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INTRODUCTION

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

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

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

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

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

PROTOCOL KEY

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

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

PEDIATRIC PROTOCOLS

For the purposes of these clinical care protocols, pediatric patients are those less than 12 years of age. Infant is defined as less than 1 year of age. Neonate is defined as less than one month of age. Pediatric specific indications will be noted by a purple box.

TRAINING AND EDUCATION

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

The curriculum for initial EMS provider training may not cover some of the treatments, procedures and medications included in these protocols. Therefore, it is the responsibility of the EMS agency and Medical Director to ensure the initial training, verification, and maintenance of these skills falling outside traditional EMS education with all agency providers. This may be of additional importance when training and orienting newly hired providers prior to independent practice.
0020 GENERAL GUIDELINES: CONFIDENTIALITY

CONFIDENTIALITY

A. The patient-physician relationship, the patient-registered nurse relationship, and the patient-EMT relationship are recognized as privileged. This means that the physician, nurse, or EMT may not testify as to confidential communications unless:
   1. The patient consents
   2. The disclosure is allowable by law (such as Medical Board or Nursing Board proceedings, or criminal or civil litigation in which the patient's medical condition is in issue)

B. The prehospital provider must keep the patient's medical information confidential. The patient likely has an expectation of privacy, and trusts that personal, medical information will not be disclosed by medical personnel to any person not directly involved in the patient's medical treatment.
   1. Exceptions
      i. The patient is not entitled to confidentiality of information that does not pertain to the medical treatment, medical condition, or is unnecessary for diagnosis or treatment.
      ii. The patient is not entitled to confidentiality for disclosures made publicly.
      iii. The patient is not entitled to confidentiality with regard to evidence of a crime.

C. Additional Considerations:
   1. Any disclosure of medical information should not be made unless necessary for the treatment, evaluation or diagnosis of the patient.
   2. Any disclosures made by any person, medical personnel, the patient, or law enforcement should be treated as limited disclosures and not authorizing further disclosures to any other person.
   3. Any discussions of prehospital care by and between the receiving hospital, the crewmembers in attendance, or at in-services or audits which are done strictly for educational or performance improvement purposes, will fall under the “Carol J. Shanaberger Act” Colorado Revised Statutes §25-3.5-901 et seq., provided that all appropriate criteria have been met for the agencies peer protection program. Further disclosures are not authorized.
   4. Radio communications should not include disclosure of patient names.
   5. This procedure does not preclude or supersede your agency’s HIPAA policy and procedures.
General Principles: Adults

A. An adult in the State of Colorado is 18 years of age or older.
B. Every adult is presumed capable of making medical treatment decisions. This includes the right to make "bad" decisions that the prehospital provider believes are not in the best interests of the patient.
C. A person is deemed to have decision-making capacity if he/she has the ability to provide informed consent, i.e., the patient:
   1. Understands the nature of the illness/injury or risk of injury/illness.
   2. Understands the possible consequences of delaying treatment and/or refusing transport.
   3. Not intoxicated with drugs and/or alcohol
   4. Given the risks and options, the patient voluntarily refuses or accepts treatment and/or transport.
D. A call to 9-1-1 itself does not prevent a patient from refusing treatment. A patient may refuse medical treatment (IVs, oxygen, medications), but you should try to inform the patient of the need for therapies, offer again, and treat to the extent possible.
E. The odor of alcohol on a patient's breath does not, by itself, prevent a patient from refusing treatment.
F. Implied Consent: An unconscious adult is presumed to consent to treatment for life-threatening injuries/illnesses.
G. Involuntary Consent: A person other than the patient in rare circumstances may authorize Consent. This may include a court order (guardianship), authorization by a law enforcement officer for prisoners in custody or detention, or for persons under a mental health hold or commitment who are a danger to themselves or others or are gravely disabled.

Procedure: Adults

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

General Principles: Minors

A. A parent, including a parent who is a minor, may consent to medical or emergency treatment of his/her child. There are exceptions:
   1. Neither the child nor the parent may refuse medical treatment on religious grounds if the child is in imminent danger as a result of not receiving medical treatment, or when the child is in a life-threatening situation, or when the condition will result in serious handicap or disability.
   2. The consent of a parent is not necessary to authorize hospital or emergency health care when an EMT in good faith relies on a minor's consent, if the minor is at least 15 years of age and emancipated or married.
   3. Minors may seek treatment for abortion, drug addiction, and venereal disease without consent of parents. Minors > 15 years may seek treatment for mental health.
B. When in doubt, your actions should be guided by what is in the minor's best interests and base contact.

Procedure: Minors

A. A parent or legal guardian may provide consent to or refuse treatment in a non-life-threatening situation.
B. When the parent is not present to consent or refuse:
   1. If a minor has an injury or illness, but not a life-threatening medical emergency, you should attempt to contact the parent(s) or legal guardian. If this cannot be done promptly, transport.
   2. If the child does not need transport, they can be left at the scene in the custody of a responsible adult (e.g., teacher, social worker, grandparent). It should only be in very rare circumstances that a child of any age is left at the scene if the parent is not also present.
   3. If the minor has a life-threatening injury or illness, transport and treat per protocols. If the parent objects to treatment, CONTACT BASE immediately and treat to the extent allowable, and notify police to respond and assist.
0040 GENERAL GUIDELINES: PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

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

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

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

Special notes
A. Every situation may be different, based on the physician, the scene, and the condition of the patient.
B. CONTACT BASE when any question(s) arise.
NOTE TO PHYSICIANS ON INVOLVEMENT WITH EMS PROVIDERS

THANK YOU FOR OFFERING YOUR ASSISTANCE.

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

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

THANK YOU FOR OFFERING YOUR ASSISTANCE DURING THIS EMERGENCY.

Medical Director

Agency
0040 GENERAL GUIDELINES: PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

PHYSICIAN AT THE SCENE/MEDICAL DIRECTION ALGORITHM

EMS arrives on scene

EMT attempts patient care

Physician reports on patient and relinquishes patient care

Provide care per protocol

Physician wants to help or is involved in or will not relinquish patient care

Prehospital provider identifies self and level of training

Physician willing to just help out

Provide general instructions and utilize physician assistance

Physician requests or performs care inappropriate or inconsistent with protocols

Shares Physician at the Scene/Medical Direction Note with physician and advise physician of your responsibility to the patient

Physician does not relinquish patient care and continues with care inconsistent with protocols

CONTACT BASE for Medical Consult

Physician complies

Provide care per protocol
0050 GENERAL GUIDELINES: TERMINATION OF RESUSCITATION AND FIELD PRONOUNCEMENT GUIDELINES

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

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

Termination of Resuscitation (TOR)
All cases described below require contact with a base physician to approve termination of resuscitation (TOR). Pediatric patients (<12 years): treatment and transport should be initiated in all pediatric trauma arrests unless obvious signs of death.

1. Blunt Trauma Arrest:
   a. Contact Base for TOR if patient found apneic and pulseless despite basic airway maneuvers and no signs of life witnessed by Denver Paramedic on scene (spontaneous movement, pupillary response, respiratory effort, or pulse).

2. Penetrating Trauma Arrest:
   a. Resuscitate and transport to a trauma facility.
      i. Contact Base for TOR if time of arrest suspected to be > 10 minutes and no signs of life (spontaneous movement, pupillary response, respiratory effort, or pulse).

3. Medical Pulseless Arrest:
   a. Resuscitate according to Universal Pulseless Arrest Algorithm on scene (unless unsafe) until one of the following end-points met:
      i. Return of spontaneous circulation (ROSC).
      ii. No ROSC despite 15 minutes of provision of ALS care or BLS care with an AED. If shockable rhythm still present, continue resuscitation and transport to closest emergency department.
      iii. Contact base for TOR at any point if continuous asystole for at least 15 minutes in any patient despite adequate CPR with ventilation and no reversible causes have been identified.
   b. For BLS-only providers, contact base for TOR when all of the following criteria met:
      i. No AED shock advised
      ii. No ROSC
      iii. Arrest unwitnessed by either EMS or bystanders
      iv. No bystander CPR before EMS arrival
   c. The following patients found pulseless and apneic warrant resuscitation efforts beyond 30 minutes and should be transported:
      i. Hypothermia
      ii. Drowning with hypothermia and submersion < 60 minutes
      iii. Pregnant patient with estimated gestational age ≥ 20 weeks
      iv. Lightning strike & electrocutions
      v. Avalanche victim

4. After pronouncement, do not alter condition in any way or remove equipment (lines, tubes, etc.), as the patient is now a potential coroner’s case.
Advance Medical Directives

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

Additional Considerations:

A. Patients with valid DNR orders or advanced medical directives should receive supportive or comfort care, e.g. medication by any route, positioning and other measures to relieve pain and suffering. Also the use of oxygen, suction and manual treatment of an airway obstruction as needed for comfort.
B. Mass casualty incidents are not covered in detail by these guidelines. (See State Trauma Triage Algorithm).
C. If the situation appears to be a potential crime scene, EMS providers should disturb the scene as little as possible and communicate with law enforcement regarding any items that are moved or removed from the scene.
D. Mechanisms for disposition of bodies by means other than EMS providers and vehicles should be prospectively established in each county or locale.
   1. In all cases of unattended deaths occurring outside of a medical facility, the coroner should be contacted immediately.
0070 GENERAL GUIDELINES: PATIENT DETERMINATION: “PATIENT OR NO PATIENT”

General Guidelines
This protocol is intended to refer to individual patient contacts. In the event of a multiple party incident, such as a multi-vehicle collision, it is expected that a reasonable effort will be made to identify those parties with acute illness or injuries. Adult patients indicating that they do not wish assistance for themselves or dependent minors in such a multiple party incident do not necessarily require documentation as patients.

No protocol can anticipate every scenario and providers must use best judgment. When in doubt as to whether individual is a “patient”, err on the side of caution and perform a full assessment and documentation.

Decision-Making Capacity
(Must meet all criteria)
- Understands nature of illness or injury
- Understands consequences of refusal of care
- Not intoxicated with drugs or alcohol
- No criteria for a Mental Health Hold:
  - Not homicidal or suicidal
  - Not gravely disabled or psychotic
  - Not a danger to self or others

Individual meets definition of a Patient
(PCR Required)

Person is a minor
(Age < 18 yrs)

No

Person lacks decision-making capacity
(See adjacent)

No

Acute illness or injury suspected based on appearance, MOI, etc

No

Person has a complaint resulting in a call for help

No

3rd party caller indicates individual is ill, injured or gravely disabled

No

Person does not meet definition of a patient, and does not require PCR or refusal of care
A person who has decision-making capacity may refuse examination, treatment and transport.

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

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

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

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

For potentially intoxicated patients, refer to Alcohol Intoxication.

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

Standing Order Refusal
No Base Contact required if ALL criteria met:
- 18 and older, or 5 and older if parent/guardian on scene
- Patient has decision-making capacity

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

High Risk Patients
Base contact is required whenever, in the clinical judgement of the EMS provider, the patient is at high risk of deterioration without medical intervention.
**0090 GENERAL GUIDELINES: EMERGENCY DEPARTMENT DIVERT AND ADVISORY**

**Purpose**

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

**General Principles**

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

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

General Principles

A. The 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 Medical Directors place great faith in the training and expertise of our EMS colleagues and therefore wide latitude is granted throughout the protocol.

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

C. Throughout the protocol patient “BASE CONTACT” is used to signify the need for call in. These algorithm points are set and agreed upon by the medical directors and reflect critical decision points in care where communication with physician support is expected.

Preferred Base Contact Times.

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

1. Any time “BASE CONTACT” is required or recommended per protocol.
2. Unusual presentations or patient care situations not covered by set protocol and outside the scope of practice or comfort level of care by individual prehospital provider.
3. Necessary deviation from protocol deemed to be in the best interest of the patient.
4. For selected patient care refusals as indicated by General Guidelines: Patient Non-Transport or Refusal.
5. During the care of critically ill patient who is not responding to protocol/algorithmic treatment.
0130 GENERAL GUIDELINES: TRANSPORTATION OF THE PEDIATRIC PATIENT

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

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

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

1. For a child who is not a patient, but requires transport to a facility
   All reasonable effort should be made to transport children who are not patients in a vehicle other than the ambulance. If transport in a vehicle other than an ambulance is not possible, transport in a size-appropriate child restraint system in the front passenger seat 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.

