Northern Colorado Prehospital Protocols

Version 1.2
February 1, 2019
What follows are the Northern Colorado Prehospital Protocols (NCPP). This document is based on the collective work of the Denver Metro EMS Medical Directors. It has been modified to fit the needs of our community.

I’d like to acknowledge the work of the Denver Metro EMS Medical Directors and am happy to be adding their body of work.

**January 2018 Denver Metro EMS Medical Directors**

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I would also like to recognize the ongoing contributions by our local EMS representatives and local EMS educators whose continued input into the protocol document and revisions is essential to its success.

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INTRODUCTION

The following protocols are the authorized Northern Colorado Prehospital Protocols (NCPP) version of the Denver Metro EMS Protocols. The contents of the source document have been developed and approved by the Denver Metro EMS Medical Directors (DMEMSMD) group. The source document has been modified to best suit the needs of our community with an awareness of system challenges, resources, and unique characteristics. These protocols define the standard of care for EMS providers, and delineate the expected practice, actions, and procedures to be followed in commonly encountered medical emergencies. In that light, these protocols are not guidelines or suggested practice; rather they embody the clinical expectations of the Medical Director (MD).

No protocol can account for every clinical scenario encountered, and the MD recognizes 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 to EMS agency leaders in a timely fashion. In certain instances, such documentation should be submitted directly to the MD.

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 EMS providers will be familiar with standard drug doses. Drug dosages are included with the medications section of the protocols as a reference.

PROTOCOL KEY

Boxes without any color fill describe actions applicable to all certification levels. When appropriate, an uncolored box will contain the words “EMR/EMT” to articulate clinical expectations for EMRs and EMTs. An uncolored box will contain the word “EMT” to articulate clinical expectations for EMTs. Boxes with orange fill are for actions for intermediate level or higher, and blue-filled boxes are for Paramedic level. Boxes with fuchsia fill are for Critical Care Transport Paramedics, when they are functioning in a critical care transport role. Finally boxes with red fill are for Registered Nurses working in a critical care transport role. 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.

PROTOCOLS CONSIDERATIONS SPECIFIC TO AGE

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. Geriatric patients will be considered greater than 65 years of age.
0010 GENERAL GUIDELINES: INTRODUCTION

TRAINING AND EDUCATION

These protocols define the clinical expectations of the MD. In Colorado, the scope of practice and acts allowed for EMR, 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 director’s 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.

Scope Of Practice

It is the responsibility of each individual EMS provider to be fluent with their scope of practice. EMS scope of practice is defined by CDPHE Chapter Two as well as by the endorsing medical director.

Knowledge of and adherence to the boundaries defined by scope of practice protect both the patient and the EMS provider. Contact your agency’s EMS leadership if you have questions.
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.

Approved by EMS Medical Director February 1, 2019
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 ____________________________

Approved by EMS Medical Director February 1, 2019
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

Approved by EMS Medical Director February 1, 2019
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
Attempt resuscitation for all patients found pulseless and apneic, unless any of the following are present:
1. Physician orders as specified on the Colorado Medical Orders for Scope of Treatment (MOST) form: “No CPR. Do Not Resuscitate/DNR/Allow Natural Death”, present with the patient
2. A valid CPR directive present with the patient
3. Post-mortem dependent lividity
4. Rigor mortis
5. Decomposition
6. Decapitation
7. Evidence of massive blunt head, chest, or abdominal trauma
8. Incineration

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

1. Blunt Trauma Arrest:
   a. Contact Base for TOR if patient found apneic and pulseless and no response to BLS care including chest compressions and bag valve mask ventilations.
2. Penetrating Trauma Arrest:
   a. Resuscitate and transport to a trauma facility.
   i. If time of arrest suspected to be > 30 minutes, and no signs of life or response to BLS care (as above), consider base contact for TOR.
3. Medical Pulseless Arrest:
   a. Resuscitate according to Universal Pulseless Arrest Algorithm on scene (unless unsafe) until one of the following end-points met:
   i. Return of spontaneous circulation (ROSC).
   ii. No ROSC despite 40 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 If no ROSC after 40 min in a setting where pt was defibrillated or bystander CPR was performed or arrest was witnessed
   iv. Contact base for TOR if no ROSC after 20 min in a setting where pt was not defibrillated, or no bystander CPR was performed, or arrest was not witnessed.
   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 40 minutes and should be transported:
   i. Hypothermia
   ii. Drowning with hypothermia and submersion < 60 minutes
   iii. Pregnant patient with estimated gestational age ≥ 20 weeks
   iv. Lightning strike
   v. Avalanche victim
4. After pronouncement, do not alter condition in any way or remove equipment (lines, tubes, etc.), as the patient is now a potential coroner’s case.

Approved by EMS Medical Director February 1, 2019
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 and complete a PCR

Decision-Making Capacity
(Must meet all criteria)

- Person is an adult
- 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

Approved by EMS Medical Director February 1, 2019
A person who has decision-making capacity may refuse examination, treatment and transport

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

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

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

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

For potentially intoxicated patients, refer to Drug/Alcohol Intoxication

Documentation Requirements for Refusal

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

Standing Order Refusal

No Base Contact required if ALL criteria met:

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

Base Contact Required

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

High Risk Patients

Base contact is strongly recommended whenever, in the clinical judgement of the EMS provider, the patient is at high risk of deterioration without medical intervention.
Purpose
A. To provide guidelines for the reporting of suspected abuse patients.

Definition of Abuse:
A. Any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation OR an act or failure to act which presents an imminent risk of serious harm.

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

Role of Mandated Reporter:
A. A mandatory reporter has reasonable cause to know or suspect that someone has been subjected to abuse, neglect, or exploitation. He or she is to immediately report (within 24 hours) the information to local law enforcement. Report can be given in two ways:
   1. Verbal report
   2. Written report
B. Mandatory reporters that do not report abuse, neglect, or exploitation can be:
   1. Charged with a class 3 misdemeanor
   2. Liable for damages proximately caused by failing to report

What to report:
A. The name, address, age, sex, and race of the child, at-risk elder, or at-risk adult with intellectual and developmental disability
B. The name(s) and address(es) of the person(s) responsible for the suspected abuse, neglect, or exploitation—if known
C. A description of the alleged mistreatment and the situation
D. The nature and extent of any injuries—if known
E. Knowledge of previous cases of known or suspected abuse, neglect, or exploitation of the victim or others under the person’s care
F. The family composition, including any siblings or others in the household
G. The name, address and/or contact phone number, and occupation of the person making the report
H. Relation of the person making report to the victim and/or how information was obtained
I. Any action taken by the reporting source
J. Any other information reporting person feels is important.

Additional Information:
A. An at-risk elder or at-risk adult with intellectual and developmental disability (per Colorado Revised Statutes §18-6.5-102), or child who are suspected to be victims of abuse, neglect, or exploitation, as defined in Colorado Revised Statutes §19-3-304, should be reported in a manner consistent with agency guidelines/procedures within 24 hours.
B. Any "suspected" or known incident of abuse, neglect, or exploitation must be reported
C. Protecting patient confidentiality does not legally justify a failure to report
D. There is established immunity for reporters “acting in good faith”
E. Domestic violence reporting is mandated if you are treating an adult with domestic assault injury
Purpose

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

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

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

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

Recommendations

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

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

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

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

D. When time and conditions allow, patients whom pre-hospital providers presume to require inpatient management may be transported to a hospital emergency department to avoid subsequent patient transfers.
0120 GENERAL GUIDELINES: BASE CONTACT FOR PHYSICIAN CONSULTATION

Purpose
A. To explain the NCPP Medical Director’s expectations regarding base physician contact.

General Principles
A. The NCPP protocols function as standing order treatment expectations designed to reflect CDPHE Chapter 2 Rules pertaining to EMS practice and Medical Director oversight. Protocols cannot account for every patient scenario. Deviation from protocol may at times be justified and in the patient's best interest. The NCPP MD places great faith in the training and expertise of NCPP 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: medication/procedure order for indications not articulated in the protocol but still within EMS provider scope of practice, patient refusal, and medical consultation and discussion.

C. Whenever possible, base physician contact should be accomplished using a mobile or landline telephone. These communication tools allow for more sophisticated/nuanced conversation; this takes on great importance when discussing complex emergency medical care. Contact by portable radio should only be employed when a landline or mobile phone is not readily available.

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

Preferred Base Contact Times.
A. The NCPP MD 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 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.
General Principles: Transportation safety

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

1. **For a child who is not a patient, but requires transport to a facility**  
   All reasonable effort should be made to transport children who are not patients in a vehicle other than the ambulance. If transport in a vehicle other than an ambulance is not possible, transport in a size-appropriate child restraint system in the front passenger seat (with air bags off) or rear-facing EMS provider’s seat in the ground ambulance.

2. **For a child who is injured/ill and whose condition does not require continuous monitoring or interventions**  
   Transport child in a size-appropriate child restraint system secured appropriately on a cot (rear-facing) or in an integrated seat in the EMS provider’s seat. Do not use a rear-facing child restraint system in a rear-facing EMS provider’s seat. If no child restraint system is available, secure the child on the cot using three horizontal restraints across the child’s chest, waist and knees and one vertical restraint across each of the child’s shoulders. Remove any bulky clothing on child before restraining. Use blankets to maintain warmth.

3. **For a child whose condition requires continuous or intensive monitoring or interventions**  
   Transport child in a size-appropriate child restraint secured appropriately on a cot. If no child restraint system is available, secure the child on the cot using three horizontal restraints across the child’s chest, waist and knees and one vertical restraint across each of the child’s shoulders.

4. **For a child whose condition requires spinal precautions or lying flat**  
   Perform spinal immobilization procedure per protocol. Three points of restraint with shoulder straps is the optimal for the patient. Avoid placing any restraints across the abdomen. Secure the patient, not just the immobilization device to the stretcher. We do not recommend utilizing the child restraint system if spinal immobilization is required, as upright positioning places additional axial load on the patient’s neck and emergent airway intervention is not possible.

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

### Transportation of the child with special health care needs:

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

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

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

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

D. Transport the child to their medical “home” hospital whenever possible.
0140 GENERAL GUIDELINES: 911 SYSTEM RESPONSE TO REQUEST FOR INTERFACILITY TRANSPORT

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

911 response to healthcare facility for interfacility transport

Is requested treatment during transport allowed under NCPP protocol?

Can transport be safely delayed until out-of-protocol treatment completed?

Is there an alternative treatment available within NCPP protocol?

Can out-of-protocol treatment be interrupted or discontinued during transport?

Can appropriate facility staff be added to crew to monitor treatment during transport?

This patient should be transported by Critical Care Transport or other appropriate interfacility transport team

Approved by EMS Medical Director February 1, 2019
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
- Inability to oxygenate / ventilate via BVM using two person technique with OPA / NPA
  - AND
- Inability to oxygenate / ventilate via i-gel O2

Contraindications:

- 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 when compared to BLS airway maneuvers. Therefore, it is relatively contraindicated in this population, 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. Intubation, if required, should not cause interruptions in chest compressions.
  - Do not remove a functioning supraglottic airway in order to perform intubation unless other indications are met.

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. During transport, 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”
  - Dislodgement
  - Obstruction
  - Pneumothorax
  - Equipment failure (no oxygen)
- Reconfirm and document correct tube position, preferably with waveform capnography, after moving patient and before disconnecting from monitor in ED

Approved by EMS Medical Directors February 1, 2019
### Indications for RSI:
- GCS < 10
- Airway compromise due to injury, obstruction, or swelling
- TBI or CVA with unconsciousness
- Combative with inability to maintain airway (check BGL)
- Trismus
- Respiratory failure or insufficiency

### Provider may use lower doses for sedation and/or induction per provider discretion. See second page for medication dosing schedule.

