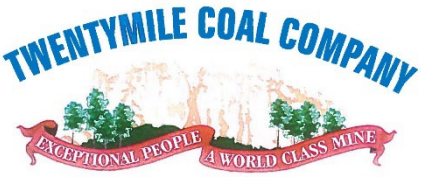
Routt County EMS Protocols



2022 Protocol Changes

1. Consent
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
2. Patient Determination
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
3. Patient Non-Transport or Refusal
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
4. Restraint
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
5. TASER® Probe Removal
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
6. Adult Wheezing
    a. Epinephrine IM administration updated from “Contraindicated” to “Use withcaution if any concern for myocardial ischemia or known coronary artery disease.”
7. Pediatric Wheezing
    a. Updated level of provider for administration of nebulized albuterol and ipratropium.
8. Medical Pulseless Arrests Considerations
    a. Under pediatric arrest, language updated regarding administration of “initial doseof epinephrine within 5 minutes from the start of chest compressions” to include “or after arrival of ALS provider.”
    b. If advanced airway in place, give breath every 2-3 seconds for pediatrics
9. ROSC
    a. Targeted vital signs updated.
10. Drug/Alcohol Intoxication
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
11. Psychiatric/Behavioral Patient
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
12. Agitated/Combative Patient
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
13. Hyperactive Delirium with Severe Agitation
    a. New protocol as part of comprehensive behavioral and agitated/combativeprotocol review.
14. Post Sedation
    a. New protocol as part of comprehensive behavioral and agitated/combativeprotocol review.
15. Transport of the Handcuffed Patient
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
16. Childbirth
    a. Correction regarding suctioning in Emergency Childbirth section.
17. Albuterol
    a. Updated to match pediatric wheezing protocol for continuous nebs withpediatrics.
    b. Indication for crush injury added to match protocol General Trauma.
18. Benzodiazepines
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
19. Calcium
    a. Indication and dosing for crush injury added to match protocol GeneralTrauma.
    b. Dosing updated.
20. Diphenhydramine
    a. Language added about half dosing for geriatric patients.
21. Droperidol
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.

22. Haloperidol
    a. Updated as part of comprehensive behavioral and agitated/combative protocolreview.
23. Ketamine for pain management
    a. Ketamine infusion for pain management
24. Opioids
    a. Updated to clarify routes of administration for fentanyl.
25. Sodium Bicarbonate
    a. Indication and dosing added to match protocols Hyperactive Delirium withSevere Agitation and General Trauma.

Thanks to our Medical Director

Dave Richter

The above medical directors would like to express thanks to the Denver Metro EMS Medical Directors who pioneered in Colorado the algorithm format used in these protocols and from whom much of this material was obtained.

TABLE OF CONTENTS

Contents

INTRODUCTION

INTRODUCTION

The following protocols have been approved by the Routt EMS Medical Directors. These protocols define the standard of care for EMS providers in the Routt County, and delineate the expected practice, actions, and procedures to be followed.

No protocol can account for every clinical scenario encountered, and the Routt County EMS 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.

EMT	AEMT	EMT-I	Paramedic

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

Teaching points

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.

Pediatric Protocol

TRAINING AND EDUCATION

These protocols define the treatments, procedures, and policies approved by the Routt EMS Physician Advisors. 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.

CONFIDENTIALITY

1. 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:
   A. The patient consents
   B. 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)
2. 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.
   A. Exceptions
      1) 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.
      2) The patient is not entitled to confidentiality for disclosures made publicly.
      3) The patient is not entitled to confidentiality with regard to evidence of a crime.
3. Additional Considerations:
   A. Any disclosure of medical information should not be made unless necessary for the treatment, evaluation or diagnosis of the patient.
   B. 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.
   C. 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.
   D. Radio communications should not include disclosure of patient names.
   E. This procedure does not preclude or supersede your agency’s HIPAA policy and procedures.

CONSENT

General Principles: Adults

1. An adult in the State of Colorado is 18 years of age or older.
2. 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.
3. A person is deemed to have decision-making capacity if he/she has the ability to provide informed consent, i.e., the patient:
   A. Understands the nature of the illness/injury or risk of injury/illness.
   B. Understands the possible consequences of delaying treatment and/or refusing transport.
   C. Not intoxicated with drugs and/or alcohol
   D. Given the risks and options, the patient voluntarily refuses or accepts treatment and/or transport.
4. 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.
5. The odor of alcohol on a patient's breath does not, by itself, prevent a patient from refusing treatment.
6. **Implied Consent:** An unconscious adult is presumed to consent to treatment for life-threatening injuries/illnesses.
7. **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

1. 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.
2. 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.
3. For patients who do not have decision-making capacity, **CONTACT BASE**.
4. 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**.
5. For patients who refuse medical treatment, if you are unsure whether or not a situation of involuntary consent applies, **CONTACT BASE**.

General Principles: Minors

1. A parent, including a parent who is a minor, may consent to medical or emergency treatment of his/her child. There are exceptions:
   A. 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.
   B. 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.
   C. Minors may seek treatment for abortion, drug addiction, and venereal disease without consent of parents. Minors > 15 years may seek treatment for mental health.
2. When in doubt, your actions should be guided by what is in the minor's best interests and base contact.

Procedure: Minors

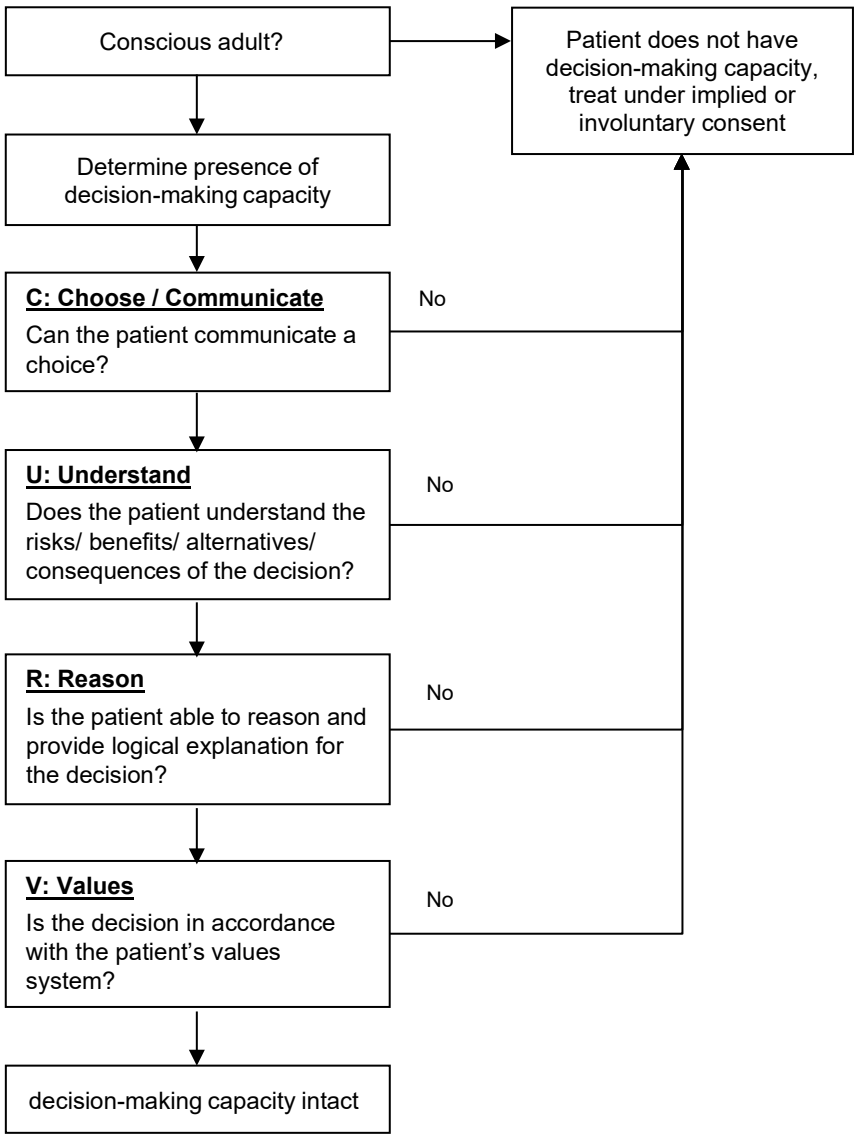
1. A parent or legal guardian may provide consent to or refuse treatment in a non- life-threatening situation.
2. When the parent is not present to consent or refuse:
   A. If a minor has an injury or illness, but not a life-threatening medical emergency, you should attempt to contact the parent(s) or legal guardian. If this cannot be done promptly, transport.

B. 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.
C. 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.

CONSENT

General Principles

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



Involuntary Consent

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

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

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

PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

Purpose

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

General Principles

1. The prehospital provider has a duty to respond to an emergency, initiate treatment, and conduct an assessment of the patient to the extent possible.
2. 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.
3. Good patient care should be the focus of any interaction between prehospital care providers and the physician.

Procedure

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

Special notes

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

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.

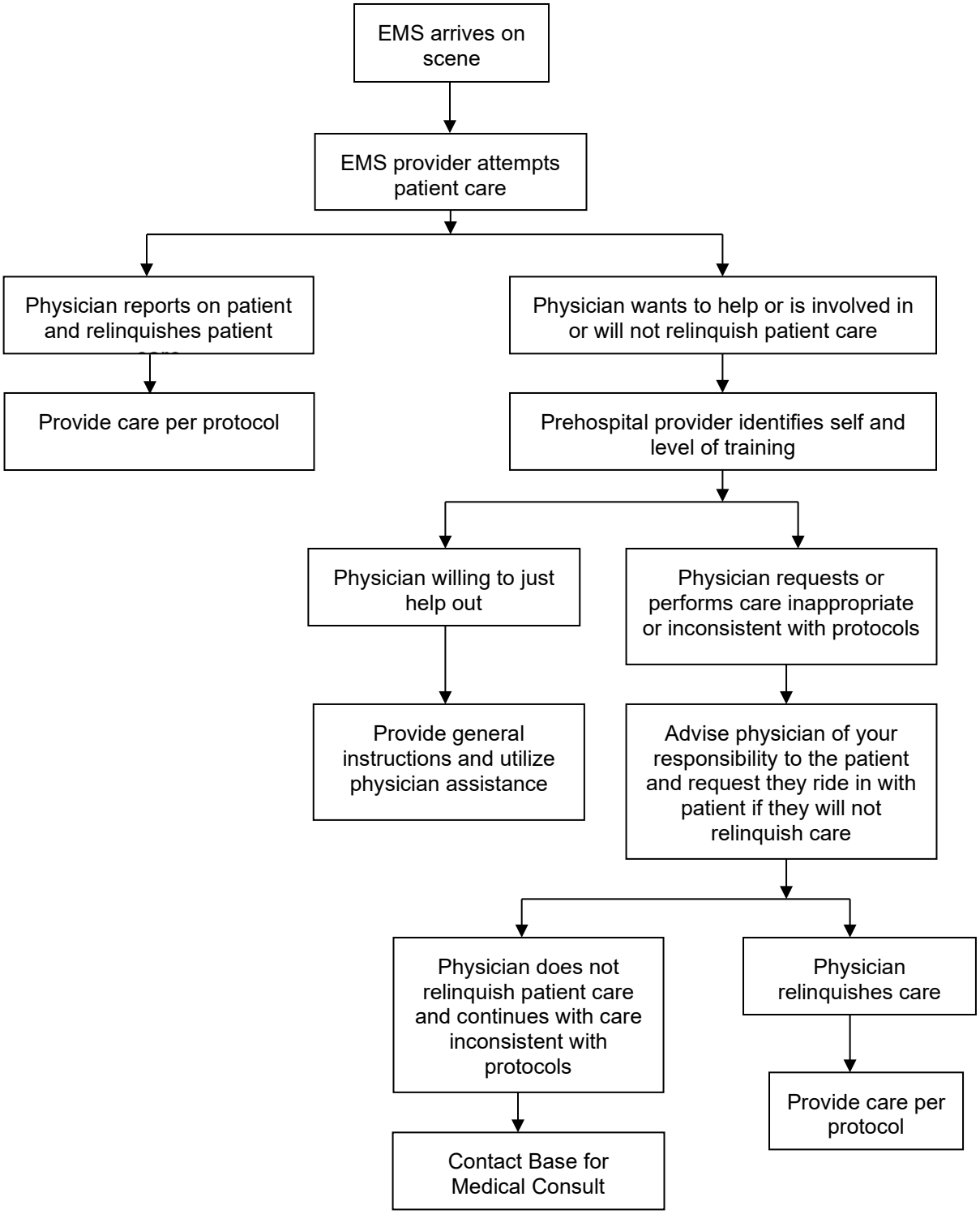
THANK YOU FOR OFFERING YOUR ASSISTANCE DURING THIS EMERGENCY.

_____ _____

Medical Director Agency

PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

PHYSICIAN AT THE SCENE/MEDICAL DIRECTION ALGORITHM



FIELD PRONOUNCEMENT

Purpose

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

General Principles

A. Agency policy determines base contact requirements for patients for whom resuscitation efforts arebeing withheld.

B. Medical Arrest:
   1. EMS providers should try their best to determine a patient's end-of-life wishes and honor them. Refer to Advanced Medical Directives protocol for discussion of advanced directives and decision making about appropriateness of performing or withholding resuscitation efforts.
      a. Do not attempt resuscitation for patients with a "No CPR" directive based on the patient's wishes or compelling reasons to withhold resuscitation as covered in AdvancedMedical Directives protocol.
      b. Do not attempt resuscitation for patients with definite signs of death, such as dependentlividity, rigor mortis, decomposition.

C. Traumatic Arrest:
   1. Do not attempt resuscitation if there is evidence of a non-survivable injury and no sign of life. Examples of non-survivable injuries include decapitation, evidence of massive head, chest, orabdominal trauma, or massive burn with charring.
   2. Blunt trauma: consider field pronouncement if there are no signs of life. Signs of life includespontaneous movement, breathing, presence of a pulse, or reactive pupils.
   3. Penetrating trauma: consider field pronouncement if there are no signs of life, and the arrestduration is suspected to be > 10 minutes.
   4. Exceptions to the above recommendations to consider field pronouncement include arrestswith the following mechanisms/scenarios:
      a. Hypothermic arrest
      b. Drowning w/ hypothermia and submersion < 60 min
      c. Lightning strike and electrocution
      d. Avalanche victim
      e. Pregnant patient with estimated gestational age 20 weeks

TERMINATION OF RESUSCITATION FOR MEDICALPULSELESS ARREST

Purpose

A. To provide guidelines for termination of resuscitation (TOR) for patients in medical pulseless arrestin the prehospital setting. EMS may transport any patient perceived to be viable, or if scene dynamics or public perception necessitates transport.

General Principles

A. Resuscitate according to Medical Pulseless Arrest Algorithm on scene (unless unsafe) until one ofthe following endpoints is met:
   1. Return of spontaneous circulation (ROSC).
   2. No ROSC despite 30 minutes of ALS care or BLS care with an AED. If shockable rhythm stillpresent, continue resuscitation and transport to closest emergency department.
   3. Contact base for TOR at any point if the effort is considered futile despite adequate CPR withventilation and no reversible causes have been identified.

B. For BLS-only providers, contact base for TOR when all of the following criteria met:
   1. No AED shock advised
   2. No ROSC
   3. Arrest unwitnessed by either EMS or bystanders
   4. No bystander CPR before EMS arrival

C. The following patients found pulseless and apneic warrant resuscitation efforts beyond 30 minutesand should be transported:
   1. Hypothermic arrest
   2. Drowning w/ hypothermia and submersion < 60 min
   3. Lightning strike and electrocution
   4. Avalanche victim
   5. Pregnant patient with estimated gestational age 20 weeks

D. Once the patient is pronounced, they become a potential coroner's case. From that point on thepatient should not be moved and no clothing or medical devices (lines, tubes etc.) should be removed or altered pending coroner evaluation.

ADVANCED MEDICAL DIRECTIVES

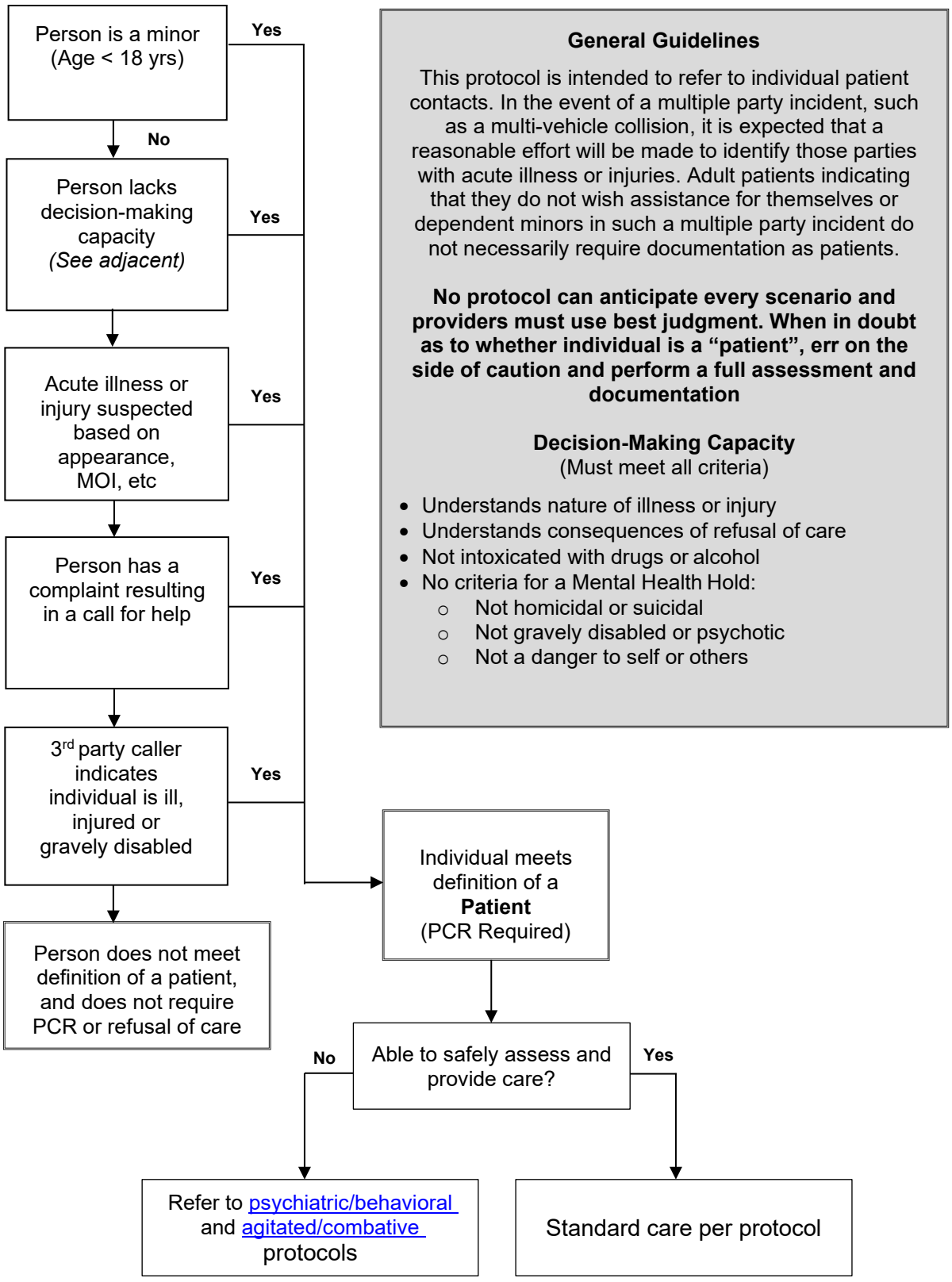
General Principles:

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

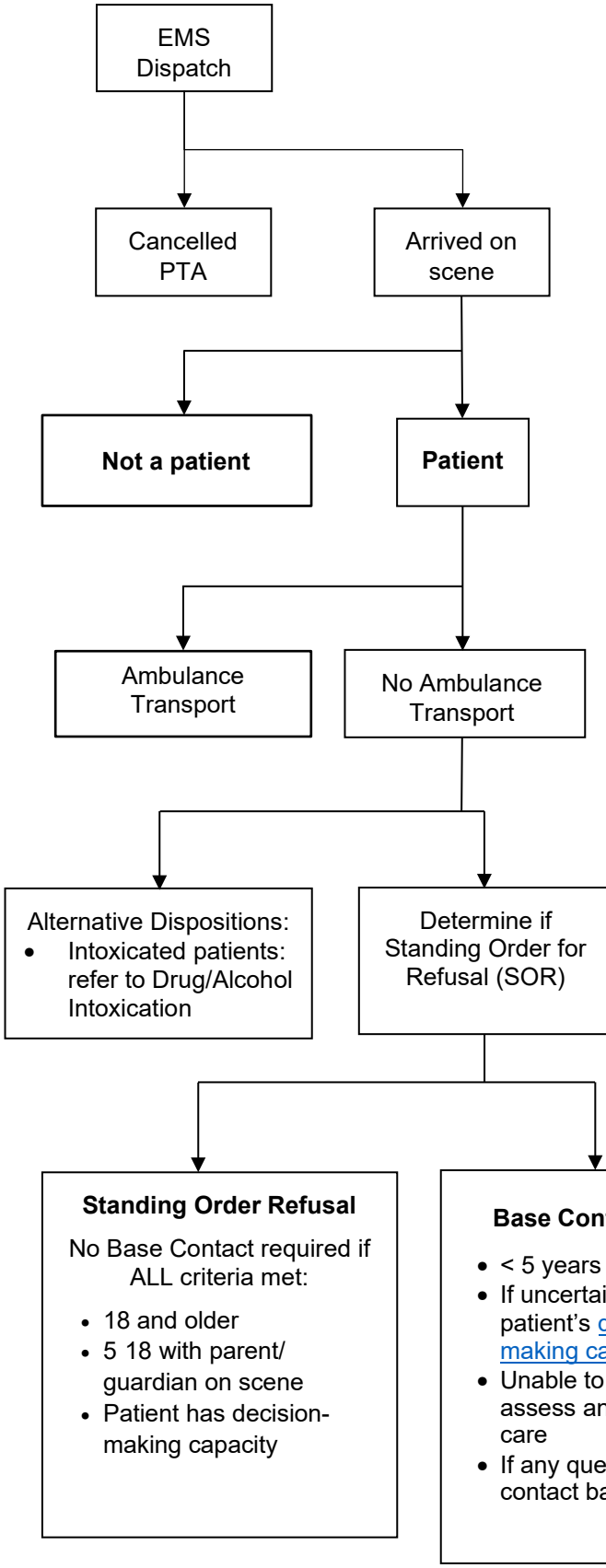
Additional Considerations

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

PATIENT DETERMINATION: "PATIENT OR NO PATIENT"



PATIENT NON-TRANSPORT OR REFUSAL



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

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

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

Documentation Requirements for Refusal

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

High Risk

Patients Base

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

MANDATORY REPORTING OF ABUSE PATIENTS

Purpose

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

Definition of Abuse:

1. 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:

1. Types of maltreatment:
   A. neglect (majority of cases)
   B. physical abuse
   C. sexual abuse
   D. emotional abuse
   E. exploitation (e.g. sex trafficking)

Role of Mandated Reporter:

1. 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:
   A. Verbal report
   B. Written report
2. Mandatory reporters that ***do not*** report abuse, neglect, or exploitation can be:
   A. Charged with a class 3 misdemeanor
   B. Liable for damages proximately caused by failing to report

What to report:

1. The name, address, age, sex, and race of the child, at-risk elder, or at-risk adult with intellectual and developmental disability
2. The name(s) and address(es) of the person(s) responsible for the suspected abuse, neglect, or exploitation—if known
3. A description of the alleged mistreatment and the situation
4. The nature and extent of any injuries—if known
5. Knowledge of previous cases of known or suspected abuse, neglect, or exploitation of the victim or others under the person's care
6. The family composition, including any siblings or others in the household
7. The name, address and/or contact phone number, and occupation of the person making the report
8. Relation of the person making report to the victim and/or how information was obtained
9. Any action taken by the reporting source
10. Any other information reporting person feels is important.

Additional Information:

1. 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.
2. Any "suspected" or known incident of abuse, neglect, or exploitation must be reported
3. Protecting patient confidentiality does not legally justify a failure to report
4. There is established immunity for reporters "acting in good faith"
5. Domestic violence reporting is mandated if you are treating an adult with domestic assault injury

Purpose

- To provide a standard procedure to reduce the risk to employees from bloodborne and airborne pathogens and to comply with the OSHA Bloodborne pathogens standard, 29 CFR 1910.1030.

Scope
This policy will apply to all field ambulance personnel.

Definitions

1. Airborne Pathogens - Pathologic microorganisms spread by droplets expelled into the air, typically through a productive cough or sneeze.

2. Blood - human blood, human blood components and products made from human blood.

3. Bloodborne Pathogen - pathologic microorganisms that are present in human blood that can cause disease in humans.

4. Contaminated - the presence or the reasonable anticipated presence of blood or other potentially infectious materials on an item or surface.

5. Contaminated Sharps - any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass and blood tubes.

6. Decontamination - the use of physical or chemical means to remove, inactivate, or destroy bloodborne or airborne pathogens on a surface or item rendering it safe for handling use or disposal.

7. Occupational Exposure - any reasonably anticipated skin, eye, mucus membrane or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

8. Other Potentially Infectious Materials (OPIM) - 1) the following body fluids: semen, vaginal fluid, synovial fluid, peritoneal fluid, amniotic fluid, saliva, urine, feces, any fluid visibly contaminated with blood and all body fluids in situations where it is impossible to differentiate between body fluids. 2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead).

9. Parenteral - piercing mucous membranes or other skin barrier through such events as needle sticks, human bites, cuts and abrasions.

10. Personal Protective Equipment - specialized equipment or clothing worn by an employee for protection against a hazard. (I.e. surgical or exam gloves, protective eye wear, gowns, face masks etc.) Protective equipment shall be considered appropriate if it does not permit blood or OPIM to pass through to reach the employees undergarments, skin, eyes, mouth or other mucous membranes or if it prevents airborne pathogens from reaching the respiratory system under normal conditions of use and for the duration of time which protective equipment will be used.

11. Universal Precautions - an approach to infection control that assumes all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV and other bloodborne pathogens.

Exposure Determination

1. Routt County EMS providers have determined that the following job descriptions are likely to have potential exposure to bloodborne / airborne pathogens or OPIM:

2. EMT Basic or Basic/ IV, EMT Intermediate, EMT Paramedic

3. The above personnel can expect occupational exposure while performing patient care. Risk is particularly present when performing the following skills: Bleeding control, dressing wounds, intravenous access, intubation, intra-muscular injection, subcutaneous injection, suctioning, cricothyrotomy, chest decompression, intraosseous access, delivery of the newborn, multi-trauma patients, and cleaning / disinfecting ambulances and equipment.

4. Should an employee have a parenteral or mucous membrane exposure to human blood or OPIM they shall immediately, or as soon as feasible notify the on-duty Medical control physician and their supervisor. The employee shall then be instructed to seek medical attention if necessary. The employee shall complete an incident form (see appendix A) and any other required worker's compensation forms. These forms will be submitted to the employee's immediate supervisor as soon as possible.

Methods of Compliance

1. In general, Universal Precautions will be observed to prevent contact with blood or OPIM. All blood or OPIM will be considered infectious regardless of the perceived status of the source individual.

Gloves

1. All Routt County EMS providers shall wear disposable, single use gloves that are provided in each agency. These gloves shall be worn for any patient contact where it can be expected that the employee may have hand contact with blood, OPIM, mucous membranes or non-intact skin. This should include all emergency responses.

2. Contaminated gloves shall be discarded in an appropriate container as soon as possible after each patient contact. Gloves should not be used for multiple patient contacts. Gloves shall be discarded before leaving the patient area and entering the cab. Single use gloves are not to be washed or decontaminated for reuse. However, utility gloves such as those worn for cleaning the ambulance can be reused unless torn, punctured or peeling.