A. The parent/guardian of a special needs child is the expert on that child and knows the details of that illness, typical responses, and baseline interactions better than anyone. Utilize and trust his/her knowledge and concerns. This may include vital signs, medication responses, or physical positioning (i.e. of contracted limbs) that may not be typical.

B. Medically complicated children are often given healthcare notes describing their unique medical history and emergency healthcare needs. Ask the parent/guardian for an emergency information sheet, emergency healthcare form, or QR code.

C. Ask the parent/guardian for the “go bag” for medical technology-assisted children. This will contain the child’s spare equipment and supplies that may be needed on scene, during transport or in the hospital.

D. Transport the child to their medical “home” hospital whenever possible.
1000 PROCEDURE PROTOCOL: OROTRACHEAL INTUBATION

Indications:

- Respiratory failure
- Absence of protective airway reflexes
- Present or impending complete airway obstruction
- Anticipated prolonged need for positive pressure ventilation

Contraindications:

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

Technique:

1. Initiate BLS airway sequence
2. Suction airway and pre-oxygenate with BVM ventilations, if possible
3. Check equipment and position patient:
   a. If trauma: have assistant hold in-line spinal immobilization in neutral position
   b. If no trauma, sniffing position or slight cervical hyperextension is preferred
4. Perform laryngoscopy
   a. To improve laryngeal view, use right hand to manipulate larynx, or have assistant apply backwards, upwards, rightward pressure (BURP)
5. Place ETT. Confirm tracheal location and appropriate depth and secure tube
   a. Correct tube depth may be estimated as 3 times the internal diameter of tube at teeth or gums (e.g: 7.0 ETT is positioned at 21 cm at teeth)
6. Confirm and document tracheal location by:
   a. ETCO2, preferably with waveform capnography
   b. Presence and symmetry of breath sounds
   c. Rising SpO2
   d. Other means as needed
7. Ventilate with BVM. Assess adequacy of ventilations
8. As soon as ETT is placed, continually reassess ventilation, oxygenation and tube position with continuous waveform capnography and SpO2

Precautions:

- Ventilate at age-appropriate rates. Do not hyperventilate
- If the intubated patient deteriorates, think “DOPE”
  o Dislodgement
  o Obstruction
  o Pneumothorax
  o Equipment failure (no oxygen)
- Reconfirm and document correct tube position, 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.

ETCO2 < 10 mm Hg: "Less than ten, check again"
ETCO2 < 8 mm Hg: "Less than eight, extubate"
1010 PROCEDURE PROTOCOL: NASOTRACHEAL INTUBATION

Indications:

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

Contraindications:

- Apnea
- Severe mid-face trauma

Technique:

1. Initiate BLS airway sequence
2. Suction airway and pre-oxygenate with BVM ventilations, if possible
3. Check equipment, choose correct ETT size (usually 7.0 in adult, limit is size of naris)
4. Position patient with head in midline, neutral position
5. If trauma: cervical collar may be in place, or assistant may hold in-line stabilization in neutral position
6. If no trauma, patient may be sitting upright
7. Administer phenylephrine nasal drops in each nostril
8. Lubricate ETT with Lidocaine jelly or other water-soluble lubricant
9. With gentle steady pressure, advance the tube through the nose to the posterior pharynx. Use the largest nostril. Abandon procedure if significant resistance is felt
10. Keeping the curve of the tube exactly in midline, continue advancing slowly
11. There will be slight resistance just before entering trachea. Wait for an inspiratory effort before final passage through cords. Listen for loss of breath sounds
12. Continue advancing tube until air is definitely exchanging through tube, then advance 2 cm more and inflate cuff
13. Note tube depth and tape securely
14. Confirm and document endotracheal location by:
   a. ETCO₂, preferably with waveform capnography
   b. Presence and symmetry of breath sounds
   c. Rising SpO₂
   d. Other means as needed
15. Ventilate with BVM. Assess adequacy of ventilations
16. As soon as ETT is placed, continually reassess ventilation, oxygenation and tube position with continuous ETCO₂ and SpO₂

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”
  o Dislodgement
  o Obstruction
  o Pneumothorax
  o Equipment failure (no oxygen)
- Reconfirm and document correct tube position, 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.

ETCO₂ < 10 mm Hg: "Less than ten, check again"
ETCO₂ < 8 mm Hg: "Less than eight, extubate"
**1030 PROCEDURE PROTOCOL: BOUGIE ASSISTED SURGICAL CRICOTHYROTOMY**

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

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

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

**Technique:**
1. Position the patient supine, with in-line spinal immobilization if indicated. If cervical spine injury not suspected, neck extension will improve anatomic view.
2. Using an aseptic technique (betadine/alcohol wipes), cleanse the area.
3. Standing on the left side of the patient, stabilize the larynx with the thumb and middle finger of your left hand, and identify the cricothyroid membrane, typically 4 finger breadths below mandible.
4. Using a scalpel, make a 3 cm centimeter vertical incision 0.5 cm deep through the skin and fascia, over the cricothyroid membrane. With finger, dissect the tissue and locate the cricothyroid membrane.
5. Make a horizontal incision through the cricothyroid membrane with the scalpel blade oriented caudal and away from the cords.
6. Insert the bougie curved-tip first through the incision and angled towards the patient's feet.
   a. If no bougie available, use tracheal hook instrument to lift caudal edge of incision to facilitate visualization and introduction of ETT directly into trachea and skip to # 9.
7. Advance the bougie into the trachea feeling for “clicks” of tracheal rings and until “hangup” when it cannot be advanced any further. This confirms tracheal position.
8. Advance a 6-0 endotracheal tube over the bougie and into the trachea. It is very easy to place tube in right mainstem bronchus, so carefully assess for symmetry of breath sounds. Remove bougie while stabilizing ETT ensuring it does not become dislodged.
9. Ventilate with BVM and 100% oxygen.
10. Confirm and document tracheal tube placement as with all advanced airways: ETCO₂ (preferably with waveform capnography) as well as clinical indicators e.g.: symmetry of breath sounds, rising pulse oximetry, etc.
11. Secure tube with ties.
12. Observe for subcutaneous air, which may indicate tracheal injury or extra- tracheal tube position.
13. Continually reassess ventilation, oxygenation and tube placement.

**Precautions:**
- Success of procedure is dependent on correct identification of cricothyroid membrane.
- Bleeding will occur, even with correct technique. Straying from the midline is dangerous and likely to cause hemorrhage from the carotid or jugular vessels, or their branches.
1050 PROCEDURE PROTOCOL: SUPRAGLOTTIC AIRWAY

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

Contraindications:
- Intact gag reflex
- Caustic ingestion

Technique:
1. Initiate BLS airway sequence
2. Select proper size supraglottic airway based on manufacturer's specifications
3. Assemble equipment, note correct volume for inflation marked on tube itself, test balloon for leaks, lubricate posterior aspect distal tip with water-soluble lubricant
4. Suction airway and maximize oxygenation with BVM ventilations
5. If trauma: have assistant hold in-line spinal immobilization in neutral position
6. If no trauma, sniffing position or slight cervical hyperextension is preferred
7. Place supraglottic airway utilizing device-specific technique
8. Inflate cuff balloon with correct volume of air (marked on device)
9. Confirm tube placement by auscultation, chest movement, and ETCO₂ (preferably with waveform capnography)
10. Continuously monitor ETCO₂ with waveform capnography, SpO₂, vital signs

Precautions:
1. Do not remove a properly functioning supraglottic airway in order to attempt intubation
2. Correct sizing of supraglottic airways is critical for correct function
3. Supraglottic airways are safe and effective in pediatric patients, provided the correct size tube is selected. The age-range for supraglottic airway use is dependent on the specific device being used. Providers should be trained on and familiar with correct size selection for their device.
4. Use with caution in patients with broken teeth, which may lacerate balloon
5. Use with caution in patients with known esophageal disease who are at increased risk of esophageal injury.
**PROCEDURE PROTOCOL: CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)**

**Indications:**
- Symptomatic patients with moderate-to-severe respiratory distress as evidenced by at least two (2) of the following:
  - Rales (crackles)
  - Dyspnea with hypoxia (SpO₂ less than 90% despite O₂)
  - Dyspnea with verbal impairment – i.e. cannot speak in full sentences
  - Accessory muscle use
  - Respiratory rate greater than 24/minute despite O₂
  - Diminished tidal volume

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

**Technique:**
1. Place patient in a seated position and explain the procedure to him or her
2. Assess vital signs (BP, HR, RR, SpO₂, and ETCO₂)
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 SpO₂
   d. Stabilized blood pressure
   e. Appropriate ETCO₂ 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 SpO₂ readings
   d. Rising ETCO₂ levels or other ETCO₂ evidence of ventilatory failure
   e. Diminished or no improvement in tidal volume

**Precautions:**
- Should patient deteriorate on CPAP:
  o Troubleshoot equipment
  o Consider endotracheal intubation
  o Assess need for possible chest decompression due to pneumothorax
  o Assess for possibility of hypotension due to significantly reduced preload from positive pressure ventilation
- In-line nebulized medications may be given during CPAP as indicated and in accordance with manufacturer guidelines
- Some fixed pressure CPAP devices do not have FiO₂ adjustment and will only administer up to 30% oxygen. If no improvement in oxygenation with a fixed pressure CPAP device, consider adding supplemental oxygen.
1070 PROCEDURE PROTOCOL: CAPNOGRAPHY

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

Contraindications:
A. None

Technique:
A. In patient with ETT or advanced airway: place ETCO₂ detector in-line between airway adaptor and BVM after airway positioned and secured
B. Patients without ETT or advanced airway in place: place ETCO₂ cannula on patient. May be placed under CPAP or NRB facemask
C. Assess and document both capnography waveform and ETCO₂ value

Precautions:
A. To understand and interpret capnography, remember the 3 determinants of ETCO₂:
   1. Alveolar ventilation
   2. Pulmonary perfusion
   3. Metabolism
B. Sudden loss of ETCO₂:
   1. Tube dislodged
   2. Circuit disconnected
   3. Cardiac arrest
C. High ETCO₂ (>45)
   1. Hypoventilation/CO₂ retention
D. Low ETCO₂ (<25)
   1. Hyperventilation
   2. Low perfusion: shock, PE, sepsis
E. Cardiac Arrest:
   1. In low-pulmonary blood flow states, such as cardiac arrest, the primary determinant of ETCO₂ is blood flow, so ETCO₂ is a good indicator of quality of CPR
   2. If ETCO₂ is dropping, change out person doing chest compressions
   3. In cardiac arrest, if ETCO₂ not > 10 mmHg after 20 minutes of good CPR, this likely reflects very low CO₂ production and is associated with poor outcome
   4. Sudden rise in EtCO₂ may be an indicator of ROSC
Indication:
A. Needle decompression of tension pneumothorax is a standing order for penetrating trauma and requires base contact for use in blunt trauma
B. **All** of the following clinical indicators must be present:
   1. Severe respiratory distress
   2. Hypotension
   3. Unilateral absent or decreased breath sounds

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

Precautions:
A. Angiocath may become occluded with blood or by soft tissue
B. A simple pneumothorax is NOT an indication for needle decompression
1090 PROCEDURE PROTOCOL: SYNCHRONIZED CARDIOVERSION

Unstable tachyarrhythmia with a pulse

Check:
- O₂ via NRB facemask
- Functioning IV line
- Suction
- Advanced airway equipment ready

Sedate with benzodiazepine whenever possible

Perform Synchronized Cardioversion

<table>
<thead>
<tr>
<th>Adult</th>
<th>Pediatric</th>
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<tbody>
<tr>
<td>200 Joules</td>
<td>0.5-1 Joules/kg</td>
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<tr>
<td>biphasic</td>
<td>biphasic</td>
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Continue treatment according to Tachycardia with Poor Perfusion

Precautions:
- If rhythm is AV nodal reentrant tachycardia (AVNRT, historically referred to as “PSVT”) it is preferred to attempt a trial of adenosine prior to electrical cardioversion, even if signs of poor perfusion are present, due to rapid action of adenosine
- If defibrillator does not discharge in “synch” mode, then deactivate “synch” and reattempt
- If sinus rhythm achieved, however briefly, then dysrhythmia resumes immediately, repeated attempts at cardioversion at higher energies are unlikely to be helpful. First correct hypoxia, hypovolemia, etc. prior to further attempts at cardioversion
- If pulseless, treat according to Universal Pulseless Arrest Algorithm
- Chronic atrial fibrillation is rarely a cause of hemodynamic instability, especially if rate is < 150 bpm. First correct hypoxia, hypovolemia, before considering cardioversion of chronic atrial fibrillation, which may be difficult, or impossible and poses risk of stroke
- Sinus tachycardia rarely exceeds 150 bpm in adults or 220 bpm in children < 8 years and does not require or respond to cardioversion. Treat underlying causes.
- Transient dysrhythmias or ectopy are common immediately following cardioversion and rarely require specific treatment other than supportive care
1100 PROCEDURE PROTOCOL: TRANSCUTANEOUS CARDIAC PACING

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

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

Contraindications
1. Pacing is contraindicated in pulseless arrest.