### Contraindications for RSI:
- Patients considered to be “difficult airway” candidates
- Patients who can be oxygenated and ventilated by less invasive means
- Patient < 12
- Patient who fits the Broselow-Luten tape
- Known hypersensitivity to any RSI medications

---

**Patient presentation indicates need for airway management**

- Assess ABCs: give supplemental O₂, monitor vital signs, cardiac rhythm, SpO₂ and waveform capnography. Does patient meet indications for RSI?
- Yes → Oxygenate and ventilate by least invasive means and treat underlying medical emergency.
- No → Able to oxygenate & ventilate with OPA/NPA & BVM?
  - Yes → Oxygenate and ventilate by least invasive means and treat underlying medical emergency.
  - No → Able to oxygenate & ventilate via i-gel?
    - Yes → Oxygenate and ventilate by least invasive means and treat underlying medical emergency.
    - No → Able to oxygenate & ventilate via ETI without use of RSI procedure?
      - Yes → Oxygenate and ventilate by least invasive means and treat underlying medical emergency.
      - No → Does the patient have any contraindications for RSI?
        - Yes → Contact Base
        - No → Perform RSI. Only 3 attempts allowed. Successful?
          - Yes → Verify ETT placement by ETCO₂, auditory confirmation, and symmetrical chest rise/fall
          - No → Fall back to less invasive means of oxygenation and ventilation should need arise
            - Provide supportive care
            - Contact Base if needed for consult
            - Consider 12-lead EKG

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Approved by EMS Medical Director February 1, 2019
1010 RAPID SEQUENCE INTUBATION

RSI Medication Information:

<table>
<thead>
<tr>
<th>Scope</th>
<th>Medication</th>
<th>Dose</th>
<th>Notes</th>
</tr>
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<tr>
<td>P/R/N</td>
<td>Etomidate</td>
<td>0.3 mg/kg IV</td>
<td>Adult and peds</td>
</tr>
<tr>
<td>P/R/N</td>
<td>Ketamine</td>
<td>1.5 mg/kg IV</td>
<td>Adult and peds</td>
</tr>
<tr>
<td>P/R/N</td>
<td>Succinylcholine</td>
<td>2 mg/kg IV</td>
<td>Adult and peds</td>
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<tr>
<td>P/R/N</td>
<td>Rocuronium</td>
<td>1.5 mg/kg IV (adults and &gt; 1 yo)</td>
<td>Adult and peds</td>
</tr>
<tr>
<td>P/R/N</td>
<td></td>
<td>0.5 mg/kg IV (pt &lt; 1 yo)</td>
<td>Adult and peds</td>
</tr>
<tr>
<td>P/R/N</td>
<td></td>
<td>0.1 mg/kg IV; then: 0.005-0.1 mg/kg/IV q 25-40 min PRN</td>
<td>Adult and peds</td>
</tr>
<tr>
<td>P/R/N</td>
<td>Norcuron</td>
<td>0.025 mg/kg/IV q 5 min PRN</td>
<td>Adult and peds</td>
</tr>
<tr>
<td>P/R/N</td>
<td>Vorced</td>
<td></td>
<td>Adult and peds</td>
</tr>
<tr>
<td>P/R/N</td>
<td>Ativan</td>
<td>1 mg IV q 10 min PRN</td>
<td>Adult and peds</td>
</tr>
</tbody>
</table>

RSI Pearls:

Preparation:
- Look at the patient and perform a 30 second bedside evaluation
- Evaluate the 3:3:2 rule
- Mallampati classification 1-4
- Obstruction with blood, teeth, fractures, foreign bodies, edema and hematomas
- Neck immobility either to known or suspected trauma or medical considerations
- Saturation – ability to maintain at least 88%
- Note landmarks for cricothyrotomy before continuing with RSI
- Have all intubation adjuncts and rescue airway equipment readily available
- Prepare all required equipment, including back-up equipment and suction
- Ensure functioning vascular access and prepare all required medications
- If patient is spontaneously breathing, pre-oxygenate with 100% O2 for 5min. If pt is hypoventilating, then gently assist respirations with BVM while performing Modified Bimanual Laryngoscopy (MBL).
- Position the patient in the sniffing position unless c-spine precautions are necessary
- Based on clinical judgement consider apneic oxygenation and/or CPAP/BIPAP for pre-oxygenation

Precautions:
- Paralytics will cause respiratory arrest; therefore, the patient must be ventilated
- Patients may have gastric distention and are at risk for aspiration. BVM ventilation should only be done while maintaining cricoid pressure
- Maintain inline stabilization for suspected c-spine injuries
- RSI is a gentle skilled procedure and an ETT should never be forced
- Firm pressure with a lubricated appropriately sized tube may be used when visualizing the ETT pass through the cords and encountering a subglottic stenosis or FB
- When flight crew is the highest level of care, flight crew is responsible for and should confirm all medication doses prior to administration

Complications:
- Paralytic agents, usually succinylcholine, causing malignant hyperthermia, hyperkalemia, or bradycardia
- Oral, lip, tongue trauma and/or chipped or damaged teeth
- Esophageal intubation with vomiting, aspiration, and if unrecognized cerebral anoxia
- Tube displacement, either mainstem or extubation

Considerations:
- 3:3:2 rule: 3 fingers in a fully opened mouth between teeth, 3 fingers from chin to top of neck, and 2 fingers from top of neck to thyroid cartilage
- Glottic Opening (A) and Mallampati (B) classification
- All patients that undergo RSI should be assumed to have a full stomach and are at risk for passive regurgitation and aspiration; this risk is increased with BVM ventilation

Approved by EMS Medical Director February 1, 2019
1010 RAPID SEQUENCE INTUBATION

Considerations (cont):
- Consider using Modified Bimanual Laryngoscopy (MBL) where an assistant’s hand is placed over the thyroid cartilage and the laryngoscopist’s hand is placed over the assistant’s hand while performing the BURP Maneuver. Once the optimal glottic view is obtained the assistant’s hand maintains position while the laryngoscopist’s right is removed in order to pass the tube.
- If you are unable to ventilate the patient the first time, use BVM ventilation between attempts. Try something different each time up to 3 total attempts.
- After the third failed intubation attempt, utilizing available adjuncts such as the GlideScope and Bougie, continue BVM and place a rescue airway (King Airway/LMA). If a definitive airway is needed then perform cricothyroidotomy, if indicated, then continue with usual confirmation and ventilation techniques.
- The choice of which RSI paralytic to use is a matter of consideration of the clinical situation. Succinylcholine has been shown to have a superior paralytic profile for RSI when compared to Rocuronium. Rocuronium should be a secondary choice for RSI after careful consideration of the clinical situation and the potential benefits and risks of each paralytic agent. In an obese patient, Rocuronium will delay desaturation by 46 seconds longer than succinylcholine and therefore may be a safer medication.
- RSI reporting forms must be sent in for all patients undergoing RSI in the State of Colorado. Pre and post RSI vital signs must be recorded as well as indication and any complications. It is imperative that the ETT position, at the corner of the mouth, is recorded initially, subsequently with every move of the patient and on arrival at the accepting facility.
- If the transport time is estimated to be > 15 minutes, then the patient should be placed on the ReVel ventilator.

Approved by EMS Medical Director February 1, 2019
1020 PROCEDURE PROTOCOL: PERCUTANEOUS CRICOTHYROTOMY

Introduction:

- Percutaneous cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances as defined below. The reason for performing this procedure must be documented and submitted for review to the NCPP Medical Director within 24 hours of the call.

Indications:

- A life-threatening condition exists AND advanced airway management is indicated, AND adequate oxygenation and ventilation cannot be accomplished by other less invasive means; unable to oxygenate/ventilate with BLS measures, i-gel, and endotracheal intubation.

Contraindications:

- Age < 12, likelihood of success with a favorable outcome in the pediatric patient is exceedingly low.
- Anterior neck hematoma is a relative contraindication.

Technique:

1. Prepare skin using aseptic solution
2. Position the patient in a supine position, with in-line spinal immobilization if indicated. If cervical spine injury not suspected, neck extension will improve anatomic view
3. Perform cricothyrotomy according to manufacturer’s instructions for selected device
4. Confirm and document tube placement by:
   a. ETCO₂, preferably with waveform capnography
   b. Breath sounds
   c. Rising pulse oximetry
   d. Other means as needed
5. Ventilate with BVM assessing adequacy of ventilation
6. Observe for subcutaneous air, which may indicate tracheal injury or extra-tracheal tube position
7. Secure tube with tube ties or device
8. Continually reassess ventilation, oxygenation and tube placement

Precautions:

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

Approved by EMS Medical Director February 1, 2019
Indications:
- In general the primary goals of airway management are adequate oxygenation and ventilation, and these should be achieved in the least invasive manner possible.
- Cardiac arrest:
  - The i-gel O₂ Airway is the primary airway for adult and pediatric cardiac arrest patients
- Respiratory Failure/Arrest requiring assisted ventilations
  - Primary advanced airway if less invasive ventilation measures are ineffective

Contraindications:
- Intact gag reflex
- Caustic ingestion
- Suspected esophageal disease

Technique:
1. For adult patients select proper size i-gel O₂ based on patient weight:
   a. # 3 Small adult 30-60kg (65-130 lbs)
   b. # 4 Medium adult 50-90kg (110-200 lbs)
   c. # 5 Large adult 90+ kg (200+ lbs)
2. For Pediatric patients utilize length based tape
   a. #1.5 Infant 5-12 kg (pink, red or purple)
   b. # 2 Small pediatric 10-25 kg (purple, yellow, white, blue or orange)
   c. # 2.5 Large pediatric 25-35 kg (orange or green)
3. Open packaging and remove inner tray, setting the packet of lubricant to one side within easy reach. Remove the i-gel O₂.
4. Open the packet of lubricant and place a small bolus on the inner side of the main shell of the packaging.
5. Grasp the i-gel O₂ along the integral bite block and lubricate the back, sides and front of the cuff with a thin layer of lubricant. (Ensuring any excess is removed prior to insertion.)
6. Grasp the lubricated i-gel O₂ firmly along the bite block. The patient should be in the ‘sniffing the morning air’ position with head extended and neck flexed. * Unless suspected spinal trauma.
7. Position the device so that the i-gel O₂ cuff outlet is facing towards the chin of the patient. Introduce the leading soft tip into the mouth of the patient towards the hard palate.
8. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
9. Once insertion has been completed, the tip of the airway should be located into the upper esophageal opening, with the cuff located against the laryngeal framework. The incisors should be resting on the bite block.
10. Secure the device with the commercial tube holder designed for the i-gel.
11. For pediatric patients secure with tape. Be sure to exert constant manual downward pressure to keep the i-gel properly seated.
12. Place extension elbow and capnography sensor on the end of i-gel O₂
13. Lubricate and insert appropriate size gastric tube into gastric lumen. – Paramedics only
   a. Size # 2 through # 5 use 12F
   b. Size # 1.5 use 10F
14. Once the i-gel O₂ has been correctly prepared, inserted and secured, positive pressure ventilation can commence.
15. Confirm tube placement by auscultation, chest movement and ETCO₂.
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.
**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. 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
5. Monitor patient continuously, record vital signs every 5 minutes.
6. Assess patient for improvement as evidenced by the following:
   - Reduced dyspnea
   - Reduced verbal impairment, respiratory rate and heart rate
   - Increased SpO₂
   - Stabilized blood pressure
   - Appropriate ETCO₂ values and waveforms
   - Increased tidal volume
7. Observe for signs of deterioration or failure of response to CPAP:
   - Decrease in level of consciousness
   - Sustained or increased heart rate, respiratory rate or decreased blood pressure
   - Sustained low or decreasing SpO₂ readings
   - Rising ETCO₂ levels or other ETCO₂ evidence of ventilatory failure
   - Diminished or no improvement in tidal volume

**Precautions:**

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

Indications:
A. MANDATORY: to be used any time patient is being ventilated
B. To identify endotracheal tube dislodgement
C. To monitor ventilation and perfusion in any ill or injured patient

Contraindications:
A. None

Technique:
A. Patients without ETT or advanced airway in place: place ETCO2 detector in-line between ambu
   bag and face mask
B. In patient with ETT or advanced airway: place ETCO2 detector in-line between airway adaptor
   and BVM after airway positioned and secured
C. Patients without ETT or advanced airway in place: place ETCO2 cannula on patient. May be
   placed under CPAP or NRB facemask
D. 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

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1080 PROCEDURE PROTOCOL: NEEDLE THORACOSTOMY FOR TENSION PNEUMOTHORAX DECOMPRESSION

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

   OR

B. Perform bilateral needle chest decompression in traumatic pulseless arrest if any trauma to trunk

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

Precautions:
A. Angiocath may become occluded with blood or by soft tissue
B. A simple pneumothorax is NOT an indication for needle decompression
C. Extra care is needed when performing on a pediatric patient.
1090 PROCEDURE PROTOCOL: SYNCHRONIZED CARDIOVERSION

Unstable tachyarrhythmia with a pulse  

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

Sedate with benzodiazepine if not contraindicated

Perform Synchronized Cardioversion

<table>
<thead>
<tr>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td>120, 150, then 200 Joules</td>
<td>0.5-1 Joules/kg</td>
</tr>
</tbody>
</table>

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 180 bpm in children and does not require or respond to cardioversion. Treat underlying causes.
- Transient dysrhythmias or ectopy are common immediately following cardioversion and rarely require specific treatment other than supportive care

Approved by EMS Medical Director February 1, 2019
Indications
1. Symptomatic bradyarrhythmias (includes A-V block) not responsive to medical therapy
2. Pacing is rarely indicated in patients under the age of 12 years. **CONTACT BASE**

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

Contraindications
1. Pacing is contraindicated in pulseless arrest.

