or ankle
7. Crushed, degloved or mangled extremity
8. Open or depressed skull fracture

Yes → -Transport to a Level I or II trauma center

No ↓

MECHANISM OF INJURY CRITERIA

Any one of the following:

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 (auto going >20 mph)
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 closest appropriate level trauma center as time and conditions allow

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

Yes → - Transport to trauma center

No → Transport to any acute care facility

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

Adult Trauma Triage Algorithm Overview
Updated October 2015

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 all the Level I trauma centers, the only Level I Regional Pediatric Trauma Center in Colorado, and a high 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.

Closest Appropriate- MHRETAC actively supports and promotes the Medical Directors in defining the terms closest and appropriate trauma centers and applicable conditions. Ground transport between the Level I trauma centers in this RETAC is less than 15 minutes. The distance between trauma centers by air is measured in seconds. The terms time and closest have less significance in this region with the high population of trauma centers.

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. 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 October 15, 2015
Approved by Mile-High RETAC Board of Directors on November 19, 2015
Approved by Regional Medical Direction & Denver Metro EMS Medical Directors Group on January 6, 2016

MHRETAC Prehospital Trauma Triage Algorithm Guideline, 4/7/10
Pediatric Patients (Less than 15 years old)

DESTINATION INSTRUCTIONS PER MHRETAC PROTOCOL

UNABLE TO ADEQUATELY VENTILATE

Yes → Transport to appropriate facility

No ↓

PHYSIOLOGIC CRITERIA

Any one of the following:

1. Intubation or assisted ventilation
2. Any 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

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

4. Only responsive to pain or unresponsive [AVPU]

Yes → Transport to a designated pediatric Level I or II trauma center as time and conditions allow

Transport to a Level I or II trauma center

No ↓

ANATOMIC CRITERIA

Any one of the following (known or suspected):

1. Penetrating injuries to the head, neck, torso or extremities above the elbow or knee
2. Flail chest
3. Two or more proximal long bone fractures (humerus and/or femur)
4. Unstable pelvic fracture
5. Paralysis or other evidence of spinal cord injury
6. Amputation above the wrist or ankle
7. Crushed, degloved or mangled extremity
8. Open or depressed skull fracture

Yes → Transport to a designated pediatric Level I or II trauma center as time and conditions allow

Transport to a Level I or II trauma center

No ↓

MECHANISM OF INJURY CRITERIA

Any one of the following 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 (auto going >20 mph)
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 closest 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
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 trauma center

No → Transport to any emergency department

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

Pediatric Trauma Triage Algorithm Overview
Updated October 2015

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 all the Level I trauma centers, the only Level I Regional Pediatric Trauma Center in Colorado, and a high 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.

Closest Appropriate- MHRETAC actively supports and promotes the Medical Directors in defining the terms closest and appropriate trauma centers and applicable conditions. Ground transport between the Level I trauma centers in this RETAC is less than 15 minutes. The distance between trauma centers by air is measured in seconds. The terms time and closest have less significance in this region with the high population of trauma centers.

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. 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 October 15, 2015
Approved by Mile-High RETAC Board of Directors on November 19, 2015
Approved by Regional Medical Direction & Denver Metro EMS Medical Directors Group on January 6, 2016