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

Complications
1. Ventricular fibrillation and ventricular tachycardia are rare complications, but follow appropriate protocols if either occur.
2. Pacing is rarely indicated in patients under the age of 12 years.
3. Muscle tremors may complicate evaluation of pulses; femoral pulse may be more accurate.
4. Pacing may cause diaphragmatic stimulation and apparent hiccups.
1110 PROCEDURE PROTOCOL: INTRAOSSEUS CATHETER PLACEMENT

**Indications (must meet all criteria):**

A. Rescue or primary vascular access device when peripheral IV access not obtainable in a patient with critical illness defined as:
   1. Cardiopulmonary arrest or impending arrest
   2. Profound shock with severe hypotension and poor perfusion
   3. Hypoglycemia with severe symptoms (e.g. unresponsive) and no venous access
B. Utilization of IO access for all other patients requires base station contact
C. IO placement may be considered prior to peripheral IV attempts in critical patients without identifiable peripheral veins

**Technique:**

A. Site – proximal tibia.
B. Clean skin with povidone-iodine.
C. Place intraosseous needle perpendicular to the bone.
   1. For infants less than 6 months consider manual insertion of needle rather than powered device to avoid puncturing through both sides of the bone.
D. Follow manufacturer’s guidelines specific to the device being used for insertion.
E. Entrance into the bone marrow is indicated by a sudden loss of resistance.
F. Flush line with 10 mL saline. Do not attempt to aspirate marrow
G. Secure line
   1. 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.
H. 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.
I. A person should be assigned to monitor the IO at the scene and en route to the hospital.
J. Do not make more than one IO placement attempt per bone.
K. Do not remove IO needles in the field.
L. Notify hospital staff of all insertion sites/attempts and apply patient wristband included with kit to identify IO patient.

**Complications:**

A. Fracture
B. Compartment syndrome
C. Infection

**Contraindications:**

A. Fracture of target bone
B. Cellulitis (skin infection overlying insertion site)
C. Osteogenesis imperfecta (rare condition predisposing to fractures with minimal trauma)
D. Total knee replacement (hardware will prevent placement)

**Side Effects and Special Notes:**

A. 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.
B. Expect flow rates to be slower than peripheral IVs. Pressure bags may be needed. Any drug or IV fluid may be infused.
**1120 PROCEDURE PROTOCOL: TOURNIQUET PROTOCOL**

**Indications**

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

**Precautions**

A. A tourniquet applied incorrectly can increase blood loss.
B. Applying a tourniquet can cause nerve and tissue damage whether applied correctly or not. Proper patient selection is of utmost importance.
C. Injury due to tourniquet is unlikely if the tourniquet is removed within 1 hour. In cases of life-threatening bleeding, benefit outweighs theoretical risk.
D. A commercially made tourniquet is the preferred tourniquet. If none is available, a blood pressure cuff inflated to a pressure sufficient to stop bleeding is an acceptable alternative. Other improvised tourniquets are not allowed.

**Technique**

A. First, attempt to control hemorrhage by using direct pressure over bleeding area.
B. If a discrete bleeding vessel can be identified, point pressure over bleeding vessel is more effective than a large bandage and diffuse pressure.
C. If unable to control hemorrhage using direct pressure, apply tourniquet according to manufacturer specifications and using the steps below:
   1. Cut away any clothing so that the tourniquet will be clearly visible. NEVER obscure a tourniquet with clothing or bandages.
   2. Apply tourniquet proximal to the wound and not across any joints.
   3. Tighten tourniquet until bleeding stops. Applying tourniquet too loosely will only increase blood loss by inhibiting venous return.
   4. Mark the time and date of application on the patient’s skin next to the tourniquet.
   5. Keep tourniquet on throughout hospital transport – a correctly applied tourniquet should only be removed by the receiving hospital.
1130 PROCEDURE PROTOCOL: RESTRAINT PROTOCOL

Indications:
A. Physical restraint of patients is permissible and encouraged if the patient poses a danger to him/herself or to others. Only reasonable force is allowable, i.e., the minimum amount of force necessary to control the patient and prevent harm to the patient or others. Try alternative methods first (e.g., verbal de-escalation should be used first if the situation allows).

B. Paramedic: Consider pharmacological sedation for agitated patients that require transport and are behaving in a manner that poses a threat to him/herself or others.
   1. See Agitated/Combative Patient Protocol; (The term “chemical restraint” is no longer preferred)

C. Restraints may be indicated for patients who meet the following criteria:
   1. A patient who is significantly impaired (e.g. intoxication, medical illness, injury, psychiatric condition, etc) and lacks decision-making capacity regarding his or her own care.
   2. A patient who exhibits violent, combative or uncooperative behavior who does not respond to verbal de-escalation.
   3. A patient who is suicidal and considered to be a risk for behavior dangerous to his or herself or to healthcare providers.
   4. A patient who is on a mental health hold.

Precautions:
A. When appropriate, involve law enforcement
B. Restraints shall be used only when necessary to prevent a patient from seriously injuring him/herself or others (including the EMS providers), and only if safe transportation and treatment of the patient cannot be accomplished without restraints. They may not be used as punishment, or for the convenience of the crew.
C. Any attempt to restrain a patient involves risk to the patient and the prehospital provider. Efforts to restrain a patient should only be done with adequate assistance present.
D. Be sure to evaluate the patient adequately to determine his or her medical condition, mental status and decision-making capacity.
E. Do not use hobble restraints and do not restrain the patient in the prone position or any position that impairs the airway or breathing.
F. Search the patient for weapons.
G. Handcuffs are not appropriate medical restraints and should only be placed by law enforcement personnel. See Transport of Handcuffed Patient Protocol.

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

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

Complications:
A. Aspiration: continually monitor patient’s airway
B. Nerve injury: assess neurovascular status of patient’s limbs during transport
C. Complications of medical conditions associated with need for restraint
   1. Patients may have underlying trauma, hypoxia, hypoglycemia, hyperthermia, hypothermia, drug ingestion, intoxication or other medical conditions
D. Excited Delirium Syndrome. This is a life-threatening medical emergency. These patients are truly out of control. They will have some or all of the following symptoms: paranoia, disorientation, hyper-aggression, hallucination, tachycardia, increased strength, and hyperthermia.
1150 PROCEDURE PROTOCOL: TASER® PROBE REMOVAL

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

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

Technique
1. Confirm the TASER® has been shut off and the barb cartridge has been disconnected.
2. Using a pair of shears cut the TASER® wires at the base of the probe.
3. Place one hand on the patient in area where the probe is embedded and stabilize the skin surrounding the puncture site. Using the other hand (or use pliers) firmly grasp the probe.
4. In one uninterrupted motion, pull the probe out of the puncture site maintaining a 90° angle to the skin. Avoid twisting or bending the probe.
5. Repeat the process for any additional probes.
6. Once the probes are removed, inspect and assure they have been removed intact. In the event the probe is not removed intact or there is suspicion of a retained probe, the patient must be transported to the emergency department for evaluation.
7. Cleanse the probe site and surrounding skin with betadine and apply sterile dressing.
8. Advise patient to watch for signs of infection including increased pain at the site, redness swelling or fever.
2000 OBSTRUCTED AIRWAY

Attempt to determine cause of obstruction

Does patient show universal sign of choking?

No

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

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

No

• Perform abdominal thrusts or chest thrusts until obstruction relieved then reattempt ventilations with BVM

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

Yes

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

Unconscious Patient

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

Able to ventilate or obstruction cleared?

Yes

Unconscious Patient

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

No

Mild or Moderate Obstruction

Is obstruction cleared?

Yes

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

No

• For visibly pregnant or obese patients perform chest thrusts only
• For infants, 5 chest thrusts then 5 back blows

Able to ventilate or obstruction cleared?

Yes

• For infants, 5 chest thrusts, then 5 back blows

No

• Perform Heimlich maneuver
• For visibly pregnant or obese patients perform chest thrusts only
Consider pulmonary and non-pulmonary causes of respiratory distress:
- Pulmonary embolism
- Pneumonia
- Heart attack
- Pneumothorax
- Sepsis
- Metabolic acidosis (e.g.: DKA)
- Anxiety

Mixed picture may exist
- Goal is maximization of oxygenation and ventilation in all cases
- CPAP may be particularly useful in mixed picture with hypoxia and/or hypoventilation
- Avoid furosemide in uncertain diagnosis
- Avoid albuterol in suspected pulmonary edema

Respiratory Distress

For all patients:
While assessing ABCs: give supplemental O₂, monitor vital signs, cardiac rhythm, SpO₂ and ETCO₂

Patent airway?

No

Obstructed Airway protocol

Yes

Are ventilations adequate for physiologic state?

No

Assist ventilations with BVM and airway adjuncts as needed

Yes

Is anaphylaxis likely?

No

Yes

Allergy/Anaphylaxis protocol

Yes

Is asthma or COPD likely?

No

Yes

Adult Wheezing protocol

No

Is CHF/pulmonary edema likely?

No

Yes

CHF/Pulmonary Edema protocol

Transport
- Provide supportive care
- Maximize oxygenation and ventilation
- Contact Base if needed for consult
- Consider 12 lead ECG

Consider 12 lead ECG
Respiratory Distress

For all patients:
While assessing ABCs: give supplemental O₂, monitor vital signs, cardiac rhythm, and SpO₂

Patent Airway?
- Yes
- No

Are ventilations adequate for age?
- Yes
- No

Is anaphylaxis likely?
- Yes
- No

Is there a barking cough and stridor?
- Yes
- No

Is there wheezing?
- Yes
- No

- Provide supportive care
- Maximize oxygenation and ventilation
- CONTACT BASE if needed for consult

Obstructed Airway protocol

Assist ventilations at age-appropriate rate with BVM and airway adjuncts as needed

Allergy/Anaphylaxis protocol

Pediatric Stridor/Croup protocol

Pediatric Wheezing protocol

Age-appropriate ventilation rate in respiratory failure:

<table>
<thead>
<tr>
<th>Age</th>
<th>Breaths/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonate</td>
<td>40</td>
</tr>
<tr>
<td>Infants</td>
<td>30</td>
</tr>
<tr>
<td>Children</td>
<td>20</td>
</tr>
</tbody>
</table>

Assisted ventilation rates listed do not apply to the patient in cardiac arrest

Characteristics of Stridor:
- High-pitched, harsh sound most often heard on inspiration
- Occurs with upper airway restriction
- Significant restriction may result in biphasic stridor (heard on inspiration and expiration)

Consider pulmonary and non-pulmonary causes:
- Foreign body
- Croup
- Pneumonia
- Bronchiolitis
- Pulmonary embolism
- Sepsis
- Metabolic derangement
- Anxiety
2030 ADULT WHEEZING

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

Adult Respiratory Distress Protocol and prepare for immediate transport

Give oxygen, check SpO₂, & consider IV for severe respiratory distress

EMT may administer either MDI or nebulized albuterol with base contact for verbal order

Give nebulized albuterol + ipratropium

May give continuous neb for severe respiratory distress

Is response to treatment adequate?

Yes

- 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

No

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

- Consider IV magnesium; (with base contact)

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

COPD

- Correct hypoxia: do not withhold maximum oxygen for fear of CO₂ 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

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

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 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
2040 PEDIATRIC WHEEZING

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.

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

BLS airway preferred in pediatrics

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

EMT may administer either MDI or nebulized albuterol with base contact
Give nebulized albuterol + ipratropium
May give continuous neb for severe respiratory distress

Is response to treatment adequate?