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

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

1. Rescue or primary vascular access device when peripheral IV access not obtainable in a patient with critical illness defined as any of the following:
   A. Cardiopulmonary arrest or impending arrest
   B. Profound shock (systolic BP <80) with poor perfusion (adult patient)
   C. Decompensated shock based on hypotension for age (pediatric patient)
   D. Hypoglycemia with severe symptoms (e.g. unresponsive) and no venous access
2. Utilization of IO access for all other patients requires base station contact (NOT indicated for EMT-IV)

Complications:

1. Fracture
2. Compartment syndrome
3. Infection

Contraindications:

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

Side Effects and Special Notes:

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

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

Precautions

A. In cases of life-threatening bleeding, benefit of tourniquet use outweighs any theoretical risk of limb ischemia.
B. A commercially made tourniquet is the preferred tourniquet. If none is available, or if the wound is a junctional or core region of the body, pack the wound and apply direct pressure. A blood pressure cuff inflated to a pressure sufficient to stop bleeding is an acceptable alternative. No other form of improvised tourniquets is approved or permissible.

Technique

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

Approved by EMS Medical Director February 1, 2019
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.
1140 PROCEDURE PROTOCOL: OROGASTRIC TUBE INSERTION WITH ADVANCED AIRWAY

**Indications:**

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

**Contraindications:**

- Known esophageal varices

**Technique:**

1. Determine length of tube for insertion. Measure from tip of nose, to earlobe, then down to xiphoid process
2. Liberally lubricate the distal end of the orogastric tube
3. Suction airway and pre-oxygenate with BVM ventilations, if possible
4. Insert tube:
   a. For orotracheal intubation, insert tube into patient’s mouth; continue to advance the tube gently until the appropriate distance is reached
   b. For i-Gel airway, insert tube through gastric access lumen and continue to advance tube till appropriate distance is reached.
5. Confirm placement by injecting 30cc of air and auscultate for the swish or bubbling of the air over the stomach. Aspirate gastric contents to confirm proper placement.
6. Secure with tape to inserted airway and attach to low continuous suction if indicated

Approved by EMS Medical Director February 1, 2019
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

EMR/EMT  AEMT  CCT
EMT-I  Paramedic  RN

Attempt to determine cause of obstruction

Does patient show universal sign of choking?
Yes

Perform Heimlich maneuver
• For visibly pregnant or obese patients perform chest thrusts only

No

Assess severity of obstruction

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

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

Unconscious Patient

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

Able to ventilate or obstruction cleared?
Yes

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

No

Able to ventilate or obstruction cleared?

Mild or Moderate Obstruction

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

Able to ventilate or obstruction cleared?
Yes

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

For infants, 5 chest thrusts then 5 back blows

No

Is obstruction cleared?
Yes

For visibly pregnant or obese patients perform chest thrusts only

No

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

Able to ventilate or obstruction cleared?
Yes

Able to ventilate or obstruction cleared?
Yes

For infants, 5 chest thrusts, then 5 back blows

For infants, 5 chest thrusts, then 5 back blows

Approved by EMS Medical Director February 1, 2019
2010 ADULT UNIVERSAL RESPIRATORY DISTRESS

Respiratory Distress

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

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

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

Is asthma or COPD likely?

No

Yes
Adult Wheezing protocol

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

Approved by EMS Medical Director February 1, 2019
Respiratory Distress

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

Patent Airway?

Are ventilations adequate for age?

Is anaphylaxis likely?

Is there a barking cough and/or stridor?

Is there wheezing?

- 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

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

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

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

Adult Respiratory Distress Protocol and prepare for immediate transport

Give oxygen, check SpO₂, waveform capnography, & IV for severe respiratory distress

EMT may administer either Metered Dose Inhaler or nebulized albuterol (CONTACT BASE)

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, STEMI

- Consider IV magnesium

No
- Continue monitoring and assessment en route
- Be prepared to assist ventilations
- Contact base for medical consult as needed

Approved by EMS Medical Director February 1, 2019

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

- Pediatric Universal Respiratory Distress protocol
- Assess: SpO₂, respiratory rate, lung sounds, accessory muscle use and mental status

**Ascertain 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 (Contact Base)

Give nebulized albuterol + ipratropium
May give continuous neb for severe respiratory distress

Is response to treatment adequate?

#### Yes

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

Is response to treatment adequate?

#### Yes

**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.

- Assess for pneumothorax
- Assist ventilations with BVM

**BLS airway preferred in pediatrics**

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

#### No

**Is response to treatment adequate?**

- Assess for pneumothorax
- Assist ventilations with BVM

**BLS airway preferred in pediatrics**

### 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.
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 epinephrine

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

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

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

Approved by EMS Medical Director February 1, 2019
Universal Respiratory Distress Protocol

CHF/Pulmonary edema

Obtain 12 lead ECG: rule out unstable rhythm, STEMI

Give nitroglycerin (NTG)

Is oxygenation and ventilation adequate?

Yes

No

Start CPAP protocol

Is response to treatment adequate?

Yes

No

If failing above therapy:
- Remove CPAP and ventilate with BVM & OPA/NPA
- Assess for pneumothorax
- Assess for alternative diagnoses/complications
- Prepare to escalate to advanced airway

- Continue monitoring and assessment
- Transport
- Contact base for medical consult as needed

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.

Approved by EMS Medical Director February 1, 2019
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

VT/VF

Shock then CPR x 2 min

Yes

Shockable Rhythm?

No

VT/VF

Shock then CPR x 2 min

Yes

Shockable Rhythm?

No

Shockable Rhythm?

No

Asystole/PEA

CPR x 2 min

Yes

Go to Box A

No

Yes

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

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

Approved by EMS Medical Director February 1, 2019
**General Considerations**
(From 2015 AHA Guidelines)
- Newborn infants who do not require resuscitation can be identified generally based on 3 questions:
  - Term gestation?
  - Crying or breathing?
  - Good muscle tone?
- If answer to all 3 questions is “yes” then baby does not require resuscitation and should be dried skin-to-skin on mother covered to keep warm.
- If answer to any of 3 questions is “no” then infant should receive 1 or more of the following 4 categories of intervention in sequence:
  - Initial steps in stabilization (warm, clear airway, dry, stimulate)
  - Ventilation
  - Chest compressions
  - Administration of epinephrine and/or volume expansion
- Initial resuscitation steps should be completed within 60 seconds as illustrated.
- The decision to progress beyond initial steps is based on an assessment of respirations (apnea, gasping, labored, or unlabored breathing) and heart rate (>/< 100 bpm)

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

**Chest Compressions**
- Indicated for HR < 60 despite adequate ventilation with 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 at least 30 seconds of PPV AND another 60 seconds of chest compressions coordinated with PPV using 100% oxygen.

**Neonatal Oxygen Recommendations**
(From 2015 NRP Guidelines)
- Begin resuscitation of newborns ≥35 weeks gestation with room air. If breathing is labored, supplement with oxygen to the targets listed.
- Begin resuscitation of newborns <35 weeks gestation with supplemental oxygen titrated to the targets listed.

**Targeted Preductal (Right Arm) SpO2 After Birth**
(From 2015 NRP Guidelines)
- 1 minute: 60%-65%
- 3 minutes: 60%-75%
- 5 minutes: 80%-85%
- 10 minutes: 85%-95%
Termination of Resuscitation (TOR)
Medical Arrest – if no sign(s) of obvious death, begin resuscitation

Does the patient any of the following:
• Patient <14 years old OR
• Patient estimated > 20 weeks pregnant OR
• Bystander or EMS witnessed arrest OR
• Initial rhythm VF/VT OR
• AED used to defibrillate the patient

40 Minute Resuscitation*

20 Minute Resuscitation*

*Time beings when the first arriving EMS provider initiates CPR

This protocol is not applicable in hypothermic or drowning patients

Base Contact for TOR in all situations except for:
• Decapitation OR
• Incineration OR
• Decomposition OR
• Rigor Mortis OR
• Post-mortem lividity

Resuscitation may be terminated when a valid Do Not Resuscitate Order (DNR) is in effect. DNR must be:
• In written form
• Signed by a physician
• Dated
• Not expired
Post-Cardiac Care
- Following ROSC, several simultaneous and stepwise interventions must be performed to optimize care and maximize patient outcome
- Survival and neurologic outcome worsen with fever, hypoxia, hypo/hypercapnia, and hypotension. Post-ROSC care should focus on prevention of these elements

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

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

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)
  - Transfer to closest appropriate facility
  - Attach mechanical CPR device if concern for re-arrest

Approved by EMS Medical Director February 1, 2019
Tachyarrhythmia

- Support ABCs
- IV access
- Give oxygen
- 12 lead ECG

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

Is patient stable?
- Unstable signs include altered mental status, chest pain, hypotension, signs of shock-rate-related symptoms uncommon if HR <150 in adults

Stable
- Identify Rhythm
- Measure QRS width

Narrow QRS
- Adult < 0.12 msec
- Pediatric < 0.09 msec

Wide QRS
- Adult > 0.12 msec
- Pediatric > 0.09 msec

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

Converts
- Repeat 12 lead ECG
- Monitor in transport
- If recurrent dysrhythmia, go to box A

Doesn’t Convert
- Contact Base for consult
- Monitor in transport
- If unstable, go to box B

Unstable
- Immediate synchronized cardioversion

- Repeat 12 lead ECG
- Identify rhythm
- Contact Base

Probable Sinus Tachycardia?
- Yes
  - Search for and treat underlying cause: e.g. dehydration, fever, hypoxia, hypovolemia, pain
  - Ref. medical shock

Probable Sinus Tachycardia?
- No

EMT | AEMT | CCT
---|---|---
EMT-I | Paramedic | RN

Approved by EMS Medical Director February 1, 2019
Bradyarrhythmia with Poor Perfusion

Bradycardia with a pulse
Heart rate < 60

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

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

Adequate perfusion
- Cardiac monitor
- Identify rhythm
- 12-lead ECG
- Monitor and transport

Pediatric Considerations:
- Consider any HR <60 in an ill child abnormal regardless of age
- Perform CPR if HR < 60 with poor perfusion despite oxygenation and ventilation
- Administer epinephrine if bradycardia persists despite oxygenation/ventilation and chest compressions
- Atropine should be administered for increased vagal tone or AV block

Poor perfusion
- Give atropine
- If poor perfusion persists, perform transcutaneous pacing

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

Give epinephrine
- Ref. atropine
- If no improvement, Contact Base to discuss transcutaneous pacing

Ref. vaspressor infusion early if pacing and poor perfusion or hypotension persists either due to lack of capture or poor contractility despite capture

Monitor and transport

Approved by EMS Medical Director February 1, 2019
Considering life-threatening causes of chest pain in all patients:

- While assessing ABCs, provide supplemental oxygen, monitor vital signs, and check cardiac rhythm and start IV.