3. Gloves in the medium and large sizes shall be provided by each agency and shall be kept in each response vehicle and medical kit. Each agency may provide other sizes of gloves and will supply their responders with other gloves of appropriate size upon request. All responders are encouraged to carry a limited supply of gloves on their person.

Eye / Face Protection

1. In those situations where it can be reasonably anticipated that splashes, spray, splatter or droplets of blood or OPIM may be generated, the employee shall wear masks in combination with eye protection with solid side shields or chin length face shields. This level of protection should be utilized during all airway management (intubation, suctioning, etc.) activities. Additionally, this protection should be immediately available to the employee during all emergency responses

2. Masks and protective eye wear will be stocked in each vehicle in the patient compartment and medical kits.

Protective Body Clothing

1. Protective body clothing shall be worn when an occupational exposure exists that could potentially soak through an employee's clothing. Should employee's clothes become soaked with blood or OPIM the employee will change into clean clothes as soon as possible. Contaminated clothing shall not be taken home. Contaminated clothing should be placed in a biohazard bag and the Agency Management should be notified of any clothing requiring decontamination. All contaminated protective equipment shall be decontaminated before reuse or disposed of if applicable. The Responder's agency will incur any cost for decontamination or replacement.

2. Impermeable personal protective equipment (PPE) kits will be provided in the patient compartment of each ambulance.

Assisting Respirations

1. Employees shall utilize a pocket mask, bag-valve-mask or mechanical ventilator with disposable circuit when assisting respirations on a patient. These devices will be provided by EMS Agency and be available in the patient compartment and / or Medical Kit when needed.

Sharps

1. There shall be sharps containers mounted in the patient compartment of each ambulance that is readily accessible to the patient treatment area. In addition there will be portable, single use sharps containers in the Medical Kits with the IV supplies. Sharps containers will be inspected weekly and replaced when full. Once full, sharps containers will be sealed and disposed of as bio-hazard waste. Contaminated needles and other sharps shall not be bent, recapped, removed, sheared, or purposely broken. If it is absolutely necessary to recap a needle, a safe, preferably one-handed method should be used. All personnel shall observe universal precautions when disposing of contaminated sharps.

Vehicles

1. Contaminated Surfaces shall be decontaminated after contact with blood or OPIM immediately or as soon as feasible. In addition vehicles will be thoroughly cleaned, including the patient compartment, cab, inside and outside compartments at least monthly. Trash cans will be continuously lined with appropriate, non-permeable liners.

2. Eating and drinking will limited to the cab area or the patient compartment when not transporting a patient after it has been adequately decontaminated. Smoking or other use of tobacco is not permitted in the vehicle at any time. Lip balm, contact lenses or cosmetics should not be applied in the patient compartment. Antiseptic hand cleaner will be provided on each ambulance so personnel may immediately cleanse their hands after removing gloves, before leaving the patient compartment area.

Equipment

1. Equipment that has become soiled from use or exposure to blood or OPIM will be cleaned and decontaminated before being used again. Personnel will use disinfectant provided to clean equipment. Personnel will wear gloves (as well as gowns, eye wear and masks if necessary) when cleaning equipment. Equipment will be cleaned in designated areas only, away from food preparation or personal hygiene areas. Equipment that cannot be cleaned immediately should be transported in an impermeable bag and labeled as biohazard.

Hand Washing

1. Hand washing is still the best method of preventing the spread of infectious material. All personnel shall wash their hands immediately after removing gloves, either with soap and water or with the antiseptic hand cleaner provided in each vehicle. If personnel use the antiseptic hand cleaner, they should still wash with soap and water as soon as feasible.

Airborne Pathogens

1. When EMS personnel or others must transport patients with confirmed or suspected active tuberculosis or meningitis a NIOSH approved and fitted mask should be fitted to the patient. Personnel attending the patient should also wear a NIOSH approved and fitted mask. The ventilation system in the vehicle should also be set to prevent re-circulation of air (use of exhaust fan). All personnel will be issued and fit tested for a NIOSH approved mask. TB screening for all employees will be conducted upon hiring and annually thereafter. Screening may also be included in the follow up of contacts to patients with infectious tuberculosis. Personnel should wear respiratory protection for any patient with a productive cough or sputum reasonably suspected of carrying an airborne pathogen.

Hepatitis B Vaccine

1. Routt County EMS Agencies will offer the Hepatitis B vaccination to all personnel identified in section 2 free of charge before being placed on active status. Personnel declining the vaccination must sign a waiver indicating such. Personnel who refuse may elect to receive the vaccination free of charge at any time thereafter. Hepatitis B titer will be checked 60 days after completion of the series.

2. Post Exposure Evaluation and Follow Up

3. Each Department will have their own policy on post exposure evaluation and follow up.

HIV Prophylaxis

1. Personnel who have an occupational exposure from a known HIV infected source should report immediately to Yampa Valley Medical Center for evaluation and may be placed on the prophylactic medication regimen. This should ideally occur within two (2) hours of the exposure. The prophylactic medication regimen may also be utilized after an unknown source is identified as HIV infected.

Training

1. Training on this policy for all personnel will be conducted during initial orientation prior to being placed on active status. Additional training will occur as required by the OSHA standard.

Responsibility

1. All affected employees are required to be familiar with the procedures outlined within this policy. Disregard for the policy may result in disciplinary action.

References

1. *OSHA Bloodborne Pathogen Standard 29 CFR 1910.1030*

FREE-STANDING EMERGENCY DEPARTMENTS AS EMS DESTINATION

Purpose

1. 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:
   A. 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.
   B. The second type of FSED is the independent freestanding emergency centers (IFECs).
2. 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.
3. 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

1. **Hemodynamically stable patients** may be ***considered*** for transport to a hospital-affiliated FSED with the following exceptions:
   A. No OB patients > 20 weeks estimated gestational age
   B. No trauma patients meeting RETAC trauma center destination guidelines.
   C. No alerts (e.g. STEMI, Stroke, Sepsis).
   D. No post-cardiac arrest patients with ROSC unless uncontrolled airway
2. 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
3. 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.
4. 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.

BASE CONTACT FOR PHYSICIAN CONSULTATION

Purpose

1. To explain the Routt Medical Directors' expectations regarding base physician contact.

General Principles

1. The Routt County EMS 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 Routt County EMS places great faith in the training and expertise of our EMS colleagues and therefore wide latitude is granted throughout the protocol.
2. 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.
3. Throughout the protocol patient "**BASE CONTACT**" is used to signify the need for call in.

Preferred Base Contact Times.

1. The Routt County EMS group feels strongly that access to medical consultation should be readily available at all times and utilized in the following circumstances:
   A. Any time "**BASE CONTACT**" is required or recommended per protocol.
   B. 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.
   C. Necessary deviation from protocol deemed to be in the best interest of the patient.
   D. For selected patient care refusals as indicated by General Guidelines: Patient Non-Transport or Refusal.
   E. During the care of critically ill patient who is not responding to protocol/ algorithmic treatment.

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:

1. 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
2. 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
3. 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
4. Circulatory reserves are small. The loss of as little as one unit of blood can produce severe shock in an infant.
5. Fluid overload is not a concern in children. 20 mL/kg boluses are always considered safe as the initial fluid resuscitation.
6. 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.
7. Vital signs on pediatric should include a blood pressure regardless of age. Providers should, if possible, make at least one attempt at obtaining a blood pressure on every pediatric patient.

Specific Consideration: Transportation safety

Children represent a unique challenge for safe transportation in emergency vehicles. The National Highway Traffic Safety Administration has established guidelines to ensure the safe restraint and positioning of children in emergency vehicles. Children should be restrained during transport. Transport of a child in a restrained adult's arms is not recommended, but may be considered in special circumstances (i.e. severe croup, newborn).

Transportation of children on the side bench seat in the rear compartment is also not recommended. The published goals are to prevent forward motion/ejection of the child, secure the torso, and protect the head, neck and spine in each of the following scenarios:

1. **For a child who is not a patient, but requires transport to a facility**
   All reasonable effort should be made to transport children who are not patients in a vehicle other than the ambulance. If transport in a vehicle other than an ambulance is not possible, transport in a size- appropriate child restraint system in the front passenger seat (with air bags off) or rear-facing EMS provider's seat in the ground ambulance
2. **For a child who is injured/ill and whose condition does not require continuous monitoring or interventions**
   Transport child in a size-appropriate child restraint system secured appropriately on a cot (rear- facing) or in an integrated seat in the EMS provider's seat. Do not use a rear-facing child restraint system in a rear-facing EMS provider's seat. If no child restraint system is available, secure the child on the cot using three horizontal restraints across the child's chest, waist and knees and one vertical restraint across each of the child's shoulders. Remove any bulky clothing on child before restraining. Use blankets to maintain warmth.
3. **For a child whose condition requires continuous or intensive monitoring or interventions**
   Transport child in a size-appropriate child restraint secured appropriately on a cot. If no child restraint system is available, secure the child on the cot using three horizontal restraints across the child's chest, waist and knees and one vertical restraint across each of the child's shoulders.
4. **For a child whose condition requires spinal 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.
5. **For a child requiring transport as part of a multiple patient transport (newborn with mother, multiple children, etc.)**

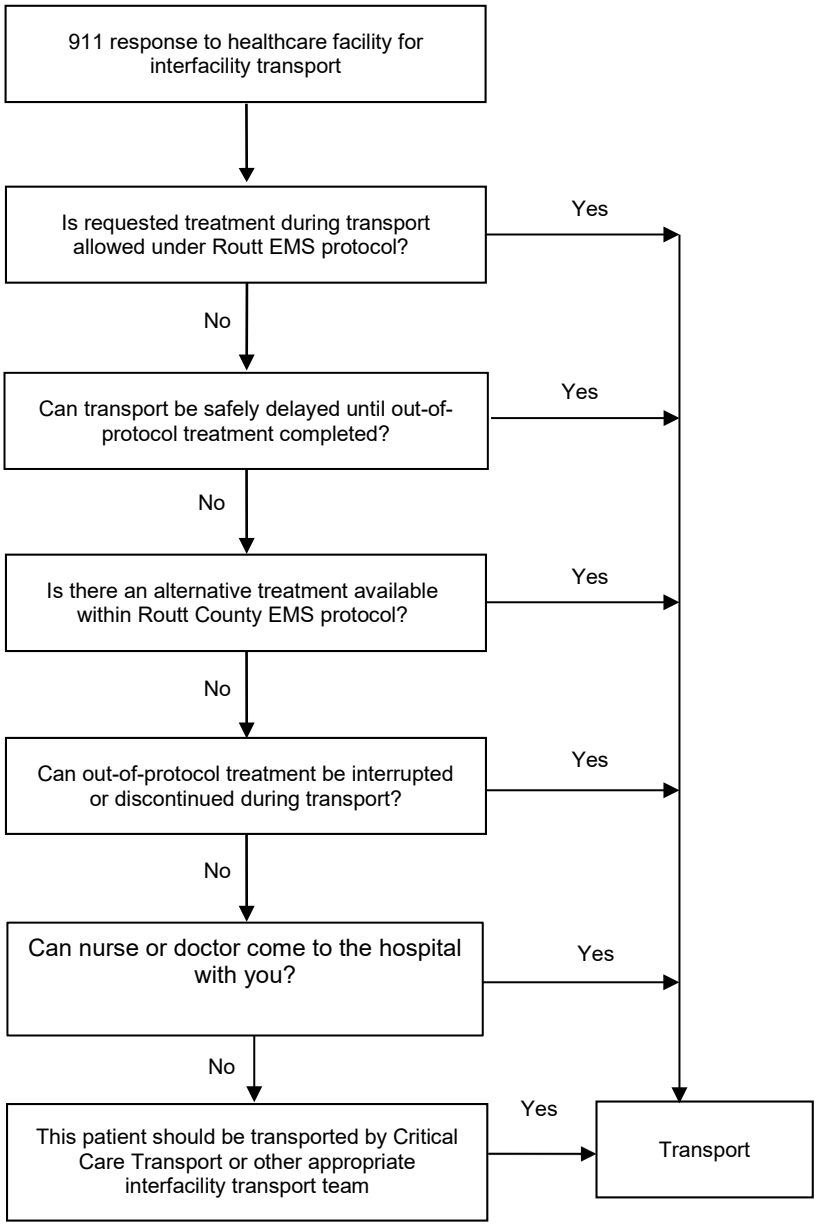
If possible, transport each as a single patient. When available resources prevent single patient transportation, transport patients using safe, designated space available exercising extreme caution and driving at reduced speeds. For mother and newborn, the newborn should be transported in a rear-facing 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.

1. 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.
2. 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.
3. 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
4. Transport the child to their medical "home" hospital whenever possible

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 Routt EMS 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 Routt EMS Protocols

CISD STRESS MANAGEMENT

POLICY

A. Posttraumatic stress disorder (PTSD) is a known complication of service in the pre-hospital environment.
B. The problems associated with PTSD include but are not limited to performance decline, drug and alcohol abuse, domestic violence, clinical depression and suicide.
C. The following policy shall be followed in order to assure that efforts to identify and mediate the effects of PTSD in the pre-hospital providers in the Routt County EMS System.

PROCEDURE

A. All approved agencies within the Routt County EMS System shall have a policy addressing the following:
    1. Method of identification of critical incidents which may require group or individual therapy and/or debriefings.
    2. Identification of a service outside of agency to provide such stress management should it be required.
    3. Attendance requirements of meetings related to critical incident stress or any job related stress.
B. The above-mentioned policy shall be provided to the EMSMD within 3 months of becoming an approved agency within the Routt County EMS System.
C. While NOT a requirement, the EMSMD recommends:
    1. Aggressive use of peer monitoring for signs of stress reactions or PTSD in the pre-hospital providers.
    2. Requiring mandatory attendance at least for initial meeting following identified critical incidents or signs of stress.

CONTROLLED SUBSTANCES INVENTORY

POLICY

A. All agencies shall have appropriate systems in place for the proper security, storage and inventory of all medications.
B. In addition, proper safeguards must exist for the controlled access to benzodiazepines and narcotics.
C. Monthly inventory for the controlled medications shall be submitted to the Medical
D. Director for review of proper use, wasting and inventory control.
E. All agencies will follow all storage and reporting requirements of the DEA.

PROCEDURE

A. All agencies procuring, storing and administering medications shall have their own DEA License and number.
B. It is the responsibility of each agency to know, and follow ALL rules and requirements as put forth by the DEA.
C. Responsibility for security, controlled access, inventory and record keeping lies exclusively with each agency.
D. The Medical Director shall have over-sight responsibility for each agency.
E. The controlled substance medication inventory shall be updated monthly or quarterly.
F. The Medical Director will reconcile inventory for each Agency prior to this meeting
    1. Inventories will be compared to prior balances, as well as the prescriptions written for the agency by the Medical Director.
    2. Variances found in the inventory of controlled substances will be discussed at the CQI/QA meeting, and agencies will be required to investigate the discrepancy.
    3. Any discrepancy will be re-addressed with the Medical Director within 48 hours by the AQD.
G. Agencies with recurrent discrepancies will be found to be in non-compliance with these protocols and will be treated according to the Disciplinary Procedures: Agencies Protocol.

HAZARDOUS MATERIALS PROTOCOL

Indications

A. Responding to reported and/or known hazardous materials incident.
B. Vapor clouds, fire and smoke, leaking substances, frost lines on cylinders, sick personnel, dead or distressed animals and noxious odors are present on or near scene.

Precautions

A. Senses are one of the best ways to detect chemicals, particularly the sense of smell. If you smell something you are too close.
B. A safe approach to the scene is the first element of any EMS response to a hazardous materials emergency. Unless you arrive safely at the site, you will not be able to perform your duties.
C. Observe the site from a distance using binoculars, if possible, before you get too close. Look for danger signs such as vapor clouds, fire and smoke, placards, shape of vehicle or container, leaking substances, frost lines on cylinders, injured personnel, and dead or distressed animals. These are key clues to warn you not to get too close. Remember, you want to be part of the solution, not part of the problem.
D. If the fire department is already on the scene, report in to the incident commander. If you are first on the scene and a hazardous material is suspected, request a hazardous materials team response. Keep yourself and your unit at a safe distance. This usually requires your unit to leave the scene, leaving patients and bystanders in a hazardous situation. Your safety comes first. Seek a location uphill and upwind from the incident.
E. EMS personnel should not be participating in patient decontamination unless trained and equipped to do so.

Procedure

A. Your safety is the highest priority. EMS operations should be established in the cold zone. You should report to the incident commander.
B. Position your vehicle to make a hasty retreat. This may require you to leave the scene to seek safety.
C. Initial assessment, treatment, and decontamination should be performed by the hazardous materials team. Decontaminated patients will be brought to the EMS unit.
D. Once the situation has been assessed, notify the receiving hospital of the following information:

1. Location of the incident
2. Name of chemicals/products involved
3. Number of injured and contaminated
4. Extent of the injuries/contamination
5. Extent that the patients will be decontaminated in the field
6. Your estimated time of arrival
7. Other pertinent information that is available

A. Patient treatment is usually based on signs and symptoms. Specific patient treatment should be based on information obtained from medical control.

FOR MEDICAL TREATMENT OR PROBLEMS CAUSED BY HAZARDOUS MATERIALS CALL CHEMTREC 1-800-424-9300

INTERAGENCY ASSISTANCE

Interagency assistance is to be initiated any time the medical or transport needs of a patient or patients cannot be provided by the primary responding crew.

In general, interagency assistance will be for addition of ALS trained EMT's (EMT-I or EMT-P) to the primary responding crew.

ALS providers are mandatory for the following patient categories:

A. ACLS is required, including medical cardiac arrest and post arrest patients.
B. Chest pain of suspected cardiac origin.
C. Critical patients, including, but not limited to: patients with systolic blood pressure of 80 or less, symptomatic bradycardia or tachycardia, sustained hypertension with headache or altered mental status, and overdose or trauma patients with abnormal vital signs.
D. Head injuries, altered level of consciousness, decreasing level of consciousness.
E. Analgesia needed.

Procedure: Interagency assistance should be requested through Routt County Dispatch. Interagency assistance will never be automatically paged out. The primary responding agency should request interagency assistance prior to the assessment of the patient if it appears from dispatch information, that assistance will be necessary. (For example, if a patient is reported to be in a cardiac arrest and there are no ALS providers on the primary responding crew, that crew should request interagency assistance prior to assessment of the patient.)

Note: EMT-I's are ALS providers and need to only call for EMT-P assistance when it is necessary. EMT-I's should bear in mind that there are stabilizing and lifesaving procedures and medicines that only EMT-P's can perform or administer. At no time and for no reason should appropriate and/or necessary care be withheld from a patient. (Do not hesitate to call for a paramedic.)

MEDICAL HELICOPTER EVACUATION / RENDEZVOUS

Purpose: Facilitate appropriate and timely use of Medical Helicopter response in Routt County:

General Principles

A. Consider use of Medical Helicopter scene response when:
   1. Multi Systems trauma patient with prolonged extrication and/or transport time (i.e. using Medical helicopter will reduce “scene to hospital” time).
   2. Multiple casualty incidents and inability of ground transport units to manage and transport all patients in a timely manner.
   3. Inability or difficulty in transporting patient using conventional means.

B. Highest level EMS provider on-scene or the Incident Commander should make the decision to mobilize a medical helicopter.

C. Consider time of helicopter vs ground transport, where is the helicopter coming from.

D. Consider use of Emergency Medicine Physician scene response if appropriate.

Procedure

A. Decision made to request Medical Helicopter.

B. Request helicopter through Routt County Dispatch or through the helicopter service app, then advise Routt County Dispatch.

C. Give the Medical Helicopter Service Dispatch needed information: scene location with GPS coordinates, LZ, weather and scene ground contact with radio frequency.

D. Continue patient care and stabilization efforts while awaiting helicopter arrival or rendezvous.

Destination

A. In general, patients are to be transported per helicopter service protocol.

B. If there are extenuating circumstances and the patient is to be transported to YVMC this decision is to be discussed with the receiving physician at YVMC.

Medical Helicopter Services

- Classic Lifeguard 1-800-444-9223
- HealthONE Airlife 1-800-821-1994
- Flight for Life 1-800-332-3123
- St Mary’s Airlife 1-800-332-4923
- Greeley Airlife 1-800-247-5433
- Flight for Life (Colorado Springs) 1-800-442-2254

MEDICAL QUALITY CONTROL PROGRAM

Intent

This policy is designed to assure the continuing competency of all of the EMT's in the Routt County EMS system. This policy is also designed to insure continuous quality and quality improvement in all aspects of the system.

Protocols and Standing Orders

The NWRETAC protocols will be followed with exception and/or additions as noted in the Routt County Specific Protocol Section.

The protocols and standing orders contain procedure guidelines and operational guidelines.

The protocols and standing orders are to be strictly adhered to. Deviation from the protocols is to be explained in patient care documentation. All EMT's in Routt County must be familiar with the entire protocol manual and are to complete the form attesting to this familiarity.

Evaluation

Prospective evaluation is performed through assuring that all in the EMT's in the system have the proper certification.

Concurrent evaluation is performed on every run. The low volume nature of the EMS environment in Routt County allows an intimate familiarity with all of the EMT's. On-line medical control is provided through the base station at Yampa Valley Medical Center by the Medical Director or one of the other emergency medicine physicians. The local control of all on-line medical interactions allows evaluation of communication capabilities and assures the appropriateness of all verbal orders. In addition, nearly 100% of patients are transported to Yampa Valley Medical Center and all of these patients are evaluated by the Medical Director or one of the other emergency medicine physicians. Feedback is provided immediately to the EMT's providing care.

Retrospective evaluation is performed on every patient interaction through review of run sheets. Every run is reviewed in detail by the representative of the service and a cross section is reviewed by the Medical Director. Comments, positive and negative, are noted on the Routt County EMS Run Review Form and returned to the service. The comments are reviewed by the EMT. Trends are noted and addressed on an individual basis remedial action and education/training is recommended on an individual basis, if necessary.

Complaint Processing

Any written or verbal complaint delivered to any provider or administrator in the Routt County system is to be formally documented and presented to the chief or director of the involved service and to the Medical Director.
Complaints will be addressed on an individual basis.

Concerns regarding inappropriate care or other patient care incidents that surface from inside or outside the system should be addressed in an identical manner.

Continuing Medical Education

The individual EMT's and service agencies are responsible for maintaining appropriate continuing education. Remedial education or experience is addressed on an individual basis.

NURSES FUNCTIONING IN THE PREHOSPITAL ENVIRONMENT

The Board of Nursing generally takes the position that a nurse may practice according to his/her skill and training, regardless of the environment (prehospital or in-hospital). If a question arises as to whether or not the nurse should have performed a particular delegated medical act, the nurse would have to prove to the Medical Director or Board of Nursing that he/she was adequately trained and competent to perform the particular act. The Nurse Practice Act does not specifically require that a nurse function with written protocols. However, in the prehospital setting, written protocols are considered customary and appropriate. COPIC Risk Management recommendations with regard to supervision of non-physician health care providers at any level are that the physician specify what medical acts and skills (scope of practice) the delegate be allowed, protocols be written consistent with that scope of practice, documentation of the training and work history of the delegate be maintained, and a quality improvement program be developed to ensure that supervision is reviewed in a timely fashion.

POLICY

1. Nurses may function in the prehospital environment on EMS agencies in the Routt County EMS.
2. They will be required to follow the same procedures as any other provider including signing agreements, probationary periods, and skills testing.
3. The Medical Director reserves the right to set the level of practice of any RN at the level appropriate for that nurse given their experience and training level.

PROCEDURE

1. Any nurse who wishes to practice in the Routt County EMS System will meet with the EMSMD, and a plan for probation and level of practice (EMT-B, EMT-I or EMT-P) will be decided upon.
2. The details of this agreement between the EMSMD and a specific nurse will be placed in writing, so as to avoid any confusion regarding the Medical Skills and Acts allowed or the Formulary of Medications Allowed to be Administered by the nurse under the EMSMD's medical license.
3. The level a specific nurse may function at is solely at the discretion of the EMSMD.

MEDICATION ADMINISTRATION

All EMT's and agencies shall take all possible actions to reduce the possibility of medication errors; including, but not limited to, following these protocols. All medication errors shall be reported to the Medical Director within 24 hours. All medication errors shall be **immediately** reported to the Medical Director, or their designee, if any adverse reactions occurred in the patient secondary to the error.

POLICY AND PROCEDURE

1. Once a medication has been chosen for use, the proper medication identification and concentration shall be confirmed, and reconfirmed, prior to administration.
2. Certain medications can be administered via one route only, others via several. Medications also come in different concentrations. **Double-check everything** prior to administration.
3. If the patient has an unexpected response, or lack of response, to a medication- re-check vial or syringe to confirm what medication was given. Contact base if unsure how to treat any possible complications.
4. Any medication administration error shall be recorded in the PCR **exactly** as it happened, without explanations. If patient is awake, it should be explained to them what has occurred and what the possible complications might be.
5. Medication errors will also be explained directly to the accepting EDP at time of patient drop-off.
6. **If an EDP orders you to give a medication you are not allowed to administer, it is your job to inform the EDP of this fact, and NOT administer that medication. You, not the EDP, are responsible for knowing your scope of practice.**
7. Intramuscular medications shall be given in the deltoid or lateral thigh areas only. The superior gluteal site is **NOT** to be used.

ROUTT COUNTY EMS FORMULARY

1. The State of Colorado is very progressive in the number and varieties of medications it allows physicians to delegate administration of to EMS providers. Some of these medications may not have been taught to the providers during their initial EMT training.
2. **It is the responsibility of each EMT, and each EMS Agency, and the Medical Director that all approved and/or required supplemental education has occurred prior to an EMT being allowed to administer any medication.**

MEDICATION ADMINISTRATION SPECIAL CIRCUMSTANCES

1. EMT may administer and monitor medications beyond their approved level under the direct visual supervision of an on-protocol Routt County EMS System approved EMT-I or Paramedic if-
    a. The patient is in extremis or cardiac arrest; **AND**
    b. The medication(s) are approved for the EMT-I or the Paramedic; **AND**
    c. Neither EMT, EMT-I nor Paramedic is in their probationary training period.
    d. The senior EMT is ultimately responsible for all decisions.

2. EMT-I may administer and monitor medications beyond their approved level under the direct visual supervision of an on-protocol Mesa County EMS System approved Paramedic if-
    a. The medication(s) are approved for the Paramedic; **AND**
    b. Neither EMT is in their probationary training period.
    c. The senior EMT is ultimately responsible for all decisions.

3. Communication Failure

a. There are times when communications are not capable between providers and on-line medical control. Attempt to contact medical control must be documented.
b. In the event a provider is unable to communicate with on-line medical control for medications orders, the provider is to use their best judgment in medication use until such time that communications are restored and on-line medical control can be notified of medication administration.
c. In general, medications used in times of communication failure are those which are absolutely necessary for the patient's emergent health needs and not just for comfort measures.
d. All medication administration performed during communication failure shall be reviewed for appropriateness and appropriate documentation. Use of this policy shall be the exception and not the rule. Abuse of this policy shall be dealt with as a Level I deviation.

TRIAGE COLOR GUIDELINES

Red – critically injured or ill patient – needs immediate treatment and transport in order to survive – findings may include:

1. patient is unconscious or has a markedly altered mental status that is not improving or is deteriorating
2. patient has significant respiratory compromise secondary to airway or breathing problem (very rapid or very slow respirations, ineffective effort or inability to breathe)
3. patient has circulatory compromise – signs of shock or impending shock (weak pulse, low BP, cold or clammy skin severe uncontrolled bleeding)

Yellow – significantly injured or ill patient – will most likely survive but requires treatment – findings may include:

1. patient is conscious
2. patient may have altered mental status
3. patient has chest pain or shortness of breath
4. patient has multiple fractures or torso trauma
5. patient involved in incident with significant MOI, regardless of findings

Green – minimally injured or ill patient – findings may include:

1. patient is very stable
2. patient has isolated extremity injury with minimal distress
3. patient has no findings for Red or Yellow status

Mechanism of Injury (MOI)/Indicators of Possible Significant Injury:

MVC with death of any involved party
MVC with high energy
MVC with ejection of patient
Motorcycle crash
Auto-pedestrian accident with significant impact (>5mph)

Radio reports for red trauma patients should always be given directly to the ED Physician.