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?

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.

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.
2050 PEDIATRIC STRIDOR/CROUP

Characteristics of Croup:
- Most common cause of stridor in children
- Child will have stridor, barking 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 SpO2, give oxygen as needed

Are symptoms severe and croup most likely?
- Stridor at rest or biphasic stridor
- Severe retractions
- SpO2 < 90% despite O2
- Altered LOC
- Cyanosis

Give nebulized racemic epinephrine

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

Is response to treatment adequate?

- Continue monitoring and assessment en route
- Contact base for 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.
**2060 CHF/PULMONARY EDEMA**

**Universal Respiratory Distress Protocol**

CHF/Pulmonary edema

**Obtain 12 lead ECG: rule out unstable rhythm, STEMI**

**Give nitroglycerin (NTG)**

Is oxygenation and ventilation adequate?

**Start CPAP protocol**

Is response to treatment adequate?

**If failing above therapy:**
- Remove CPAP and ventilate with BVM
- Consider pneumothorax
- Consider alternative diagnoses/complications
- Consider advanced airway

**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

- Continue monitoring and assessment
- Transport
- Contact base for medical consult as needed
3000 UNIVERSAL PULSELESS ARREST ALGORITHM

BLS Sequence

Pulseless Arrest

Start CPR + apply AED

Check rhythm & shock if indicated. Repeat every 2 min

ALS Sequence

• Start CPR
• Attach manual defibrillator ASAP
• Give O₂

Shockable Rhythm?

Yes

No

VT/VF

Shock then CPR x 2 min

• Start IV/IO
• Epinephrine

No

Yes

Asystole/PEA

CPR x 2 min

• Start IV/IO
• Epinephrine

Reversible Causes:
• Hypovolemia
• Hypoxia
• Hydrogen ion (acidosis)
• Hypo/hyperkalemia
• Hypothermia
• Tension pneumothorax
• Tamponade, cardiac
• Toxins
• Thrombosis (pulmonary, coronary)

Suspected hyperkalemic arrest (renal failure/dialysis patient):
• Give IV calcium
• Give IV sodium bicarb
• Flush IV line between meds

Suspected Hyperkalemic Arrest (renal failure/dialysis patient):

A

Shock then CPR x 2 min

• Epinephrine every 3-5 min
• Amiodarone
• Treat reversible causes (“Hs & Ts”)

Yes

No

Shock Rhythm?

Yes

No

B

If asystole, go to box B
• If organized rhythm, check pulse. If no pulse, go to box B
• If ROSC, begin post-cardiac arrest care

Epinephrine every 3-5 min

Start IV/IO

Go to Box A

Epinephrine every 3-5 min

Start IV/IO
3010 UNIVERSAL PULSELESS ARREST CONSIDERATIONS

ADULT PATIENT

Compressions
- Follow current ACLS guidelines for chest compressions
- Minimize interruptions, resume compressions immediately after shocks, rhythm checks. Check pulses only if organized rhythm
- Push hard and fast and allow complete chest recoil
- Assess quality of CPR with continuous waveform capnography
- If ETCO₂ < 10, improve quality of compressions
- If using automated CPR devices, use manufacturer’s specifications

Defibrillation
- Biphasic: manufacturer recommendation. If unknown, use maximum energy
- Monophasic: 360 J

Ventilations
- Open the airway, place NPA/OPA, place NRB facemask with O₂ at 15 L/min for first 2 cycles 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 cycles 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 ETCO₂, 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

PEDiatric PATIENT

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

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

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

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

ROSC
- Pulse and blood pressure
- Sustained abrupt rise in ETCO₂, typically > 40

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

ICD/Pacemaker patients
- If cardiac arrest patient has an implantable cardioverter defibrillator (ICD) or pacemaker: place pacer/defib pads at least 1 inch from device. Biaxillary or anterior posterior pad placement may be used
Term Gestation?  
Breathing or crying?  
Good flex or tone?

- No
  - Warm, clear airway if necessary, dry, simulate
  - PPV, SpO2 monitoring
  - HR <100?
    - Yes
      - Take ventilation corrective steps
        - HR <60?
          - Yes
            - Chest compressions Coordinate w. PPV
              - HR <60 after 60 seconds of chest compressions?
                - Yes
                  - IV epinephrine
                - No
                  - Take ventilation corrective steps
          - No
            - Post resuscitation care
  - No
    - Labored breathing or persistent cyanosis?
      - Yes
        - Clear airway SpO2 monitoring
        - HR <100?
          - Yes
            - Post resuscitation care
          - No
            - Take ventilation corrective steps
      - No
        - Routine Care:
          - Provide warmth
          - Clear airway if necessary
          - Dry
          - Ongoing evaluation

General Considerations
(From 2015 AHA Guidelines)
- 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 O2 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 30 seconds of PPV with 100% O2 AND another 60 seconds of chest compressions coordinated with PPV using 100% O2
3030 POST-RESUSCITATION CARE WITH ROSC

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

**Return of spontaneous circulation (ROSC) criteria:**
- Pulse and measurable blood pressure
- Increase in ETCO₂ on capnography

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

**ROSC after cardiac arrest**
- Perform 12 lead EKG

**Is STEMI Present?**
- Yes → Initiate Cardiac Alert
- No
  - Assess for shock and volume status
  - Peripheral access: IO/IV
  - Oxygenation/Ventilation
    - Secure advanced airway if indicated
    - Avoid hyperventilation
    - Avoid hyper/hypocapnia (EtCO₂)
    - Correct hypoxemia
  - Elevate head of bed at 30°

**Is there hypotension for age and/or signs of shock?**
- Yes → Medical Hypotension/Shock protocol
- No
  - Assess for dysrhythmia

**Recurrent dysrhythmia?**
- Yes → Treat recurrent dysrhythmia per appropriate protocol
- No
  - Continuous rhythm monitoring and pulse checks
  - Focused neuro exam (AVPU/GCS)
  - Avoid fever and provide passive cooling
Tachyarrhythmia with Poor Perfusion

- Support ABCs
- IV access
- Give oxygen

**Stable**
- 12 lead ECG
- Identify Rhythm
- Measure QRS width

**Is rhythm regular?**

**Narrow QRS** (< 0.12 msec)

- Try Valsalva maneuver
- Give adenosine IV if suspected AV nodal reentrant tachycardia (AVRNT)*
- EMT-I requires direct order for adenosine

**Irregular**
- Atrial fibrillation, flutter, or MAT
- Do not give adenosine
- If becomes unstable go to box B

<table>
<thead>
<tr>
<th>Does rhythm convert?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Converts</strong></td>
</tr>
<tr>
<td>Monitor in transport</td>
</tr>
<tr>
<td>If recurrent dysrhythmia, go to box A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Try Valsalva maneuver</td>
</tr>
<tr>
<td>Give adenosine IV if suspected AV nodal reentrant tachycardia (AVRNT)*</td>
</tr>
</tbody>
</table>

*AVRNT is historically referred to as “PSVT”

<table>
<thead>
<tr>
<th>Irregular</th>
</tr>
</thead>
<tbody>
<tr>
<td>If unstable, go to box B</td>
</tr>
</tbody>
</table>

**Wide QRS** (> 0.12 msec)

- Atypical atrial fibrillation
- Identify Rhythm
- Contact Base

**Is rhythm regular?**

**Regular**
- 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

<table>
<thead>
<tr>
<th>Irregular</th>
</tr>
</thead>
<tbody>
<tr>
<td>See box C</td>
</tr>
<tr>
<td>Contact Base for consult</td>
</tr>
<tr>
<td>Do NOT give adenosine</td>
</tr>
</tbody>
</table>

**Unstable**
- Immediate synchronized cardioversion

- 12 lead ECG
- Identify rhythm
- Contact Base

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

<table>
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<tr>
<th>Does rhythm convert?</th>
</tr>
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<tbody>
<tr>
<td><strong>Converts</strong></td>
</tr>
<tr>
<td>Monitor in transport</td>
</tr>
<tr>
<td>If unstable, go to box B</td>
</tr>
</tbody>
</table>

**Doesn’t Convert**
- Contact base for consult
- Monitor in transport
- If unstable, go to box B
3050 BRADYARRHYTHMIA WITH POOR PERFUSION

Bradycardia with a pulse
Heart rate < 60

- Support ABCs
- Give Oxygen
- Start IV
- Initiate transport

- Cardiac monitor
- Identify rhythm
- 12-lead ECG

Are there signs or symptoms of poor perfusion present?
(Altered mental status, chest pain, hypotension, signs of shock)

Adequate perfusion
- Monitor and transport

Poor perfusion
- Give atropine
- Prepare for transcutaneous pacing

Consider vasopressor infusion early if pacing and poor perfusion or hypotension persists either due to lack of capture or poor contractility despite capture

Monitor and transport

Reminders:
- If pulseless arrest develops, go to Universal Pulseless Arrest algorithm
- Search for possible contributing factors: “5 Hs and 5 Ts”
- Symptomatic severe bradycardia is usually related to one of the following:
  - Ischemia (MI)
  - Drugs (beta blocker, Calcium channel blocker)
  - Electrolytes (hyperkalemia)
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

STEMI?

No

Yes

Notify base physician immediately if cardiac alert criteria are met

Give SL nitroglycerin if suspected cardiac chest pain and no contraindication
An EMT may administer patient’s prescribed nitroglycerin. Contact Base for verbal order

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

Life threatening causes of chest pain:
• Acute coronary syndrome (ACS)
• Pulmonary embolism
• Thoracic aortic dissection
• Tension pneumothorax

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

Causes of Chest Pain in Children:
• Costochondritis
• Pulmonary Causes
• Ischemia is rare but can be seen with a history of Kawasaki’s disease with coronary aneurysms
• Cyanotic or Congenital Heart Disease
• Myocarditis
• Pericarditis
• Arrhythmia
• Anxiety
• Abdominal Causes
3070 CARDIAC ALERT

**Goal:**

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

**Inclusion Criteria:**

- Symptoms consistent with ACS
- 12-lead ECG showing ST-segment elevation (STE) at least 1 mm in two or more anatomically contiguous leads
- Age 35 years or older (If STEMI patient outside age criteria, contact base 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 base physician

**Actions:**

- Treat according to chest pain protocol en route (cardiac monitor, oxygen, aspirin, nitroglycerin and opioid as needed for pain control).
- Notify base physician ASAP with ETA and request CARDIAC ALERT. Do not delay hospital notification. If possible, notify dispatch by radio of cardiac alert before leaving scene.
- Start 2 large bore peripheral IVs
- 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 base physician.

**Additional Documentation Requirements:**

- Time of first patient contact
- Time of first ECG
4000 MEDICAL SHOCK PROTOCOL

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

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

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, contact base

**Hypotension for Age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>&lt;70 mmHg</td>
</tr>
<tr>
<td>1-10 years</td>
<td>&lt;70 + (2 x age in years)</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>&lt;90 mmHg</td>
</tr>
</tbody>
</table>

**Tachycardia for Age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Heart Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>&gt;160 bpm</td>
</tr>
<tr>
<td>1-2 years</td>
<td>&gt;150 bpm</td>
</tr>
<tr>
<td>2-5 years</td>
<td>&gt;140 bpm</td>
</tr>
<tr>
<td>5-12 years</td>
<td>&gt;120 bpm</td>
</tr>
<tr>
<td>&gt;12 years</td>
<td>&gt;100 bpm</td>
</tr>
</tbody>
</table>

**Etiologies of Shock**

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

**Pediatric Fluid Administration**

- 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 up to 60 to 80 mL/kg.
- Goal of therapy is normalization of vital signs within the first hour
- Hypotension is a late sign in pediatric shock patients

**Pediatric Shock**

**Signs of Compensated Shock**

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

**Signs of Decompensated Shock**

- Decrease mental status
- Weak central pulses
- Poor color
- Hypotension for age
4010 UNIVERSAL ALTERED MENTAL STATUS

**Altered Mental Status (AMS)**

Assess ABCs
Go to pulseless arrest, adult respiratory distress, pediatric respiratory distress or obstructed airway protocols as appropriate

Persistent AMS?

Yes

Check BGL and consider trial of Naloxone

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

Yes

Hypoglycemia protocol

No

Seizure activity present?