- Obtain a 12-lead ECG.

- Administer aspirin if the history and exam suggest possible cardiac chest pain.

**STEMI?**

- *No*:
  - Notify the receiving facility immediately if Cardiac Alert criteria are met.

- *Yes*:
  - Give SL nitroglycerin if suspected cardiac chest pain and no contraindication.

- An EMT may administer the patient's prescribed nitroglycerin. Contact Base for a verbal order.

For hypotension following nitroglycerin:

- Give a 250 ml NS bolus, reassess, and repeat the bolus as needed. Do not give additional nitroglycerin.

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

- Repeat the 12-lead ECG if the initial 12-lead is non-diagnostic and/or the patient's condition changes.

**Life threatening causes of chest pain:**

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

**Nitroglycerin Contraindications:**

- 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
Goal:

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

Inclusion Criteria:

- Chest discomfort consistent with ACS
- 12-lead ECG showing ST-segment elevation (STE) at least 2 mm in two or more anatomically contiguous anterolateral leads
  OR
- 12-lead ECG showing ST-segment elevation (STE) at least 1 mm in two or more anatomically contiguous inferior leads
  AND
- Age 35-85 years old (If STEMI patient outside age criteria, contact receiving hospital for consult)

Exclusion Criteria:

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

Actions:

- Treat according to ACS / Cardiac Chest Pain protocol en route
- Notify receiving hospital ASAP with ETA and request CARDIAC ALERT. Do not delay hospital notification. If possible, notify ED before leaving scene.
- Start 2 large bore peripheral IVs – avoid the right wrist or hand if possible in the field to avoid interfering with cath lab radial access
- If patient does not meet inclusion criteria, or has exclusion criteria, yet clinical scenario and ECG suggests true STEMI, request medical consult with receiving hospital emergency physician.

Additional Documentation Requirements:

- Time of first patient contact
- Time of first ECG
Intent:

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

A Ventricular Assist Device (VAD) is a mechanical device used to support circulation in a patient with significant cardiac ventricular dysfunction. The Left Ventricular Assist Device (LVAD) is commonly used to support the left side of the heart and to provide extra cardiac output to the body. This device can be placed short term to bridge patients until they can receive a heart transplant or long term for people who are not candidates for a transplant. LVAD patients can be identified by an electric driveline cable that comes directly out of their abdomen and connects to an external control pack powered by two external batteries they will be wearing with a bag, harness or vest. The patient still has underlying heart function and rhythm that can be assessed and treated as appropriate per protocols.

### Assess the patient

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

- Level of consciousness
- Respiratory rate and work of breathing
- Signs of perfusion: skin color/temperature, capillary refill (HR >100 is hemodynamically unstable)
- Cardiac monitor, SpO2, blood glucose level

### Is the patient stable?

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

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

### VAD RUNNING

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

### VAD NOT RUNNING

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

### Common VAD Complications

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

### Key Points

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

Approved by EMS Medical Director February 1, 2019
4000 MEDICAL SHOCK PROTOCOL

Hypotension for age and/or signs of poor perfusion

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

Consider etiology of shock state

- Treat dysrhythmia per appropriate protocol

Administer IV/IO fluids 20 mL/kg up to 1 L; reassess and repeat x1 if signs of hypotension persist

Contact base for additional IV/IO fluids if signs of hypotension persist

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, consider early administration of blood products
- Anaphylaxis
- Overdose
- Cyanide or carbon monoxide poisoning
- Other: PE, MI, tension pneumothorax

Pediatric Fluid Administration

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

Pediatric Shock

<table>
<thead>
<tr>
<th>Signs of Compensated Shock</th>
<th>Signs of Decompensated Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal mental status</td>
<td>Decrease mental status</td>
</tr>
<tr>
<td>Normal systolic blood pressure</td>
<td>Weak central pulses</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>Poor color</td>
</tr>
<tr>
<td>Prolonged (&gt;2 seconds) capillary refill</td>
<td>Hypotension for age</td>
</tr>
<tr>
<td>Tachypnea</td>
<td></td>
</tr>
<tr>
<td>Cool and pale distal extremities</td>
<td></td>
</tr>
<tr>
<td>Weak peripheral pulse</td>
<td></td>
</tr>
</tbody>
</table>
Altered Mental Status (AMS)

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

Persistent AMS?

Check BGL and consider trial of Naloxone

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

Seizure activity present?

Perform rapid neurologic assessment including LOC and BEFAST/RACE

Focal neuro deficit or positive BEFAST/VAN?

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

During transport:
• Give supplemental oxygen, monitor vital signs, airway, breathing
• Give fluid bolus if volume depletion or sepsis suspected
• Cardiac rhythm /12 lead ECG for unexplained altered mental status

Hypoglycemia protocol

Seizure protocol

Stroke protocol
Determine time last seen normal Ref. Stroke Alert criteria and contact destination hospital

Alcohol intoxication?

Drug/Alcohol Intoxication protocol

Approved by EMS Medical Director February 1, 2019
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

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

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
  - Heat intolerance
  - BRUE (Brief Resolved Unexplained Events, formerly ALTE)
POSSIBLE STROKE
Any acute onset neurological deficit not likely due to trauma regardless of age

Assess and stabilize ABCs, rule out/treat hypoglycemia, give \( \text{O}_2 \)

Assess BEFAST (Presence of single sign sufficient)

Stoke Alert Criteria
- Patient 18 years or older
- Last known well <8 hrs
- Positive BEFAST

- 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/12 lead ECG
- Ensure full monitoring in place: cardiac, \( \text{SpO}_2 \)
  - Elevate head 30°, if possible

Fully monitor patient and continually reassess:
- Improvement or worsening of deficit
- Adequacy of ventilation and oxygenation
- Cardiovascular stability

For stroke alert patients, perform VAN and report findings during pre-arrival biophone report to receiving ED

BEFAST Stroke Scale
(Balance, Eye/vision, Face, Arm, Speech, Time)

Assess Balance
Sudden loss of coordination/balance

Assess Eyesight
Sudden change in vision

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
Assess for slurred speech, dysphasia, or aphasia

BEFAST does not identify all strokes.
See below

Stroke Mimics (for all ages):
- Hypoglycemia
- Post-ictal paralysis
- Complex migraine
- Overdose
- Trauma
- Bell’s palsy

• BEFAST is designed to be very reproducible and identify those strokes most likely to benefit from reperfusion therapy, but does not identify all strokes.
• The BEFAST is highly specific for stroke, but is not extremely sensitive, meaning if you have a positive BEFAST, you are almost certainly having a stroke, but if you do not have a positive BEFAST, 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

Approved by EMS Medical Director February 1, 2019
### Stroke VAN

<table>
<thead>
<tr>
<th>Is arm weakness present?</th>
<th>Vision</th>
<th>Aphasia</th>
<th>Neglect</th>
</tr>
</thead>
<tbody>
<tr>
<td>(extend arms with palms up for 10 seconds)</td>
<td>Test peripheral vision. (hold 2 fingers on left, 1 on right). Observe for uneven eyes / cross eyed</td>
<td>Name 2 objects. Repeat “today is a sunny day”. Follow 2 commands (close eyes, make fist)</td>
<td>Forced gaze or inability to track (ask patient to follow your finger to right then left with their eyes). Unable to feel both sides at same time (close eyes, touch both arms). Ignoring one side</td>
</tr>
<tr>
<td>□ Yes. Continue VAN assessment</td>
<td>□ Yes</td>
<td>□ Yes</td>
<td>□ Yes</td>
</tr>
<tr>
<td>□ No. VAN negative. Exam done.</td>
<td>□ No</td>
<td>□ No</td>
<td>□ No</td>
</tr>
</tbody>
</table>

VAN positive: weakness plus one or all of the V, A, or N (vision, aphasia, neglect)  
VAN negative: no weakness or no evidence of V, A, or N
**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)

---

**Actively Seizing?**
- Yes
  - If seizure < 5 min, medication not necessary
  - If seizure > 5 min or recurrent seizure then treat as follows:
    - Ref benzodiazepine via most readily available route
  - Actively seizing?
    - Yes
      - Ref benzodiazepine via most readily available route
    - No
      - Actively seizing?
        - Yes
          - Ref benzodiazepine via most readily available route
        - No
          - CONTACT BASE

- No
  - Check pulse and reassess ABC
  - Give supplemental oxygen
  - Transport and monitor ABCs, vital signs, and neurological condition
  - Cardiac monitoring if recurrent seizures and/or meds given
  - Complete head to toe assessment

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

**Document:**
- 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

---

Approved by EMS Medical Director February 1, 2019
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

Attempt to establish IV access. Successful?

Yes

Administer dextrose IV & reassess patient & Recheck BGL

No

Recheck BGL and evaluate for other causes of altered mental status

Still symptomatic?

Yes

Symptoms resolved?

Yes

Monitor and transport or contact base for refusal if indicated

No

Considerations for Hyperglycemia:

- In general, treat the patient, not the glucose value. Treat shock if present.
- Consider NS bolus for patients with hyperglycemia and no evidence of fluid overload.
- Pediatric patients with concern for DKA should not exceed 10-20 mL/kg of fluids.

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

Approved by EMS Medical Director February 1, 2019
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.

Assess ABCs and ref. pertinent protocol based on complaint and assessment findings.

Is BGL elevated?

Yes

Assess ABCs and ref. pertinent protocol based on complaint and assessment findings.

Consider NS bolus for patients with hyperglycemia and no evidence of fluid overload.

Monitor and transport or contact base for refusal if indicated.

No

Assess ABCs and ref. pertinent protocol based on complaint and assessment findings.

Considerations for Hyperglycemia:
- In general, treat the patient, not the glucose value. Treat shock if present.
- Pediatric patients with concern for DKA should not exceed 10-20 mL/kg of fluids.
DEFINITION:
An infant < 1 year of age with episode frightening to the observer characterized by apnea, choking/gagging, color change or change in muscle tone

Support ABCs as necessary

Obtain detailed history of event and medical history

Complete head-to-toe assessment

- Any child with a BRUE should be transported to ED for evaluation
- Monitor vital signs en route
- Base contact to document all refusals

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
Clinical 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
    - Contact Base for non-transport

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

Bystander Administered Naloxone:
- Refer to naloxone protocol regarding bystander administered naloxone and patient refusal.
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
- Check BGL
- Consider specific ingestions

No

Specific ingestion?

Stimulant
Tachycardia, HTN, agitation, sweating, psychosis
Ref. Combative Pt

Tricyclic antidepressant
Wide complex tachycardia, seizure
Ref. Sodium Bicarbonate for QRS > 100 msec
If intubated, consider hyperventilation to ETCO₂ 25-30 mmHg
Ref. Seizure protocol

Organophosphate or nerve agent
DUMBELS/SLUDGE syndrome
Nerve Agent Antidote Kit
Ref. Atropine
Ref. Pralidoxime

Calcium Channel Blocker
Bradycardia, heart block, hypotension
Fluids per Medical Shock Protocol
Ref. Calcium and Ref. Vasopressor Infusion

β-Blocker
Bradycardia, heart block, hypotension
Fluids per Medical Shock Protocol
Ref. Vasopressor Infusion
Ref. Glucagon
(AEMT, EMT-I requires verbal order)

Approved by EMS Medical Director February 1, 2019
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, bites & envenomation

Generalized or Systemic Reaction
Multisystem involvement: skin, mucus membranes, and gastrointestinal symptoms

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

Ref. diphenhydramine
Transport and reassess for signs of deterioration

Yes

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

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

If persistent signs of severe shock with hypotension not responsive to previous treatment and fluid bolus:
- Repeat IM Epi
- Contact Base

No

Localized Reaction
Including isolated tongue, airway

Airway involvement?
Tongue or uvula swelling, stridor

Yes

Impending airway obstruction?