YAMPA VALLEY MEDICAL CENTER EMERGENCY PHYSICIAN SCENE RESPONSE

Purpose

Facilitate the provision of advanced care at the scene of an individual or mass casualty incident. Emergency Medical Physician (EMP) will have the capability to perform endotracheal intubation, cricothyroidotomy, chest decompression, amputation and central line placement and assist in triage or other EMS activities.

Procedure

EMP and scene response pack are to be picked up at Yampa Valley Medical Center and taken to scene by dispatched transport unit at the discretion of the incident commander.
EMP will take direction from the incident commander until he/she is assigned to a medical task. While functioning at a task or station the EMP at scene will provide direction to the medical personnel in that area or assisting with a task.
EMP will provide assistance at scene as long as feasible. Variables dictating time at scene include continued need for EMP at scene, hospital need for EMP in ER and resources available for EMP at scene.
EMP will be transported back to Yampa Valley Medical Center by dispatch transport unit at the discretion of the incident commander.

Notes

EMP will be equipped with helmet, turn-out coat and trauma pack.
Please note that the EMP is not trained in detailed fire/scene Safety procedures and will need direction at the scene.
This SOP should only be utilized if advanced care, of the nature mentioned above, is necessary.
EMP will only be available for scene response if the ER at Yampa Valley Medical Center is adequately staffed.

QUICK REFERENCE FOR PROCEDURES ALLOWED BY PROTOCOL

Abbreviations	S = Standing order	B = Base contact

Airway Procedures	B	AEMT	I	P
Capnography	S	S	S	S
Supraglottic airway	S	S	S	S
Continuous positive airway pressure (CPAP)	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	AEMT	I	P
Tourniquet	S	S	S	S
ECG - Acquire (including 12-lead)	S	S	S	S
ECG - Interpretation (including 12-lead)			S	S
Blood glucose monitoring	S	S	S	S
IV – Peripheral		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	S
Umbilical Vein Access/Medications			S	S
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
Defibrillation – Manual			S	S
Valsalva maneuver				S
Synchronized cardioversion				S
Transcutaneous cardiac pacing				
• Adult			S	S
• Pediatric			B	S

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
- Primary ALS Airway

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.

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.

NASOTRACHEAL INTUBATION

Paramedic

Indications:

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

Contraindications:

- Apnea
- Severe mid-face trauma

Technique:

1. Initiate BLS airway sequence
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
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.

RAPID SEQUENCE INTUBATION (R.S.I.) ADULT

(Steamboat Springs Fire Rescue Paramedics only)

Paramedic

Indications

GCS ≤ 9 with intact gag reflex and potential for airway compromise.
Trismus / Clenched Jaw
Closed head injury or major stroke with unconsciousness.
Respiratory Failure or Insufficiency
Combative with Inability to Maintain Airway.
Airway Injury, swelling or obstruction
Potential for Airway Compromise

EQUIPMENT

BVM
Suction
ET Tube – tube tie
King Vision
Cricothyrotomy kit
I-Gel
$EtCO_2$
Bougie
RSI Kit

BSI
Restrain the patient if necessary.
Neurological exam with Glasgow Coma Scale.
Attempt to have 2 paramedics on scene.
Establish IV access X2

Pre-oxygenate with NRB or BVM
High flow NC with $ETCO_2$
Monitor, 2 min BP, HR, SPO_2, $ETCO_2$

Ketamine

Yes

Ketamine 2.0 mg/kg IV push

succinylcholine 1.5 mg/kg IV push

Intubation
Verification of proper tube placement

Ketamine 2.0 mg/kg/hr IV maintenance infusion 500mg in 250 of NS

If Needed
- Fentanyl 100 mcg, every 15 minutes.
- Versed 5 mg, every 15 minutes.
- Vecuronium, 10 mg IVP

No

Etomidate 0.3 mg/kg slow IV push. If not adequately sedated, may give up to 0.6 mg/kg.

succinylcholine 1.5 mg/kg IV push.

Intubation
Verification of proper tube placement

- Vecuronium, 10 mg IVP
- Fentanyl 100 mcg, every 15 minutes.
- Versed 5 mg, every 15 minutes.

Treat bradycardia with atropine, 0.5-1 mg IV

Verification of proper tube placement.

A. Visualization of tube passing through the cords
B. Visualization of the chest rising and falling with ventilation.
C. Presence of bilateral breath sounds
D. Absence of air sounds over the epigastrium.
E. Clearing of the tracheal tube with lung inflation and misting of the tube with lung deflation.
F. End tidal CO_2
    1. Capnometer digital
        a. Attach capnometer
        b. Readings
            1) If less than 4 mm/Hg, ET tube may be in the esophagus.
            2) Head injuries at 30 mm/Hg.
            3) Severe asthma; intubated >50 mm/Hg initially; maintain at 35 mm/Hg
            4) If patient has probable acidosis (significant CPR or apneic time) consider readings at 25 mm/Hg
            5) All other patients maintain at 30-40 mm/Hg
        c. Check for good waveform readings.
        d. Once ETT placement is verified, capnometer is to remain in place.
G. Obtain pulse oximetry reading. SaO_2 should be over 95%.
    1. May not be reliable in shock or cold.
    2. Always correlate with heart rate from cardiac monitor or measured pulse.
H. Note proper tube position and secure with appropriate device.
I. Reassess the patient.

Complications

A. Esophageal intubation: particularly common when tube not visualized as it passes through cords. The greatest danger is in not recognizing the error. Auscultation over stomach during trial ventilations should reveal air gurgling through gastric contents with esophageal placement. Also make sure patient's color improves, as it should when ventilating.
B. Intubation of right mainstem bronchus; be sure to listen to chest bilaterally.
C. Upper airway trauma due to excess force with laryngoscope or to traumatic tube placement.
D. Vomiting and aspiration during traumatic intubation or intubation of patient with intact gag reflex.
E. Hypoxia due to prolonged intubation attempt.
F. Cervical spine fracture in-patients with arthritis and poor cervical mobility.
G. Cervical cord damage in trauma victims with unrecognized spine injury.
H. Ventricular dysrhythmias or fibrillation in hypothermia patients from stimulation of airway.
I. Induction of pneumothorax, either from traumatic insertion, forceful bagging, or aggravation of underlying pneumothorax.

Mandatory Reporting

.
A. State Reporting through image trend
B. QA/QI review form filled out with doctor.
C. All RSI procedures will be reviewed by the agency physician advisor or his/her designee within 7 days.
D. All Paperwork goes to jwernig@steamboatsprings.net

BOUGIE ASSISTED SURGICAL CRICOTHYROTOMY

Paramedic

Introduction:

1. 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
2. EMS Medical Director within 24 hours. Surgical cricothyrotomy is to be performed only by paramedics trained in this procedure.
3. 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.
4. 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:

1. 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:

1. 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:

1. Success of procedure is dependent on correct identification of cricothyroid membrane
2. 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.

PEDIATRIC NEEDLE CRICOTHYROTOMY

Paramedic

Introduction:

1. 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.
2. 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.
3. This protocol is considered optional and may not be adopted by all EMS Medical Directors or by all EMS agencies.
4. 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.
5. 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:

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

Contraindications:

1. 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. $ETCO_2$ 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.

SUPRAGLOTTIC AIRWAY/LARYNGEAL MASK AIRWAY/i-Gel

EMT	AEMT	EMT-I	Paramedic

Indications

1. Rescue airway if unable to intubate a patient in need of airway protection
2. Primary airway if intubation anticipated to be difficult and rapid airway control is necessary
3. Primary airway in pulseless arrest, when attempts at intubation are likely to interrupt CPR
4. Designated supraglottic airway for EMTs

Contraindications

1. Pharyngeal pathology (abscess or hematoma)
2. Obstructive lesion below glottis
3. Limited mouth opening
4. Intact gag reflex

Equipment needed

1. BSI
2. Correctly sized laryngeal mask airway or i-Gel(see charts below)
3. Bag valve mask
4. Suction unit
5. Tube tie, securing device
6. Appropriate syringe for expanding cuff
7. ETCO2 with waveform capnography and oxygen saturation monitoring device
8. Cricothyrotomy equipment

Laryngeal Mask Airway Sizes

Mask size	Patient weight(kg)	Age(years)	Length (cm)	Cuff Volume (ml)	Largest ETT*
1	<5 kg	<0.5	10 cm	4ml	3.5
1.5	5-10		10	5-7	
2	6.5-20	0.5-1	11.5	7-10	4.5
2.5	20-30	5-10	12.5	14	5.0
3	30-60	10-15	19	15-20	6.0
4	60-80	>15	19	25-30	6.5
5	>80	>15	19	30-40	7.0

LMA Technique

1. Prepare the LMA for use
2. Perform LMA test, check cuff
3. Deflation of the LMA cuff without wrinkles in cuff
4. Lubricate tube (spread about the cuff) with water soluble lubricant
5. Position the patient's head
6. Properly orient and grasp the tube
7. Insert LMA upward against the hard palate and push the device inwards and backward with the index finger. Advance until definite resistance is felt. Do not use force.
8. Use the other hand to press down on the LMA tube before removing index finger.
9. Ensure that the black line on the airway tube is oriented anteriorly toward the upper lip.
10. Inflate the cuff with just enough air to obtain a seal. Varies with cuff size and patient anatomy. Do not hold the tube during cuff inflation.
11. Ventilate the patient

i-Gel

i-gel size	Patient size	Patient weight guidance (kg)
1	Neonate	2-5
1.5	Infant	5-12
2	Small pediatric	10-25
2.5	Large pediatric	25-35
3	Small adult	30-60
4	Medium adult	50-90
5	Large adult+	90+

1. Grasp the lubricated i-gel firmly along the integral bite block. Position the device so that the i-gel cuff outlet is facing towards the chin of the patient.
2. The patient should be in the 'sniffing the morning air' position with head extended and neck flexed. The chin should be gently pressed down before proceeding to insert the i-gel.
3. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
4. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
5. WARNING: Do not apply excessive force on the device during insertion. It is not necessary to insert fingers or thumbs into the patient's mouth during the process of inserting the device. If there is early resistance during insertion, a 'jaw thrust', 'Insertion with deep rotation' or triple manoeuvre is recommended.
6. At this point the tip of the airway should be located into the upper oesophageal opening and the cuff should be located against the laryngeal framework. The incisors should be resting on the integral bite-block

Post Placement

1. Auscultate breath sounds and confirm placement
2. $EtCO_2$ with waveform capnography.
3. Insert a bite block and secure the tube.
4. Monitor end-tidal carbon dioxide level.
5. Monitor oxygen saturation levels

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:

1. Respiratory or cardiac arrest
2. Systolic BP less than 90mmHg
3. Lack of airway protective reflexes
4. Significant altered level of consciousness such that unable to follow verbal instructions or signal distress
5. Vomiting or active upper GI bleed
6. Suspected pneumothorax
7. Trauma
8. 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:

1. Should patient deteriorate on CPAP:
   A. Troubleshoot equipment
   B. Consider endotracheal intubation
   C. Assess need for possible chest decompression due to pneumothorax
   D. Assess for possibility of hypotension due to significantly reduced preload from positive pressure ventilation

2. In-line nebulized medications may be given during CPAP as indicated and in accordance with manufacturer guidelines
3. 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.

CAPNOGRAPHY

EMT	AEMT	EMT-I	Paramedic

Indications:

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

Contraindications:

- 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:

1. To understand and interpret capnography, remember the 3 determinants of $ETCO_2$:
   A. Alveolar ventilation
   B. Pulmonary perfusion
   C. Metabolism
2. Sudden loss of $ETCO_2$:
   A. Tube dislodged
   B. Circuit disconnected
   C. Cardiac arrest
3. High $ETCO_2$ (> 45)
   A. Hypoventilation/CO_2 retention
4. Low $ETCO_2$ (< 25)
   A. Hyperventilation
   B. Low perfusion: shock, PE, sepsis
5. Cardiac Arrest:
   A. 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
   B. If $ETCO_2$ is dropping, change out person doing chest compressions
   C. 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
   D. Sudden rise in $EtCO_2$ may be an indicator of ROSC

NEEDLE THORACOSTOMY FOR TENSION PNEUMOTHORAX DECOMPRESSION

EMT-I	Paramedic

Indication:

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

Technique:

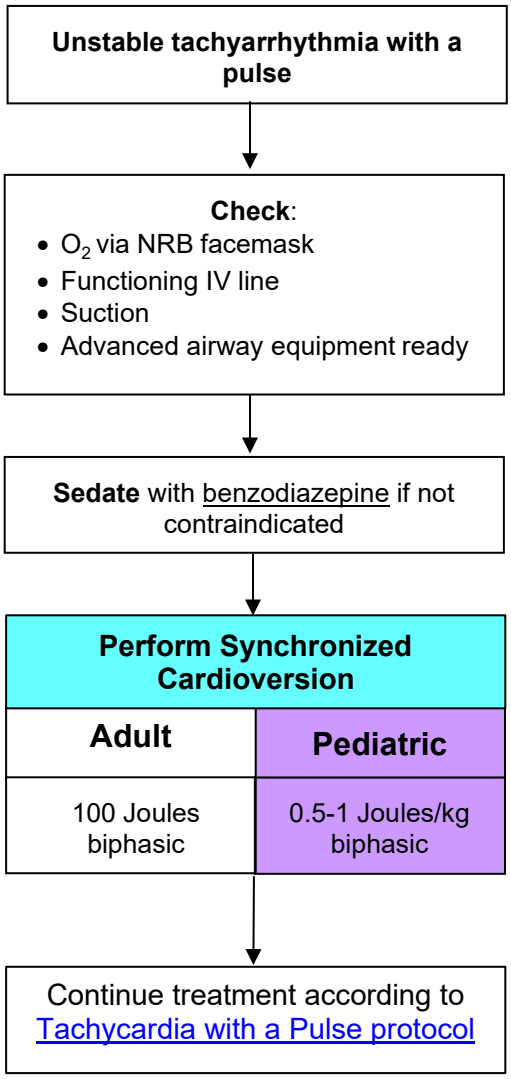
1. Expose entire chest
2. Clean skin overlying site with available skin prep
3. Insert angiocath either at 2nd intercostal space at midclavicular line, or 5th intercostal space at midaxillary line
   A. Either approach is acceptable, generally the site with the least soft tissue overlying ribs is preferred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

Precautions:

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

SYNCHRONIZED CARDIOVERSION

Paramedic



Precautions:

- If rhythm is AV nodal reentrant tachycardia (AVNRT, historically referred to as “PSVT”) it is preferred to attempt a trial of adenosine prior to electrical cardioversion, even if signs of poor perfusion are present, due to rapid action of adenosine
- If defibrillator does not discharge in “synch” mode, then deactivate “synch” and reattempt
- If sinus rhythm achieved, however briefly, then dysrhythmia resumes immediately, repeated attempts at cardioversion at higher energies are unlikely to be helpful. First correct hypoxia, hypovolemia, etc. prior to further attempts at cardioversion
- If pulseless, treat according to Medical Pulseless Arrest Algorithm
- Chronic atrial fibrillation is rarely a cause of hemodynamic instability, especially if rate is < 150 bpm. First correct hypoxia, hypovolemia, before considering cardioversion of chronic atrial fibrillation, which may be difficult, or impossible and poses risk of stroke
- Sinus tachycardia rarely exceeds 150 bpm in adults or 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
- Increase Joules by 50 if rhythm does not convert

TRANSCUTANEOUS CARDIAC PACING

EMT-I	Paramedic

Indications

Symptomatic bradyarrhythmias (includes A-V block) not responsive to medical therapy

Precautions

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

Contraindications

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 60-80 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 patient has systolic BP above 100 consider ketamine or versed
10. 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.

INTRAOSSEOUS CATHETER PLACEMENT

EMT-IV In extremis	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 or alcohol prep.
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
5. **EMT-IV may start and IO if patient in extremis and properly trained.**

TOURNIQUET PROTOCOL

EMT	AEMT	EMT-I	Paramedic

Indications

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

Precautions

1. A tourniquet applied incorrectly can increase blood loss.
2. Applying a tourniquet can cause nerve and tissue damage whether applied correctly or not. Proper patient selection is of utmost importance.
3. Injury due to tourniquet is unlikely if the tourniquet is removed within 1 hour. In cases of life- threatening bleeding, benefit outweighs theoretical risk.
4. 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

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

RESTRAINT PROTOCOL

EMT	AEMT	EMT-I	Paramedic

Indications:

1. 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).
2. **Paramedic:** Consider pharmacological sedation for agitated patients that
3. require transport and are behaving in a manner that poses a threat to him/herself or others.
   A. See Agitated/Combative Patient Protocol: (The term “chemical restraint” is no longer preferred)
4. Restraints may be indicated for patients who meet the following criteria:
   A. 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.
   B. A patient who exhibits violent, combative or uncooperative behavior who does not respond to verbal de-escalation.
   C. A patient who is suicidal and considered to be a risk for behavior dangerous to his or herself or to healthcare providers.
   D. A patient who is on a mental health hold.

Precautions:

1. When appropriate, involve law enforcement
2. 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.
3. 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.
4. Be sure to evaluate the patient adequately to determine his or her medical condition, mental status and decision-making capacity.
5. Do not use hobble restraints and do not restrain the patient in the prone position or any position that impairs the airway or breathing.
6. Search the patient for weapons.
7. 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

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.

OROGASTRIC TUBE INSERTION WITH ADVANCED AIRWAY

Paramedic

Indications:

- Gastric decompression in the intubated patient
- Gastric decompression with placement of King/iGel/LMA airway
- Intended for agencies with prolonged transport times in situations 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.
   C. 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.
5. Secure with tape to inserted airway and attach to low continuous suction if indicated

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. Be alert for any medical conditions which may ensue following physical struggle. Refer to agitate/combative protocol for appropriate assessment and treatment.
2. Confirm the TASER® has been shut off and the barb cartridge has been disconnected.
3. Using a pair of shears cut the TASER® wires at the base of the probe.
4. Place one hand on the patient in area where the probe is embedded and stabilize the skin surrounding the puncture site. Using the other hand (or use pliers) firmly grasp the probe.
5. In one uninterrupted motion, pull the probe out of the puncture site maintaining a 90° angle to the skin. Avoid twisting or bending the probe.
6. Repeat the process for any additional probes.
7. Once the probes are removed, inspect and assure they have been removed intact. In the event the probe is not removed intact or there is suspicion of a retained probe, the patient must be transported to the emergency department for evaluation.
8. Cleanse the probe site and surrounding skin with betadine and apply sterile dressing.
9. Advise patient to watch for signs of infection including increased pain at the site, redness swelling or fever.

PAIN MANAGEMENT

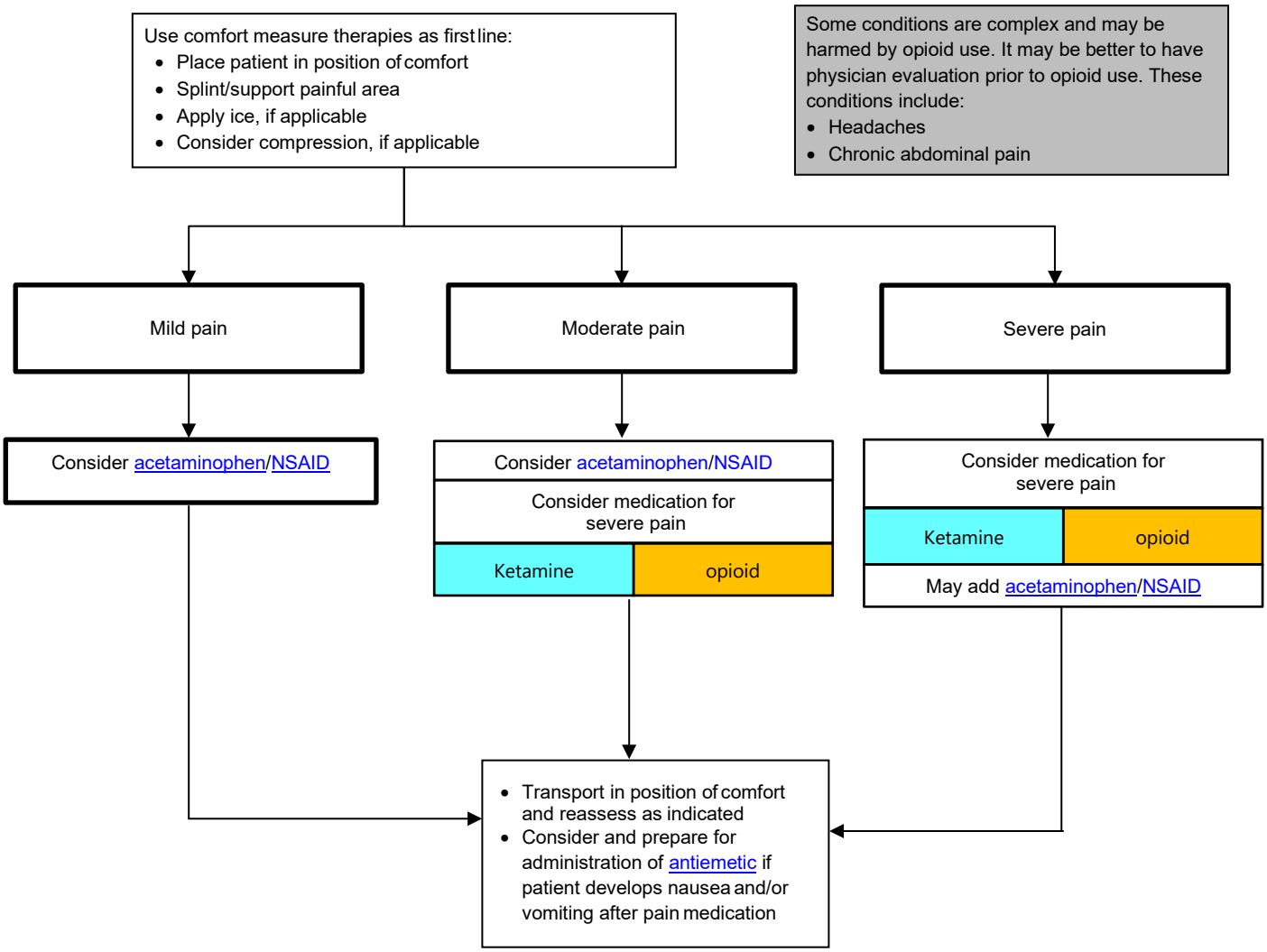
Goal of Pain Management

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

Assessment

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

General Pain Management Technique



General Information

A. Document assessment or pain scale before and after administration of pain medications. Reassess pain 5 minutes after IV administration.
B. Strongly consider ½ typical dosing in the elderly or frail patient

Pediatric Pain Scales

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

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

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

Recommended Pain Scale for Ages 4-12 Years

Faces Pain Scale – Revised (FPS-R)

0 2 4 6 8 10

OBSTRUCTED AIRWAY

EMT | AEMT | EMT-I | Paramedic

Attempt to determine cause of obstruction

Does patient show universal sign of choking?

Yes
- Perform Heimlich maneuver
- For visibly pregnant or obese patients perform chest thrusts only
- For infants, 5 chest thrusts then 5 back blows

No

If obstruction is complete, patient will be mute.
If patient can speak, obstruction is incomplete

Assess severity of obstruction

Severe or Complete Obstruction
(mute, silent cough, severe stridor)

- Open airway with head tilt-chin lift or jaw thrust if craniofacial trauma
- Attempt ventilation with BVM

Able to ventilate or obstruction cleared?

Yes

No

- Perform laryngoscopy
- If foreign body visualized, use McGill forceps to remove or consider pushing object into mainstem bronchus with ETT

Able to ventilate or obstruction cleared?

Yes

No

- Perform abdominal thrusts or chest thrusts until obstruction relieved then reattempt ventilations with BVM
- For infants, 5 chest thrusts, then 5 back blows

Consider cricothyrotomy if suspected supraglottic obstruction and unable to oxygenate with BVM

Unconscious Patient

Begin chest thrusts
Each time airway is opened look in mouth for FB and if found, remove it

Mild or Moderate Obstruction

- Do not interfere with a spontaneously breathing of coughing patient
- Position of comfort
- Give high flow oxygen
- Suction if needed

Is obstruction cleared?