Yes

Seizure protocol

No

Perform rapid neurologic assessment including LOC and Cincinnati Prehospital Stroke Score (CPSS)

Focal neuro deficit or positive CPSS?

Yes

Stroke protocol

Determine time last seen normal
Consider Stroke Alert criteria and contact destination hospital

No

Consider other causes of AMS:
Head trauma, overdose, hypoxia, hypercapnea, heat/cold emergency, sepsis, & metabolic

- During transport: give supplemental oxygen, monitor vital signs, airway, breathing, and cardiac rhythm.
- Give fluid bolus if volume depletion or sepsis suspected

 Alcohol intoxication?

Yes

Alcohol Intoxication protocol

No

Alcohol Intoxication protocol

No
4020 SYNCOPE

**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.

**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

**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.)
- Important historical features of pediatric syncope include: color change, seizure activity, incontinence, post-ictal state, and events immediately prior to syncope event.

**Universal Altered Mental Status**
- Assess and stabilize ABCs, give O₂, 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**
POSITIVE STROKE
Any acute onset neurological deficit not likely due to trauma regardless of age

Assess and stabilize ABCs, give O₂

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

Rule out or treat hypoglycemia

- Determine when last KNOWN to be normal and document specific time
- “At 2:15 PM, not 1 hour ago”

Obtain medical history
- Document medications
- Identify family or friend who may assist with history and decision-making, get contact info and strongly encourage to come to ED as they may be needed for consent for treatments

Consider common stroke mimics/syndromes

- Start IV and draw blood
- Document cardiac rhythm
- Ensure full monitoring in place: cardiac, SpO₂
- Elevate head 30°, if possible

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

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 is highly specific for stroke, but is not extremely sensitive, meaning if you have a positive CPSS, you are almost certainly having a stroke, but if you do not have a positive CPSS, you still may be having a stroke
- Stroke signs may be very subtle, therefore it is important to know other signs of stroke, which include:
  - Impaired balance or coordination
  - Vision loss
  - Headache
  - Confusion or altered mental status
  - Seizure

Stoke Mimics (for all ages):
- Hypoglycemia
- Postictal paralysis
- Complex migraine
- Overdose
- Trauma
- Bell’s palsy

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 an old dog new tricks”, or “No ifs, ands, or buts”

CPSS does not identify all strokes. See below
4040 SEIZURE

- 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:

No

- Check pulse and reassess ABC
- Give supplemental oxygen

Actively seizing after 5 minutes?

Yes

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

No

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

CONTACT BASE

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)
**4050 HYPOGLYCEMIA**

Check blood glucose level in ANY patient with signs or symptoms consistent with hypoglycemia

Examples: Altered MS, agitation, focal neurologic deficit, seizure, weakness, diaphoresis, decreased motor tone, pallor

If hypoglycemia still most likely despite normal reading on glucometer, administer glucose **regardless**, while considering other causes of altered mental status

Is BGL < 60?  

Yes  

Can the patient safely tolerate oral glucose?  

intact gag reflex, follows verbal commands  

Yes  

Administer oral glucose. Reassess patient  

No  

Are you able to establish IV access?  

Yes  

Administer dextrose IV & reassess patient  

No  

Regarding refusals after a hypoglycemic episode:  

See Patient Refusal protocol  

Transport is always indicated for any of the following patients:  

- Pts with unexplained hypoglycemia  
- Pts taking oral hypoglycemic meds  
- Pts not taking food by mouth  
- Pts who do not have competent adult to monitor

Symptoms resolved?  

No  

Recheck BGL and consider other causes of altered mental status  

Yes  

Monitor and transport or contact base for refusal if indicated
DEFINITION:
An infant < 1 year of age with episode frightening to the observer characterized by apnea, choking/gagging, color change or change in muscle tone

Support ABCs as necessary

Obtain detailed history of event and medical history

Complete head-to-toe assessment

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

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

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

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

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. If considering release, must check BGL.

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

Consider Denver CARES transport. Contact base if considering release to other party, e.g.: police, family

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

* Always consider alternative diagnoses: see universal altered mental status protocol
4080 OVERDOSE AND ACUTE POISONING

PPE and decontaminate when appropriate

Obtain specific information:
- Type of ingestion(s)
- What, when and how much ingested?
- Bring the poison, container, all medication and other questionable substances to the ED
- Note actions taken by bystanders or patient (e.g.: induced emesis, “antidotes”, etc)
- Supportive Care is key to overdose management

ABCs
IV, oxygen, monitor

Need for airway management?

Yes
Consider Naloxone
See Adult or Pediatric Respiratory Distress protocols

No

Hypotension for age?

Yes
IV fluid bolus per Medical Shock protocol

No

Altered mental status?

Yes
Universal Altered Mental Status protocol

No

Specific ingestion?

Stimulant
Tachycardia, HTN, agitation, sweating, psychosis

Tricyclic antidepressant
Wide complex tachycardia, seizure

Organophosphate or nerve agent
DUMBELS syndrome

Calcium Channel Blocker
Bradycardia, heart block, hypotension

β-Blocker
Bradyarrhythmia, heart block, hypotension

Benzodiazepine for severe symptoms
See Agitated/Combative Patient protocol

Sodium Bicarbonate for QRS > 100 msec
If intubated, consider hyperventilation to ETCO₂ 25-30 mmHg
See Seizure protocol

Nerve Agent Antidote Kit
Atropine
Pralidoxime

Fluids per Medical Shock Protocol
Calcium and Vasopressor Infusion for hypotension
Glucagon (requires base contact)

Vasopressor Infusion
Glucagon (requires base contact)

Check BGL
Consider specific ingestions
**4090 ALLERGY AND ANAPHYLAXIS**

**Allergic reaction, anaphylaxis or angioedema**

- Assess ABCs, give oxygen
- 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

---

**Generalized or Systemic Reaction**

*Multisystem involvement: skin, mucous membranes, and gastrointestinal symptoms*

**Does patient have any of the following signs or symptoms?**
- Hypotension
- Signs of poor perfusion
- Bronchospasm, stridor
- Altered mental status

**Yes**

- Give epinephrine IM, then:
  - Start IV and give IV bolus per medical shock protocol
  - Give diphenhydramine
  - Give methylprednisolone
  - Consider addition of albuterol if wheezing

- 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:**

- **Contact Base**
- Consider IV epiinephrine drip per vasopressor infusion protocol

---

**Localized Reaction**

*Including isolated tongue, airway*

**Airway involvement?**
- Tongue or uvula swelling, stridor

**Yes**

- Impending airway obstruction?

**No**

- Give immediate IM epinephrine & manage airway per Obstructed Airway Protocol

**Yes**

- Give immediate IM epinephrine & manage airway per Obstructed Airway Protocol

---

**Consider diphenhydramine if significant discomfort**

- Transport and reassess for signs of deterioration

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**Definitions:**

- **Anaphylaxis**: severe allergic reaction that is rapid in onset and potentially life-threatening. Multisystem signs and symptoms are present including skin and mucous membranes
  - **Mainstay of treatment is epinephrine**

- **Angioedema**: deep mucosal edema causing swelling of mucus membranes of upper airway. May accompany hives
  - **Mainstay of treatment is methylprednisolone. 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 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 opioid for severe pain

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
**4110 SUSPECTED CARBON MONOXIDE EXPOSURE**

**ABCs**

- Symptoms of CO or hypoxia
  - Yes → 100% FIO₂ and transport
  - No → Measure COHb% (SpCO)

**Measure COHb% (SpCO)**

- SpCO 0-5%
  - No further evaluation of SpCO is needed

- SpCO 5-15%
  - Contact Base for consult

- SpCO > 15%
  - 100% FIO₂ and transport

**General Guidelines:**

- **Signs and Symptoms of CO exposure include:**
  - Headache, dizziness, coma, altered mentation, seizures, visual changes, chest pain, tachycardia, arrhythmias, dyspnea, N/V, “flu-like illness”

- The absence or low readings of COHb is not a reliable predictor of toxicity of other fire byproducts

- In smoke inhalation victims, consider cyanide treatment with Hydroxycobalamin as per indications

- The fetus of a pregnant woman is at higher risk due to the greater affinity of fetal hemoglobin to CO. With CO exposure, the pregnant woman may be asymptomatic while the fetus may be in distress. In general, pregnant patients exposed to CO should be transported.

- Cigarette smokers’ COHb is normally higher than nonsmokers; >10% is clinically significant

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<table>
<thead>
<tr>
<th>COHb</th>
<th>Severity</th>
<th>Signs and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;15-20%</td>
<td>Mild</td>
<td>Headache, nausea, vomiting, dizziness, blurred vision</td>
</tr>
<tr>
<td>21-40%</td>
<td>Moderate</td>
<td>Confusion, syncope, chest pain, dyspnea, tachycardia, tachypnea, weakness</td>
</tr>
<tr>
<td>41-59%</td>
<td>Severe</td>
<td>Dysrhythmias, hypotension, cardiac ischemia, palpitations, respiratory arrest, pulmonary edema, seizures, coma, cardiac arrest</td>
</tr>
<tr>
<td>&gt;60%</td>
<td>Fatal</td>
<td>Death</td>
</tr>
</tbody>
</table>
**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.

**Active nosebleed**

- 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**
5000 DROWNING

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

Assess 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
    - Remove wet garments, dry and insulate patient
    - Suction as needed
    - Start IV, check BGL, give oxygen
    - Transport
    - Monitor ABC, VS, mental status
    - Consider advanced airway especially if suspected pulmonary edema
    - Monitor cardiac rhythm
  - 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, ETCO2

Start CPR, attach AED/monitor/defibrillator and treat per Universal Pulseless Arrest Algorithm with following changes:

PEA
- Handle very gently
- Start IV w. warm IVF
- Insulate patient

Asystole or V-fib/VT
- Single dose epinephrine IV/IO
- For Vfib/VT: single attempt defibrillation only

BLS airway preferred in pediatrics

Drowning/submersion commonly associated with hypothermia.
- Even profound bradycardias may be sufficient in setting of severe hypothermia and decreased O2 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

ABCs

Spinal Immobilization before moving patient if trauma suspected

Awake and alert
- Remove wet garments, dry and insulate patient
- Transport, even if initial assessment normal
- Monitor ABC, VS, mental status
- Delayed pulmonary edema may occur after drowning.
5010 HYPOTHERMIA

Hypothermia and Frostbite

Localized cold injury
* Frostbite, frostnip
  - Remove wet garments, dry and insulate patient
  - Transport, even if initial assessment normal
  - Monitor ABC, VS, mental status
  - Dress injured area lightly in clean cloth to protect from further injury
  - Do not rub, do not break blisters
  - Do not allow injured part to refreeze. Repeated thaw freeze cycles are especially harmful
  - Monitor for signs of systemic hypothermia

Systemic hypothermia
* Presumed to be primary problem based on clinical scenario
  - High flow O₂
  - ABCs

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
      - Even profound bradycardias may be sufficient in setting of severe hypothermia and decreased O₂ 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
    - Yes
      - Remove wet garments, dry and insulate patient
      - Consider all causes of Altered Mental Status
      - Suction as needed
      - Start IV, obtain BGL and give oxygen
      - Transport
      - Monitor ABC, VS, mental status, ETCO₂

Start CPR, attach AED/monitor/defibrillator and treat per Universal Pulseless Arrest Algorithm with following changes:

PEA
  - PEA
  - Handle very gently
  - Start IV w. warm IVF
  - Insulate patient

Asystole or V-fib/VT
  - Single dose epinephrine IV/IQ
  - For Vfib/VT: single attempt defibrillation only

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If not breathing, start rescue breathing
ALS: advanced airway and resuscitation medications are indicated
5020 HYPERTHERMIA

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

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

Heat Stroke
- Very high core body temperature
- Hot, dry skin w. cessation of sweating
- Hypotension
- Altered mental status
- Seizure
- Coma

Rapid transport indicated

Adequate airway and breathing?

No

Assist ventilations and manage airway as needed

Administer O₂
Administer IV/IO fluids 20 mL/kg up to 1 L of cool saline; reassess and repeat if needed

Yes

Monitor VS and transport

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

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)
6000 PSYCHIATRIC/BEHAVIORAL PATIENT PROTOCOL

Scene Safety
A. Scene safety and provider safety are a priority. Consider police contact if scene safety is a concern.
B. Refer to restraint protocol as needed, especially as it relates to A.