No

Yes

Give IM epinephrine & manage airway per Obstructed Airway Protocol

- Start IV
- Give diphenhydramine
- Give methylprednisolone

Definitions:

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

Approved by EMS Medical Director February 1, 2019
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

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

Ref antiemetic for vomiting

Ref 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

Approved by EMS Medical Director February 1, 2019
COHb | Severity | Signs and Symptoms |
---|---|---|
<15-20% | Mild | Headache, nausea, vomiting, dizziness, blurred vision |
21-40% | Moderate | Confusion, syncope, chest pain, dyspnea, tachycardia, tachypnea, weakness |
41-59% | Severe | Dysrhythmias, hypotension, cardiac ischemia, palpitations, respiratory arrest, pulmonary edema, seizures, coma, cardiac arrest |
>60% | Fatal | Death |

General Guidelines:
- **Signs and Symptoms of CO exposure include:** Headache, dizziness, coma, altered mentation, seizures, visual changes, chest pain, tachycardia, arrhythmias, dyspnea, N/V, “flu-like illness”
- The absence or low readings of COHb is not a reliable predictor of toxicity of other fire byproducts
- In smoke inhalation victims, consider cyanide treatment with Hydroxocobalamin as per indications
- The fetus of a pregnant woman is at higher risk due to the greater affinity of fetal hemoglobin to CO. With CO exposure, the pregnant woman may be asymptomatic while the fetus may be in distress. In general, pregnant patients exposed to CO should be transported.
**4120 ADRENAL INSUFFICIENCY PROTOCOL**

**Patient at risk for adrenal insufficiency (Addisonian crisis):**
- Identified by family or medical alert bracelet
- Chronic steroid use
- Congenital Adrenal Hyperplasia
- Addison’s disease

**Assess for signs of acute adrenal crisis:**
- Pallor, weakness, lethargy
- Vomiting, abdominal pain
- Hypotension, shock
- Congestive heart failure

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

**Give corticosteroid**
- Continue to monitor for development of hypoglycemia
- Contact base for consult if patient not responding to treatment
- Monitor 12 lead ECG for signs of hyperkalemia

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

Approved by EMS Medical Director February 1, 2019
Active nosebleed

ABCs

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

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

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

General Guidelines:
- Most nose bleeding is from an anterior source and may be easily controlled.
- Avoid phenylephrine in suspected ACS
- Anticoagulation with aspirin, clopidogrel (Plavix), warfarin (Coumadin) will make epistaxis much harder to control. Note if your patient is taking these, or other, anticoagulant medications.
- Posterior epistaxis is a true emergency and may require advanced ED techniques such as balloon tamponade or interventional radiology. Do not delay transport. Be prepared for potential airway issues.
- For patients on home oxygen via nasal cannula, place the cannula in the patient’s mouth while nares are clamped or compressed for nosebleed.
4140 SEPSIS PROTOCOL

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

- ABCs
- Complete set of vital signs
- Monitoring including SpO2 and waveform capnography
- O2 as appropriate

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

Are there two or more SIRS criteria?

Is there evidence of hypoperfusion? (ANY ONE OF THE FOLLOWING):
- Systolic BP < 90 mmHg (or hypotensive for age)
- MAP < 65 mmHG (or hypotensive for age)
- Altered Mental Status
- SpO2 < 90
- Sustained EtCO2 < 25 mmHg

Pediatrics: Additional criteria for hypoperfusion (either of these):
- Altered mental status (excluding simple febrile seizure)
- Delayed capillary refill

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

For ongoing hypotension, poor perfusion or pulmonary edema, consider Vasopressor Infusion (adult patients only)

NOTIFY HOSPITAL of Sepsis Alert

EMT  AEMT  EMT-I  Paramedic  CCT  RN

Principles of Sepsis
- Multiple studies demonstrate the benefit of early recognition and treatment of sepsis, including in the prehospital setting.
- Early hospital notification of sepsis may lead to shorter time to IV fluid and IV antibiotics, and increase survival.
- Patients with septic shock require aggressive IV fluid resuscitation. Starting dose should be 30mL/kg of IV fluid.
- EtCO2 has been demonstrated to correlate with serum lactate levels and predictive of severity of sepsis. A sustained EtCO2 < 25 mmHg may indicate hypoperfusion.
- A lactate level of ≥ 2 mmol/L is indicative of hypoperfusion.
5000 DROWNING

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

EMR/EMT | AEMT
---|---
Intermediate | Paramedic
CCT | RN

Spinal Immobilization before moving patient if trauma suspected

Assess mental status

Awake and alert

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

Awake but altered LOC

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

Comatose or unresponsive

Pulse Present?

- 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
- Transport
- Monitor ABC, VS, mental status, waveform capnography
- Consider advanced airway especially if suspected pulmonary edema
- Monitor cardiac rhythm

BLS airway preferred in pediatrics

PEA

- Handle very gently
- Start IV w. warm IVF
- Insulate patient
- Consider advanced airway especially if suspected pulmonary edema
- Monitor cardiac rhythm, waveform capnography

Asystole or V-fib/VT

- Single dose epinephrine IV/IO
- Consider advanced airway especially if suspected pulmonary edema
- Monitor cardiac rhythm

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

Approved by EMS Medical Director February 1, 2019
5010 HYPOTHERMIA

Hypothermia and Frostbite

- 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

EMR/EMT AEMT CCT
EMT-I Paramedic RN

Localized cold injury
Frostbite, frostnip

- Start CPR
- Attach AED/monitor/defibrillator
- Single defibrillation attempt only
- Treat per Universal Pulseless Arrest Algorithm with following changes:

      ·  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

      - Consider advanced airway especially if suspected pulmonary edema
      - Monitor cardiac rhythm, waveform capnography

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      ·  Single dose epinephrine IV/IO

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Comatose or unresponsive

Pulse Present?

No

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- Consider all causes of Altered Mental Status
- Suction as needed
- Start IV, obtain BGL and give oxygen
- Transport
- Monitor ABC, VS, mental status, waveform capnography

Yes

- Single dose epinephrine IV/IO

- Consider advanced airway especially if suspected pulmonary edema

- Monitor cardiac rhythm

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Systemic hypothermia
Presumed to be primary problem based on clinical scenario

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Frostbite, frostnip

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      ·  BLS: pulse and respirations may be very slow and difficult to detect if patient is...
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

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

Monitor VS and transport

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

Heat Stroke
- Very high core body temperature
- Hot, 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

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)

Remove excess clothing
For heat stroke, consider external cooling measures if prolonged transport
- Treat seizures, cardiac arrhythmias per protocol
- Monitor and transport

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

Administer O₂

Monitor and transport

Approved by EMS Medical Director February 1, 2019
5030 HIGH ALTITUDE ILLNESS

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

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

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

Symptoms of illness at altitude

- ABCs
- IV, oxygen
- Cardiac monitor

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

- O₂ NRB facemask
- Ref. CPAP
- Assist ventilations as needed
- Airway management as indicated
- Do NOT give diuretic

- Descent from altitude
- O₂ NRB facemask
- Assist ventilations as needed
- Airway management as indicated
- Elevate head of bed

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

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

Assess for localized vs. systemic signs and symptoms and depending on animal involved

Localized Symptoms:
- Pain, warmth and swelling

Ref. opioid for severe pain
Ref. diphenhydramine if needed for itching

Systemic Symptoms:
- Hives, generalized erythema, swelling, angioedema
- Hypotension
- Altered mental status
- Other signs of shock

Administer oxygen
Start IV

Treat per allergy & anaphylaxis protocol

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

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

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

Approved by EMS Medical Director February 1, 2019
Obtain specific information:
- Appearance of snake (rattle, color, thermal pit, elliptical pupils)
- Appearance of wound: location, # of fangs vs. entire jaw imprint
- Timing of bite
- Prior 1st aid

Assess for localized vs. systemic signs and symptoms

Localized Symptoms:
- Pain and swelling
- Numbness, tingling to bitten part
- Bruising/ecchymoses

Ref. Opioid for severe pain

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

Be prepared to manage airway if signs of airway obstruction develop

Ref. Opioid for severe pain

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

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

Specific Precautions:
- The prairie rattlesnake is most common venomous snake bite in the region.
- Exotic venomous snakes, such as pets or zoo animals, may have different signs and symptoms than those of pit vipers. In case of exotic snake bite, contact base and consult zoo staff or poison center for direction.
- Take a picture of the snake, including images of head and tail. If an adequate photo can be taken, it is not necessary to bring snake to ED.
Scene Safety
A. Scene safety and provider safety are a priority. Consider police contact if scene safety is a concern.
B. Refer to restraint protocol as needed, especially as it relates to A.

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

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

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

Transporting Patients Who Have a Psychiatric Complaint
A. If a patient has an isolated mental health complaint (e.g. suicidality), and does not have a medical complaint or need specific medical intervention, then that patient may be appropriately transported by law enforcement according to their protocols.
B. If a patient has a psychiatric complaint with associated illness or injury (e.g. overdose, altered mental status, chest pain, etc), then the patient should be transported by EMS
C. Reasonable concern for suicidal or homicidal ideation, or grave disability from psychiatric decompensation, is sufficient to assume that the patient may lack medical decision-making capacity to refuse ambulance transport. Effort should be made to obtain consent for transport from the patient, and to preserve the patient’s dignity throughout the process. However, the patient may be transported over his or her objections and treated under implied consent if patient does not comply.
D. A patient being transported for psychiatric evaluation may be transported to any appropriate receiving emergency department.
E. Accusations of kidnapping or assault of the patient are only theoretical and rarely occur. The 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.

Approved by EMS Medical Director February 1, 2019
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. A patient who does not have decision making capacity.

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.
Patient is agitated and a danger to self or others
- Attempt to reasonably address patient concerns
- Assemble personnel

Assume the patient has a medical cause of agitation and treat reversible causes

Does patient have signs of the Excited Delirium Syndrome?

No

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
- Ref benzodiazepine

Still significantly agitated?

- Repeat sedation dose
- If still significantly agitated 5 minutes after 2nd dose sedative, Contact Base

Yes

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

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, waveform capnography monitoring and rapid transport

General Guideline:
Emphasis should be placed on scene safety, appropriate use of restraints and aggressive treatment of the patient’s agitation.
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.
7000 CHILDBIRTH PROTOCOL

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

EMR/EMT AEMT EMT-I Paramedic CCT RN

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

If suspected imminent childbirth:
• Allow patient to remain in position of comfort
• Visualize perineum
• Determine if there is time to transport

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

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
  • 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

Approved by EMS Medical Director February 1, 2019
For All Patients with obstetrical complications

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

Possible actions for specific complications (below)

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

**Prolapsed Umbilical Cord**

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

**Breech Delivery**

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

**Complications of Late Pregnancy**

**3rd Trimester Bleeding (6-8 months)**

- High flow O₂ via NRB, IV access
- Suspect placental abruption or placenta previa
- Initiate rapid transport
- Position patient on left side
- Note type and amount of bleeding
- IV NS bolus for significant bleeding or shock

**Eclampsia/Toxemia**

- High flow O₂ via NRB, IV access
- SBP > 140, DBP > 90, peripheral edema, headache, seizure
- Transport position of comfort
- Treat seizures with Magnesium Sulfate
- See seizure protocol

**Shoulder Dystocia**

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

**Postpartum Hemorrhage**

- Massage abdomen (uterine fundus) until firm
- Initiate rapid transport
- Note type and amount of bleeding
- Treat signs of shock with IV fluid boluses
8000 GENERAL TRAUMA CARE

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

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

- General impression
- ABCs, LOC and BGL
- Rapid Trauma Assessment
- Apply pelvic stabilization if pelvic injury suspected
- Prepare for immediate transport
- SAMPLE history

- Give high flow oxygen
- Assist ventilations and manage airway as indicated
- Spinal immobilization if indicated
- IV access (not indicated for EMR)

Assess Disability and Limitation:
- Brief neuro assessment
- Extremity splinting if indicated