Yes

No

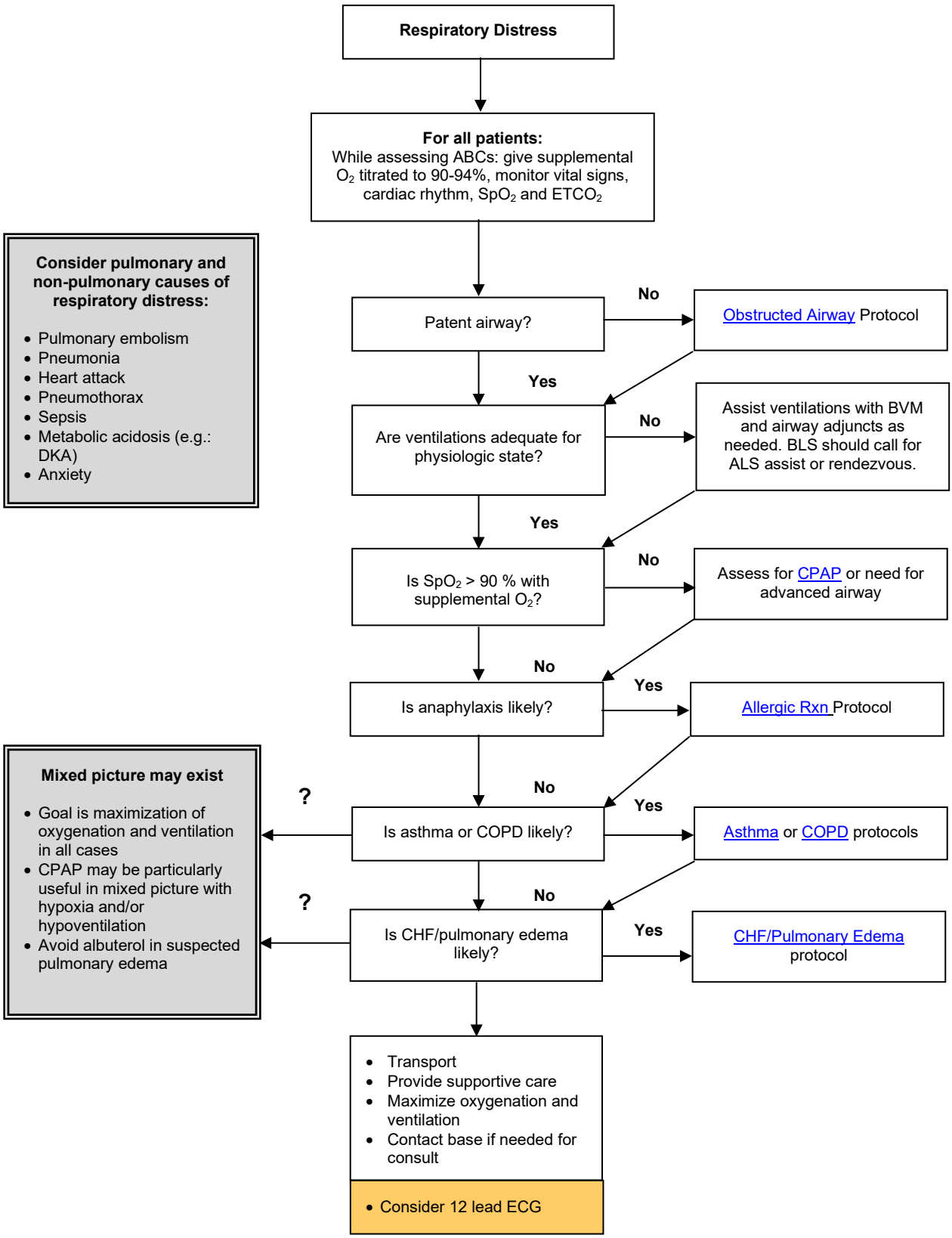
- Supportive care and rapid transport
- If patient deteriorating or develops worsening distress proceed as for **complete obstruction**

Once obstruction relieved:
- Position of comfort or left lateral recumbent position
- O2 via NRB 15 Lpm
- Monitor ABCs, SpO2, vital signs
- Suction PRN and be prepared for vomiting, which commonly occurs after obstruction relieved

- For visibly pregnant or obese patients perform chest thrusts instead
- Consider chest thrusts in any patient if abdominal thrust ineffective

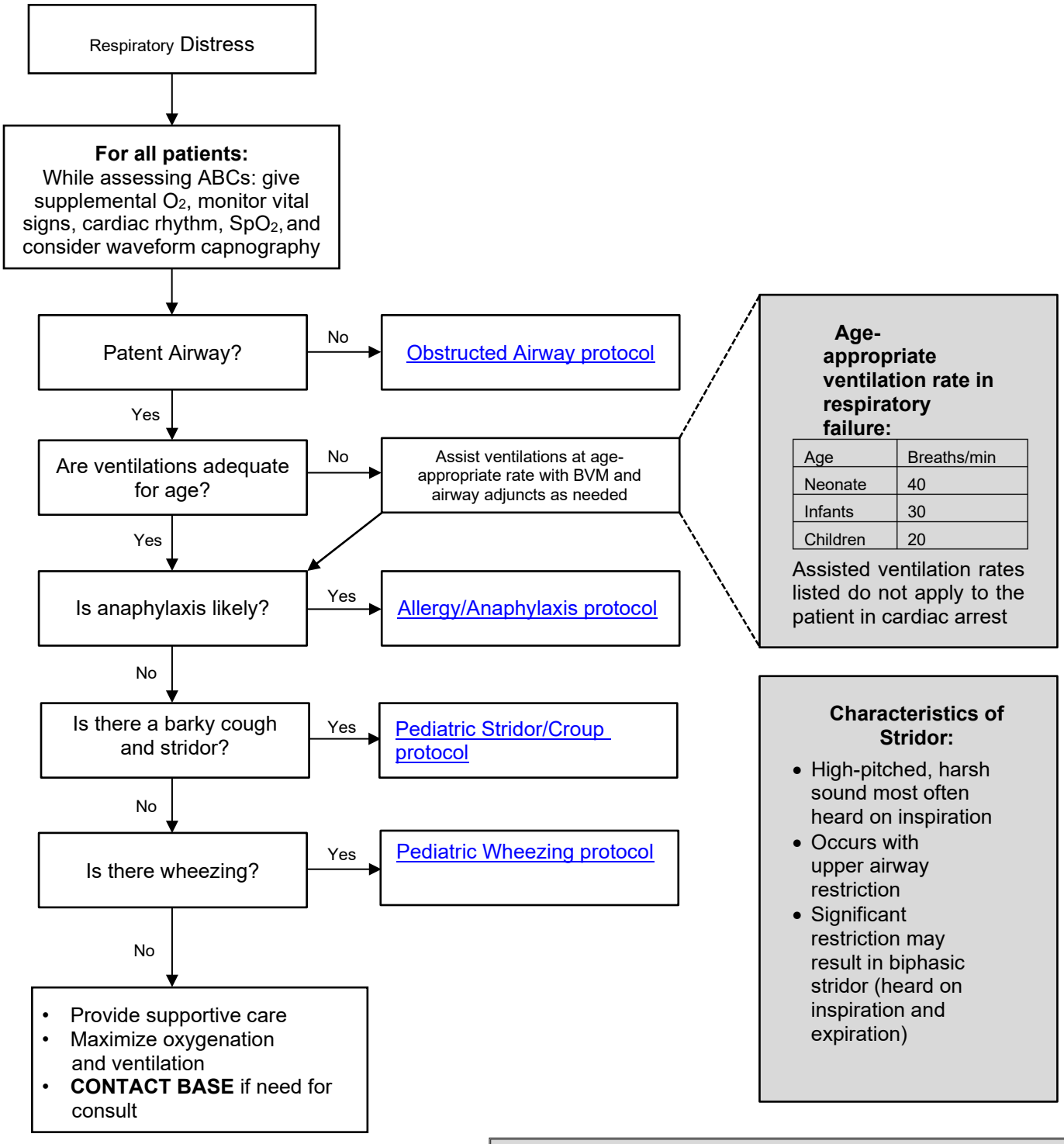
UNIVERSAL RESPIRATORY DISTRESS

EMT	AEMT	EMT-I	Paramedic



PEDIATRIC UNIVERSAL RESPIRATORY DISTRESS

EMT	AEMT	EMT-I	Paramedic



Consider pulmonary and non-pulmonary causes:

- Foreign body
- Croup
- Pneumonia
- Bronchiolitis
- Pulmonary embolism
- Sepsis
- Metabolic derangement
- Anxiety

ADULT WHEEZING

EMT	AEMT	EMT-I	Paramedic

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

Adult Respiratory Distress Protocol and prepare for immediate transport

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

Give nebulized albuterol + ipratropium

MDI or nebulized albuterol

May give continuous neb for severe respiratory distress

Consider pulmonary and non-pulmonary causes of respiratory distress:

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

Is response to treatment adequate?

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

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

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

COPD

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

Is response to treatment adequate?

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

- Consider IV magnesium

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

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

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

PEDIATRIC WHEEZING

EMT | AEMT | EMT-I | Paramedic

- Pediatric Universal Respiratory Distress protocol
- Assess: SpO_2, consider waveform capnography, RR, lung sounds, accessory muscle use and mental status

Consider the cause of wheezing before initiating specific therapy

Initial best indicator is age. If patient 2 years old, bronchiolitis is most likely. Age > 2 reactive airways disease is more likely.

Although bronchiolitis and asthma are the most common causes of wheezing in infants and children, respectively, you should consider pulmonary and non-pulmonary causes of respiratory distress, especially if patient not responding as expected to treatment:

Examples: pneumonia, pulmonary edema, congenital heart disease, anaphylaxis, pneumothorax, sepsis, metabolic acidosis (e.g.: DKA, toxic ingestion), foreign body aspiration, and croup.

Age ≤ 2 years old

Bronchiolitis most common

- Viral illness characterized by fever, copious secretions and respiratory distress typically seen November through April
- Most important interventions are to provide supplemental oxygen and suction secretions adequately
- Bronchodilators and steroids do not work

- Administer oxygen to obtain saturations > 90%
- Nasal suction
- Transport in position of comfort
- Monitor SpO2, RR, retractions, mental status

If worsening respiratory distress despite above therapies, re-suction nostrils and assist ventilations with BVM

Age > 2 years old

Asthma most common

Presentation suggests asthma:
wheezing, prolonged expiratory phase, decreased breath sounds, accessory muscle use, known hx of asthma or albuterol use

Give nebulized albuterol + ipratropium

MDI or nebulized albuterol

May give continuous neb for severe respiratory distress

Is response to treatment adequate

Yes

No

Severe exacerbation

- IM epinephrine if no response to neb and severe distress
- Start IV
- IV methylprednisolone
- 20mL/kg NS bolus

Is response to treatment adequate?

Yes

No

- Assess for pneumothorax
- Assist ventilations with BVM
- Consider Advanced Airway

- Continue monitoring and assessment en route
- Be prepared to assist ventilations as needed
- **Contact Base** for medical consult if deterioration

IV methylprednisolone

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

IM epinephrine

Is indicated for the most severe attacks deemed life-threatening and not responding to inhaled bronchodilators.

PEDIATRIC STRIDOR/CROUP

EMT	AEMT	EMT-I	Paramedic

Characteristics of Croup:

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

Pediatric Universal Respiratory Distress protocol and prepare for immediate transport

↓

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

↓

Check SpO_2, give oxygen as needed

↓

Are symptoms severe and croup most likely?

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

No → ↓

Yes → ↓

Give nebulized epinephrine

↓

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

↓

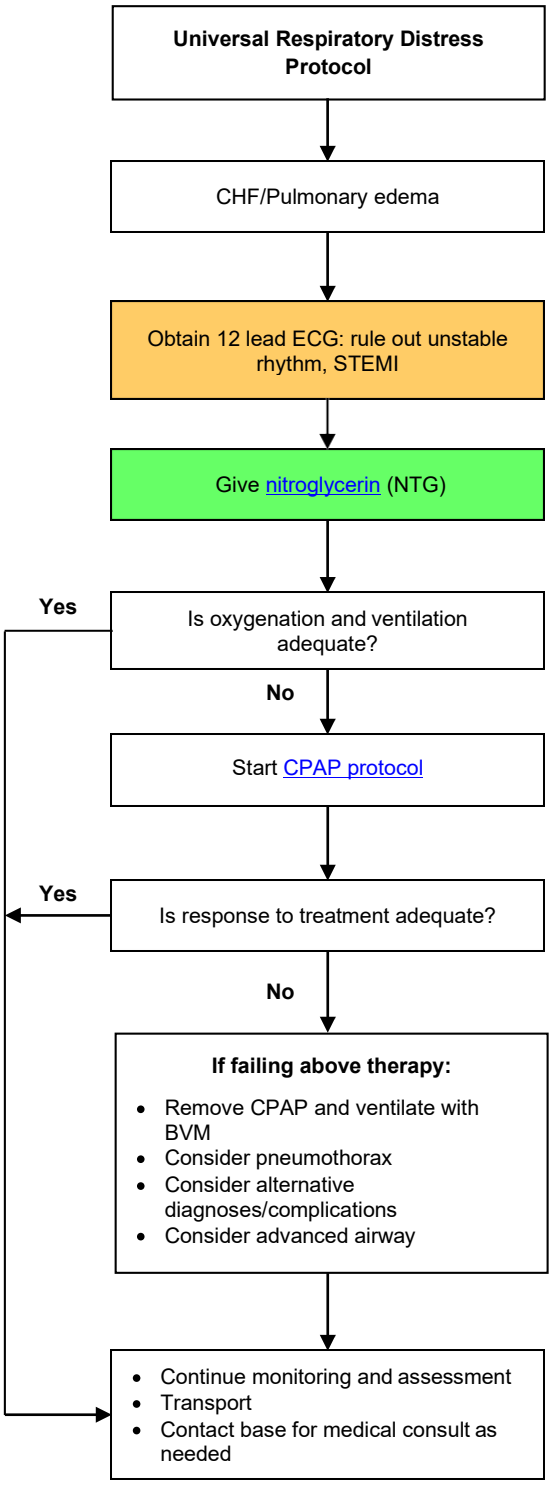
- Continue monitoring and assessment en route
- **Contact Base** for repeat dose of nebulized epinephrine and medical consult as needed

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.

CHF/PULMONARY EDEMA

EMT	AEMT	EMT-I	Paramedic



Therapeutic Goals:

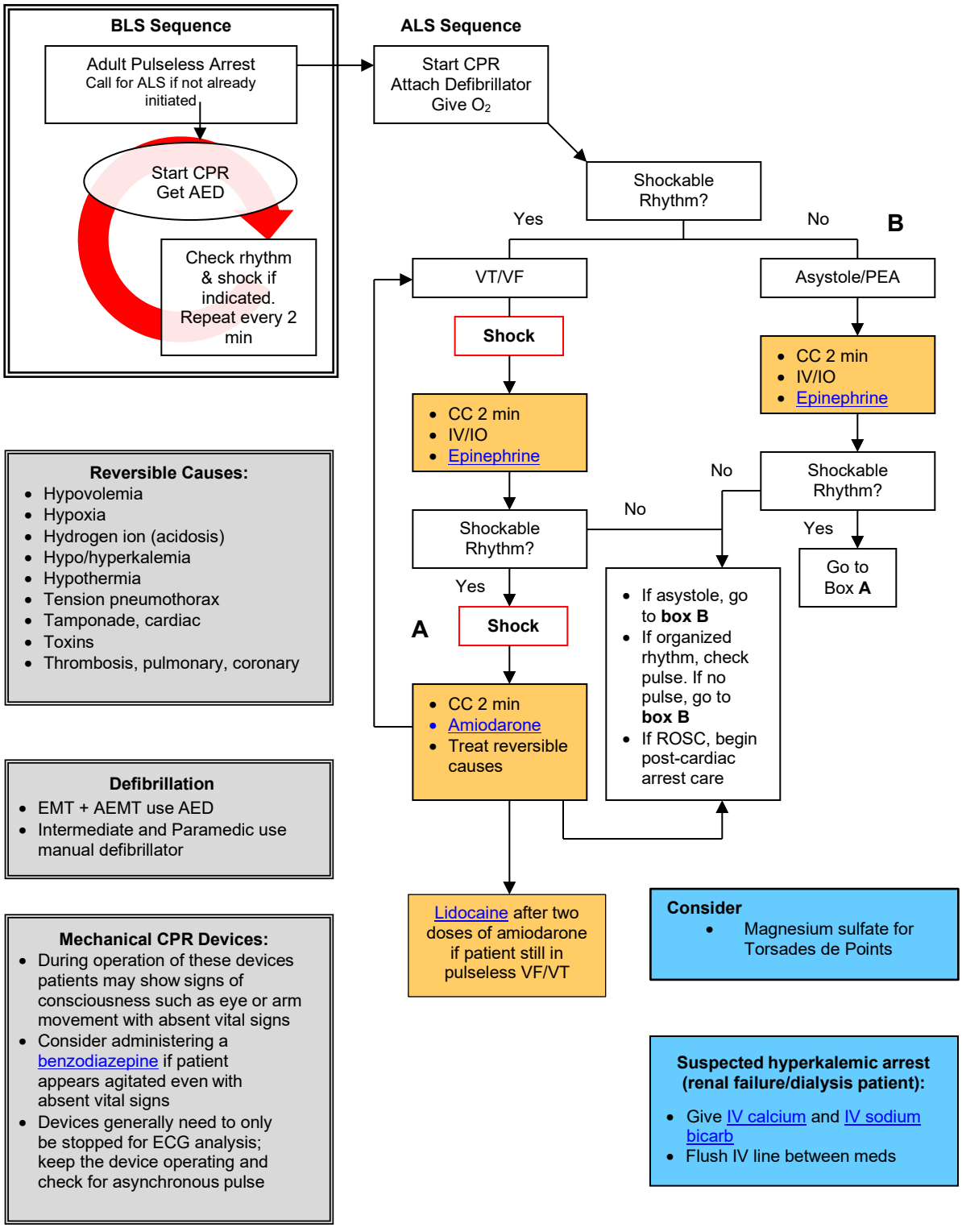
- Maximize oxygenation
- Decrease work of breathing
- Identify cardiac ischemia (Obtain 12 lead ECG)

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

MEDICAL PULSELESS ARREST ALGORITHM

EMT	EMT-IV	AEMT	EMT-I	Paramedic



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

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 2 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, give breath every 2-3 seconds
- Do not over ventilate

Medications

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

Airway

- BVM initially then advanced airway
- 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

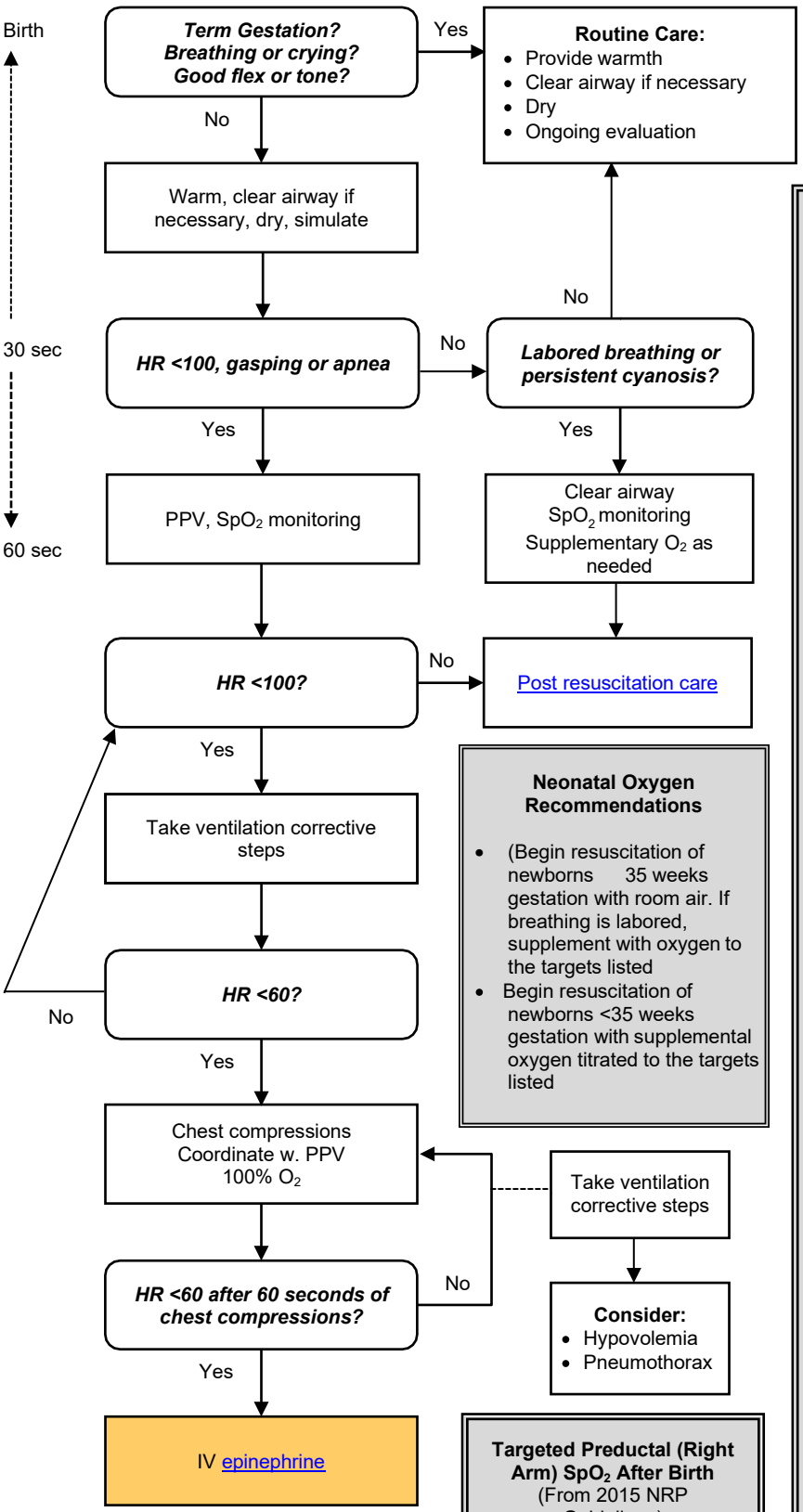
- Pacing is not indicated for asystole and PEA. Instead start chest compressions according to Medical Pulseless Arrest Algorithm.
- Pacing should not be undertaken if it follows unsuccessful defibrillation of VT/VF as it will only interfere with CPR and is not effective

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

NEONATAL RESUSCITATION

EMT | EMT-IV | AEMT | EMT-I | Paramedic



Neonatal Oxygen Recommendations

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

Targeted Preductal (Right Arm) SpO_2 After Birth
(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

POST-RESUSCITATION CARE WITH ROSC

EMT	EMT-IV	AEMT	EMT-I	Paramedic

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 after ROSC, if possible

Target ROSC Vital Signs

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

ROSC after cardiac arrest

↓

Perform 12 lead EKG

↓

Is STEMI Present? → Initiate Cardiac Alert

↓

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

↓

Is there hypotension for age and/or signs of shock? → Medical Hypotension/Shock protocol

↓

Assess for dysrhythmia

↓

Recurrent dysrhythmia? → Treat recurrent dysrhythmia per appropriate protocol

↓

- Continuous rhythm monitoring and pulse checks
- Focused neuro exam (AVPU/GCS)
- Transfer to closest appropriate facility

TACHYARRHYTHMIA WITH POOR PERFUSION

EMT | EMT-IV | AEMT | EMT-I | Paramedic

Tachyarrhythmia

- Support ABCs
- IV access
- Give Oxygen
- 12 Lead ECG

Probable Sinus Tachycardia?
- Adult: rate usually <150
- Children: rate usually <180
- Infants: rate usually <220

- Search for and treat underlying cause: e.g. dehydration, fever, hypoxia, hypovolemia, pain
- Consider medical shock

1 **Is patient stable?**

Unstable signs include altered mental status, chest pain, hypotension, signs of shock-rate-related symptoms uncommon if HR < 150

Stable
- Identify rhythm
- **Measure QRS width**

2 **Unstable**

Immediate synchronized cardioversion

- Repeat 12 lead ECG
- Identify rhythm
- **Contact Base**

Narrow QRS
Adult < 0.12 msec
Pediatric <0.09 msec

Wide QRS
Adult >0.12 msec
Pediatric >0.09 msec

Regular
- Children who are stable with AVNRT generally remain so and transport is preferred over
- Try Valsalva maneuver
- Give adenosine IV If suspected AV nodal reentrant tachycardia (AVNRT)*
- EMT-I requires **direct order** for adenosine

3 **Irregular**
- Atrial fibrillation, flutter or MAT
- Do not give adenosine
- New onset Consider diltiazem
- Monitor and transport
- If becomes unstable, go to **box 2**

Regular
- Contact Base for consult
- V Tach (>80%) or SVT with aberrancy
- Contact Base for verbal order for amiodarone unless contraindicated
- If regular and polymorphic (Torsades de Pointes) consider magnesium

Irregular
- See **box 3**
- Contact base for consult
- Do **NOT** give adenosine

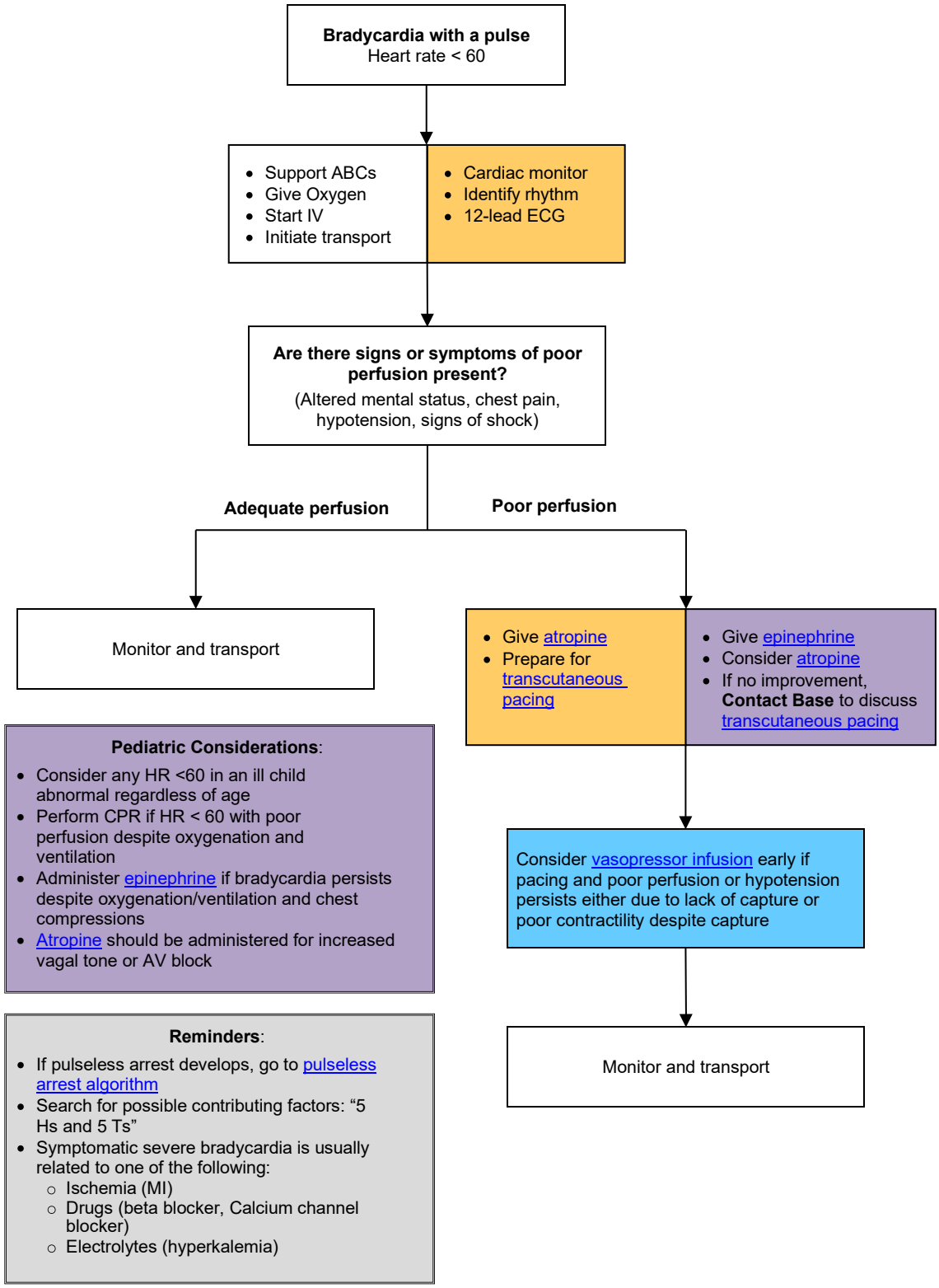
Does rhythm convert?

Converts
- Monitor in transport
- If recurrent dysrhythmia, go to **box 1**

Doesn't Convert
- If Atrial Flutter, consider diltiazem
- Contact base for consult
- Monitor in transport
- If unstable, go to **box 2**

BRADYARRHYTHMIA WITH POOR PERFUSION

EMT	EMT-IV	AEMT	EMT-I	Paramedic



CHEST PAIN

EMT	EMT-IV	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?

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

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)

Give SL nitroglycerin if suspected cardiac chest pain and no contraindication

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

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

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

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
- Place combination defibrillation/pacing pads on patient
- 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

HYPERTENSION

EMT-I	Paramedic

General Considerations: There are many causes for hypertension, most of which do not require immediate treatment. Acute problems are rarely due to hypertension itself. Make sure you are treating the underlying condition and not just the hypertension. This protocol is intended for isolated hypertension.

IF PREGNANT TREAT PER OB/GYN PROTOCOL

Monitor Airway
Administer O_2
-titrate to SaO_2 > 92%

↓

Establish IV access

↓

- -Monitor cardiac rhythm, consider 12 lead ECG
- -If diastolic remains >130 and patient has symptoms of encephalopathy, chest pain, pulmonary edema, **CONTACT BASE** to consider **nitroglycerine 0.4mg** SL and/or **nitroglycerine paste**

Acute stroke victims will frequently have elevated blood pressures which should not be treated in the field

VENTRICULAR ASSIST DEVICES

EMT	EMT-IV	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.

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

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

Is the patient stable?

STABLE

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

UNSTABLE

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

VAD RUNNING

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

VAD NOT RUNNING

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

Common VAD Complications

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

Key Points

- Unstable VAD patients should be transported to the nearest appropriate facility. University of Colorado Hospital is the only facility in the region that definitively treats VAD patients—and is therefore the preferred destination when patient condition is stable and conditions/operational factors allow transport.
- **Contact VAD Coordinator as soon as possible at 24/7 pager # (303) 266-4522. For pediatric patients contact the Children's Hospital Colorado transplant coordinator pager at (303) 890-3503.** Provide patient name, DOB, condition & ETA at destination for consultation and/or if transporting to University of Colorado Hospital. VAD coordinator will call back.
- VAD patient family members are excellent resources to assist with patient history and evaluation/repair of VAD alarms/faults.
- **It is vital to transport the patient's back-up batteries and emergency equipment with the patient.**

Device specific information for EMS can be found at: https://www.mylvad.com/medical-professionals/ems

MEDICAL SHOCK PROTOCOL

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Hypotension for age and/or signs of poor perfusion

- ABCs
- Complete set of vital signs
- Full monitoring
- O_2 via NRB facemask @ 15L/min
- IV/IO access
- Elevate legs

Consider etiology of shock state

Treat dysrhythmia per appropriate protocol

Administer IV/IO fluids 20 mL/kg up to 1 L; reassess and repeat if needed

For ongoing hypotension, poor perfusion or pulmonary edema, consider Vasopressor Infusion

If patient at risk for adrenal insufficiency, see Adrenal Insufficiency protocol

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

SEPSIS

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Evaluate and identify potential sepsis – is there suspected or confirmed infection?