Specific Information Needed
A. Obtain history of current event; inquire about recent crisis, toxic exposure, drugs, alcohol, emotional trauma, and suicidal or homicidal ideation.
B. Obtain past history; inquire about previous psychiatric and medical problems, medications.

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

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

Transporting Patients Who Have a Psychiatric Complaint
A. If a patient has an isolated mental health complaint (e.g. suicidality), and does not have a medical complaint or need specific medical intervention, then that patient may be appropriately transported by law enforcement according to their protocols.
B. If a patient has a psychiatric complaint with associated illness or injury (e.g. overdose, altered mental status, chest pain, etc), then the patient should be transported by EMS
C. Reasonable concern for suicidal or homicidal ideation, or grave disability from psychiatric decompensation, is sufficient to assume that the patient may lack medical decision-making capacity to refuse ambulance transport. Effort should be made to obtain consent for transport from the patient, and to preserve the patient’s dignity throughout the process. However, the patient may be transported over his or her objections and treated under implied consent if patient does not comply.
D. A patient being transported for psychiatric evaluation may be transported to any appropriate receiving emergency department.
E. Accusations of kidnapping or assault of the patient are only theoretical and rarely occur. The Denver Metropolitan EMS Medical Directors feel strongly that the risk of abandonment of a potentially suicidal or otherwise gravely impaired patient is far greater. Be sure to document your reason for taking the patient over their objections, that you believe that you are acting in the patient's best interests, and be sure to consult a BASE PHYSICIAN if there are concerns.
6000 PSYCHIATRIC/BEHAVIORAL PATIENT PROTOCOL

Specific Precautions

A. Patients presenting with psychiatric decompensation often have an organic etiology. Be suspicious for hypoglycemia, hypoxia, head injury, intoxication, or toxic ingestion.

B. Providers transporting a patient over his or her objections should reassure the patient. The provider should strongly consider whether the patient may need restraint and/or sedation for safety. Beware of weapons. These patients can become combative.

Transporting Patients on a Mental Health Hold

A. By law, patients detained on a mental health hold may not refuse transport. Similarly, by law, patients on a mental health hold are required to be evaluated by a physician or psychologist and must be transported.

B. Although it is commonly believed that the original copy of the mental health hold (form M-1) is required to accompany the patient, a legible copy of the M-1 is also sufficient if the original cannot be found.

C. The M-1 form documenting the mental health hold should be as complete as possible, including the correct date and time that the patient was detained. The narrative portion should be completed. A signature and license or badge number is also required. Assure that the form is complete before departing.

D. The mental health hold does not need to be started on patients who are intoxicated on drugs and/or alcohol. Nor is it required for patients who are physically incapable of eloping from care, such as those who are intubated, or physically unable.

E. The patient rights form (M-2) does not need to accompany the patient. The receiving facility may complete this form if there are concerns.

F. If possible, seek direction from the sending facility regarding whether the patient may require sedation and restraint. Consider ALS transport if this is the case.

G. Recall that patients who are a danger to self/others or gravely disabled due to mental illness may be transported by EMS without a mental health hold, under implied consent.
Assume the patient has a medical cause of agitation and treat reversible causes

Still significantly agitated?

Patient does not respond to verbal de-escalation techniques

Restraint Protocol
Obtain IV access as soon as may be safely accomplished

Still significantly agitated?

Sedate
- Consider cause of agitation
- Options: ketamine, benzodiazepine or butyrophenone

Still significantly agitated?

- If ketamine administered: **contact base**
- Other: Repeat benzo sedation dose if still significantly agitated 5 minutes after 2nd dose sedative, **Contact Base**

Consider Cause of Agitation:
Both benzodiazepines and butyrophenones (e.g. haloperidol) are acceptable options for agitated patients. In certain clinical scenarios individual medications may be preferred
- ETOH (butoxphenone)
- Sympathomimetic (benzo)
- Psych (butoxphenone)
- Head injury (butoxphenone)

Restraints
No transport in hobble or prone position. Do not inhibit patient breathing, ventilations

Excited Delirium Syndrome
These patients are truly out of control and have a life-threatening medical emergency they will have some or all of the following sx:
- Paranoia, disorientation, hyper-aggression, hallucination, tachycardia, increased strength, hyperthermia

- Give ketamine
- Goal is rapid tranquilization in order to minimize time struggling

GENERAL GUIDELINE:
Emphasis should be placed on scene safety, appropriate use of restraints and aggressive treatment of the patient's agitation.

Complete Restraint Protocol

- Reassess ABCs post sedation
- High flow O₂
- Start 2 large bore IVs as soon as may be safely accomplished
- Administer 2 liters NS bolus

Start external cooling measures

Full cardiac, SpO₂, EtCO₂ (if available) monitoring and rapid transport
6020 TRANSPORT OF THE HANDCUFFED PATIENT

**Purpose:**

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

**Guideline:**

1. Handcuffs are only to be placed by law enforcement. EMS personnel are not permitted to use handcuffs.
2. Request that law enforcement remain with the patient in the ambulance, if possible. If not possible, request that police ride behind ambulance so as to be readily available to remove handcuffs if needed in an emergency situation to facilitate medical care of the patient.
3. EMS personnel are not responsible for the law enforcement hold on these patients.
4. Handcuffed patients will not be placed in the prone position.
5. Handcuffs may be used with spinal immobilization. Medical priorities should take priority in the positioning of the handcuffs.
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

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

Imminent Delivery
*Delivery is imminent if there is crowning or bulging of perineum*

Emergency Childbirth Procedure
- If there is a prolapsed umbilical cord or apparent breech presentation, go to obstetrical complications protocol and initiate immediate transport
- For otherwise uncomplicated delivery:
  - Position mother supine on flat surface, if possible
  - Do not attempt to impair or delay delivery
  - Support and control delivery of head as it emerges
  - Protect perineum with gentle hand pressure
  - Check for cord around neck, gently remove from around neck, if present
  - Suction mouth, then nose of infant as soon as head is delivered
  - If delivery not progressing, baby is “stuck”, see obstetrical complications protocol and begin immediate transport
  - As shoulders emerge, gently guide head and neck downward to deliver anterior shoulder. Support and gently lift head and neck to deliver posterior shoulder
  - Rest of infant should deliver with passive participation – get a firm hold on baby
  - Keep newborn at level of mother’s vagina until cord stops pulsating and is double clamped

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

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
### 7010 Obstetrical Complications

#### For All Patients with Obstetrical Complications
- Do not delay: immediate rapid transport
- Give high-flow oxygen
- Start IV en route if time and conditions allow. Treat signs of shock w. IV fluid boluses per [Medical Hypotension/Shock Protocol](#)

#### Possible Actions for Specific Complications (Below)
- The following actions may not be feasible in every case, nor may every obstetrical complication be 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

<table>
<thead>
<tr>
<th>Complication</th>
<th>Possible Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prolapsed Umbilical Cord</strong></td>
<td>Discourage pushing by mother&lt;br&gt;Position mother in Trendelenberg or supine with hips elevated&lt;br&gt;Place gloved hand in mother’s vagina and elevate the presenting fetal part off of cord until relieved by physician&lt;br&gt;Feel for cord pulsations&lt;br&gt;Keep exposed cord moist and warm</td>
</tr>
<tr>
<td><strong>Breech Delivery</strong></td>
<td>Never attempt to pull infant from vagina by legs&lt;br&gt;IF legs are delivered gently elevate trunk and legs to aid delivery of head&lt;br&gt;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&lt;br&gt;Apply gentle abdominal pressure to uterine fundus&lt;br&gt;IF infant delivered see childbirth protocol – Postpartum care of infant and mother</td>
</tr>
<tr>
<td><strong>Complications of Late Pregnancy</strong></td>
<td>3rd Trimester Bleeding (6-8 months)&lt;br&gt;High flow O₂ via NRB, IV access&lt;br&gt;Suspect placental abruption or placenta previa&lt;br&gt;Initiate rapid transport&lt;br&gt;Position patient on left side&lt;br&gt;Note type and amount of bleeding&lt;br&gt;IV NS bolus for significant bleeding or shock</td>
</tr>
<tr>
<td><strong>Eclampsia/Toxemia</strong></td>
<td>High flow O₂ via NRB, IV access&lt;br&gt;SBP &gt; 140, DBP &gt; 90, peripheral edema, headache, seizure&lt;br&gt;Transport position of comfort&lt;br&gt;Treat seizures with Magnesium Sulfate&lt;br&gt;See seizure protocol</td>
</tr>
<tr>
<td><strong>Shoulder Dystocia</strong></td>
<td>Support baby’s head&lt;br&gt;Suction oral and nasal passages&lt;br&gt;DO NOT pull on head&lt;br&gt;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&lt;br&gt;IF infant delivered see childbirth protocol – Postpartum care of infant and mother</td>
</tr>
<tr>
<td><strong>Postpartum Hemorrhage</strong></td>
<td>Massage abdomen (uterine fundus) until firm&lt;br&gt;Initiate rapid transport&lt;br&gt;Note type and amount of bleeding&lt;br&gt;Treat signs of shock with IV fluid boluses</td>
</tr>
</tbody>
</table>
8000 GENERAL TRAUMA CARE

- 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
- 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

If unstable see Traumatic Shock Protocol
8020 TRAUMA IN PREGNANCY

See General Trauma Care protocol

Pregnant Trauma (EGA < 20 weeks)

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

Pregnant Trauma (EGA ≥ 20 weeks)

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

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

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

Interpret VS with caution. Pregnant patient has:

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

Estimated Gestational Age (EGA)

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

*If uterus is at umbilicus then EGA > 20 weeks*

Estimation by Last Menstrual Period:
Due Date = LMP + 9 months + 7 days
EGA = current date - date of last menstrual period
If available, utilize pregnancy wheel to determine EGA.
8030 TRAUMATIC PULSELESS ARREST

General Trauma Care protocol

Are there obvious signs of death OR the presence of non-survivable injuries? (SEE BELOW)

Yes

Contact Base for Consideration of Field Pronouncement

No

Consider MOI (isolated GSW to head treated similar to blunt trauma)

Blunt Trauma

Penetrating Trauma

Unwitnessed arrest? (At no point definite signs of life in field)

Yes

No, witnessed arrest by EMS

Contact Base for consideration of Field Pronouncement

• Rapid transport to appropriate trauma center.
• Complete Basic Trauma Care protocol
• Initiate BLS CPR and ventilations at age-appropriate rate

Non-survivable Injuries
• Decapitation
• 90% 3º burns

Document:
• General impression
• Mechanism: blunt vs. penetrating
• Time and duration of arrest
• Were vital signs present at any time?

• Consider bilateral needle chest decompression with trauma to trunk

• Place IO unless peripheral IV already in place.
• Administer NS bolus 20 mL/kg up to 1 L
• Pull/push bolus for pediatrics

• Consider Field Pronouncement if suspected arrest time > 10 minutes and no signs of life or no response to BLS care
8040 TRAUMATIC SHOCK

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

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

Yes
- 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

Evaluate breath sounds, respiratory effort, and consider tension pneumothorax

- See Needle Decompression for suspected tension PTX for arrest or pending arrest

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

No

Hypotension for Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>&lt;70 mmHg</td>
</tr>
<tr>
<td>1-10 years</td>
<td>&lt;70 + (2 x age in years)</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>&lt;90 mmHg</td>
</tr>
</tbody>
</table>

Tachycardia for Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Heart Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>&gt;160 bpm</td>
</tr>
<tr>
<td>1-2 years</td>
<td>&gt;150 bpm</td>
</tr>
<tr>
<td>2-5 years</td>
<td>&gt;140 bpm</td>
</tr>
<tr>
<td>5-12 years</td>
<td>&gt;120 bpm</td>
</tr>
<tr>
<td>&gt;12 years</td>
<td>&gt;100 bpm</td>
</tr>
</tbody>
</table>

Pediatric Shock

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

Pediatric Fluid Administration

- 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 up to 60 to 80 mL/kg.
- Goal of therapy is normalization of vital signs within the first hour
- Hypotension is a late sign in pediatric shock patients

Pediatric Fluid Administration

- Decrease mental status
- Weak central pulses
- Poor color
- Hypotension for age
**8050 AMPUTATIONS**

- **General Trauma Care Protocol**
  - **Complete Amputation**
    - **Apply tourniquet without delay**
      - Large bore IV
      - If hypotensive for age, treat per Traumatic Shock Protocol
      - Document neurovascular exam
    - **Amputated part**:
      - Wrap in moist, sterile dressing
      - Place in sealed plastic bag
      - Place bag in ice water
      - Do not freeze part
    - **Stump**:
      - Cover with moist sterile dressing covered by dry dressing
    - **Partial Amputation**:
      - Cover with moist sterile dressing
      - Splint near-amputated part in anatomic position
    - Treat severe pain with opioid as needed
  - **Partial Amputation**
    - **Life-threatening bleeding**
      - Control with direct pressure to bleeding area or vessel
      - Apply tourniquet if bleeding not controlled with direct pressure
        - Cover with moist sterile dressing
        - Splint near-amputated part in anatomic position
    - **Non-Life-threatening bleeding**
      - Monitor and transport to appropriate Trauma Center
      - Treat other injuries per protocol
8060 HEAD TRAUMA PROTOCOL

General Trauma Care protocol

GCS < 8 or comatose?