- Rapid transport to appropriate Trauma Center
- If unstable see Traumatic Shock Protocol
- Consider pain management
8000 GENERAL TRAUMA CARE

- Full Trauma Team activation for GCS <9
- Full Trauma Team activation for any pt with a tourniquet in place
Coordinate transport destination with law enforcement

See General Trauma Care protocol

**Sexual Assault**
- Confine history to pertinent medical needs
  - Provide same-sex provider if possible
  - Respect patient’s emotional needs
  - Don’t judge, accuse or confront victim
  - Protect evidence: No washing or changing clothes
- Coordinate transport destination with law enforcement

**Abuse/neglect**
- Observe pt’s behavior around caregivers
  - Watch out for:
    - Injury inconsistent with stated mechanism
    - Delayed treatment
    - Spreading blame
    - Conflicting stories
    - Prior/ healing injuries
  - Don’t judge, accuse or confront victim or suspected assailant
  - Transport patient if suspected abuse or neglect, no matter how apparently minor the injury

Report to law enforcement or per agency guidelines (See General Guidelines Mandatory Reporting)

**Mandatory Reporters:**
- EMS providers provide a critical layer of protection to vulnerable adults and children who have been abused.
- **C.R.S. 19-3-304** passed in 2014 extends the role of mandated reporters to EMS providers in Colorado
- Mandated reporters are to “register their suspicion” of abuse. This is not considered a direct accusation
  - Informing providers at the receiving facility of suspicions for DOES NOT meet the requirements of a mandated reporter - EMS providers **ARE REQUIRED** to register their suspicion with the appropriate authorities

Approved by EMS Medical Director February 1, 2019
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

Approved by EMS Medical Director February 1, 2019
8030 TRAUMATIC PULSELESS ARREST

- Are there obvious signs of death?
  - Yes → Contact Base for Consideration of Field Pronouncement
  - No → Consider Mechanism of injury

  - Blunt Trauma
    - Witnessed arrest? (Were signs of life observed by EMS at any point?)
      - Unwitnessed → Contact Base for possible Field Pronouncement
      - Witnessed → Witnessed arrest?

  - Penetrating Trauma

If unable to transport, begin BLS resuscitation. If no signs of life after 15 min, Contact Base for field pronouncement

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

**Rapid transport to appropriate trauma center.**
- Identify and treat reversible life threats
  - Control Exsanguinating Hemorrhage
  - Advanced airway
- Bilateral needle chest decompression if any trauma to trunk
- 2 IVs preferred IV NS bolus 20 mL/kg up to 1 L (IO if no IV access)
- Hypothermia prevention
- Initiate BLS CPR and ventilations at age-appropriate rate
- Ref. pelvic stabilization
- Pull/push for pediatric fluid administration

Approved by EMS Medical Director February 1, 2019
8040 TRAUMATIC SHOCK

- Initiate transport
- Treat en-route
- Complete history/physical

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

Yes
- Rapid transport to appropriate trauma center.
- Identify and treat reversible life threats
  - Control Exsanguinating Hemorrhage
  - Bilateral needle chest decompression if any trauma to trunk
- 2 IVs preferred IV NS bolus 20 mL/kg up to 1 L (IO if no IV access)
- Hypothermia prevention
- Pelvic stabilization if indicated
- Pull/push for pediatric fluid administration

Reassess

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

Reassess

- Complete General Trauma Care
- Keep patient warm
- Monitor ABCs, VS, mental status
- Transport to trauma center
- Monitor cardiac rhythm

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 Fluid Administration

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

Pediatric Shock

Signs of Compensated Shock
- Normal mental status
- Normal systolic blood pressure
- Tachycardia
- Prolonged (>2 seconds) capillary refill
- Tachypnea
- Cool and pale distal extremities

Signs of Decompensated Shock
- Decrease mental status
- Weak central pulses
- Poor color
- Hypotension for age

Approved by EMS Medical Director February 1, 2019
8050 AMPUTATIONS

General Trauma Care Protocol

Partial Amputation - Apply direct pressure to bleeding area or vessel

Complete Amputation

Apply tourniquet without delay

Life-threatening bleeding

Non-Life-threatening bleeding

Partial Amputation:
- Cover with moist sterile dressing
- Splint near-amputated part in anatomic position

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

Ref. opioid to treat pain
Ref. Ketamine 0.3mg/kg slow IVP, if vitals unstable

Monitor and transport to appropriate Trauma Center
- Treat other injuries per protocol

EMR/EMT
AEMT
CCT
EMT-I
Paramedic
RN

Approved by EMS Medical Director February 1, 2019
8060 HEAD TRAUMA PROTOCOL

General Trauma Care protocol

GCS < 8 or comatose?

Yes
Open airway and assist ventilations

Escalate to 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

• 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

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

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

Motor:
1. No motor response.
2. Extension to pain.
3. Flexion to pain.
5. Localizes pain.
6. Obey Commands.

Approved by EMS Medical Director February 1, 2019
General Trauma Care Protocol

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

Laryngeal trauma*

Yes

Avoid intubation if patient can be oxygenated by less invasive means

No

Severe airway Bleeding?

Yes

Direct pressure if appropriate

No

- 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

Transport ASAP to appropriate Trauma Center

- IV access en route – not indicated for EMR
- Treat other injuries per protocol
- Suction airway as needed

Monitor ABCs, VS, mental status, SpO₂, ETCO₂

Spinal precautions not routinely indicated for penetrating neck injury unless signs of neurologic injury

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

BLS airway preferred in pediatrics
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 changes in shoulders and upper extremities bilaterally and spares the lower extremities. It may be subtle

Spinal Immobilization not routinely indicated for penetrating neck injury

*Penetrating injury is very rarely associated with unstable spinal column*
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

No

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

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

Is there an objective neurological deficit?

Yes

No

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

Yes

No

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

Yes

No

Full spinal immobilization

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

Notes:
- Self-extrication from a vehicle with assistance is likely better than standard extrication procedures.
- Full spinal stabilization indicated for pts >65 with signs of trauma above clavicles.
- Consider improvised cervical spine immobilization such as towel rolls and tape or a SAM splint if needed to prevent airway compromise or worsening spinal injury if the rigid cervical collar cannot be correctly sized to the patient.
- Neurological exam documentation is MANDATORY in patients with potential spinal trauma, including serial exams.
- Cervical collar is not indicated in isolated penetrating trauma.
- Full spinal immobilization includes backboard, scoop, vacuum splint, or agency approved device.

Approved by EMS Medical Director February 1, 2019
Suspected Spinal Injury

Are helmet and pads in place?

Yes

Are helmet and pads properly fitted and snug?

Yes

Do helmet and pads allow for neutral alignment of spine with or without minimal padding?

Yes

Is facemask removable in timely manner?

Yes

Immobilize/Transport with helmet and pads in place

No

Standard immobilization techniques

No

Remove helmet and pads prior to transport

Overview

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

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

All athletic equipment is not the same. Athletic Trainers on scene should be familiar with equipment in use and be able to remove facemask prior to, or immediately upon, EMS arrival.
8110 CHEST TRAUMA

- Ref. General Trauma Care protocol
- Transport to Trauma Center

Are you able to oxygenate and ventilate effectively?

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 – not indicated for EMR

Flail Chest?

Yes

Assess need for assisted ventilations

No

Hypotension for age?

Yes

Ref. Traumatic Shock protocol in route

No

Monitor ABCs, VS, mental status, SpO₂, ETCO₂

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

BLS airway preferred in pediatrics

Ref. Chest Needle Decompression tension pneumothorax

Tension pneumothorax should be suspected with presence of the following:
- Unilateral absent breath sounds with JVD, hypotension, OR difficult/unable to ventilate
- Needle decompression is NOT indicated for simple pneumothorax

Approved by EMS Medical Director February 1, 2019
8120 ABDOMINAL TRAUMA

- General Trauma Care protocol
- Rapid transport to Trauma Center

- IV – not indicated for EMR
  - 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, SpO2, ETCO2

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
- Transport to Trauma Center

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

Respiratory Distress hoarseness or stridor?
- Yes
  - \(O_2\) NRB 15 Lpm
  - Manage airway and assist ventilations as indicated
  - Consider CO, CN
- No

Evaluate degree and body surface are involved

Critical Burn*?
- Yes
  - Start 2 large-bore IVs – not indicated for EMR
  - Hypotensive for age?
- No
  - 250 NS IV-not indicated for EMR

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

Monitor ABCs, VS, mental status, SpO2, waveform capnography

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

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

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

**Designated Regional Burn Centers**
Consider direct transport of isolated burns if time and conditions allow
- Children’s Hospital Colorado: Age \(\leq 14\)
- University of Colorado Hospital: Age \(\geq 15\)
- NCMC

**ABA Recommended Prehospital Fluid Therapy**
14 and older \(500 \text{ mL/hr NS or LR}\)
5 - 13 years \(250 \text{ mL/hr NS or LR}\)
Younger than 5 \(125 \text{ mL/hr DSW, NS or LR}\)
If no signs of clinical hypovolemia or shock, large volume of IV fluid not needed. For typical 30 minute prehospital time, give 250 mL bolus for patient age \(\geq 14\).
ADENOSINE (ADENOCARD)

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

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

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

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

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

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

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

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

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

Approved by EMS Medical Director February 1, 2019
Protocol
- Tachyarrhythmia with Poor Perfusion

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

**Description**
- Albuterol is a selective 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:**
- **Single Neb dose**
  Albuterol sulfate 0.083% (one unit dose bottle of 3.0 ml), by nebulizer, at a flow rate (6-8 lpm) that will deliver the solution over 5-15 minutes. May be repeated twice during transport (total of 3 doses).
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/VF.
- **Symptomatic VT and undifferentiated wide complex tachycardia with a pulse:**
  - CONTACT BASE 150 mg IV bolus infusion over 10 minutes.

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

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

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

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

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

Indications
- Nausea and vomiting

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

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

Dosage and Administration

**Ondansetron**
- **Adult:** 4 mg IV/IM/PO/ODT. May repeat x 1 dose as needed.
- **Pediatric ≥ 4 years old:** 4 mg IV/PO/ODT
- **Pediatric 6 months to 4 years old:** 2 mg IV/PO/ODT
- **Pediatric < 6 months:** BASE CONTACT

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

**Metoclopramide**
- **Adult:** 10 mg IV/IM.
- **Pediatric 8-12 years old:** 5 mg IV/IM.

Protocol
- Abdominal Pain/Vomiting
- Altitude Illness

**Promethazine and Metoclopramide Side effects/Special Notes:**
- Drowsiness, dizziness, dry mouth and blurred or double vision are common.
- If hypotension occurs, administer fluid bolus.
- Dystonia and akathisia may occur, and should be treated with diphenhydramine.
- Elderly may become agitated or disoriented. Consider reducing the dose in elderly patients.
**ASPIRIN (ASA)**

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

**Indications**
- Suspected acute coronary syndrome

**Contraindications**
- Active gastrointestinal bleeding
- Aspirin allergy

**How Supplied**
Chewable tablets 81mg

**Dosage and Administration**
- 324mg PO

**Protocol**
- Chest Pain

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

Description
Atropine is a naturally occurring antimuscarinic, anticholinergic substance. It is the prototypical anticholinergic medication with the following effects:
• Increased heart rate and AV node conduction
• Decreased GI motility
• Urinary retention
• Pupillary dilation (mydriasis)
• Decreased sweat, tear and saliva production (dry skin, dry eyes, dry mouth)

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

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

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

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

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

Stable Bradycardia and Poisoning/Overdose
CONTACT BASE

Protocol
• Bradycardia with poor perfusion
• Poisoning/Overdose

Special Considerations
• Atropine causes pupil dilation, even in cardiac arrest settings
BENZODIAZEPINES (LORAZEPAM, MIDAZOLAM)

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

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

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

Contraindications
- Hypotension
- Respiratory depression

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

Dosage and Administration

MIDAZOLAM:

Seizure or sedation for cardioversion or transcutaneous pacing:

Adult:
- **IV/IO route:** 2 mg
  - Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses
- **IN/IM route (intranasal preferred):** 5 mg
  - Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses

Approved by EMS Medical Director February 1, 2019
9070 MEDICATIONS

Pediatric:

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

**IN/IM route (intranasal preferred):** 0.2 mg/kg.
- Maximum single dose is 5 mg IN or IM. Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses.