- ABCs
- Complete set of vital signs
- Monitoring including SpO2 and waveform capnography
- O_2 as appropriate

Evaluate potential SIRS Criteria:
- Temp < 36C (96.8F) or > 38C (100.4F)
- HR > 90 (or tachycardic for age)
- RR > 20 or mechanical ventilation (or tachypneic for age)

Are there two or more SIRS criteria?

No →
- Routine Care
- IV, O_2, monitor
- Consider fluid bolus if sepsis suspected
- Transport to closest appropriate hospital
- Continue to re-assess vital signs and perfusion

Yes

Is there evidence of hypoperfusion? (ANY ONE OF THE FOLLOWING):

- Hypotension for age
- Altered mental status (excluding simple febrile seizure)
- Delayed capillary refill AND mottling
- Systolic BP <90mmHg
- MAP <65 mmHg
- Sustained EtCO2 <25 mmHg

No →
- Routine Care
- IV, O_2, monitor
- Consider fluid bolus if sepsis suspected
- Transport to closest appropriate hospital
- Continue to re-assess vital signs and perfusion

Yes

- IV fluid bolus @ 30mL/kg (if no sign of fluid overload)
- 2 large bore IV's
- Transport to closest appropriate hospital

NOTIFY HOSPITAL of potential sepsis (hospital activation criteria may vary)

For ongoing hypotension, poor perfusion, or pulmonary edema, consider Vasopressor Infusion

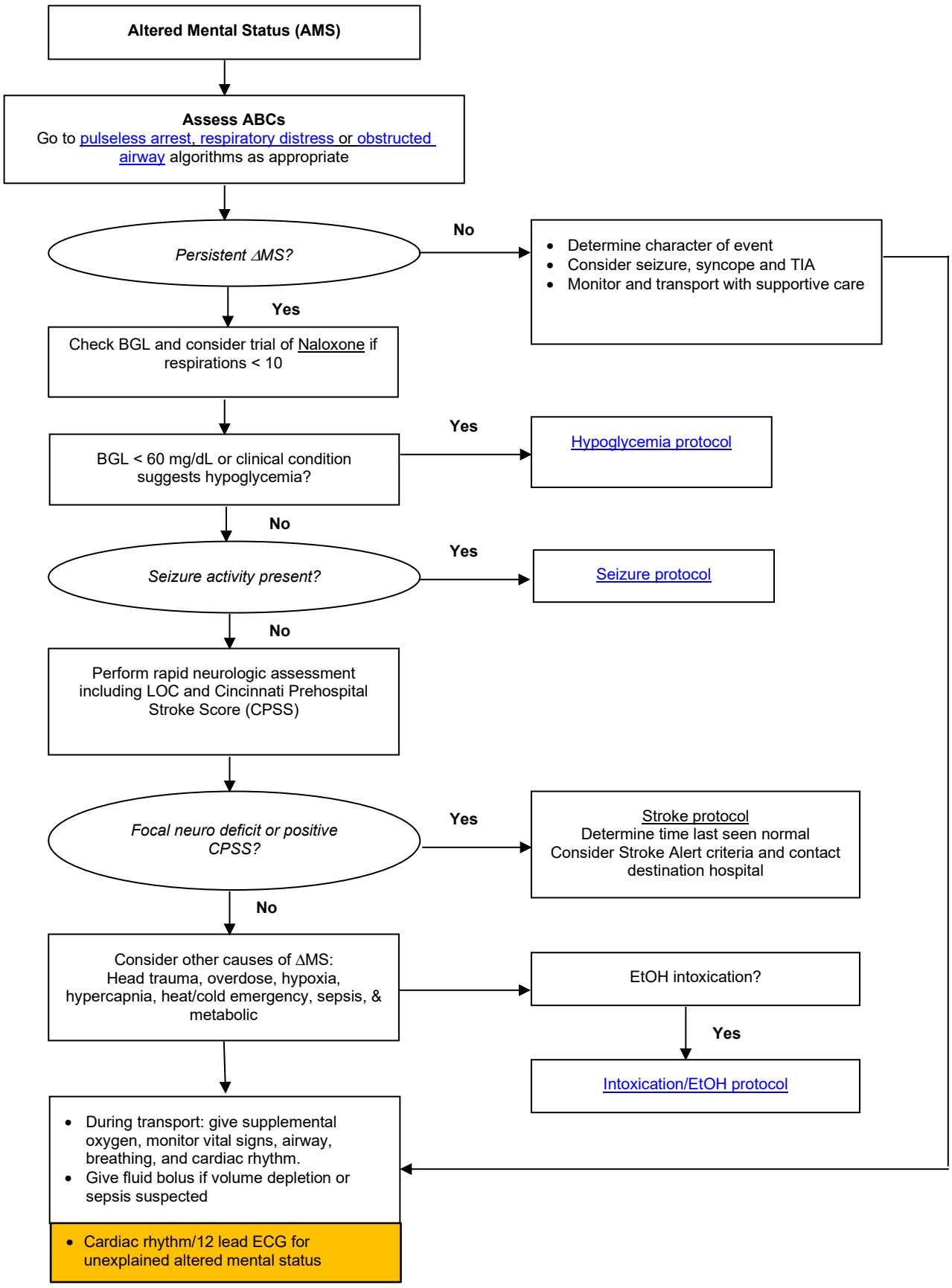
Common Infection Sites with Severe Sepsis
- Respiratory
- Bacteremia (unspecified site)
- Genitourinary (more prevalent with females)
- Abdominal
- Device-related
- Soft tissue/wound
- Central nervous system
- Endocarditis

Principles of Sepsis
- Multiple studies demonstrate the benefit of early recognition and treatment of sepsis, including in the prehospital setting.
- Early hospital notification of sepsis may lead to shorter time to IV fluid and IV antibiotics and increase survival.
- Patients with septic shock require aggressive IV fluid resuscitation. Starting dose should be 30mL/kg of IV fluid.
- EtCO2 has been demonstrated to correlate with serum lactate levels and predictive of severity of sepsis. A sustained EtCO2 <25 mmHg may indicate hypoperfusion.
- Some agencies may carry lactate monitors. In that case, a lactate level of 4 mmol/L is indicative of hypoperfusion.

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, may need to repeat fluid bolus up to 60mL/kg.
- Goal of therapy is normalization of vital signs within the first hour.
- Hypotension is a late sign in pediatric shock patients.

ALTERED MENTAL STATUS

EMT	EMT-IV	AEMT	EMT-I	Paramedic



SYNCOPE

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Universal Altered Mental Status

- Assess and stabilize ABCs, give O_2, assess vital signs
- Rule out and treat hypoxia
- Rule out and treat hypoglycemia
- Perform and document neurologic exam

- Obtain 12 lead ECG

Consider etiology and treat accordingly

All patients with syncope are advised to come to the hospital for evaluation

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

STROKE

EMT	EMT-IV	AEMT	EMT-I	Paramedic

POSSIBLE STROKE
Any acute onset neurological deficit not likely due to trauma

↓

Assess and Stabilize ABC's titrate O_2

↓

Assess Cincinnati Prehospital Stroke Score
(Presence of single sign sufficient)

↓

Check BG and treat per hypoglycemia if low
Consider naloxone if respirations < 10

↓

- 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

↓

- Start IV and draw blood
- Document cardiac rhythm
- Ensure full monitoring in place: cardiac, SpO2

↓

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**

Cincinnati Prehospital Stroke Score
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 on old dog new tricks", or "No ifs, ands, or buts"

CPSS does not identify all strokes. See below

Stroke Mimics

- Hypoglycemia
- Post-ictal paralysis
- Complex migraine
- Overdose
- Trauma
- Bell's palsy

- **The Cincinnati Prehospital Stroke Score (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 has a high positive predictive value, but a low negative predictive value. Meaning if you have a positive CPSS, you are almost certainly having a stroke, but if you do not have a positive CPSS, you still may be having a stroke
- Stroke signs may be very subtle, therefore it is important to know other signs of stroke, which include:
  - Impaired balance or coordination
  - Vision loss
  - Headache
  - Confusion or altered mental status
  - Seizure

SEIZURE

EMT	EMT-IV	AEMT	EMT-I	Paramedic

- Support ABCs:
- Give oxygen
- Rule out or treat hypoglycemia
- Universal seizure precautions (see below)
- Consider the cause (see below)

Actively Seizing?

Yes

- If seizure brief and self-limited, treatment not necessary
- Rule out hypoglycemia (check blood glucose)
- If prolonged (e.g.: > 5 min) or recurrent seizure, then treat as follows:

Give benzodiazepine

Actively seizing after 5 minutes?

No

Yes

- Establish IV access if not already in place
- Repeat benzodiazepine

Actively seizing after 5 minutes?

No

Yes

- Repeat benzodiazepine
- Consider RSI

No

- Check pulse and reassess ABC
- Give supplemental oxygen

- Transport and monitor ABCs, vital signs, and neurological condition
- Cardiac monitoring if recurrent seizures and/or meds given
- Complete head to toe assessment

Universal Seizure Precautions:

- Ensure airway patency, but do not force anything between teeth.
- Give oxygen
- Suction as needed
- Protect patient from injury
- Check pulse immediately after seizure stops
- Keep patient on side

Document:

- Document: Seizure history: onset, time interval, previous seizures, type of seizure
- Obtain medical history: head trauma, diabetes, substance abuse, medications, compliance with anticonvulsants, pregnancy

Pregnancy and Seizure:

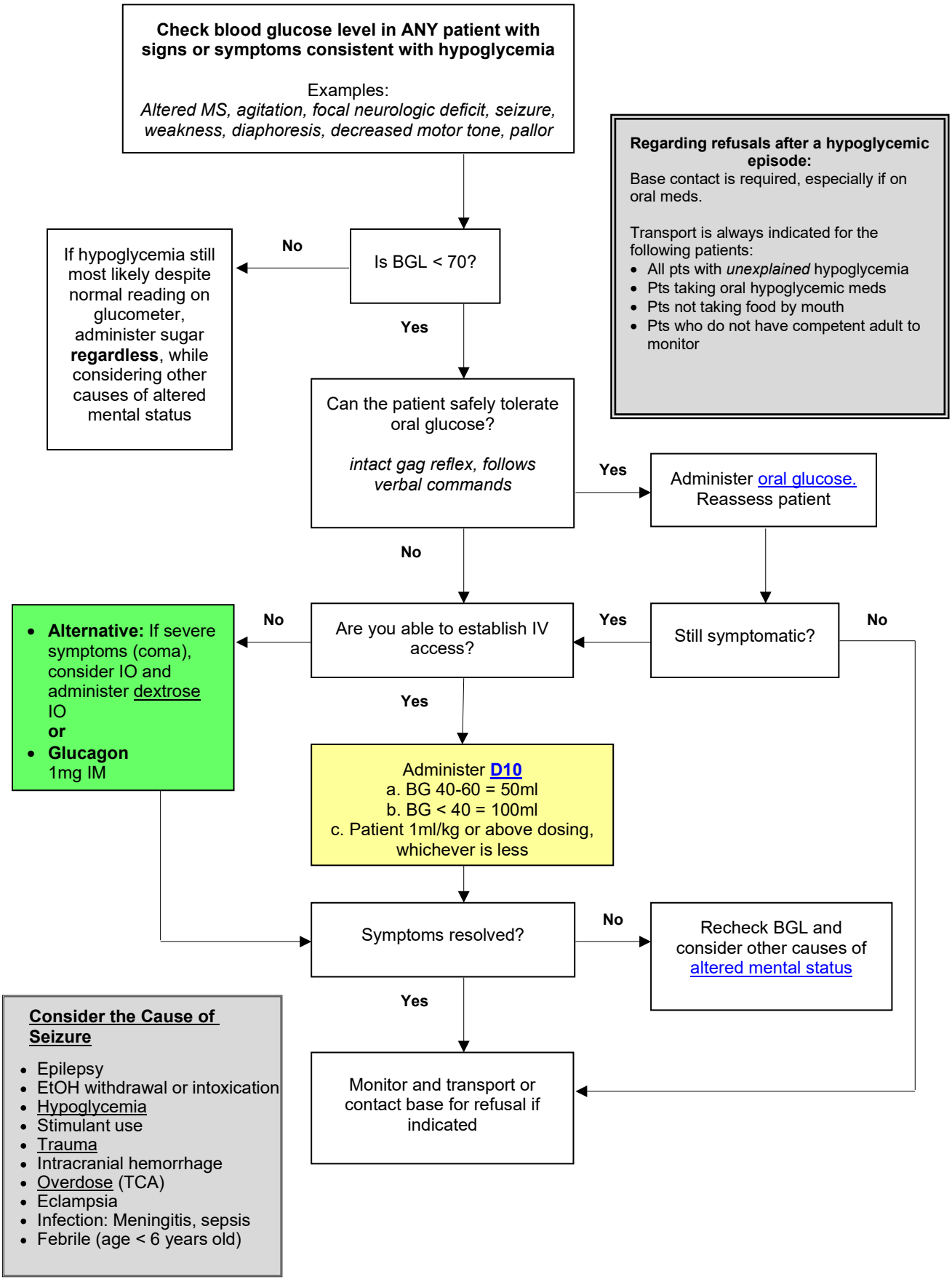
- If 3rd trimester pregnancy or post-partum: administer magnesium sulfate

Consider the Cause of Seizure

- Epilepsy
- EtOH withdrawal or intoxication
- Hypoglycemia
- Stimulant use
- Trauma
- Intracranial hemorrhage
- Overdose (TCA)
- Eclampsia
- Infection: Meningitis, sepsis
- Febrile (age < 6 years old)

HYPOGLYCEMIA

EMT	EMT-IV	AEMT	EMT-I	Paramedic



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

EMT	EMT-IV	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 a 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

DRUG/ALCOHOL INTOXICATION

EMT | EMT-IV | AEMT | EMT-I | Paramedic

Clinical alcohol intoxication

Determine LOC and assess ABCs

- Obtain vital signs
- Perform head-to-toe exam
- Determine medical history, medications
- Check BGL unless mild symptoms and if considering release

Always consider alternative diagnoses: see universal altered mental status protocol

BGL < 60 mg/dL or clinical condition suggests hypoglycemia?

Yes

Hypoglycemia protocol

No

Does patient have evidence of **incapacitating intoxication**?

Yes

Transport to ED

No

Does patient have signs of **acute illness or injury**?

Yes

Transport to ED

No

These findings suggest lower level of intoxication that is low risk. These may declinetreatment and/or transport and be released to law enforcement or to a sober friend or family member.

DEFINITIONS:

Intoxicated patient with any of the following must be transported to ED:

Incapacitating Intoxication

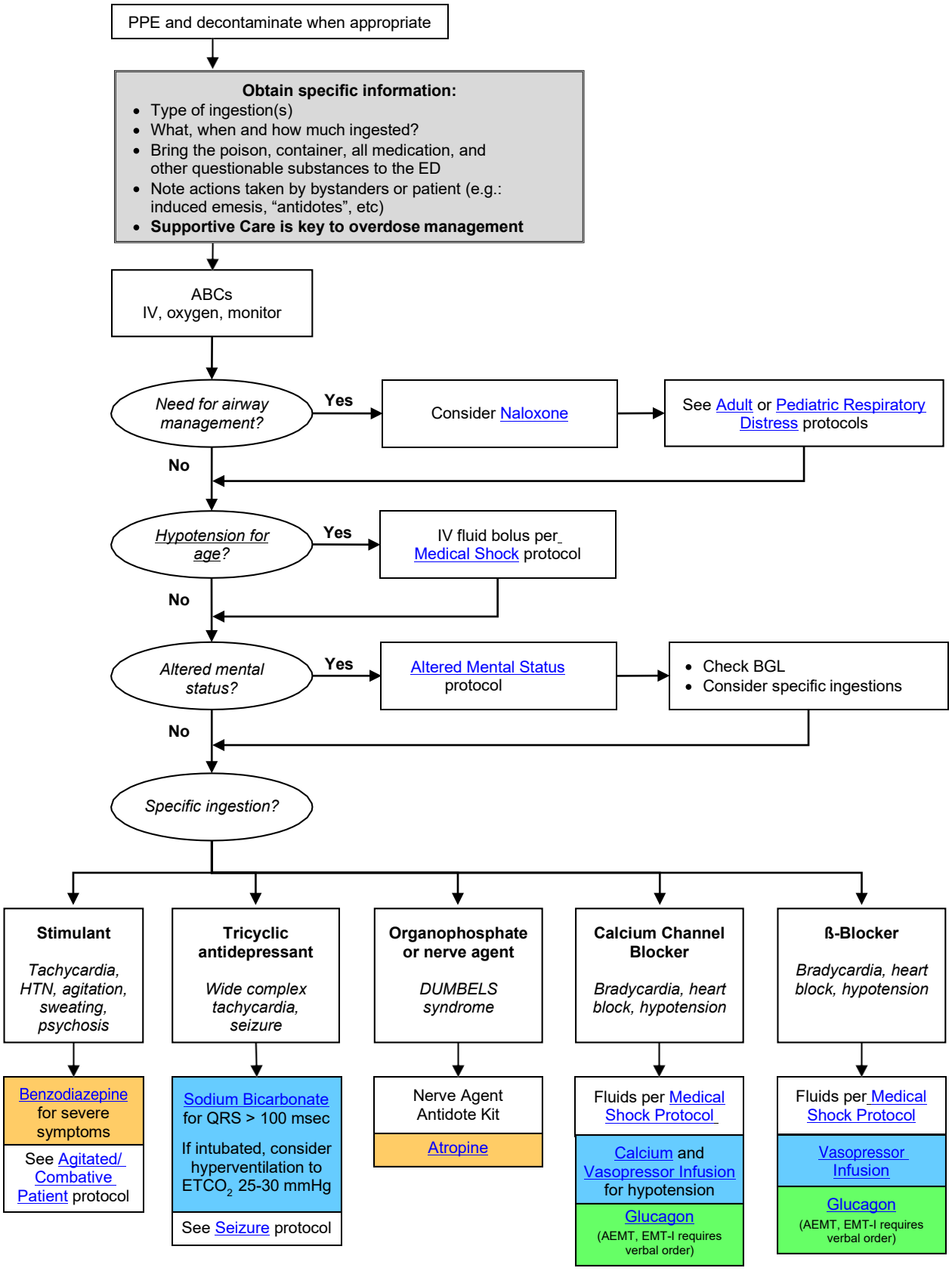
- Inability to maintain airway
- Inability to stand from seated position and walk with minimal assistance
- At immediate risk of environmental exposure or trauma due to unsafe location

Acute Illness or Injury

- Abnormal vital signs
- Physical complaints that might indicate an underlying medical emergency, e.g.: chest pain
- Seizure or hypoglycemia
- Signs of trauma or history of acute trauma
- Signs of head injury, e.g.: bruising, lacerations, abrasions

OVERDOSE AND ACUTE POISONING

EMT	EMT-IV	AEMT	EMT-I	Paramedic



ALLERGY AND ANAPHYLAXIS

EMT | EMT-IV | AEMT | EMT-I | Paramedic

Allergic reaction, anaphylaxis or angioedema

- Assess ABCs, titrate O_2
- If possible, determine likely trigger
- Determine PMH, medications, allergies
- Classify based on symptom severity and systems involved
- Other specific protocols may apply: e.g.:
  - obstructed airway
  - bites & envenomations

Generalized or Systemic Reaction
Multisystem involvement: skin, lungs, airway, etc

Does patient have any of the following signs or symptoms?

- Hypotension
- Signs of poor perfusion
- Bronchospasm, stridor
- Altered mental status

No → Consider diphenhydramine if significant discomfort

Transport and reassess for signs of deterioration

Yes

- Give epinephrine IM, *then*:
- Start IV and give IV fluid bolus 20cc/kg NS
- Give diphenhydramine
- Give methylprednisolone
- Consider addition of albuterol if wheezing

EMT may use EpiPen auto injector if available whenever epinephrine IM indicated for anaphylaxis.

Localized Reaction
Including isolated tongue, airway

Airway involvement?
Tongue or uvula swelling, stridor

No → Consider diphenhydramine if significant discomfort

Transport and reassess for signs of deterioration

Yes

Impending airway obstruction?

No

- Start IV
- Give diphenhydramine

Yes

Give immediate IM epinephrine & manage airway per Obstructed Airway Protocol

- Start IV
- Give diphenhydramine

- Monitor ABCs, SpO2, cardiac rhythm
- Reassess for signs of deterioration

- If persistent signs of severe shock with hypotension not responsive to IM epinephrine and fluid bolus: Consider IV epinephrine drip

Definitions:

- **Anaphylaxis**: severe allergic reaction that is rapid in onset and potentially life-threatening. Multisystem signs and symptoms are present including skin and mucus membranes
  - **Mainstay of treatment is epinephrine**
- **Angioedema**: deep mucosal edema causing swelling of mucus membranes of upper airway. May accompany hives
  - **Epinephrine indicated for any impending airway obstruction.**

Document:

- History of allergen exposure, prior allergic reaction and severity, medications or treatments administered prior to EMS assessment
- Specific symptoms and signs presented: itching, wheezing, respiratory distress, nausea, weakness, rash, anxiety, swelling of face, lips, tongue, throat, chest tightness, etc.

NON-TRAUMATIC ABDOMINAL PAIN/VOMITING

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Non-traumatic abdominal pain and/or vomiting

- Assess ABCs
- Give oxygen
- Complete set of vital signs
- Consider life-threatening causes

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

- Consider IV
- If GI bleed, start 2nd IV
- Transport in position of comfort

Consider antiemetic for vomiting

Consider medication for severe pain

Ketamine | opioid

Cardiac monitor and 12 lead ECG for any of the following:

- Diabetic
- Age > 50
- Upper abdominal pain concerning for ACS
- Unstable vital signs in the adult patient

- Monitor and transport
- Frequent reassessment for deterioration and response to treatment

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:

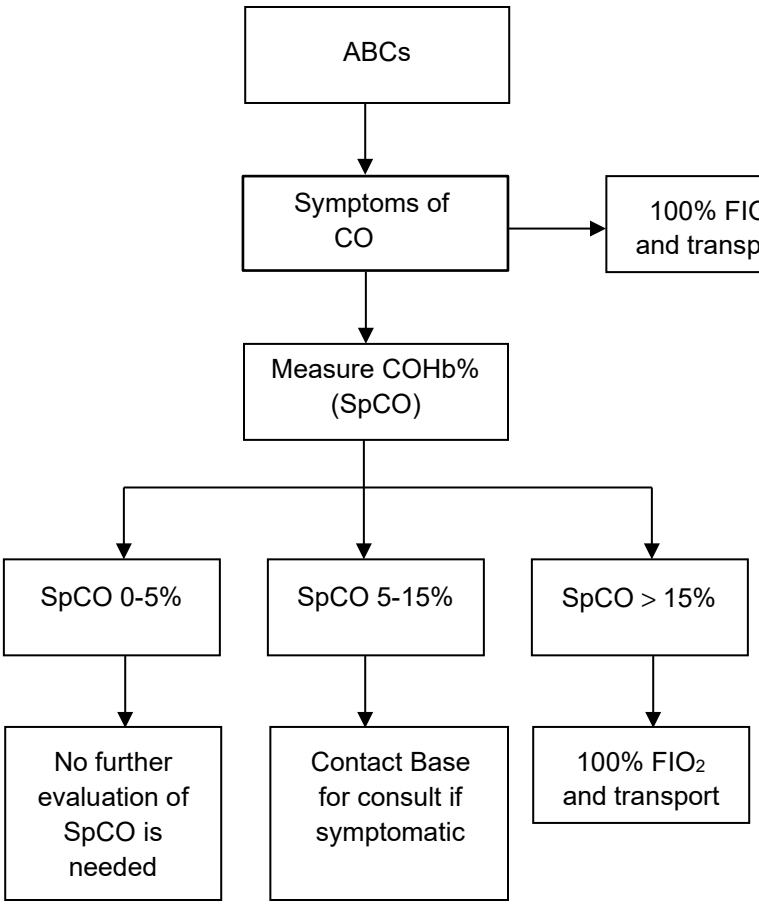
- Life-threatening causes vary by age. Consider occult or non-accidental trauma, toxic ingestion, button battery ingestion, GI bleed, peritonitis
- For most pediatric patients without signs of shock, no IV is required and pharmacologic pain management should be limited

Elderly Patients:

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

SUSPECTED CARBON MONOXIDE EXPOSURE

EMT	EMT-IV	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
- 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

ADRENAL INSUFFICIENCY PROTOCOL

EMT	EMT-IV	AEMT	EMT-I	Paramedic

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 methylprednisolone

↓

- 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

- 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

EPISTAXIS MANAGEMENT

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Active nosebleed

↓

ABCs

↓

- Tilt head forward
- Have patient blow nose to expel clots

↓

- Spray both nares with phenylephrine
- Compress nostrils with clamp or fingers, pinching over fleshy part of nose, not bony nasal bridge
- Transport in position of comfort, usually sitting upright

↓

IV access and IV fluid bolus if signs of hypoperfusion, shock

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.

DROWNING

EMT	EMT-IV	AEMT	EMT-I	Paramedic

ABCs

Spinal Immobilization *before* moving patient if trauma suspected

Assess mental status

Specific Information Needed:

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

Awake and alert

- Remove wet garments, dry and insulate patient
- Transport, even if initial assessment normal
- Monitor ABC, VS, mental status

Awake but altered LOC

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

Comatose or unresponsive

Pulse Present?