Yes

Open airway and assist ventilations

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

BLS airway preferred in pediatrics

No

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

Support ventilations & maintain ETCO₂ 35-45 mmHg

- Obtain IV access
- Support ventilations PRN
- Correct hypoxia
- Treat hypotension
- Decrease ICP by elevating head 30° if possible. Use reverse Trendelenburg if spinal precautions needed
- Complete Rapid Trauma Assessment en route to hospital
- Treat other injuries per protocol

Monitor:
- ABCs, VS, mental status, ETCO₂
- Rapid transport to appropriate trauma center
- Monitor cardiac rhythm

Pediatric GCS (Minimum 3, Maximum 15)

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

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

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

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

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

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

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

Pediatric GCS (Minimum 3, Maximum 15)

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

Verbal:
1. No vocal response
2. Extension to pain.
3. Flexion to pain.
4. Withdrawal from pain
5. Localizes pain.
6. Obey commands.
8070 FACE AND NECK TRAUMA

General Trauma Care Protocol

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

Spinal precautions not routinely indicated for penetrating neck injury

Penetrating injury is very rarely associated with unstable spinal column

Laryngeal trauma*

Yes

Avoid intubation if patient can be oxygenated by less invasive means

No

Severe airway Bleeding?

Yes

Direct pressure if appropriate

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

No

BLS airway preferred in pediatrics

- Complete neuro exam
- Assess 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

Regarding Nasal Intubation:
- Contraindicated in pediatrics
- Relatively contraindicated with mid-face trauma.
- Avoid if mid-face grossly unstable

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

Consider opioid for pain control as needed

Monitor ABCs, VS, mental status, SpO₂, ETCO₂

*Suspect laryngeal trauma with:
- Laryngeal tenderness, swelling, bruising
- Voice changes
- Respiratory distress
- Stridor
**8080 SPINAL TRAUMA**

**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

**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, SpO2, ETCO2**

**Consider opioid for pain control**

**Spinal Immobilization not routinely indicated for penetrating neck injury**

*Penetrating injury is very rarely associated with unstable spinal column*
8090 SPINAL PRECAUTIONS PROTOCOL

Does patient have/complain of any of the following:

- Midline C/T/L spine tenderness on palpation
- Neurologic complaints or deficits
- Other injuries which are potentially distracting
- Alteration in mentation or under influence of drugs or EtOH
- Barrier to evaluate for spinal injury (e.g. language or developmental barrier)

Yes

Place cervical 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:

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

Yes

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

No

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

Yes

Full spinal immobilization

No

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

No

Is there an objective neurological deficit?
8110 CHEST TRAUMA

- General Trauma Care protocol
- Rapid transport to Trauma Center

Are you able to oxygenate and ventilate effectively?

No

Consider advanced airway if adequate ventilation and oxygenation cannot be achieved with basic airway maneuvers
BLS airway preferred in pediatrics
Consider tension pneumothorax and Chest Needle Decompression

Yes

Penetrating trauma?

Yes

Rapid transport & stabilize in route
For open sucking chest wounds - 3 sided occlusive dressing or agency approved device

No

Large bore IV consider 2nd line

Flail Chest?

Yes

Splint with bulky dressing
Assess need for assisted ventilations

No

Hypotension for age?

Yes

Treat per Traumatic Shock protocol in route

No

Consider opioid for pain control

Tension pneumothorax should be suspected with presence of the following:
- Unilateral absent breath sounds AND: JVD, hypotension, difficult/unable to ventilate
- Needle decompression is NEVER indicated for simple pneumothorax

Monitor ABCs, VS, mental status, SpO₂, ETCO₂
8120 ABDOMINAL TRAUMA

- General Trauma Care protocol
- Rapid transport to Trauma Center

- IV access
- Consider 2nd line if MOI significant

Penetrating trauma?

Yes

Cover wounds, viscera with saline moistened gauze dressing

No

Do not attempt to repack exposed viscera

Hypotension for age?

Yes

Resuscitate per Traumatic Shock protocol

No

Monitor ABCs, VS, mental status, \( \text{SpO}_2 \), \( \text{ETCO}_2 \)

Consider opioid for pain control

Documentation
- MOI
- Time of injury
- Initial GCS
- Penetrating trauma
  - Weapon/projectile/trajectory
- Blunt vehicular trauma
  - Condition of vehicle
  - Speed
  - Ejection
  - Airbag deployment
  - Restraints, helmets
8130 BURNS

- 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 or stridor?
- Yes
  - O2 NRB 15 lpm
  - Manage airway and assist ventilations as indicated
  - Consider CO, CN
- No

Evaluate degree and body surface are involved

Critical Burn*?
- Yes
  - Start 2 large-bore IVs
  - Fluids per ABA recommendations (chart below)**
- No

IV NS TKO

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

Consider opioid for pain control

Monitor ABCs, VS, mental status, SpO2, ETCO2

*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.

**ABA Recommended Prehospital Fluid Therapy

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Fluid Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 and older</td>
<td>500 mL/hr NS or LR</td>
</tr>
<tr>
<td>5 - 13 years</td>
<td>250 mL/hr NS or LR</td>
</tr>
<tr>
<td>Younger than 5</td>
<td>125 mL/hr D5W, NS or LR</td>
</tr>
</tbody>
</table>

If no signs of clinical hypovolemia or shock, large volume of IV fluid not needed. For typical 30 minute prehospital time, give 250cc bolus for patient age ≥ 14.
9000 GENERAL GUIDELINES: MEDICATION ADMINISTRATION

Purpose

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

General Principles

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

B. Pediatric medication dosing and equipment size recommendations vary by length and/or weight. As such, an assessment tool such as a length-based tape should be utilized on every pediatric patient to guide medication dosing and equipment size

C. Optional routes of medication administration are vast and appropriateness given the clinical situation should be considered. Specific considerations include:
   1. Intranasal (IN) administration often results in more rapid resolution or improvement in symptoms compared to IV or intramuscular (IM) administration
   2. IM drug absorption and onset of action is often the slowest, as vascular absorption from fat tissue is prolonged

D. EMS agencies should work to establish a system of Just Culture. This is an approach to workplace 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
ADENOSINE (ADENOCARD)

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

Onset & Duration
- Onset: almost immediate
- Duration: 10 sec

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

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

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

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

Dosage and Administration
Adult:
12 mg IV bolus, rapidly, followed by a normal saline flush.
Additional dose of 12 mg IV bolus, rapidly, followed by a normal saline flush with Base Contact. Contact medical control for further considerations

Pediatric: (Requires CALL IN and DIRECT VERBAL ORDER)
See Handtevy
Protocol

- Adult Tachyarrhythmia with Poor Perfusion
- Pediatric 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
- Adenosine requires continuous EKG monitoring throughout administration
## ALBUTEROL SULFATE (PROVENTIL, VENTOLIN)

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

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

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

### Contraindications
- Severe tachycardia is a relative contraindication

### Adverse Reactions
- Tachycardia
- Palpitations
- Dysrhythmias

### Drug Interactions
- Sympathomimetics may exacerbate adverse cardiovascular effects.
- β-blockers may antagonize albuterol.

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

### Dosage and Administration

#### Adult:
- **Single Neb dose**: Albuterol sulfate solution 0.083% (one unit dose bottle of 3.0 ml), by nebulizer, at a flow rate (6-8 lpm) that will deliver the solution over 5 to 15 minutes. May be repeated twice (total of 3 doses).
- **Continuous Neb dose**: In more severe cases, place 3 premixed containers of albuterol (2.5 mg/3ml) for a total dose of 7.5 mg in 9 ml, into an oxygen-powered nebulizer and run a continuous neb at 6-8 lpm.

#### Pediatric:
- See Handtevy
9020 MEDICATIONS

Protocol
- Adult Wheezing
- Pediatric Wheezing
- Allergy and Anaphylaxis

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

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

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

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

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

**Adverse Reactions**
- Hypotension
- Bradycardia

**Dosage and Administration**

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

**Pediatric:**
- **Pulseless Arrest (Refractory VT/VF):**
  - See Handtevy
  - CONTACT BASE for additional doses.

**Protocol**
- Universal Pulseless Arrest Algorithm
- Tachycardia with Poor Perfusion

**Special Considerations**
- A 12-lead EKG should be performed and documented, when available.
- Amiodarone is preferred to adenosine for treatment of undifferentiated WCT with a pulse.
9040 MEDICATIONS

ANTIEMETICS: ONDANSETRON (ZOFRAN)

Description
- Ondansetron is a selective serotonin 5-HT3 receptor antagonist antiemetic. Ondansetron is the preferred antiemetic, if available.

Indications
- Nausea and vomiting

Contraindications
- Ondansetron: No absolute contraindication. Should be used with caution in first trimester of pregnancy and should be reserved for only those patients with severe dehydration and intractable vomiting

Adverse Effects:
- Ondansetron: Very low rate of adverse effects, very well tolerated.

Dosage and Administration

Ondansetron

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

Pediatric < 4 years old:
See Handtevy

Pediatric ≥ 4 years old:
See Handtevy

Protocol
- Abdominal Pain/Vomiting
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 an endogenous antimuscarinic, anticholinergic substance. It is the prototypical anticholinergic medication with the following effects:
- Increased heart rate and AV node conduction
- Decreased GI motility
- Urinary retention
- Pupillary dilation (mydriasis)
- Decreased sweat, tear and saliva production (dry skin, dry eyes, dry mouth)

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

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

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

Dosage and Administration
Hemodynamically Unstable Bradycardia
Adult:
0.5 mg IV/IO bolus.
Repeat if needed at 3-5 minute intervals to a maximum dose of 3 mg. (Stop at ventricular rate which provides adequate mentation and blood pressure)
Pediatric:
See Handtevy

Stable Bradycardia and Poisoning/Overdose
CONTACT BASE

Protocol
- Bradycardia with poor perfusion
- Poisoning/Overdose

Special Considerations
- Atropine causes pupil dilation, even in cardiac arrest settings
BENZODIAZEPINES - (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.

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.
- 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)

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
- 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:
See Handtevy
9070 MEDICATIONS

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

Post-intubation sedation

Adult:
- **IV/IO route:** 2.5 -- 5 mg

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

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

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

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

Contraindications
- Known hypercalcemia
- Suspected digoxin toxicity (i.e. digoxin overdose)

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

Dosage and Administration

**Calcium Gluconate 10% Solution**

**Adult:**
- **Pulseless arrest assumed due to hyperkalemia:**
  - 3 g (30 mL) slow IV push
- **Calcium channel blocker overdose with hypotension and bradycardia:**
  - Contact Base for order. 3 g (30 mL) slow IV/IO push. Dose may be repeated every 10 minutes for total of 3 doses

**Pediatric:**
- **Calcium channel blocker overdose with hypotension for age and bradycardia:**
  - Contact Base for order. See Handtevy, not to exceed 1 g slow IV/IO push not to exceed 2 mL/minute, may repeat every 10 minutes for total of 3 doses

Protocol
- Universal Pulseless Arrest
- Poisoning/Overdose
9090 MEDICATIONS

DEXTROSE

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

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

Precautions
- None

Dosage and Administration
Adult:
25 gm (250 mL of a 10% solution) IV/IO infusion; titrating dose to clinical effect

Pediatric:
See Handtevy

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.
**Description**

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

**Indications**

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

**Precautions**

- Asthma or COPD, thickens bronchial secretions
- Narrow-angle glaucoma

**Side effects**

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

**Drug Interactions**

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

**Dosage and Administration**

**Adults:**

50 mg IV/IO/IM

**Pediatrics:**

See Handtevy

**Protocol**

- Allergy/Anaphylaxis
**DuoDote™ (NERVE AGENT ANTIDOTE KIT)**

**Description**

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

**Indications**

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

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

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

With the other hand, pull off the gray safety release. The DuoDote™ auto-injector is now ready to be administered.
The injection site is the mid-outer thigh. The DuoDote™ auto-injector can inject through clothing. However, make sure pockets at the injection site are empty.