### Sedation of severely agitated or combative patient

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

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

**LORAZEPAM:**

#### Seizure or sedation for cardioversion or transcutaneous pacing:

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

- **IN/IM route (intranasal preferred):** 2 mg
  - Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses

**Pediatric:**
- **IV route:** 0.05 mg/kg
  - Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses

- **IN/IM route (intranasal preferred):** 0.1 mg/kg
  - Dose may be repeated x 1 after 5 minutes if still seizing. **Contact Base** for more than 2 doses

**Sedation of severely agitated or combative patient**

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

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

---
Protocol
- Synchronized Cardioversion
- Transcutaneous Pacing
- Seizure

Approved by EMS Medical Director February 1, 2019
• 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.
- 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.
- Must give in separate line or flush between administration of IV sodium bicarb to prevent precipitation/formation of calcium carbonate.
- In setting of digoxin toxicity, may worsen cardiovascular function.

Dosage and Administration

**Calcium Chloride 10% Solution**

**Adult:**
- Pulseless arrest assumed due to hyperkalemia:
  - 1 g (10 mL) slow IV push
- Calcium channel blocker overdose with hypotension and bradycardia:
  - Contact Base for order. 1 g (10 mL) slow IV/IO push. Dose may be repeated every 10 minutes for total of 3 doses

**Pediatric:**
- Calcium channel blocker overdose with hypotension for age and bradycardia:
  - Contact Base for order. 20 mg/kg (0.2 mL/kg), not to exceed 1 g slow IV/IO push not to exceed 1 mL/min, may repeat every 10 minutes for total of 3 doses.

Protocol
- Universal Pulseless Arrest
- Poisoning/Overdose
Calcium Gluconate Gel

Description
Calcium Gluconate Gel or HF Antidote Gel is a topical medication used specifically for the treatment of Hydrofluoric Acid burns.

Indications
- Hydrofluoric Acid Burns

Precautions
- Apply only to intact tissue. Avoid mucous membranes.

Side effects

Drug Interactions
- Avoid cross contamination with other chemicals, surfaces, and self. Proper PPE must be used.

Dosage and Administration
- Apply gel over affected burn area.
- Place patient on Cardiac Monitor (large HF burns can cause hypocalcemia and cardiac arrest).

Protocol
- 8130 Burns
DEXTROSE

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

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

Precautions
• None

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

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

Protocol
• Hypoglycemia
• Universal Altered Mental Status
• Seizures
• Poisoning/Overdose
• Psych/Behavioral

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

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

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

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

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:
1 mg/kg slow IV/IO/IM. Repeat once. (not to exceed 50 mg)

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

Instructions

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

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

![Images of self-aid and emergency personnel aid]

• 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.

![Images of self-aid and emergency personnel aid]

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

**Special Considerations**

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

**Protocol:**

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

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

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

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

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

**Dosage and Administration**

**Adult:**
- **Pulseless Arrest**
  1 mg (10 ml of a 1:10,000 solution), IV/IO bolus.
  Repeat every 3-5 minutes.
- **Asthma:**
  0.3 mg (0.3 ml of a 1:1,000 solution) IM. May repeat dose x 1.
- **Systemic allergic reaction/Anaphylaxis:**
  0.3 mg (0.3 ml of a 1:1,000 solution) IM. May repeat dose x 1.

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

**Pediatric:**
- **Pulseless arrest:**
  0.01 mg/kg IV/IO (0.1 ml/kg of 1:10,000 solution).
  Subsequent doses repeated every 3-5min: 0.01 mg/kg IV/IO (0.1 ml/kg of 1:10,000 solution)
- **Bradyccardia (CONTACT BASE):**
  0.01 mg/kg (0.1 ml/kg of 1:10,000 solution) IV/IO
- **Asthma:**
  0.01 mg/kg (0.01 ml/kg of 1:1,000 solution) IM
  Alternative: 0.15 mg (0.15 mL of 1:1,000) for <25 kg and 0.3 mg (0.3 mL of 1:1,000) for >25 kg

Approved by EMS Medical Director February 1, 2019
Moderate to Severe Allergic Reactions

0.01 mg/kg (0.01 ml/kg of 1:1,000 solution) IM
Alternative: 0.15 mg (0.15 mL of 1:1,000) for <25 kg and 0.3 mg (0.3 mL of 1:1,000) for >25 kg

Protocol
• Universal Pulseless Arrest Algorithm
• Neonatal Resuscitation
• Allergy and Anaphylaxis Protocol
• Adult Wheezing
• Pediatric Wheezing

Special Considerations
• May increase myocardial oxygen demand and angina pectoris. Use with caution in patients with known or suspected CAD
**Etomidate**

**Description**
Etomidate is a hypnotic drug without analgesic activity. IV injection of Etomidate produces hypnosis characterized by a rapid onset of action, usually within 1 minute.

**Indications**
- Sedation for RSI.

**Precautions**
- Emergence occurs in 6-12 minutes. Versed should be used following successful RSI for continued sedation.

**Side effects**
- Myoclonus, nausea, and hypotension.

**Dosage and Administration**
- Adults IV: 0.3 mg/kg
- Peds IV: 0.3 mg/kg (Flight Nurse Only)

**Protocol**
- RSI

**Considerations**
- Administration to patients ≤12 years old by Flight Nurse only.
- Emergence occurs within 6-12 minutes, therefore the patient may be consciously aware.
- Adrenocortical suppression, but rarely of clinical significance.
- Use caution in patients under chronic steroid therapy and with adrenal insufficiency.
- In known or suspected sepsis, some evidence may suggest use of etomidate can produce adrenal insufficiency. In the septic patient ketamine is a better choice over etomidate in RSI.
GLUCAGON

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

Onset & Duration
• Onset: variable

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

Side Effects
• Tachycardia
• Headache
• Nausea and vomiting

Dosage and Administration
Adult:
Hypoglycemia:
• 1 mg IM
Beta Blocker/Calcium Channel overdose with hypotension and bradycardia:
• 2 mg IV bolus

Pediatric:
Hypoglycemia:
• < 25 kg: 0.5 mg IM.
• > 25 kg: 1 mg IM
Beta Blocker/Calcium Channel overdose with hypotension for age, signs of poor perfusion and bradycardia:
• 0.1 mg/kg IV

Protocol
• Hypoglycemia
• Poisoning/Overdose
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 that cannot be controlled with direct pressure. Most often involving wounds to the scalp, face, neck, axilla, groin or buttocks.

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

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

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

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

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

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

Adverse Reactions
- Hypertension
- Allergic reaction/anaphylaxis

Dosage and Administration
- Dosing
  - Adult dose is 5 gm IV
  - Pediatric dose is 70 mg/kg up to 5 gm IV

<table>
<thead>
<tr>
<th>Average Weight by Group</th>
<th>Grey 4 kg</th>
<th>Pink 6.5 kg</th>
<th>Red 8.5 kg</th>
<th>Purple 10.5 kg</th>
<th>Yellow 13 kg</th>
<th>White 16.5 kg</th>
<th>Blue 21 kg</th>
<th>Orange 26.5 kg</th>
<th>Green 33 kg</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose</td>
<td>275mg (11mL)</td>
<td>450mg (18mL)</td>
<td>600mg (24mL)</td>
<td>725mg (29mL)</td>
<td>900mg (36mL)</td>
<td>1150mg (46mL)</td>
<td>1475mg (59mL)</td>
<td>1850mg (74mL)</td>
<td>2300mg (92mL)</td>
<td>5000mg (200mL)</td>
</tr>
</tbody>
</table>

- 5 gm vial instructions:
  1. The Cyanokit consists of a 5 gm vial of hydroxocobalamin
  2. 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.
  3. Mix: The vial should be repeatedly inverted or rocked, not shaken, for at least 60 seconds prior to infusion.
  4. Infuse Vial: Use vented intravenous tubing, hang and infuse desired dose over 15 minutes.

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

Approved by EMS Medical Director February 1, 2019
**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

**Pediatric > 2**
**Bronchospasm:**
Ipratropium (0.5 mg/2.5 ml) with albuterol in a nebulizer
*Not indicated for repetitive dose or continuous nebulization*

**Protocol**
- Adult Wheezing
- Pediatric Wheezing
**Ketamin (Ketalar)**

**Description**
Nonbarbiturate, sedative hypnotic. Ketamine produces profound analgesia through dissociative anesthesia.

**Indications**
- Sedation for RSI.
- Pain Management
- Excited Delirium

**Precautions**
- Ketamine can cause hypertension and tachycardia. Caution should be used with cardiac, stroke and intracranial hemorrhage patients.

**Contraindications**
- Hypertensive Emergency
- Suspected MI or Stroke

**Side effects**
- Laryngospasm, vomiting, and hypersalivation.
- Emergence with anxiety, agitation or hallucinations.

**Dosage and Administration**
- **RSI Induction**
  - Adult IV: 1.5 mg/kg
- **RSI post intubation sedation**
  - Adult IV: 0.5 mg/kg
- **Pain Management**
  - Adult Dose IV: 0.3 mg/kg (slow IV push)
  - Pediatric Dose IV: 0.3 mg/kg (slow IV push)
  - Can only be administered following an initial dose of fentanyl or morphine
- **Excited Delirium**
  - Adult Dose IM: 4 mg/kg (max dose 500mg)

**Protocol**
- Agitated/combative patient
- Pain
- RSI

**Considerations**
- When giving for excited delirium make sure to have ETCO2 and cardiac monitoring. Be vigilant since airway management is very likely.
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:
  o 2 gm, IV bolus.
• Refractory Severe Bronchospasm:
  o 2 gm IV, mixed in 100mL of Normal Saline over 10min.
• Eclampsia:
  o 2 gm IV, mixed in 100mL of Normal Saline over 10min. May repeat x 1.

Protocol
• Universal Pulseless Arrest Algorithm
• Adult wheezing
• Obstetric Complications

Approved by EMS Medical Director February 1, 2019
METHYLPREDNISOLONE (SOLU-MEDROL)

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

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

Contraindications
- Evidence of active GI bleed

Adverse Reactions
Most adverse reactions are a result of long-term therapy and include:
- Gastrointestinal bleeding
- Hypertension
- Hyperglycemia

Dosage and Administration
Adult:
125 mg, IV/IO bolus, slowly, over 2 minutes

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

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

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

**Description**

Naloxone is a competitive opioid receptor antagonist

**Onset & Duration**

Onset: Within 5 minutes  
Duration: 1-4 hours

**Indications**

- For reversal of suspected opioid-induced CNS and 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. May repeat once.

**Pediatrics:**

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

**Protocol**

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

**Special Considerations**

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

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

Given the above risks, it is strongly preferred that patients who have received naloxone be transported and evaluated by a physician. However, if the patient clearly has decision-making capacity he/she does have the right to refuse transport. If adamantly refusing, patients must be warned of the multiple risks of refusing transport.

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

Description
Short-acting peripheral venodilator decreasing cardiac preload and afterload

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 sublingually (tablet or metered spray) every 5 minutes, titrated to symptoms unless SBP falls below 100.
- **CHF / Pulmonary Edema**:
  - 0.4 mg sublingually (tablet or metered spray) every 5 minutes, titrated to symptoms unless SBP falls below 100.
  - Nitropaste: 1 inch of nitropaste applied to chest wall if using CPAP. If SBP falls below 100, remove paste.

Protocol
- Chest Pain
- CHF/Pulmonary Edema
**OPIOIDS (FENTANYL, MORPHINE)**

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

**Indications**
- Treatment of hemodynamically stable patients with moderate to severe pain due to traumatic or medical conditions, including cardiac conditions, abdominal pain, back pain, etc.
- Treatment of shivering with Targeted Temperature Management (TTM).