No

- Start CPR, manual ventilantions
- attach AED/monitor/defibrillator Single defibrillation attempt only if hypothermic
- Treat per Pulseless Arrest Algorithm
  - Handle very gently
  - Start IV with warm IVF
  - Insulate patient
- For aystole, v-fib, or pulseless v-tach single dose epinephrine IV/IO
- Consider advanced airway especially if suspected pulmonary edema
- Monitor cardiac rhythm, $ETCO_2$ with waveform capnography

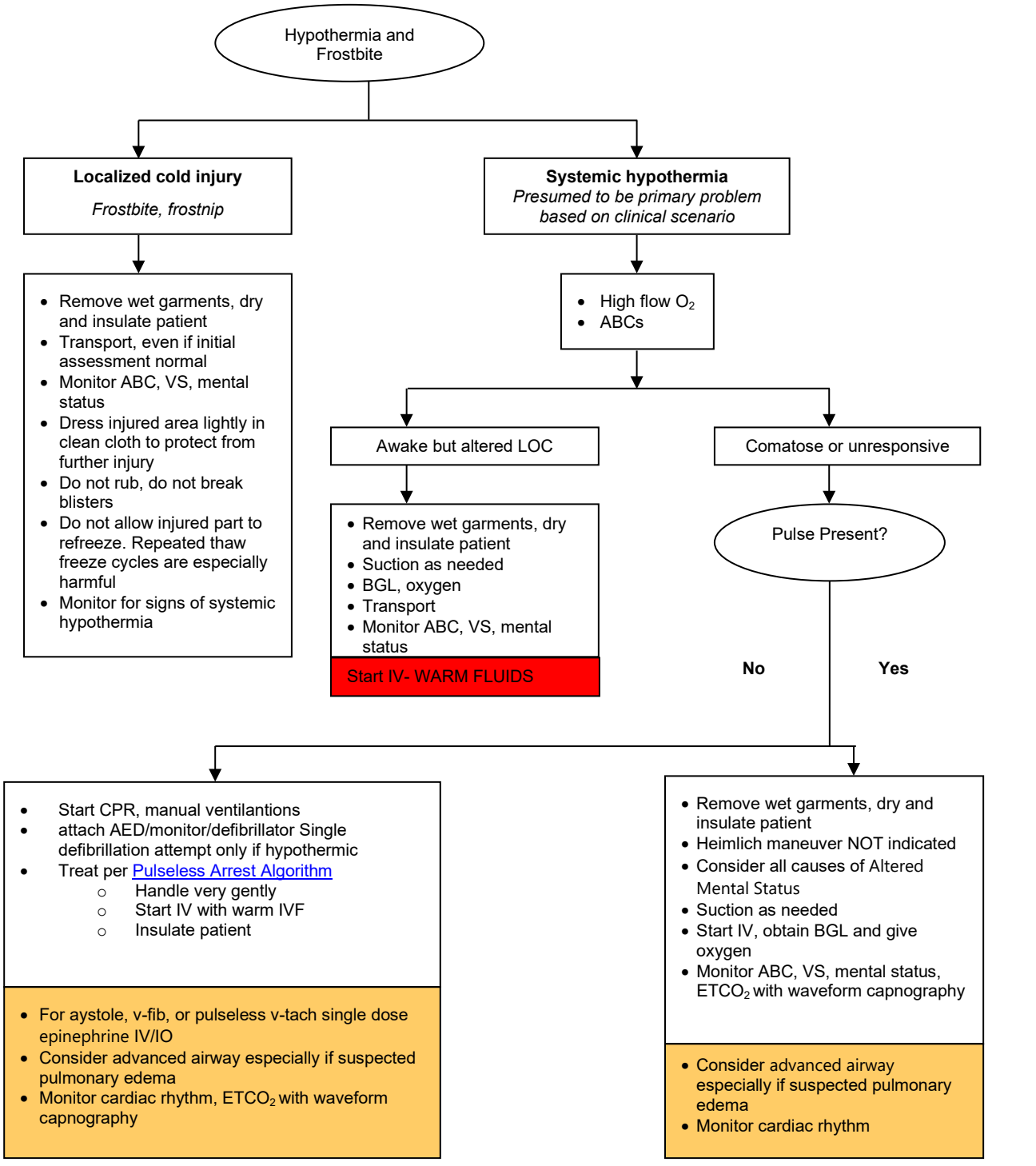
Yes

- Remove wet garments, dry and insulate patient
- Heimlich maneuver NOT indicated
- Consider all causes of Altered Mental Status
- Suction as needed
- Start IV, obtain BGL and give oxygen
- Monitor ABC, VS, mental status, $ETCO_2$
- Consider advanced airway especially if suspected pulmonary edema
- Monitor cardiac rhythm

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

HYPOTHERMIA

EMT	EMT-IV	AEMT	EMT-I	Paramedic



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

HYPERTHERMIA

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Hyperthermia
- Classify by clinical syndrome
- Consider non-environmental causes (see below)

Heat Cramps
- *Normal or slightly elevated body temperature*
- *Warm, moist skin*
- *Generalized weakness*
- *Diffuse muscle cramping*

IVF 20cc/kg bolus with cool saline

Monitor VS and transport

Heat Exhaustion
- *Elevated body temperature*
- *Cool, diaphoretic skin*
- *Generalized weakness*
- *Anxiety*
- *Headache*
- *Tachypnea*
- *Possible syncope*

Heat Stroke
- *Very high core body temperature*
- *Hot skin, may be dry or moist*
- *Hypotension*
- ***Altered mental status***
- *Seizure*
- *Coma*

Rapid transport indicated

Adequate airway and breathing?

No

Assist ventilations and manage airway as needed

Yes

Start IV, titrate O_2 90-94% SaO_2
IVF 20cc/kg bolus with cool saline unless signs of volume overload

- Remove excess clothing
- For heat stroke, consider external cooling measures if prolonged transport
- If altered mental status, check BG and treat per protocol
- Treat seizures, cardiac arrhythmias per protocol
- Monitor and transport

Consider other causes of hyperthermia besides environment exposure, including:

- **Neuroleptic malignant syndrome (NMS)**: *patients taking antipsychotic medications*
- **Sympathomimetic overdose**: *cocaine, methamphetamine*
- **Anticholinergic toxidrome**: *overdose ("Mad as a hatter, hot as a hare, blind as a bat, red as a beet") common w. ODs on psych meds, OTC cold medications, Benadryl, Jimson weed, etc.*
- **Infection**: *fever (sepsis)*
- **Thyrotoxicosis**: *goiter* (enlarged thyroid)

HIGH ALTITUDE ILLNESS

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Acute mountain sickness (AMS): headache, insomnia, anorexia, nausea, fatigue

High-altitude pulmonary edema (HAPE): dyspnea, cough, headache, nausea, fever

High-altitude cerebral edema (HACE): ataxia, confusion, neuro deficits, seizure, coma, and headache

Symptoms of illness at altitude

- ABCs
- IV, oxygen
- Cardiac monitor

- Head to toe assessment
- Complete history:
- Rate of ascent, prior altitude illness, rapidity of sx onset
- Consider non-altitude-related illness

- Never assume that symptoms at altitude are necessary due to altitude illness.
- Acute exacerbations of chronic medical illness at altitude are more common that altitude illness.

AMS

Consider antiemetic for vomiting

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

HAPE

- O_2NRB facemask
- Consider CPAP
- Assist ventilations as needed
- Airway management as indicated

- Do **NOT** give diuretic

HACE

- Descent from altitude
- O_2 NRB facemask
- Assist ventilations as needed
- Airway management as indicated
- Elevate head of bed

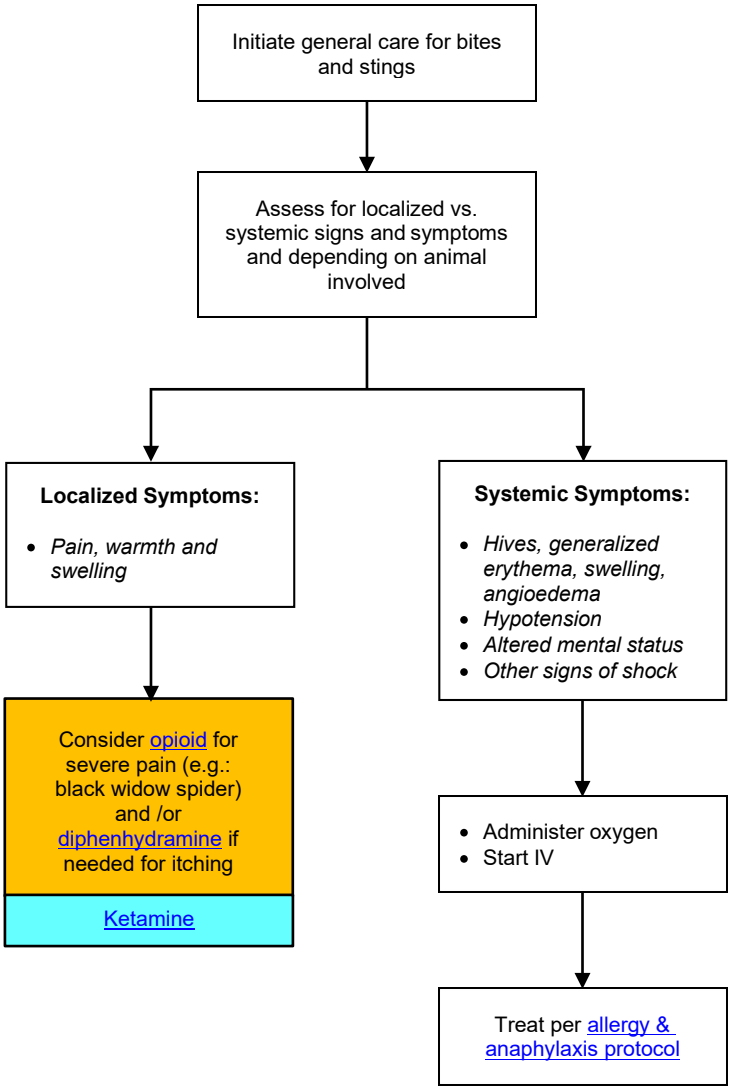
HACE is rare at elevations in Colorado; always consider alternative cause of altered mental status

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

INSECT/ARACHNID STINGS AND BITES PROTOCOL

EMT	EMT-IV	AEMT	EMT-I	Paramedic



General Care

- For bees/wasps:
  - Remove stinger mechanism by scraping with a straight edge. Do not squeeze venom sac
- For spiders:
  - Bring in spider if captured or dead for identification

Specific Information Needed:

- Timing of bite/sting
- Identification of spider, bee, wasp, other insect, if possible
- History of prior allergic reactions to similar exposures
- Treatment prior to EMS eval: e.g. EpiPen, diphenhydramine, etc

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

SNAKE BITE PROTOCOL

EMT	EMT-IV	AEMT	EMT-I	Paramedic

- Assess ABCs, mental status
- Administer oxygen
- Start IV
- Monitor VS

Initiate general care for snake bites

Assess for localized vs. systemic signs and symptoms

Localized Symptoms:

- *Pain and swelling*
- *Numbness, tingling to bitten part*
- *Bruising/ecchymoses*

Consider medication for severe pain

Ketamine | opioid

Systemic Symptoms:

- *Metallic or peculiar taste in mouth*
- *Hypotension*
- *Altered mental status*
- *Widespread bleeding*
- *Other signs of shock*

Be prepared to manage airway if signs of airway obstruction develop

Consider medication for severe pain

Ketamine | opioid

If there is hypotension for age and/or definite signs of shock, treat per Shock Protocol

- Transport with bitten part immobilized
- Monitor ABCs and for development of systemic signs/sx
- Complete General Care en route

General Care:

- Remove patient from proximity to snake
- Remove all constricting items from bitten limb (e.g.: rings, jewelry, watch, etc.)
- Immobilize bitten part
- Initiate prompt transport
- Do NOT use ice, refrigerants, tourniquets, scalpels or suction devices
- Mark margins of erythema and/or edema with pen or marker and include time measured

Obtain specific information:

- Appearance of snake (rattle, color, thermal pit, elliptical pupils)
- Appearance of wound: location, # of fangs vs. entire jaw imprint
- Timing of bite
- Prior 1st aid
- To help with identification of snake, photograph snake, if possible. Include image of head, tail, and any distinctive markings.
- Do not bring snake to ED

Specific Precautions:

- The prairie rattlesnake is native to 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.

PSYCHIATRIC/BEHAVIORAL PATIENT PROTOCOL

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Scene Safety

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

Specific Information Needed

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

Specific Objective Findings

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

Treatment

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

Transporting Patients Who Have a Behavioral Health Complaint

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

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

Specific Precautions

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

Transporting Patients on a Mental Health Hold

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

AGITATED/COMBATIVE PATIENT PROTOCOL

EMT	EMT-IV	AEMT	EMT-I	Paramedic

A **Patient is agitated and cooperative**

- Attempt to reasonably addresspatient concerns and verbally deescalate
- IMC-RASS +1 or +2

B **Patient is agitated and disruptive/dangerous**

- Continue to address patient concernsand verbally deescalate
- Assemble personnel and resuscitation equipment
- IMC-RASS +3 or +4

Patient responds to verbal de-escalation techniques

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

If patient escalates during treatment (IMC-RASS +3 or +4), refer to box **B**

Patient agitated and danger to self/providers

Patient EXTREMELY agitated posing serious, probable, and imminent bodily harm to self/providers

See hyperactive delirium with severe agitation protocol

Sedate and Restrain

- Consider cause of agitation
- Options: benzodiazepine or roperidol, aldol
- Restraint protocol

Continue Assessment

- Capnography and SpO_2 must be initiated as soon as possible to do so
- Cardiac monitor
- Transport to appropriate EmergencyDepartment

- If patient still agitated and disruptive 5 minutes after first sedation dose, repeat the sedation dose
- IMC-RASS +3 or +4

- If still agitated and disruptive 5 minutes after 2nd dose sedative
- IMC-RASS +3 or +4
- **Contact Base**

Complete post sedation protocol

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

General Guideline

Emphasis should be placed on patient and provider safety and dignity as well as appropriate use ofsedation and restraints in treatmentof agitation.

Documentation

Include specifics on actions or behaviors that put patient and /or provider safety at risk. Document IMC-RASS scale.

Consider Cause of Agitation:

Both benzodiazepines and butyrophenones (e.g., haloperidol or droperidol*) are acceptable options for agitated patients. In certain clinical scenarios individual medications may be preferred*

- EtOH (butyrophenone)
- Sympathomimetic (benzodiazepines)
- Psych (butyrophenone)
- Head injury (butyrophenone)

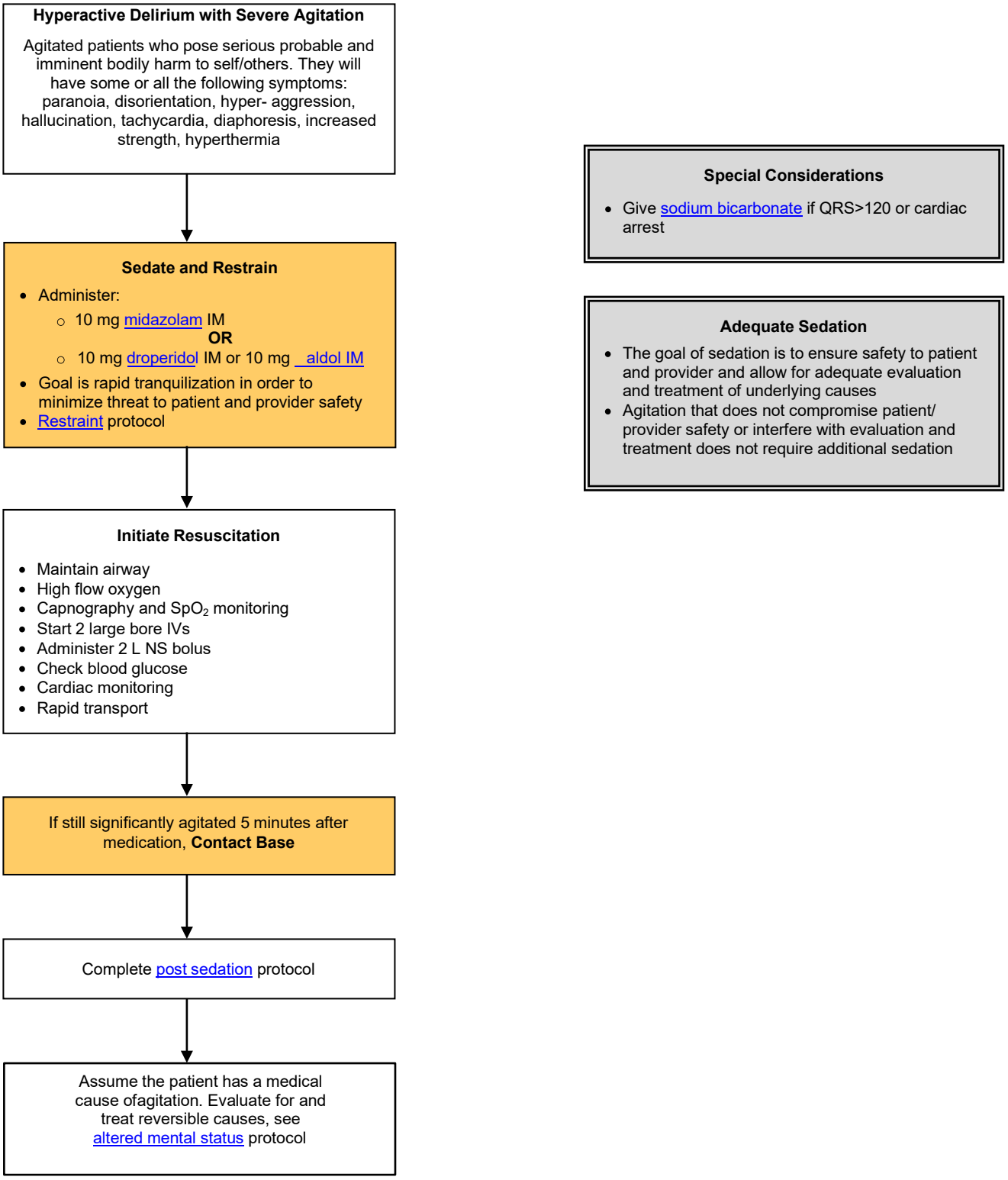
Adequate Sedation

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

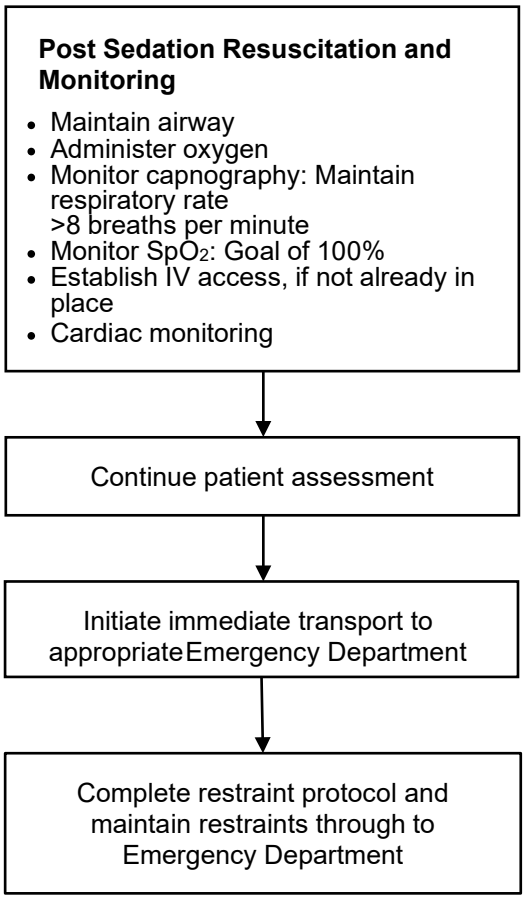
AGITATED/COMBATIVE PATIENT PROTOCOL

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

HYPERACTIVE DELIRIUM WITH SEVERE AGITATION



POST SEDATION RESUSCITATION AND MONITORING



Adequate Sedation

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

General Guidelines

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

TRANSPORT OF THE HANDCUFFED PATIENT

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Purpose:

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

Guideline:

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

CHILDBIRTH PROTOCOL

EMT	EMT-IV	AEMT	EMT-I	Paramedic

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

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
- Dry baby and place skin to skin on the mother. Assess breathing, tone, and activity.

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

OBSTETRICAL COMPLICATIONS

EMT	EMT-IV	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 Shock Protocol

Possible actions for specific complications (below)

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

Prolapsed Umbilical Cord

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

Breech Delivery

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

Postpartum Hemorrhage

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

Complications of Late Pregnancy

3rd Trimester Bleeding (6-8 months)

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

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

GENERAL TRAUMA CARE

EMT	EMT-IV	AEMT	EMT-I	Paramedic

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

↓

- General impression
- ABCs and LOC
- Rapid Trauma Assessment
- Prepare for immediate transport
- SAMPLE history

↓

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

↓

Control Exsanguinating Hemorrhage:

- Direct pressure (with hemostatic agent if available)
- Tourniquet protocol if indicated
- Pelvic stabilization if suspected unstable pelvis based on physical exam

↓

Assess Disability and Limitation:

- Brief neuro assessment
- Extremity splinting if indicated

↓

- Rapid transport to appropriate Trauma Center
- Consider pain management

→ Consider medication for severe pain: Ketamine | opioid

↓

If unstable see Traumatic Shock Protocol

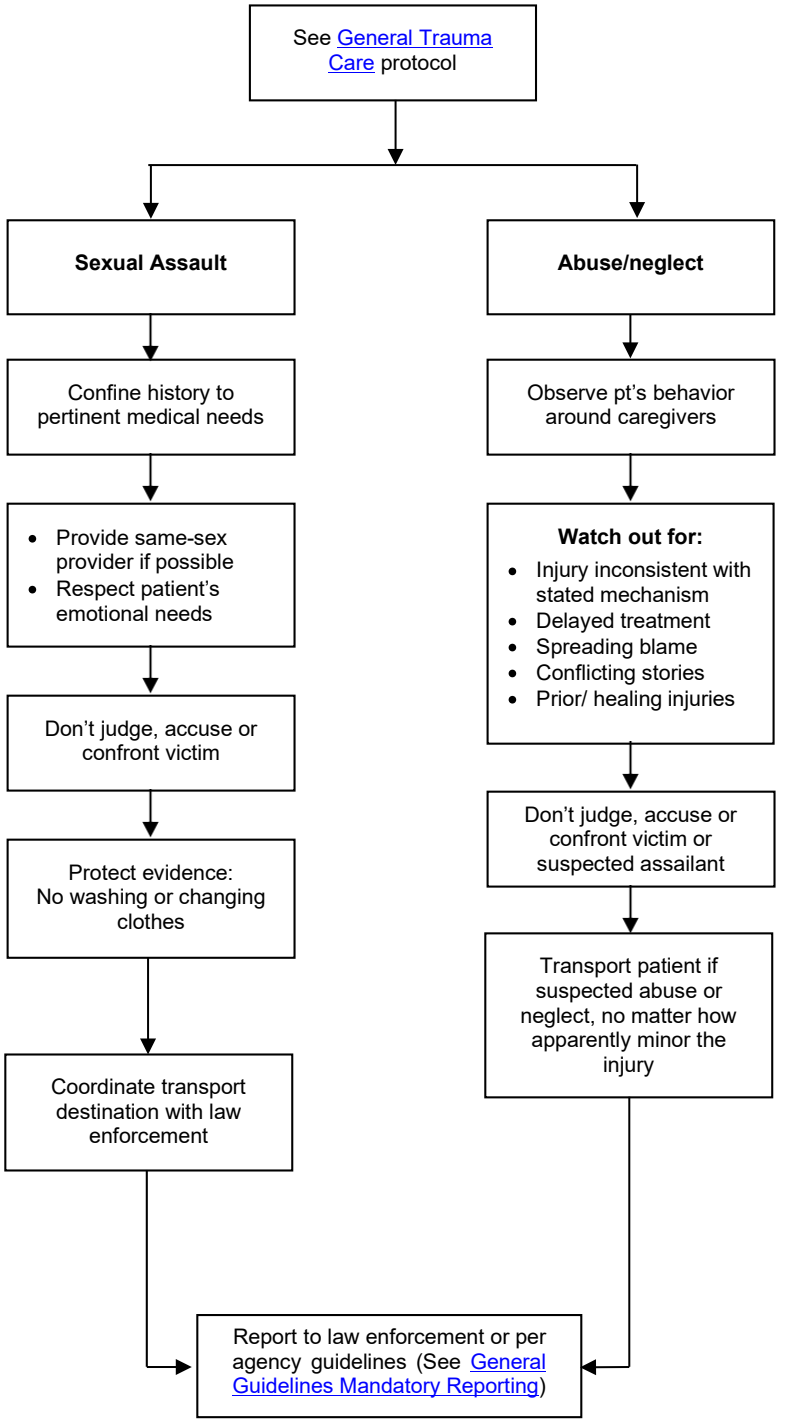
Prolonged Entrapment:

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

SPECIAL TRAUMA SCENARIOS PROTOCOL

Coordinate transport destination with law enforcement

EMT	EMT-IV	AEMT	EMT-I	Paramedic



Mandatory Reporters:

- EMS providers provide a critical layer of protection to vulnerable adults and children who have been abused.
- **C.R.S. 19-3-304** passed in 2014 extends the role of mandated reporters to EMS providers in Colorado
- Mandated reporters are to "register their suspicion" of abuse. This is not considered a direct accusation

- Informing providers at the receiving facility of suspicions for DOES NOT meet the requirements of a mandated reporter - EMS providers **ARE REQUIRED** to register their suspicion with the appropriate authorities

TRAUMA IN PREGNANCY

EMT	EMT-IV	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

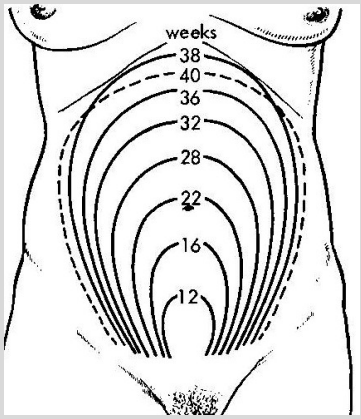
- Avoid supine position:
  - Place in left lateral recumbent position if possible
  - If immobilized tilt backboard 15 to 30 degrees to the left side

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.

TRAUMATIC ARREST

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Traumatic Arrest

For non-survivable injury refer to field pronouncement for traumatic arrest

Consider mechanism of injury. If medical cause of arrest suspected, treat per Medical Pulseless Arrest Algorithm

Blunt
(Include isolated GSW to head)

Penetrating

If arrest suspected to be >10 minutes, refer to Field Pronouncement for Traumatic Arrest

Signs of Life? (Any of the following)
- Spontaneous movement
- Pulses
- Reactive pupils
- Breathing

- Rapid transport to appropriate traumacenter.
- Identify and treat reversible life threats
- Control Exsanguinating Hemorrhage
  - Advanced airway

- Bilateral Needle Chest Decompression if any trauma to trunk

- 2 IVs preferred IV NS bolus 20 mL/kg upto 1 L (IO if no IV access)
- Hypothermia prevention
- Consider pelvic stabilization
  - Initiate BLS CPR and ventilations at age-

- Pull/push for pediatric fluid administration

Refer to Field Pronouncement for Traumatic Arrest

Non-survivable Injuries
- Decapitation
- Massive burns without signs of life
- Evidence of massive blunt head, chest, abdominal trauma
- Decomposition
- Dependent lividity or rigor mortis

Exceptions to Traumatic Arrest Protocol:
- Hypothermia
- Drowning
- Pregnant with estimated gestational age 20 weeks
- Lightning strike or electrocution
- Avalanche victim

TRAUMATIC SHOCK

EMT	EMT-IV	AEMT	EMT-I	Paramedic

- General Trauma Care protocol
- Initiate rapid transport
- Treat en-route

↓

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

No → Treat en-route; Complete General Trauma Care; Keep patient warm; Monitor ABCs, VS, mental status; Rapid transport to appropriate trauma center; Monitor cardiac rhythm

Yes ↓

- Evaluate breath sounds, respiratory effort, and consider tension pneumothorax
- See Needle Decompression for suspected tension PTX for arrest or pending arrest

↓

- Control Exsanguinating Hemorrhage
- Consider pelvic stabilization
- 2 IVs preferred IV NS bolus 20 mL/kg up to 1 L
- Pull/push for pediatrics
- Consider IO if no ready peripheral IV access

↓

Reassess

↓

Repeat NS bolus 20 mL/kg up to additional 1 L as needed for persistent hypotension for age and/or definite signs of shock

↓

Reassess

↓

- Treat en-route
- Complete General Trauma Care
- Keep patient warm
- Monitor ABCs, VS, mental status
- Rapid transport to appropriate trauma center
- Monitor cardiac rhythm

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

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

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

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

Hypotension for Age

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

Tachycardia for Age

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

Minimum Blood Pressure with TBI

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

Pediatric Fluid Administration

- For children <40 kg or not longer than length-based tape, hand pull/push fluid with a 60 mL syringe utilizing a 3 way stop cock
- 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