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

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

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

**Protocol:**

*Overdose and Acute Poisoning*
**EPINEPHRINE (ADRENALIN)**

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

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

**Adverse Reactions**
- Tachycardia and tachydysrhythmia
- Hypertension
- Anxiety
- May precipitate angina pectoris

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

**Dosage and Administration**

**Adult:**

- **Pulseless Arrest**
  1 mg (10 ml of a 1:10,000 solution), IV/IO bolus.
  Repeat every 3-5 minutes.

- **Bradycardia with hypotension and poor perfusion refractory to other interventions**
  Continuous infusion titrated to effect: see [Vasopressor infusion](#).

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

- **Systemic allergic reaction:**
  0.3 mg (0.3 ml of a 1:1,000 solution) IM. May repeat dose x 1.

- **Severe systemic allergic reaction (Anaphylaxis) refractory to IM epinephrine:**
  Continuous infusion titrated to effect: see [Vasopressor infusion](#)

- **ALTERNATIVE to racemic epinephrine:** (for stridor at rest)
  5 mL of 1:1,000 epinephrine via nebulizer x 1

**Epinephrine Auto-Injector:**

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

**Pediatric:**

- **Pulseless arrest:**
  See Handtevy

- **Bradycardia (CONTACT BASE)**
  See Handtevy

- **Asthma**
  See Handtevy
9120 MEDICATIONS

Moderate to Severe Allergic Reactions
See Handtevy

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

ALTERNATIVE to racemic epinephrine: (for stridor at rest)
See Handtevy

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Protocol

- **Universal Pulseless Arrest Algorithm**
- **Bradycardia with poor perfusion**
- **Neonatal Resuscitation**
- **Allergy and Anaphylaxis Protocol**
- **Adult Wheezing**
- **Pediatric Wheezing**
- **Vasopressor Infusion**

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Special Considerations

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

Pediatric:
Hypoglycemia:
- See Handtevy

Beta Blocker/Calcium Channel overdose with hypotension for age, signs of poor perfusion and bradycardia:
- See Handtevy; contact base

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
- Children < 8 years old

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

Dosage and Administration
Adults and Pediatrics > 8 years old: 5 - 10 mg IM/IV

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

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

Protocol
- Agitated/Combative Patient Protocol
9150 MEDICATIONS

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

Description

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

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

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

Onset and Duration

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

Indications

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

Contraindications

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

Precautions

- Bleeding control is achieved via combination of direct pressure and hemostatic gauze packing for a minimum of 3-5 minutes.
- If bleeding soaks through the dressing, apply additional dressings while continuing direct pressure. **Do not remove dressings from the injured site.** This will disrupt any clots that have already formed.
- Stabilize patient per General Trauma Care Protocol.
- If a tourniquet is indicated (refer to Tourniquet Protocol), it should be applied first, before application of hemostatic agent.
- **DO NOT USE LOOSE GRANULAR OR POWDERED HEMOSTATIC AGENTS.** These are out date and will produce exothermic reactions that may cause burns and additional tissue damage.

Procedure

1. Deploy the hemostatic agent via external application, or wound packing directly onto the wound and then apply direct consistent pressure for at least 3 minutes over the bleeding source. **DO NOT lift or remove the dressing** once it has been applied.
2. Wrap the hemostatic dressing with another suitable dressing such as Kerlex roller gauze, ace wraps, etc. in order to maintain direct pressure.
3. Place the empty hemostatic agent packaging into the outer dressing to notify the receiving facility of it’s presence.
HYDROXYCOBALAMIN (CYANOKIT)

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

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

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

Adverse Reactions
- Hypertension
- Allergic reaction/anaphylaxis

Dosage and Administration
- **Adult** dose is 5 gm IV
- **Pediatric dosing is in the rear cover of the Handtevy Reference**
  - Cyanokit consists of either a single 5 gm vial or 2 x 250 mL vials each containing 2.5 gm of hydroxocobalamin.
- **Single 5 gm vial Instructions:**
  1. Reconstitute: Place the vial in an upright position. Add 200 mL of 0.9% Sodium Chloride Injection* to the vial using the transfer spike. Fill to the line. *0.9% Sodium Chloride Injection is the recommended diluent (diluent not included in the kit). Lactated Ringer’s Solution and 5% Dextrose Injection have also been found to be compatible with hydroxocobalamin.
  2. Mix: The vial should be repeatedly inverted or rocked, not shaken, for at least 60 seconds prior to infusion.
  3. Infuse Vial: Use vented intravenous tubing, hang and infuse desired dose over 15 minutes.
- **2 x 2.5 gm vials instructions:**
  1. Reconstitute: Add 100 mL of 0.9% Sodium Chloride Injection* to the vial using the transfer spike. Fill to the line.
  2. Mix: The vials should be repeatedly inverted or rocked, not shaken, for at least 30 seconds prior to infusion.
  3. Infuse 1<sup>st</sup> vial: Use vented intravenous tubing, hang and infuse desired dose over 7.5 min.
  4. Infuse 2<sup>nd</sup> vial (repeat steps 1 and 2 before 2<sup>nd</sup> infusion) to desired dose over 7.5 min.

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

Protocols
- Carbon Monoxide Exposure
- Burns
**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**
See Handtevy
Not indicated for repetitive dose or continous neb use

**Protocol**
- Adult Wheezing
- Pediatric Wheezing
**KETAMINE**

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

**Onset & Duration**
- Onset: 1-5 minutes after IM administration.
- Duration: 10-15 minutes

**Indications**
- Adult patient with signs of excited delirium where the safety of patient and/or providers is of substantial concern

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

**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
  d. Establish and maintain physical restraint.
- 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.

**Dosage and Administration**
- Adults: 5 mg/kg IM, 500 mg maximum dose
- Contact base for additional doses
- Pediatric:
  - Excited delirium is not reported in children and use of ketamine use is not expected in pediatric patients

**Special Considerations**
- Excited delirium is a medical emergency. Expedite rapid and safe transport.
- Ketamine is provided for IM administration in 100 mg/mL concentration
- All cases of ketamine use will be reviewed by the Medical Director.

**Protocol**
- Agitated/Combative Patient Protocol
- Psychiatric/Behavioral Protocol
- Restraints
- Benzodiazepine
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 g, IV bolus.
- **Refractory Severe Bronchospasm:**
  - 2 g, IV bolus, over 2 minutes; contact base
- **Eclampsia:**
  - 2 g, IV bolus slowly
  - Mix 4 g, diluted in 50 ml of Normal Saline (0.9 NS), IV drip over 15-30 minutes.

Protocol
- Universal Pulseless Arrest Algorithm
- Adult wheezing
- Obstetric Complications
**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:**
- See Handtevy

**Protocol**
- Adult Wheezing
- Pediatric Wheezing
- Allergy and Anaphylaxis
- Medical Hypotension/shock

**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-induced 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

Pediatrics:
See Handtevy

Protocol
- Universal Altered Mental Status
- 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 naloxone must be transported to a hospital
**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 or spray, every 5 minutes PRN up to a total of 3 doses for persistent CP
- **Pulmonary Edema**: 0.4 mg (1/150 gr) sublingually or spray, every 5 minutes PRN titrated to symptoms and blood pressure
- **Nitropaste**: 1 inch of Nitropaste on the patient's left anterior chest for CHF/Pulmonary Edema

**Protocol**
- Chest Pain
- CHF/Pulmonary Edema
9230 MEDICATIONS

OPIOIDS (FENTANYL)

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.
- 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
- Strongly consider ½ typical dosing in elderly or frail patient

**Adult:**

**IV/IO route:** 1-2 mcg/kg.
- Dose may be repeated after 5 minutes and titrated to clinical effect to a maximum cumulative dose of 3 mcg/kg
- Additional dosing requires BASE CONTACT

**IN route:** 1-2 mcg/kg.
- Dose may be repeated after 5 minutes after initial IN dose to a maximum cumulative dose of 3 mcg/kg. IV route is preferred for repeat dosing.
- Additional dosing requires BASE CONTACT

**Pediatric (1-12 years):**

**IV/IO route:** See Handtevy
- 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
9230 MEDICATIONS

IN route: See Handtevy
  • Administer a maximum of 1 ml of fluid per nostril
  • Dose may be repeated after 5 minutes after initial IN dose to a maximum cumulative
dose of 3 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

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 | Abdominal Pain | Amputations | Burns | Face and Neck Trauma | Chest Trauma | Abdominal Trauma | Spinal Trauma |
**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 CO₂ 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 SpO₂ to ≥ 90%. This may take some time.
- Do not withhold oxygen from a COPD patient out of concerns for loss of hypoxic respiratory drive. This is never a concern in the prehospital setting with short transport times.

**Administration**

<table>
<thead>
<tr>
<th>Flow</th>
<th>LPM Dosage</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Flow</td>
<td>1-2 LPM</td>
<td>Minor medical / trauma</td>
</tr>
<tr>
<td>Moderate Flow</td>
<td>3-9 LPM</td>
<td>Moderate medical / trauma</td>
</tr>
<tr>
<td>High Flow</td>
<td>10-15 LPM</td>
<td>Severe medical / trauma</td>
</tr>
</tbody>
</table>

**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 SpO₂ while adequate ventilation is assessed with clinically and with ETCO₂.

### OXYGEN FLOW RATES

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

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenylephrine is an alpha adrenergic agonist. When administered intranasally, it causes vasoconstriction in the nasal mucosa and subsequently decreased bleeding and nasal decongestion.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to nasotracheal intubation to induce vasoconstriction of the nasal mucosa</td>
</tr>
<tr>
<td>Nosebleed (epistaxis).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid administration into the eyes, which will dilate pupil.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dosage and Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instill two drops of 1% solution, or 2 sprays, in the nostril prior to attempting nasotracheal intubation.</td>
</tr>
<tr>
<td>For patients with active nosebleed, first have patient blow nose to expel clots. Then, administer 2 sprays into affected naris(es).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasotracheal intubation</td>
</tr>
<tr>
<td>Epistaxis</td>
</tr>
</tbody>
</table>
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 β 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.

Contraindications
- Metabolic and respiratory alkalosis
- Hypocalcemia
- Hypokalemia

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

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

Dosage and Administration
Adults (> 10 kg), 8.4%
Tricyclic OD with hypotension or prolonged QRS > 0.1 sec or suspected hyperkalemia-related pulseless arrest:
- 1 mEq/kg slow IV push. Repeat if needed in 10 minutes.

Peds: See Handtevy

Protocol
- Universal Pulseless Arrest
- Poisoning/Overdose

Special Considerations
- Sodium bicarbonate administration increases CO₂ 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.
TOPICAL OPHTHALMIC ANESTHETICS

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

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

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

Precautions
- Transient burning/stinging when initially applied.

Dosage and Administration
- Instill 2 drops into affected eye. Contact Base for repeat dosing.

Special Considerations
- This is single patient use. Unused portions should be discarded and only new bottles may be used.
- Do not administer until patient consents to transport and transport has begun.
- Topical ophthalmic anesthetics should never be given to a patient for self-administration.
9300 MEDICATIONS

VASOPRESSOR CONTINUOUS INFUSION – ADULT PATIENTS ONLY

Description:

**Epinephrine**: Preferred vasopressor for all indications.
- Endogenous catecholamine alpha, beta-1, and beta-2 adrenergic receptor agonist.
  Causes dose-related increase in heart rate, myocardial contractility and oxygen demand, peripheral vasoconstriction and bronchodilation

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

Contraindications:

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

Adverse Reactions

- Dysrhythmia
- Hypertension
- Anxiety
- Angina

Drug Interactions

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

Dosage and Administration:

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

Protocol

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

Special Considerations

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