**Contraindications**
- Hypotension < 90 SBP
- Respiratory depression
- Allergy / Hypersensitivity

**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.
- **Coadministration of opioids and benzodiazepines is only done with direct physician verbal order.**
- Chest wall rigidity has been reported with rapid administration of fentanyl.

**Dosage and Administration**

**FENTANYL:**
- Adult doses may be rounded to nearest 25 mcg increment
- **Administer ½ typical dosing in elderly or frail patient**

**Adult:**
- **IV/IO route:** 1 mcg/kg.
  - Dose may be repeated once
  - Additional dosing requires BASE CONTACT

- **IN route:** 1 mcg/kg.
  - Dose may be repeated once.
  - Additional dosing requires BASE CONTACT

**Pediatric (1-12 years):**
- **IV/IO route:** 0.5 mcg/kg.
  - Dose may be repeated once.
  - Additional dosing requires BASE CONTACT

- **IN route:** 0.5 mcg/kg.
  - Administer a **maximum of 1 ml of fluid** per nostril
  - Dose may be repeated once
  - Additional dosing requires BASE CONTACT
Pediatric < 1 year: BASE CONTACT

MORPHINE:

Adult:

IV/IO/IM routes: 2mg increments titrated to a maximum of 10mg
  • Additional cumulative dosing > 10 mg requires BASE CONTACT.
  • Morphine may not be given IN as it is poorly absorbed

Pediatric:

IV/IO/IM routes: 0.05 mg/kg
  • Dose may be repeated once.
  • Additional cumulative dosing requires BASE CONTACT.
  • Morphine may not be given IN as it is poorly absorbed

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

Approved by EMS Medical Director February 1, 2019
ORAL GLUCOSE (GLUTOSE, INSTA-GLUCOSE)

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

Indications
- Known or suspected hypoglycemia and able to take PO

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

Administration
All ages: One full tube 15 g buccal.

Protocol
- Universal Altered Mental Status
- Hypoglycemia
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 clinically and with waveform capnography.

<table>
<thead>
<tr>
<th>OXYGEN FLOW RATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHOD</td>
</tr>
<tr>
<td>Room Air</td>
</tr>
<tr>
<td>Nasal Cannula</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Simple Face Mask</td>
</tr>
<tr>
<td>Non-rebreather Mask</td>
</tr>
<tr>
<td>Bag/Valve/Mask (BVM)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Bag/Valve/Mask with Reservoir</td>
</tr>
<tr>
<td>Oxygen-powered breathing device</td>
</tr>
</tbody>
</table>
**PHENYLEPHRINE (INTRANASAL)**

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

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

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

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

**Protocol**
- Epistaxis
RACEMIC EPINEPHRINE

Description
Racemic epinephrine 2.25% is an aqueous solution that delivers 11.25 mg of racemic epinephrine per 0.5mL for use by inhalation only. Inhalation causes local effects on the upper airway as well as systemic effects from absorption. Vasoconstriction may reduce swelling in the upper airway, and 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.
Rocuronium (Zemuron)

Description
Rocuronium is a non-depolarizing neuromuscular blocking agent with a rapid to intermediate onset and a duration of 40-60min.

Indications
• Paralytic for RSI

Precautions / Contraindications
• Must be used only following sedation.

Side effects

Dosage and Administration
• Adults IV: 1.5 mg/kg
• Peds IV: 0.5 mg/kg (Flight Nurse Only)

Protocol
• RSI

Considerations
• Administration to patients <12 by flight nurse only.
• The choice of which RSI paralytic to use is a matter of consideration of the clinical situation. Succinycholine has been shown to have a more superior paralytic profile for RSI when compared to Rocuronium. Rocuronium should be a secondary choice for RSI after careful consideration of the clinical situation and the potential benefits & risks of each paralytic agent. (In the obese patient, Rocuronium will delay desaturation by 46 seconds longer than succinylcholine and therefore may be a safer medication.)
• Rescue airways should be readily available in case of difficult intubation or accidental extubation.
• Perform a neurologic assessment and note any focal deficits before administration because a detailed neurologic exam can’t be performed for 40-60 minutes which can be problematic in CVA evaluations.
• Decrease dose if severe liver disease.
**SODIUM BICARBONATE**

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

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

**Contraindications**
- Metabolic and respiratory alkalosis
- Hypocalcemia
- Hypokalemia

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

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

**Dosage and Administration**
**Adults and children (8.4% Standard Solution):**
- Tricyclic OD with hypotension or prolonged QRS > 0.10 sec
  - 1 mEq/kg IV/IO
- Cardiac Arrest with suspected hyperkalemia.
  - 1 mEq/kg IV/IO

**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.
Succinylcholine (Anectine)

Description
Succinylcholine is a depolarizing skeletal muscle relaxant. Onset of paralysis is rapid and has a duration of approximately 4-6 minutes.

Indications
- Paralytic for RSI

Contraindications
- In conscious and semiconscious patient an induction agent must be given first.
- Do not use in persons with a history of malignant hyperthermia
- Do not use in persons with familial or acquired skeletal muscle myopathies.
- Do not use in persons with spinal injuries or denervation syndromes (MS, ALS, muscular dystrophy, etc.)
- Do not use with patients following major burns or crush injury.
- Do not use with presence of hyperkalemia.
- Do not use with suspected organophosphate poisoning.

Side effects
- May trigger malignant hyperthermia

Dosage and Administration
- Adults IV: 2 mg/kg

Protocol
- RSI

Considerations
- The choice of which RSI paralytic to use is a matter of consideration of the clinical situation. Succinylcholine has been shown to have a more superior paralytic profile for RSI when compared to rocuronium. Rocuronium should be a secondary choice for RSI after careful consideration of the clinical situation and the potential benefits & risks of each paralytic agent. (In the obese patient, Rocuronium will delay desaturation by 46 seconds longer than succinylcholine and therefore may be a safer medication.)
- Rescue airways should be readily available in case of difficult intubation or accidental extubation.
- Perform a neurologic assessment and note any focal deficits before administration.
- Drug of choice for RSI when neurologic assessment is important on arrival to hospital i.e. CVA
TOPICAL OPHTHALMIC ANESTHETICS

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

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

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

Precautions
- Transient burning/stinging when initially applied.

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

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

Description:

**Dopamine**: vasopressor for indications of hypotension or bradycardia, but not for anaphylaxis or status asthmaticus.
- Endogenous catecholamine chemically related to epinephrine and norepinephrine. Increases blood pressure through combination of dopamine, alpha and beta receptor effects leading to increased heart rate, contractility and peripheral vasoconstriction.

Indications:

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

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

Adverse Reactions

- Dysrhythmia
- Hypertension
- Anxiety
- Angina
Dosage and Administration:

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

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

Special Considerations
- May increase myocardial oxygen demand and angina pectoris. Use with caution in patients with known or suspected CAD
**Advanced Resuscitation Technique (ART) CPR**

**Medical Arrest – Compressor**

<table>
<thead>
<tr>
<th>ART CPR</th>
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</thead>
<tbody>
<tr>
<td><strong>Chest Compressions with AED</strong></td>
</tr>
<tr>
<td>Start Chest Compressions</td>
</tr>
<tr>
<td>• Using palm-over-palm heel raising technique, allow full chest recoil with each compression</td>
</tr>
<tr>
<td>Second rescuer will apply and activate AED. Follow AED’s instructions. If pt remains in arrest continue chest compressions:</td>
</tr>
<tr>
<td>• Using palm-over-palm heel raising technique, allow full chest recoil with each compression</td>
</tr>
<tr>
<td>• Using audible metronome from AED, target compression rate is 100 per minute</td>
</tr>
<tr>
<td>• Follow AED verbal prompts regarding compression rate/depth and chest recoil</td>
</tr>
<tr>
<td>• AED will prompt rescuer(s) to stop compressions at next rhythm analysis phase – no rescuer intervention required</td>
</tr>
<tr>
<td>Compressor will count out compressions to facilitated 10:1 compression to ventilation ratio</td>
</tr>
<tr>
<td>• Do not pause compressions to deliver ventilations</td>
</tr>
<tr>
<td><strong>Chest Compressions with X-series monitor</strong></td>
</tr>
<tr>
<td>Compressor will use CPR dashboard displayed on X-series to give effective compressions</td>
</tr>
<tr>
<td>• Using palm-over-palm heel raising technique, all full chest recoil with each compression</td>
</tr>
<tr>
<td>• 100-120 compressions per minute</td>
</tr>
<tr>
<td>• 2 to 2.4 inches of compression depth</td>
</tr>
<tr>
<td>Compressor will count out compressions to facilitated 10:1 compression to ventilation ratio</td>
</tr>
<tr>
<td>• Do not pause compressions to deliver ventilations</td>
</tr>
</tbody>
</table>
## ART CPR

### Deploy X-series monitor
- Check patient’s responsiveness, breathing and pulse – verify pt is in **medical** arrest
  - Verify compressor is performing ART-style compressions
  - Verify ventilator is placing an I-Gel O2 Airway

### Transition patient from AED to X-series. Zoll AEDs use the same therapy pads as the X-series
- Do not remove appropriately placed therapy pads to put on another set of pads

### If ALS arrives prior to AED deployment, place pt on X-series
- Attach capnography sensor to BVM and activate capnography on X-series
- Verify appropriate compressions/ventilations using CPR Dashboard and capnography
- Place X-series so compressor and ventilators can see the CPR Dashboard and capnography data

## Defibrillation
- Verify Filtered ECG lead is displayed. Filtered ECG allows for rhythm identification while CPR is being performed
  - Do not pause compressions for rhythm check so long as Filtered ECG is working

### Defibrillate VF and pulseless VT
- Whenever there is a change from a non-shockable to a shockable rhythm
  - **OR**
  - At 2 min intervals whenever a shockable rhythm persists

## IV/IO access
- Post defibrillation verify resumption of compressions and ventilations

### Delegate
  - IV/IO placement
  - Medications prep and administration as indicated

### Lead Paramedic must
  - Correctly interpret and treat rhythm
  - Routinely verify efficacy of resuscitation using CPR dashboard and capnography

## Advanced Airway
- Ensure I-Gel O2 Airway is function properly
  - Waveform capnography
  - Auscultation of breathe sounds
  - Assess for breathe sounds over epigastrum
  - Ensure I-Gel is secured

### If unable to oxygenate and ventilate via I-Gel, see NCPP Oral Intubation Procedure Protocol
## Advanced Resuscitation Technique (ART) CPR

### Adult Medical Arrest – Ventilator

<table>
<thead>
<tr>
<th>ART CPR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Rescuer Oxygenation &amp; Ventilation</strong>&lt;br&gt;<strong>I-Gel O2 Airway</strong></td>
</tr>
<tr>
<td>Correctly size and insert an I-Gel O2 Airway</td>
</tr>
<tr>
<td>Insert ETCO2 between BVM and I-Gel. When ALS arrives connect ETCO2 to X-series</td>
</tr>
<tr>
<td>Connect BMV to O2 source, set regulator to 15 lpm</td>
</tr>
<tr>
<td>Oxygenate and ventilate the patient using 1 Rescuer Technique&lt;br&gt;• Squeezes bag 1 breath every 10th compression</td>
</tr>
</tbody>
</table>

### I-Gel O2 Airway Verification

Auscultate breath sounds and verify absent sounds over epigastrum<br>Verify effective oxygenation and ventilation with SPO2 and ETCO2<br>Oxygenate and ventilate the patient using 1 Rescuer Technique<br>• Squeezes bag 1 breath every 10th compression

| **2 Rescuer Oxygenation & Ventilation**<br>**BLS Airway** |
| If unable to oxygenate & ventilate via I-Gel, revert to 2 rescuer oxygenation & ventilation with BLS airway |
| Correctly size and insert an OPA |
| Connect ETCO2 to X-series and BVM once ALS arrives |
| Connect BMV to O2 source, set regulator to 15 lpm |
| Oxygenate and ventilate the patient using 2 Rescuer Technique<br>• First rescuer squeezes bag 1 breath every 10th compression<br>• Second rescuer seals mask to pt’s face use “C-E” Technique |