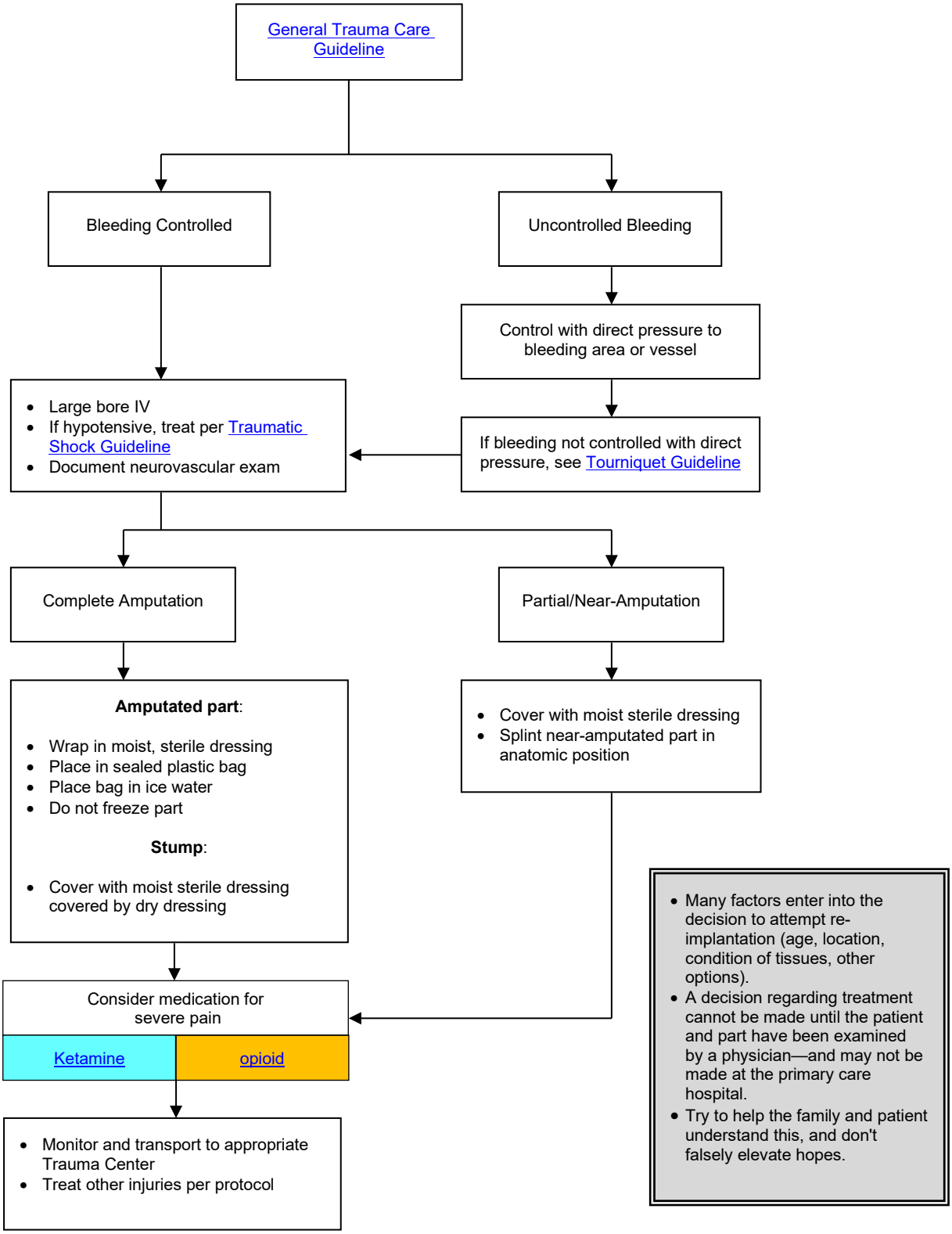
- Normal mental status
- Normal systolic blood pressure
- Tachycardia
- Prolonged (>2 seconds) capillary refill
- Tachypnea
- Cool and pale distal extremities
- Weak peripheral pulse

Signs of Decompensated Shock

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

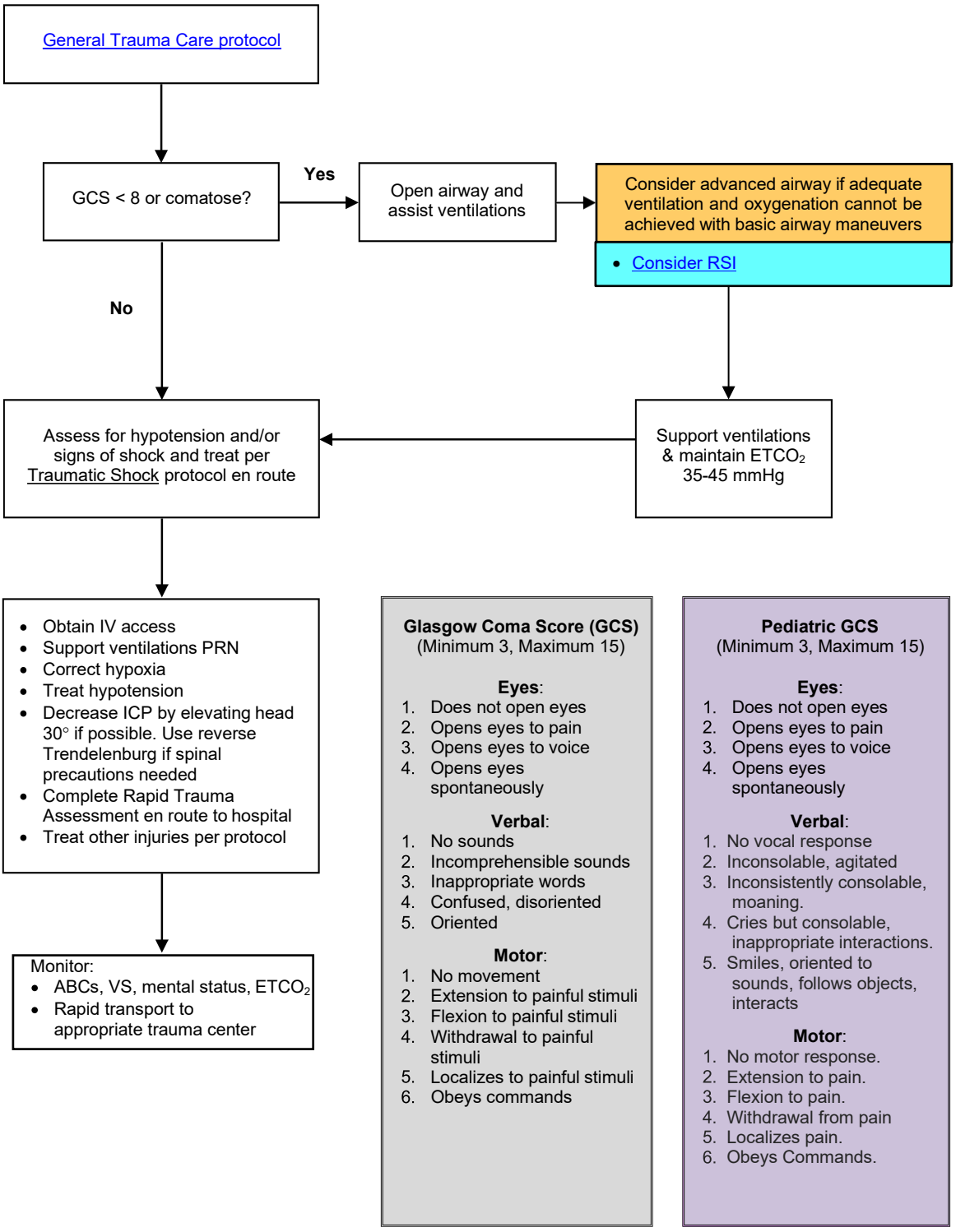
AMPUTATIONS

EMT	EMT-IV	AEMT	EMT-I	Paramedic



HEAD TRAUMA PROTOCOL

EMT	EMT-IV	AEMT	EMT-I	Paramedic



FACE AND NECK TRAUMA

EMT | EMT-IV | AEMT | EMT-I | Paramedic

General Trauma Care Protocol

- Clear airway
- Rapid trauma assessment
- Spinal immobilization Protocol
- Assess for need for airway management

Spinal Immobilization not routinely indicated for penetrating neck injury

Penetrating injury is very rarely associated with unstable spinal column

Laryngeal trauma* — **Yes** → Rapid transport → Avoid intubation if patient can be oxygenated by less invasive means

No

Severe airway bleeding? — **Yes** → Direct Pressure if appropriate → Consider ETI

- Consider RSI
- Nasal intubation *relatively* contraindicated with mid-face trauma.
- Avoid if mid-face grossly unstable

No

- Complete neuro exam
- Asses for subcutaneous air
- Cover/protect eyes as indicated
- Do not try to block drainage from ears, nose
- Save avulsed teeth in saline-soaked gauze, do not scrub clean

- Transport ASAP to appropriate Trauma Center
- IV access en route
- Treat other injuries per protocol
- Suction airway as needed

Consider medication for severe pain

Ketamine | opioid

- Monitor ABCs, VS, mental status, SpO_2, $ETCO_2$

Regarding Nasal Intubation:

- Contraindicated in pediatrics
- *Relatively* contraindicated with mid-face trauma.
- Avoid if mid-face grossly unstable

*Suspect laryngeal trauma with:

- Laryngeal tenderness, swelling, bruising
- Voice changes
- Respiratory distress
- Stridor

SPINAL TRAUMA

EMT	EMT-IV	AEMT	EMT-I	Paramedic

Patient with signs of traumatic acute spinal cord injury

↓

General Trauma Care Protocol

↓

- Full spinal precautions if any neurological signs and symptoms consistent with a spine injury are present
- Document neuro assessments before and after immobilization

↓

Rapid transport to appropriate Trauma Center

↓

Large bore IV and consider 2nd line

↓

If hypotension and/or signs of shock, resuscitate per Traumatic Shock protocol

↓

- Complete patient assessment
- Treat other injuries per protocol
- Monitor for status changes

↓

Monitor ABCs, VS, mental status, SpO_2, $ETCO_2$

↓

Consider medication for severe pain

Ketamine	opioid

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

SPINAL PRECAUTIONS PROTOCOL

EMT	EMT-IV	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*)
- The provider feels there is a potential spinal injury (see **Notes** section).

Yes

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

No

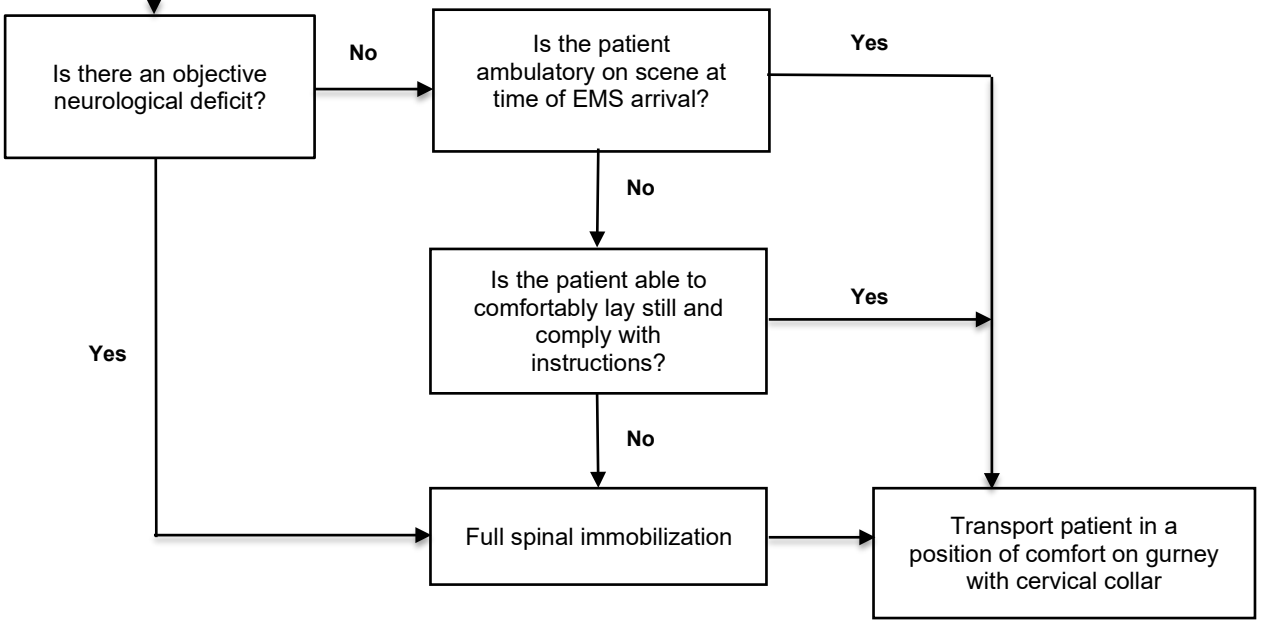
If **NONE** of above criteria, and you think patient is not likely to have a spinal injury, no spinal precautions required

Notes

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

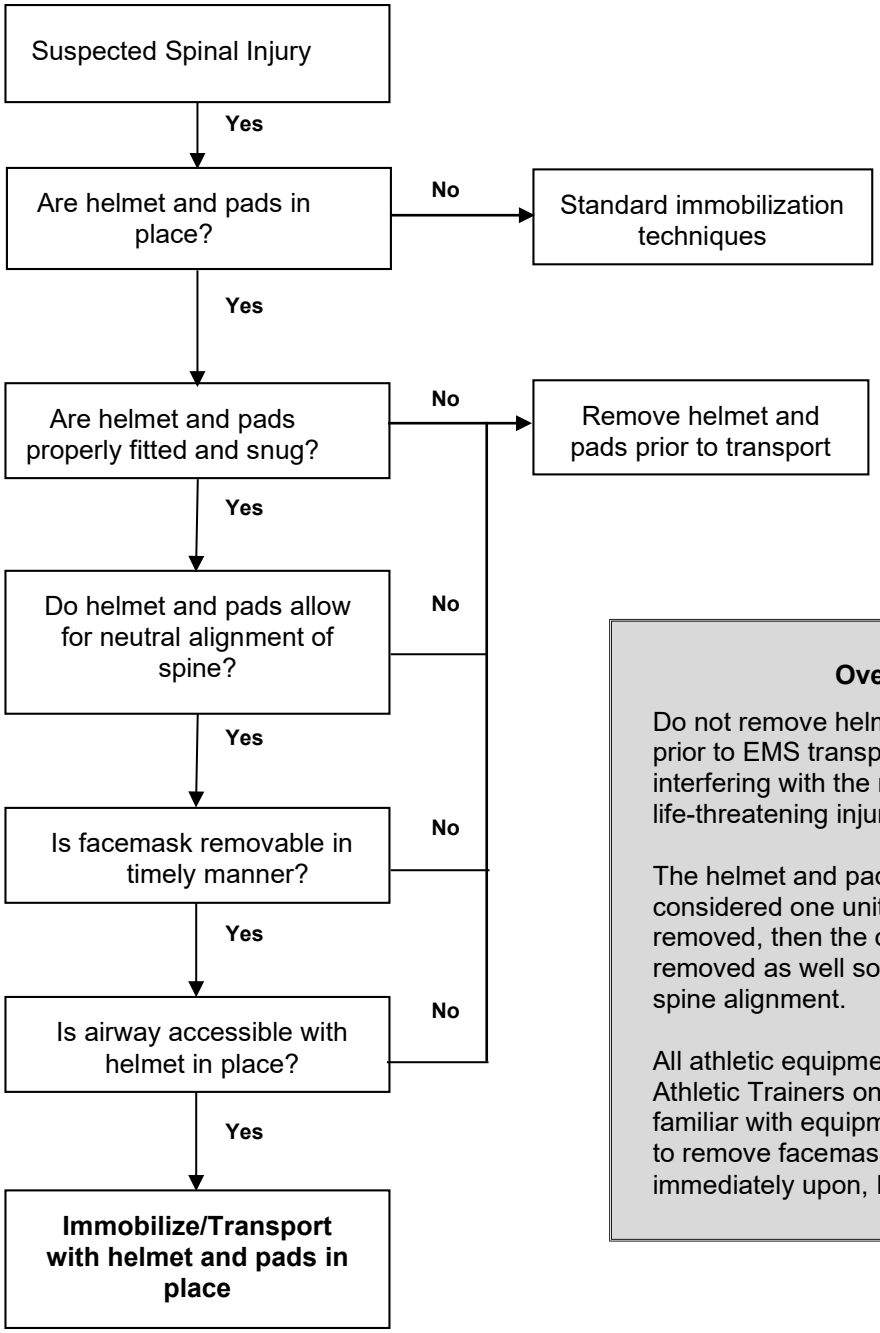
Pediatric Considerations

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



SUSPECTED SPINAL INJURY WITH PROTECTIVE ATHLETIC EQUIPMENT IN PLACE

EMT	EMT-IV	AEMT	EMT-I	Paramedic



Overview

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

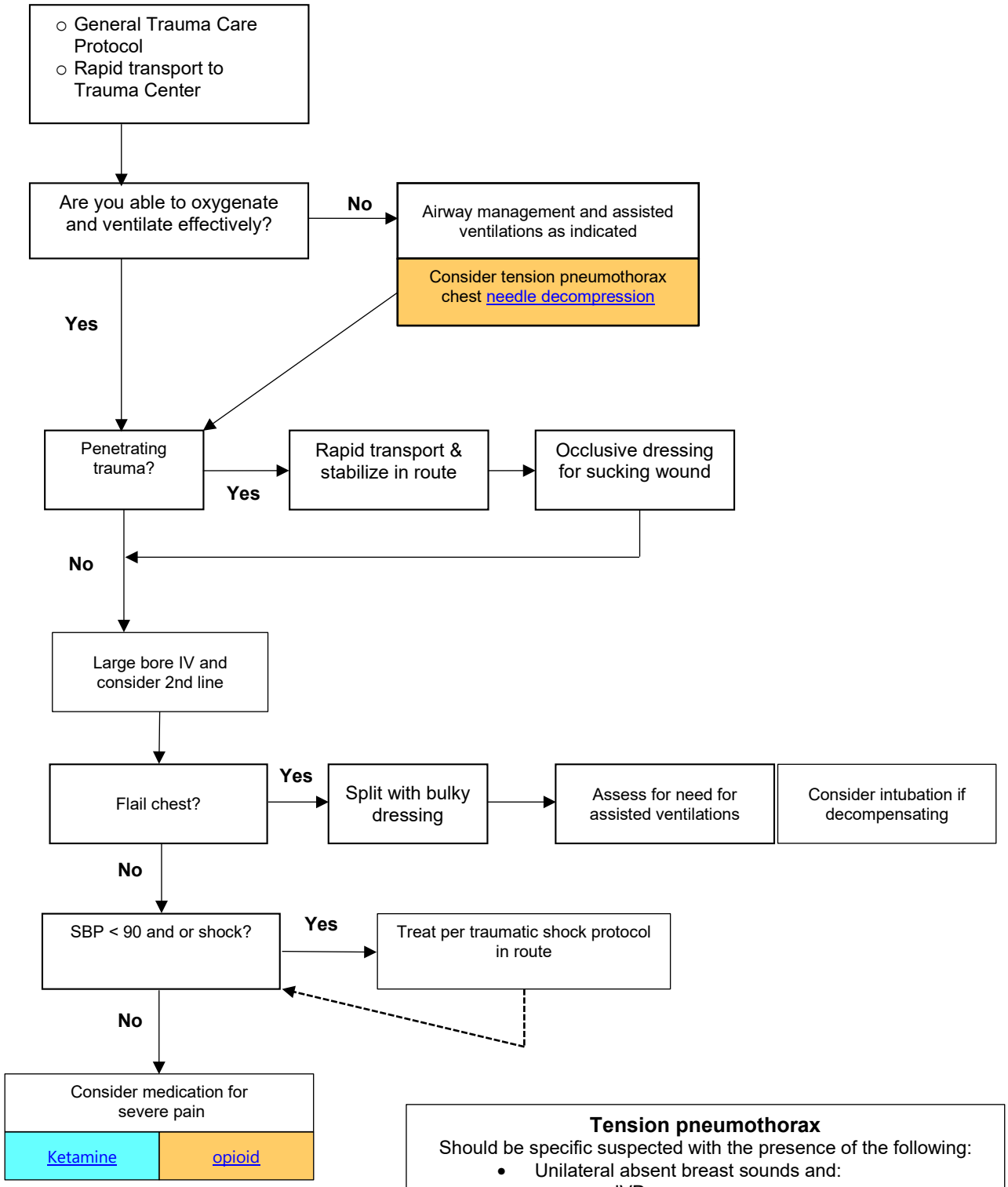
The helmet and pads should be considered one unit. Therefore, if one is removed, then the other should be removed as well so as to assure neutral spine alignment.

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.

CHEST TRAUMA

EMT	EMT-IV	AEMT	EMT-I	Paramedic

2 2



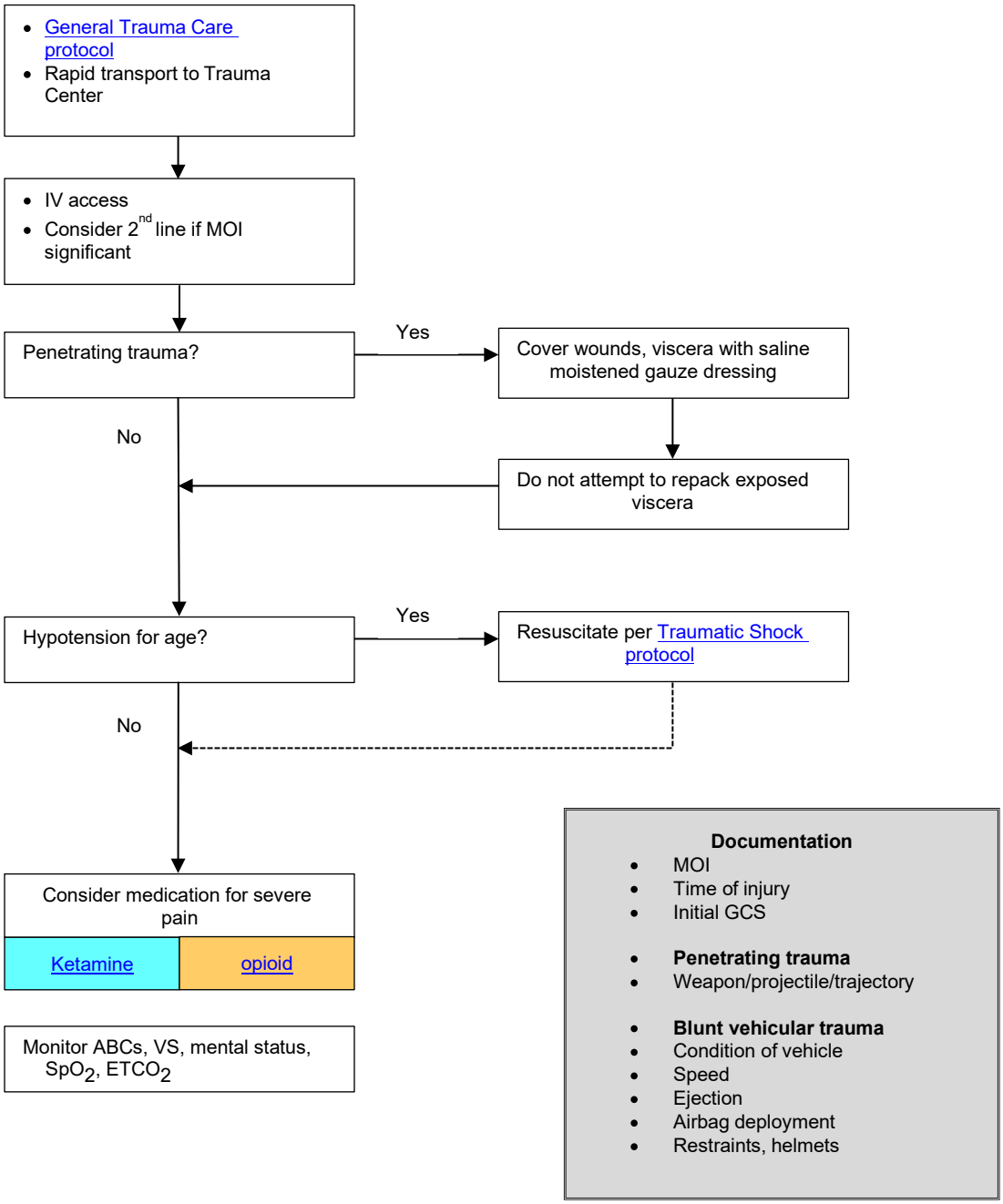
Tension pneumothorax

Should be specific suspected with the presence of the following:

- Unilateral absent breast sounds and:
  - JVD
  - Hypotension
  - Difficult/unable to ventilate
- Needle decompression is **never** indicated for simple pneumothorax

ABDOMINAL TRAUMA

EMT	EMT-IV	AEMT	EMT-I	Paramedic



BURNS

EMT	EMT-IV	AEMT	EMT-I	Paramedic

- General Trauma Care protocol
- Rapid transport to Trauma Center

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

Respiratory Distress hoarseness or stridor? — Yes
- O_2 NRB 15 Lpm
- Manage airway and assist ventilations as indicated
- Consider CO, CN

No

Evaluate degree and body surface are involved

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

No

IV NS TKO

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

Consider medication for severe pain

Ketamine	opioid

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

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

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

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

**** 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.

MEDICATION ADMINISTRATION

Purpose

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

General Principles

A. The appropriate procedure for safe medication administration includes:

1. Verification of the "Six Rights" of medication administration (right patient, right drug, right dose, right route, right time, right documentation)
2. Medication administration cross-check with practice partner verifying the Six Rights prior to drug administration. This should include verbal repeat-back of the order by the practice partner.
3. Obtaining vital signs every 5 minutes or after any intervention.

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 Routt 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

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

QUICK REFERENCE DRUG CARD

Primary doses listed not all doses from protocols

Medication Name	Adult Dose	Pediatric Dose	Routes	B	BIV	AEMT	I	P
Acetaminophen	1000mg	15mg/kg	PO	SO	SO	SO	SO	SO
Adenosine (Adenocard)	12mg, 12mg	0.1 mg/kg 0.2 mg/kg	IV, IO				CI	SO
Albuterol sulfate (Ventolin)	2.5 mg	2.5 mg	SVN	SO	SO	SO	SO	SO
Amiodarone - Arrest	300 mg, 150mg	5mg/kg	IV, IO				CI	SO
Symptomatic wide complex tachycardia	150mg over 10 min		IV, IO				CI	SO
Post arrest following successful conversion of VF or VT	150mg over 10 min		IV, IO				CI	SO
Antiemetics								
Ondansetron (Zofran)	4mg	4 mg >40 lbs 2 mg < 4 YO	IV, IO, IM		SO	SO	SO	SO
Ondansetron (Zofran) ODT	4mg	4 mg >40 lbs 2 mg < 4 YO	ODT	SO	SO	SO	SO	SO
Promethazine	12.5mg		IV, IM				CI	SO
Metoclopramide	10mg	5 mg 8-12 YO	IV, IM				CI	SO
Droperidol (Inapsine)	1.25mg		IV, IM				CI	SO
Aspirin	324 mg		Oral	SO	SO	SO	SO	SO
Atropine sulfate IV								
Symptomatic bradycardia	1 mg	0.02 mg/kg	IV, IO				CI	SO
RSI	0.5-1 mg							SO
Benzodiazepine								
Diazepam Seizure	5 mg	0.3 mg/kg	IV, IM				SO	SO
Seizure	5 mg	0.3 mg/kg	PR			CI	SO	SO
Agitated of Combative	5 mg	Contact Base	IV, IM				SO	SO
Lorazepam (Ativan) Seizure	2 mg	0.05 mg/kg IV, IO 0.1 mg/kg IN, IM	IV, IO IN, IM				SO	SO
Agitated of Combative	2 mg	Contact Base	IV, IN, IM				SO	SO
Anxiety	0.5-1 mg		IV, IN				SO	SO
Midazolam (Versed) Seizure, Cardioversion or pacing	2.5 mg IV, IO 5mg IN, IM	0.1 mg/kg IV, IO 0.2 mg/kg IN, IM	IV, IO, IM, IN				SO	SO
Seizure	5mg IN	0.2 mg/kg IN	IN			CI	SO	SO
Agitated or Combative	2.5 mg IV 5mg IN, IM	Contact Base	IV, IN, IM				SO	SO
Hyperactive delirium	10 mg		IM				SO	SO
RSI	5 mg		IV, IO					SO
Calcium Gluconate 10%	3g	60mg/kg	IV, IO					SO
Calcium Chloride 10%	1g	20mg/kg	IV, IO					SO
Dextrose 10%	5g=50ml BGL 40-60 10g=100m BGL <40	1ml/kg	IV, IO		SO	SO	SO	SO
Diltiazem	0.25mg/kg		IV					SO
Diphenhydramine (Benadryl)	50 mg	1-2 mg/kg	IV, IO, IM			SO	SO	SO
Dopamine	5-20 mcg/kg/min	5-20 mcg/kg/min	IV, IO					SO
Droperidol (Inapsine)	5mg		IV, IM				CI	SO
Hyperactive delirium	10 mg		IM				CI	SO
Epinephrine 1:10,000 Cardiac Arrest	1 mg	0.01 mg/kg	IV, IO				CI	SO
Refractory Bradycardia		0.01 mg/kg	IV, IO				CI	SO

Medication Name	Adult Dose	Pediatric Dose	Routes	B	BIV	AEMT	I	P
Epinephrine Drip								
Refractory Bradycardia	2-10 mcg/min	2-10 mcg/min	IV, IO				CI	SO
Severe anaphylaxis	2-10 mcg/min	2-10 mcg/min	IV, IO				CI	SO
Epinephrine 1:1000								
Anaphylaxis	0.3 mg	0.01 mg/kg 0.15 mg(<25kg) 0.3 mg(>25kg)	IM	SO	SO	SO	SO	SO
Asthma/allergic reactions	0.3 mg	0.01 mg/kg 0.15 mg(<25kg) 0.3 mg(>25kg)	IM			SO	SO	SO
Croup	5 mL	5 mL	SVN				CI	SO
Etomidate (Amidate)	0.3-0.6 mg/kg		IV, IO					SO
Glucagon	1mg	< 25 kg: 0.5 mg > 25 kg: 1 mg	IM			SO	SO	SO
Beta Blocker/Calcium Channel Overdose	2mg	0.1mg/kg	IV			CI	CI	SO
Hemostatic Agents	Per agent			SO	SO	SO	SO	SO
Haloperidol (Haldol)	5-10 mg IM >65 YO 2.5 mg		IM				CI	SO
Ibuprofen	600 mg	10mg/kg	PO	SO	SO	SO	SO	SO
Ipratropium bromide (Atrovent)	0.5 mg/2.5ml	0.5 mg	SVN	SO	SO	SO	SO	SO
Ketamine for Pain	0.1-0.3 mg/kg	0.1-0.3 mg/kg	IV,IO					SO
	0.3-0.5 mg/kg	0.3-0.5 mg/kg	IM, IN					SO
Drip	0.3 mg/kg/hr							SO
Ketamine for RSI	2mg/kg		IV, IO					SO
Drip	2mg/kg/hr							
Lidocaine Cardiac Arrest	1-1.5 mg/kg		IV, IO				CI	SO
IO infusion	0.5 mg/kg slow		IO			SO	SO	SO
Magnesium Sulfate – Torsades, Respiratory, Eclampsia	2 G		IV, IO					SO
Methylprednisolone (Solu-Medrol)	125 mg	2 mg/kg	IV, IO				SO	SO
Naloxone (Narcan)	0.5-2 mg	0.5-2 mg	IV, IO, IM, IN	SO IN	SO	SO	SO	SO
Nitroglycerine	0.4 mg		SL			SO	SO	SO
Nitroglycerine (Patient assisted)	0.4		SL	CI	CI	SO	SO	SO
Opioids								
Fentanyl citrate	1-2 mcg/kg	1-2mcg/kg 2mcg/kg	IV, IO, IM, IN			CI	SO	SO
Post RSI	100mcg		IV, IO					SO
Morphine sulfate	5-10mg	0.1 mg/kg	IV, IO, IM			CI	SO	SO
Hydromorphone (Dilaudid)	0.5 - 1mg	0.2mg	IV, IO					SO
Normal saline		20 ml/kg	IV, IO		SO	SO	SO	SO
Oral glucose (Glutose)	15 mg	15 mg	PO	SO	SO	SO	SO	SO
Oxygen	1-25 L	1-25L	NC, NRB, BVM	SO	SO	SO	SO	SO
Phenylephrine - topical (Neo-Synephrine)	1-2 sprays in each nostril		IN					SO
Racemic Epinephrine		0.5ml/3ml	SVN				CI	SO
Sodium bicarbonate	1 mEq/kg	1 mEq/kg 8.4%	IV, IO				CI	SO
Succinylcholine (Anectine)	1.5 mg/kg		IV, IO					SO
Topical Ophthalmic Anesthetics	2 Drops	2 Drops	EYE				SO	SO
Vecuronium (Norcuron)	10 mg		IV, IO					SO

SO=Standing Order **CI=Call In** **[ ]=Not Allowed**

ACETAMINOPHEN (TYLENOL)

Description

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

Onset & Duration

Onset: 20 minutes
Duration: 4 hours

Indications

Mild pain
Fever (any origin)

Contraindications

Known hypersensitivity
Known or suspected chronic liver disease

Adverse Reactions

- Acetaminophen has a wide therapeutic window. Recommended maximum therapeutic doses are less than half the toxic dose.
  - Single toxic dose in a 70 kg adult is greater than 7 grams
  - Single toxic dose in a child is greater than 150 mg/kg
  - Chronic supratherapeutic acetaminophen poisoning is possible as many medications contain acetaminophen

Drug Interactions

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

Dosage and Administration

Adult:
1,000 mg PO

Pediatric
15 mg/kg PO – **See Chart**

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

Protocol

Pain Management

ADENOSINE (ADENOCARD)

Description

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

Onset & Duration

- Onset: almost immediate
- Duration: 10 sec

Indications

- Narrow-complex supraventricular tachyarrhythmia after obtaining 12 lead ECG (This may bethe 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
IO shoulder site.

Pediatric:

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

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

Protocol

- Tachyarrhythmia with Poor Perfusion

Special Considerations

- Reliably causes short lived but very unpleasant chest discomfort. Always warn your patient of this before giving medication and explain that it will be a very brief sensation
- May produce bronchospasm in patients with asthma
- Transient asystole and AV blocks are common at the time of cardioversion
- Adenosine is not effective in atrial flutter or fibrillation

- Adenosine is safe in patients with a history of Wolff-Parkinson-White syndrome if the rhythm is regular and QRS complex is **narrow**
- A 12-lead EKG should be performed and documented, when available
- Adenosine requires continuous EKG monitoring throughout administration

ALBUTEROL SULFATE (PROVENTIL, VENTOLIN)

Description

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

Onset & Duration

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

Indications

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

Contraindications

- Severe tachycardia is a relative contraindication

Adverse Reactions

- Tachycardia
- Palpitations
- Dysrhythmias

Drug Interactions

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

How Supplied

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

Dosage and Administration

Adult and Pediatric:

Single Neb dose

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

Continuous Neb dose

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

Protocol

Adult Wheezing

Pediatric Wheezing

Allergy and Anaphylaxis

General Trauma Care

Special Considerations

- Consider inline nebs for patients requiring endotracheal intubation or CPAP.
- May precipitate angina pectoris and dysrhythmias
- Should be used with caution in patients with suspected or known coronary disease, diabetes mellitus,

hyperthyroidism, prostatic hypertrophy, or seizure disorder
- Wheezing associated with anaphylaxis should first be treated with epinephrine IM.

AMIODARONE (CORDARONE)

Description

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

Indications

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

Precautions

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

Contraindications

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

Adverse Reactions

- Hypotension
- Bradycardia

Dosage and Administration

Adult:

Pulseless Arrest (Refractory VT/VF):

300 mg IV bolus.
Administer additional 150 mg IV bolus in 3-5 minutes if shock refractory or recurrent VF/VT.

Post Arrest Care after pulseless VT/VF

Post arrest following successful conversion of VT/VF
150 mg IV bolus infusion over 10 minutes

Symptomatic VT and undifferentiated wide complex tachycardia with a pulse:

150 mg IV bolus infusion over 10 minutes.

Pediatric:

Pulseless Arrest (Refractory VT/VF)

5mg/kg IV bolus.
CONTACT BASE for additional doses.

Protocol

Medical Pulseless Arrest Algorithm

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.

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

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.

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.

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:

1 mg IV/IO bolus. Repeat if needed at 3-5 minute intervals to a maximum dose of 3 mg. (Stop at ventricular rate which vides adequate mentation and blood pressure)

RSI

0.5-1 mg IV/IO bolus

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

Rapid Sequence Intubation

Special Considerations

- Atropine causes pupil dilation, even in cardiac arrest settings

BENZODIAZEPINES (DIAZEPAM, LORAZEPAM, MIDAZOLAM)

Description

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

Onset & Duration

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

Indications

- Status epilepticus
- Sedation of the severely agitated/combative patient
- 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
- RSI

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: 2.5 mg
- Dose may be repeated x 1 after 5 minutes if still seizing. Contact Base for more than 2 doses
- RSI 5 mg every 15 minutes if needed.
- 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.

Hyperactive delirium with severe agitation

- **IM route**: 10 mg.

Sedation of severely agitated or combative patient

Adult:

- IV route: 2.5 mg
- IN/IM route: 5 mg
- Dose may be repeated x 1 after 5 minutes. Contact base for more than 2 doses

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: 2 mg
  - Dose may be repeated after 5 minutes if still seizing. Max of 6mg
- IN/IM route (intranasal preferred): 2 mg
  - Dose may be repeated after 5 minutes if still seizing. Max of 6mg

Anxiety:

- 0.5-1 mg slow IVP or IN, IM, may repeat 1 mg, up to a total of 2 mg.

Pediatric:

- IV route: 0.05 mg/kg
  - Dose may be repeated x 1 after 5 minutes if still seizing.
- 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 after 5 minutes. Max of 6mg

Pediatric:

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

---

Protocol

Synchronized Cardioversion
Seizure
Transcutaneous Pacing
Agitated/Combative Patient

Special Considerations

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

CALCIUM

Description

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

Indications

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

Contraindications

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

Pediatric:

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

Calcium Chloride 10% Solution

Adult:

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

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

Pediatric:

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

Protocol

Medical Pulseless Arrest

Poisoning/Overdose

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:

Adult:

5-10 gm (50 – 100 ml of a 10% solution) IV/IO bolus

Pediatric: (Use length based tape for approximate weight)

1 ml/kg of D10 or adult dosing, whichever is less

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.

DILTIAZEM HCL (CARDIZEM)

Indications

- To control rapid ventricular response associated with new onset atrial fibrillation and flutter.

Contraindications

- Patient with sick sinus syndrome except in the presence of a functioning ventricular pacemaker.
- Patient with second or third degree AV blocks except in the presence of a functioning ventricular pacemaker.
- Hypotension less then 90 mm/Hg systolic.
- Patient who have demonstrated an hypersensitivity to this drug.
- Patient suspected of having a acute myocardial infarction.

Administration

- Adult: approximately 0.25 mg/kg bolus (typically 20 mg) IV over 2 minutes.
- 25 mg / 5 ml vial; 50 mg / 10 ml vial. Non - refrigerated: LYO-JECT syringe.

Precautions / Adverse Reactions

- Bradycardia, second or third-degree AV blocks, chest pain, CHF, syncope.
- V-Fib, V-tach, nausea, vomiting, hypotension, dizziness, dry mouth, dyspnea, headache.
- Caution in patients using medications that affect cardiac contractility.
- In general, should not be used in patients on Beta-blockers or digoxin (Contact Medical Control).

Pharmacology and actions

- Block influx of calcium ions into cardiac muscle: prevents spasm of coronary arteries.
- Slows conduction through the AV node, causes vasodilation, decreases rate of ventricular response, decreases myocardial oxygen demand.
- Use in caution in patients with renal or hepatic dysfunction.
- PVCs may be noted at time of conversion of PSVT to sinus rhythm.

Protocol

- Tachycardia with Poor Perfusion

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

Protocol

Allergy/Anaphylaxis

DROPERIDOL (INAPSINE)

Description

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

Onset & Duration

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

Indications

- Primary use for management of agitated/combative patients.
- Second line medication for management of intractable vomiting.
- 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, repeat dose if desired effect not achieved after 10 minutes.

Hyperactive Delirium with Severe Agitation

IM route: 10 mg IM administration.

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

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.

EMT may give IM Epinephrine for Anaphylaxis

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 anaphylaxis:

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

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

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

EMT may give IM Epinephrine for Anaphylaxis

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

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

Protocol

- Medical 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

ETOMIDATE (AMIDATE)

Description

- Etomidate is a hypnotic drug without analgesic activity, IV injection of etomidate produces hypnosis characterized by a rapid onset of action, usually within one minute.

Onset & Duration

- Etomidate is a hypnotic drug without analgesic activity, IV injection of etomidate produces hypnosis characterized by a rapid onset of action, usually within one minute. Duration of hypnosis is dose dependent but relatively brief, usually three to five minutes when an average dose of 0.3mg/kg.

Indications

- Rapid sequence intubation

Contraindications

- In patients with known hypersensitivity to drug

Adverse Reactions

- Significant venous pain may be a side effect, but this appears to be less frequently noted when larger, more proximal arm veins are employed, and it appears to be more frequently noted when smaller, more distal hand or wrist veins are employed.
- Transient skeletal muscle movements may be noted, and may be bilateral or unilateral.
- Nausea and/or vomiting may be noted.
- Causes adrenocortical suppression, so it is not used for prolonged sedation.
- Overdose may occur from too rapid or repeated injections. Too rapid injection may be followed by a fall in blood pressure.

Dosage and Administration

- Administer etomidate 0.3 mg/kg slow IVP, over 30-60 seconds. If not adequately sedated, may give up to 0.6mg/kg mg for adults and pediatrics

Protocol

Rapid Sequence Intubation

Special notes

- EMT-B-IVs or EMT-I will be allowed to administer medication under the direct supervision of an EMT-P if the patient is in extremis.

GLUCAGON

Description

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

Onset & Duration

- Onset: variable

Indications

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

Side Effects

- Tachycardia
- Headache
- Nausea and vomiting

Dosage and Administration Adult:

Hypoglycemia:

- 1 mg IM

Beta Blocker/Calcium Channel overdose with hypotension and bradycardia:

- 2 mg IV bolus

Pediatric:

Hypoglycemia:

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

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

- 0.1 mg/kg IV

Protocol

Hypoglycemia

Poisoning/Overdose

HALOPERIDOL (HALDOL)

Description

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

Onset & Duration

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

Indications

- Sedation of a severely agitated and/or combative patient

Contraindications

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

Precautions

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

Dosage and Administration

Adults:

5-10 mg IM

Hyperactive Delirium with Severe Agitation

IM route: 10 mg IM administration.

Pediatrics (not for use in children <6 years):

Base Contact Ages 6-12: 2 mg IM, Base Contact must be made for additional doses (consider if no effects within 10 minutes)

Special Considerations

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

Protocol

Agitated/Combative Patient Protocol

HEMOSTATIC AGENT (QuikClot, Celox, BloodSTOP, Actcel, HemCon, ChitoGauze)

Description

- QuikClot 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

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

IBUPROFEN (ADVIL, MOTRIN)

Description
Ibuprofen is a non-steroidal anti-inflammatory drug (NSAID) that inhibits synthesis of prostaglandins in body tissues by inhibiting at least 2 cyclo-oxygenase (COX) isoenzymes, COX-1 and COX-2.
May inhibit chemotaxis, alter lymphocyte activity, decrease proinflammatory cytokine activity and inhibit neutrophil aggregation; these effects may contribute to anti-inflammatory activity.

Onset & Duration
Onset: 30-60 minutes
Duration: 6-8 hours

Indications
Mild pain
Fever (any origin)

Contraindications
Aspirin or NSAID allergy

Peptic ulcer disease
Chronic kidney disease
Anticoagulated patient

Adverse Reactions
Allergy/anaphylaxis
Hives, angioedema, bronchospasm, rash, hypotension, etc.

Drug Interactions
Avoid concomitant administration with other NSAID within past 6 hours.

Dosage and Administration
Adult:

600 mg PO

Pediatric
10 mg/kg PO

Ibuprofen Dosing Chart

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

Protocol

Pain Management

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

KETAMINE for Pain Management

Steamboat Springs Fire Rescue, Steamboat Ski Patrol only

Description

Ketamine is a non-competitive NMDA receptor antagonist and dissociative, amnestic, analgesic anesthetic agent.

Onset & Duration

- Onset: 45-60 seconds IV, IO; 1-5 minutes after IM administration.
- Duration: 10-15 minutes

Indications

- Analgesia in circumstances of severe pain

Contraindications

- Relatively contraindicated in penetrating eye trauma
- Relative contraindication in patients with known cardiovascular disease. (ketamine causes tachycardia)

Dosage and Administration

Adult and Pediatrics

Pain Management (may be administered with other narcotic pain medications):

0.1-0.3 mg/kg IV, IO q 10-15 minutes prn pain, max of **THREE** doses. (Slow IV Push all patients)

0.3-0.5 mg/kg IM, IN q 20 minutes prn pain, max of **TWO** doses.

IV Drip

0.3 mg/kg/hr 250mg in 250 of NS

Contact medical control for additional doses.

Pain Management, Ketamine Infusion			
250mg in 250ml NS (1mg/ml)			
Micro Drop 60 gtts			
kg	**mL/hr**	**mL/min**	**gtts/min**
40	12	0.1	12
50	15	0.125	15
60	18	0.15	18
70	21	0.175	21
80	24	0.2	24
90	27	0.225	27
100	30	0.25	30

Side Effects

- Laryngospasm: this very rare adverse reaction presents with stridor and respiratory distress. After every administration of ketamine:
  a. Prepare to provide respiratory support including bag-valve-mask ventilation and suction which are generally sufficient in rare cases of laryngospasm.
  b. Institute cardiac monitoring, pulse oximetry and continuous waveform capnography
  c. Establish IV or IO access, check blood glucose
- Emergence reaction: presents as anxiety, agitation, apparent hallucinations or nightmares as ketamine is wearing off. For severe reactions, consider benzodiazepine.
- Nausea and Vomiting: always have suction available after ketamine administration. Give antiemetic as needed.
- Hypersalivation: Suction usually sufficient. If profound hypersalivation causing airway difficulty, administer atropine 0.5 mg IV.

Special Considerations

- Ketamine is provided for IM administration in 100 mg/mL concentration
- Ski Area patient well have less monitoring, try to get as many as possible.
- All cases of ketamine use will be reviewed by the Medical Director.

Protocol

Benzodiazepine
Extremity Injuries
Abdominal Pain
Amputations
Burns
Bites/Stings Snake Bites
Face and Neck Trauma
Chest Trauma
Abdominal Trauma
Spinal Trauma

KETAMINE for RSI

Steamboat Springs Fire Rescue Only

Description

Ketamine is a non-competitive NMDA receptor antagonist and dissociative, amnestic, analgesic anesthetic agent.

Onset & Duration

- Onset: 45-60 seconds IV, IO; 1-5 minutes after IM administration.
- Duration: 10-15 minutes

Indication

- Rapid sequence induction for the purpose of intubation.

Contraindications

- Relatively contraindicated in penetrating eye trauma
- Relative contraindication in patients with known cardiovascular disease. (ketamine causes tachycardia)

Dosage and Administration

Rapid Sequence Intubation

1. 2mg/kg IV, IO during RSI induction.
2. 2.0 mg/kg/hr IV maintenance infusion.

Side Effects

- Laryngospasm: this very rare adverse reaction presents with stridor and respiratory distress. After every administration of ketamine:
    a. Prepare to provide respiratory support including bag-valve-mask ventilation and suction which are generally sufficient in rare cases of laryngospasm.
    b. Institute cardiac monitoring, pulse oximetry and continuous waveform capnography
    c. Establish IV or IO access, check blood glucose when possible.
    d. Establish and maintain physical restraint if needed.
- Emergence reaction: presents as anxiety, agitation, apparent hallucinations or nightmares as ketamine is wearing off. For severe reactions, consider benzodiazepine.
- Nausea and Vomiting: always have suction available after ketamine administration. Give antiemetic as needed.
- Hypersalivation: Suction usually sufficient. If profound hypersalivation causing airway difficulty, administer atropine 0.5 mg IV.

Special Considerations

- All cases of ketamine use will be reviewed by the Medical Director.

Protocol

Benzodiazepine

Atropine

Rapid Sequence Intubation

LIDOCAINE 2% SOLUTION

Description
- Secondary antiarrhythmic after amiodarone.
- Local anesthetic for relief of pain during intraosseous fluid administration.

Indications
- Analgesic for intraosseous infusion
- Recurrent or refractory ventricular fibrillation or ventricular tachycardia

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 IO

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

Cardiac arrest

Adult: 1.0-1.5 mg/kg IV bolus

Repeat 0.5-0.75 mg/kg IV bolus every 5 minutes up to 3 more doses, max 3mg/kg

Pediatric: 1 mg/kg IV bolus

Head trauma

100 mg IV bolus: no additional bolus is required.

Protocol
Intraosseous Procedure

Medical Pulseless Arrest Algorithm

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

Lidocaine Jelly 2%:
- Indication – Anesthetic lubricant for nasotracheal intubation
- Contraindication – Known history of hypersensitivity to local anesthetics
- Dosage and Administration
  - Apply a moderate amount of jelly to the endotracheal tube shortly before use.
  - Avoid introducing the jelly into the lumen of the tube
  - If jelly has dried before insertion, reapply

MAGNESIUM SULFATE

Description

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

Indications

Antiarrhythmic

- Torsade de pointes associated with prolonged QT interval

Respiratory

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

Obstetrics

- Eclampsia: Pregnancy > 20 weeks gestational age or post partum with seizures

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 100 ml of Normal Saline (0.9 NS), IV drip over 15-30 minutes.

Protocol

Medical Pulseless Arrest Algorithm

Adult wheezing

Obstetric Complications

METHYLPREDNISOLONE (SOLU-MEDROL)

Description

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

Indications

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

Contraindications

- Evidence of active GI bleed

Adverse Reactions

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

- Gastrointestinal bleeding
- Hypertension
- Hyperglycemia

Dosage and Administration

Adult:

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

Pediatric:

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

Protocol

Adult Wheezing
Pediatric Wheezing
Allergy and Anaphylaxis
Medical Hypotension/shock
Adrenal Insufficiency

Special Considerations

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

NALOXONE (NARCAN)

Description
Naloxone is a competitive opioid receptor antagonist

Onset & Duration
Onset: Within 5 minutes
Duration: 1-4 hours

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

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

Protocol
Medical 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).
- There are significant concomitant inherent risks in patients who have received naloxone, including:
    - Recurrent respiratory/CNS depression given short half-life of naloxone
    - Co-existing intoxication from alcohol or other recreational or prescription drugs
    - Acetaminophen toxicity from combination opioid/acetaminophen prescriptions
    - Non-cardiogenic pulmonary edema associated with naloxone use
    - Acute psychiatric decompensation, overdose, SI/HI or psychosis requiring ED evaluation
    - Sudden abrupt violent withdrawal symptoms which may limit decision making capacity
- Given the above risks, it is strongly preferred that patients who have received naloxone be transported

and evaluated by a physician. However, if the patient clearly has decision-making capacity he/she does have the right to refuse transport. If adamantly refusing, patients must be warned of the multiple risks of refusing transport.

- If the patient is refusing transport contact base. If any concerns or doubts about decision-making capacity exist, err on the side of transport.

NITROGLYCERIN (NITROSTAT, NITROQUICK, etc)

Description
Short-acting peripheral venodilator decreasing cardiac preload and afterload

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

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.

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

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/IM route: 1-2 mcg/kg.

- Dose may be repeated after 5 minutes and titrated to clinical effect to a maximum cumulative dose of 3 mcg/kg
- Additional dosing requires BASE CONTACT
- **RSI** 100 mcg, every 15 minutes if needed

IN route: 1-2 mcg/kg.

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

Pediatric (1-12 years): IV/IO 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/IM 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:
- 0.5-1 mg IV or IM over 2-5 minutes, 1-2 mg IM, titrated to pain relief, with a maximum dose of 3 mg. Systolic blood pressure must be >100.
- 0.5 mg IV or IM over 2-5 minutes, if prior analgesia has been administered. Repeat as needed with a maximum dose of 3 mg. Systolic blood pressure must be >100

Pediatric 1-12 years and ≥ 10kg:
IV/IO/IM routes: 0.2 mg
- Max of 3 doses, contact base for additional doses

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
Rapid Sequence Intubation

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

Medical Altered Mental Status

Hypoglycemia

OXYGEN

Description

Oxygen added to the inspired air increases the amount of oxygen in the blood, and thereby increases the amount delivered to the tissue. Tissue hypoxia causes cell damage and death. 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 . his may take sometime.
- 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

- Use the appropriate oxygen delivery method and flow rate to achieve SpO_2 of 90-96% when oxygen therapy is indicated.

Special Notes

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

PHENYLEPHRINE (INTRANASAL)

Description

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

Indications

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

Precautions

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

Dosage and Administration

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

Protocol

Nasotracheal intubation

Epistaxis

RACEMIC EPINEPHRINE

Description

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

Onset & Duration

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

Indications

- Stridor at rest

Side Effects

- Tachycardia
- Palpitations
- Muscle tremors

Dosage and Administration

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

Protocol

Pediatric Stridor/Croup

Special Considerations

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

SODIUM BICARBONATE

Description

Sodium bicarbonate is an 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.
- Hyperactive delirium with severe agitation that develops widening of QRS interval >120 msec orpulseless arrest
- Crush or suspension injury with known or suspected hyperkalemia

Contraindications

- Metabolic and respiratory alkalosis
- Hypocalcemia
- Hypokalemia

Adverse Reactions

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

Drug Interactions

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

Dosage and Administration 8.4%

Adults and pediatric

- **Pulseless arrest suspected due to hyperkalemia** (e.g., typically patient withdialysis, end-stage renal disease, hyperactive delirium with severe agitation)
  - 1 mEq/kg slow IV push. Repeat if needed x 2 every 5 minutes.
- **TCA poisoning with wide QRS >120 msec or ventricular arrhythmia Hyperactive delirium with severe agitation that develops wide QRS >120 msecCrush or suspension injury with known or suspected hyperkalemia**
  - 1 mEq/kg slow IV push. Repeat if needed x 2 every 5 minutes or until QRS is narrowed.

Protocol

Medical Pulseless Arrest

Poisoning/Overdose

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.

SUCCINYLCHOLINE (ANECTINE)

Description

- Succinylcholine is an ultra-short action depolarizing type skeletal muscle relaxant.
- As does acetylcholine it combines with the cholinergic receptors of the motor end plate to produce depolarization

Onset & Duration

- Onset of flaccid paralysis is rapid (less than 1 minute after IV administration) and with single administration lasts approximately 4-6 minutes.

Indications

- Rapid sequence intubation
- Short term paralysis to facilitate endotracheal intubation.

Contraindications

- Preexisting hyperkalemia
- Chronic myopathy or denervating neuromuscular disease
- 48 hours post-acute denervating event.
- In patients with known hypersensitivity to the drug and in patients with abnormally low plasma pseudocholinesterase, angle-closure glaucoma, malignant hypertension or penetrating eye injuries.
- Massive crush injuries.
- Burns greater than 8 hours.

Adverse Reactions

- Include the following; Apnea, malignant hyperthermia, dysrhythmias, bradycardia, hypertension, cardiac arrest, hyperkalemia, increased intraocular pressure and fasciculations
- Succinylcholine has no effect on consciousness, pain threshold or cerebration.

Dosage and Administration

- Administer succinylcholine 1.5 mg/kg rapid IVP (paralyzing dose)

Protocol

- Rapid Sequence Intubation

Special Notes

- EMT-B-IVs or EMT-I will be allowed to administer medication under the direct supervision of an EMT-P if the patient is in extremis.

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. Repeat as needed

Special Considerations

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

VASOPRESSOR CONTINUOUS INFUSION

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

Adverse Reactions

- Dysrhythmia
- Hypertension
- Anxiety
- Angina

Drug Interactions

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

Dosage and Administration:
Epinephrine:
- **2-10 mcg/min Mix**: inject 1 mg epinephrine into 250 mL Normal Saline bag to achieve 4mcg/mL concentration (This means 1 mL of 1:1000 or 10 mL of 1:10,000 – either way 1 mg of drug). Use micro drip set.
- **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.
- **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

Overdose and Acute Poisoning

Medical Hypotension/Shock

Special Considerations

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

VECURONIUM (NORCURON)

Description

A non-depolarizing agent that prevents acetylcholine from binding to receptors on the muscle end plate, thus blocking depolarizing.

Onset & Duration

- Norcuron will produce complete neuromuscular block with clinical duration of action of 25-45 minutes.

Indications

- Rapid sequence intubation
- Long term paralysis to facilitate endotracheal intubation if needed.

Contraindications

- In patients with known hypersensitivity to drug.
- Newborns
- Myasthenia Gravis

Adverse Reactions

- Apnea
- Profound weakness

Dosage and Administration

- Adult dose for long term paralysis, administer Norcuron 10 mg.

Protocol

- Rapid Sequence Intubation

Special Notes

- EMT-B-IVs or EMT-I will be allowed to administer medication under the direct supervision of an EMT-P if the patient is in extremis.